ROTORUA URBAN AREA
COMPREHENSIVE STORMWATER CONSENT APPLICATION
&
ASSESSMENT OF ENVIRONMENTAL EFFECTS

Updated June 2023

(Previously updated 30 June 2015 / December 2018)

Applicant:
Rotorua Lakes Council

Private Bag 3029
ROTORUA
Tel: 07 – 348 4199

Consultant
Sigma Consultants Ltd
1281 Hinemoa Street
P O Box 553
ROTORUA
Tel: 07 - 347 3456
Email: consult@sigmaconsult.co.nz
Website: http://www.sigmaconsult.co.nz

ROTORUA URBAN AREA – COMPREHENSIVE STORMWATER DISCHARGE CONSENT APPLICATION

TABLE OF CONTENTS

EXECUTIVE SUMMARY

APPENDICES

SEPARATELY BOUND

Comprehensive Catchment Management Plan (CMP)

EXECUTIVE SUMMARY

- Rotorua Lakes Council (the Council) has applied to the Bay of Plenty Regional Council (the Regional Council) for resource consent to authorise the discharge of stormwater within the Rotorua Urban Area (RUA). This application for resource consent will authorise the discharge of stormwater to Lake Rotorua from seven main catchment areas within the Rotorua Urban Area (RUA) except for discharges from high risk sites[1]. The discharges and associated works will be managed through one comprehensive catchment management plan. Consent is required under Rule DW R8 (Rule 37) of the Regional Natural Resources Plan (RNRP) for a comprehensive stormwater catchment consent.

- The Council has a total investment in the existing stormwater and land drainage infrastructure valued at $229 million in 2022. The stormwater infrastructure involves an annual operating cost of $5.5m (in 2022/23) with planned capital works of $90 million over the 10 years from 2021-2031.

- The discharges are from seven main catchment areas to Lake Rotorua. However, with the exception of the Waitawa Stream area, this application does not include maintenance works in or adjacent to the beds of streams, as the Regional Council is responsible for works relating to the Waingaehe, Puarenga, Utuhina, Waiowhero, Ngongotaha and Waiteti Streams and their tributaries within the RUA through the Upper Kaituna River Maintenance Area. Therefore, the application relates to the discharges up to and including the outlets to the streams but not for works in the streams themselves unless otherwise stated.

- The RUA Catchment has been further divided into 29 stormwater catchments for the purposes of managing stormwater. These are shown on the Map in Appendix A.

- The Council has statutory responsibility for the provision of public infrastructure including the provision of stormwater utility services throughout the District. In particular in urban areas, it is essential that the Council provides a reliable and effective stormwater network to minimise the effects of adverse weather events on people and property. An effective stormwater system is vital to assist with minimising the effects of adverse weather events on the district's economy and the health, safety and wellbeing of the people of the District.

- Stormwater runoff from the urban area can contain contaminants that could adversely affect the water quality in the waterways and lake, freshwater habitats, and cultural, recreational and aesthetic values, as well as increased runoff having physical impacts such as erosion, scour and deposition.

- Key issues affecting the management of stormwater quantity in the catchment are flooding due to high lake levels, high stream levels, lack of stream maintenance increasing high stream levels, and lack of capacity due to additional development, age or design level. Secondary flow paths, low gradient pipes near the outlets and blockages due to debris and sand build

[1] High risk sites – sites zoned industrial, HAIL or potential HAIL sites

up also lead to ponding. As stream maintenance and lake level management is undertaken by the Regional Council, flooding due to high lake and stream levels is outside the control of the Council.

- Key contaminants affecting urban freshwater quality in the catchment are heavy metals, pathogens and sediment. Research was undertaken as part of this application to identify the effects of stormwater on sediments in streams, drains and the lake, on water quality, MCI scores, and on mussels. In addition, grab samples of stormwater flow were analysed. These results were compared with past studies. In future a staged monitoring approach aims to identify the source of contaminants and then ensure contaminant loads are reduced. RLC will ensure the discharges from land use activities under RLC control do not exceed regional permitted levels or cause freshwater quality to exceed target attribute states (set by BOPRC and the community as part of the NPS process) for streams in the Freshwater Management Unit.

- Sediment build up at culverts and at stream mouths has impacted drainage and is an ongoing issue to address.

- The Lake Rotorua receiving environment showed minor impacts from stormwater discharges, but these are confined to stormwater discharge points (i.e. river mouths) and therefore the study identifies that the effects may be considered to be acceptable subject to mixing zones (but notes that further work would be needed to ascertain what is acceptable). Points of concern were the absence of mussels from the lake front (i.e. does this reflect lower levels of sampling, geothermal conditions or stormwater discharges) and the slow reduction of lead in mussel tissue near the Utuhina River mouth. This may reflect very slow 'flushing' of historic lead from the catchment or ongoing sources (industrial). This may warrant further investigation.

- The RNRP specifies three outcomes in relation to the water quality classifications, after reasonable mixing noting that all the streams are classified "Aquatic Ecosystem". The Waitawa area is classified as Regional Baseline/ Drain water. The required outcomes are as follows:
    - Aquatic Ecosystem – "No more than minor adverse effects"
    - Regional Baseline/ Drain water – "Any significant adverse effects"

  Lake Rotorua is "Managed State" and the outcome required is the same as Regional Baseline/ Drain water – "any significant adverse effects". Overall, the study concluded that the effect of the discharge of RUA stormwater on water quality in the receiving waters is minor.

- Water ways are of great significance to iwi and ensuring that the mauri of the waterbodies is not affected is fundamental to managing effects on water quality and quantity appropriately. The Essential Freshwater package has supported increased focus on Te Mana o te Wai and avoiding further degradation of freshwater.

- Managing the stormwater network to meet appropriate water quality standards and to avoid or minimise potential flooding is a positive outcome of the consent process. Without correct management in place, there may be disruption to the community, loss of economic return and loss of cultural, social and recreational values. This application brings together existing consents and current best practice and enables integrated management of stormwater within the RUA catchment.

- The Council proposes to exclude discharges from high risk sites within the RUA. The high risk sites will be placed on a register and identified on a map. High risk sites will be required to hold a stormwater licence. Where the permitted activity standards in the BOP Regional Natural Resources Plan are not met, they will be required to apply for and obtain a resource consent from BOPRC. The receiving environment monitoring will assist in identifying non-compliance and the Council will assist BOPRC where enforcement action is required in relation to any breaches.

- Stormwater management is essential to the wellbeing of the community served. The potential adverse effects that are identified in this assessment will be less than minor and it is considered that appropriate conditions can be imposed on the new consent to manage the stormwater network in an integrated manner.

- Consultation is an integral part of this application process and has proceeding in parallel to the application process to ensure that interested and affected parties are informed and consulted. The consultation process to date has included an engagement process currently being managed by Te Papa Ahurewa. This commenced with a hui a iwi in January followed by workshops. A public feedback process has been initiated through the Council's Korero Mai/ Let's Talk web page to seek public feedback.

- The comprehensive stormwater consent will enable a two tier system for managing and authorising works in relation to the stormwater infrastructure and actual and potential effects. The main mechanism is the CMP which will provide for and manage day to day activities, as required by the BOPRC Guidelines. The conditions to the consent will establish parameters for preparing the CMP and updating it, set standards for contaminants for monitoring, and impose requirements for liaison and reporting as necessary and reasonable.

- The Comprehensive Stormwater Catchment consent for the RUA is consistent with Section 5 of the RMA as it will enable the sustainable management of the physical resource that is the stormwater supply infrastructure. In addition, an efficient stormwater disposal system is essential to the social, economic and cultural well-being of the community. Granting consent will promote the purpose of the Act and will be consistent with Sections 6, 7 and 8 of the RMA.

1. INTRODUCTION

1.1 Rotorua District Council (trading as Rotorua Lakes Council, "the Council") has applied to the Bay of Plenty Regional Council (the Regional Council) for resource consent to authorise the discharge of stormwater within the Rotorua Urban Area (RUA). The application covers the discharge of stormwater and associated works for the whole of the RUA. Rather than holding individual consents, this process will integrate the authorisation and management of all discharges into one catchment wide consent. The discharges and associated works will then be managed through one comprehensive catchment management plan to achieve consistent outcomes.

1.2 The discharges located within seven main catchment areas and ultimately to Lake Rotorua. With the exception of the Waitawa area, this application does not generally include maintenance works in or adjacent to the beds of streams, as these are the responsibility of the Regional Council. Through the Upper Kaituna Catchment Control Scheme, the Regional Council is responsible for works relating to the Waingaehe, Puarenga, Utuhina, Waiowhiro, Ngongotaha and Waiteti Streams and their tributaries within the RUA. Therefore, the application relates to the works and discharges up to and including the outlets to the streams but not for works in the streams themselves, unless otherwise stated.

1.3 The Council originally applied for resource consent on 19 January 2001, with reference to a list of 18 discharge consents to be integrated in the new consent. Since that time, additional consents have been transferred to the Council or have expired and are continuing under section 124 of the Resource Management Act 1991 (RMA) until this application process has been completed. This document updates the original application and draws together the transferred consents and information relating to the urban stormwater network in accordance with the Resource Management Act 1991 (the RMA). It replaces and updates the document as lodged and previously provided.

1.4 The Regional Council procedure now requires that comprehensive stormwater consents are obtained to authorise catchment wide discharge of stormwater and associated works. The Regional Council document, *Guidelines for the Development of Comprehensive Stormwater Consent Applications and Catchment Management Plans,* supports the *Environment Bay of Plenty Stormwater Strategy.* This application has been prepared in accordance with the guidelines and current requirements of the relevant planning documents for practical evaluation. However, this does not take away any reliance on authorisation enabled through the application as lodged and reliance on section 124.

1.5 The key change since lodgement is that the application now makes it clear that consent is sought for discharges from all land except for high risk sites (it includes roads and reserves in RLC ownership). RLC intends to continue to license or register stormwater discharges, but this process is not intended to permit discharges to stormwater that exceed Regional Council permitted levels. It is proposed that Council will monitor, investigate and identify where possible non-compliant discharges so that these can be mitigated where possible. It is

proposed that BOPRC rules relating to the discharge of contaminants to water or discharges to land that may enter water will continue to apply to individual dischargers. A site specific consent from the Regional Council may be required for discharges that breach permitted levels. The high risk sites excluded are currently located in the Waitawa, Puarenga, Utuhina, Waiwhiro and Ngongotaha Stream catchments, being 5u, 6u, 7u, 15u, 16u, 17u, 19u and 27u.

1.6 In relation to monitoring water quality, part of the strategy for licensing/ registering discharges from high risk sites is to provide information and the ability to access and sample discharges when routine stream and network monitoring triggers investigative monitoring. The outcome of the iwi/hapū engagement process will also inform the final location and selection of monitoring sites. It is proposed that all catchments will be monitored at strategic locations and at locations identified as important through the engagement process. A Draft Monitoring Framework is included in this updated application as Appendix H.

1.7 RLC has a focus on enabling development and where there are flooding issues (quantity) then this will be addressed at the time of development. Funding has also been allocated to address localised flooding issues, with infrastructure renewal also funded on an annual basis.

1.8 The application comprises the relevant forms, description of the environment, the stormwater network and the status of the activities, together with an assessment of environmental effects. The separately bound *Rotorua Urban Area Stormwater Catchment Management Plan* (the CMP) and its technical appendices provide the basis for the application. The documents have been prepared in accordance with Schedule 4 of the RMA as well as relevant Regional Council documents.

2. BACKGROUND

2.1 The Rotorua Te Arawa Lakes are a taonga (treasure) to the people of Te Arawa. The Te Arawa Lakes Trust (TALT) represents the interests of Te Arawa hapu and whanau in relation to the 2006 Settlement. TALT have partnered with BOPRC and RLC to protect and restore the Rotorua Lakes. Rainwater runoff from the Rotorua urban environment is a component of the Te Arawa Rotorua Lakes Programme.

2.2 At a local level, Council provides stormwater network to convey rainwater that falls on the urban environment to our freshwater bodies. One of Council's priorities is supporting the protection and restoration of our natural environment.

2.3 The Council has statutory responsibility for the provision of public infrastructure including the provision of stormwater utility services throughout the District. In particular serving the urban areas, it is essential that the Council provides a reliable and effective stormwater network to minimise the effects of adverse weather events on people and property. An effective stormwater system is vital to assist with minimising the effects of adverse weather events on the district's economy.

2.4 At an operational level, the 2021-2031 Long Term Plan identifies that the Council's role in relation to stormwater and land drainage is:

- *To manage the drainage of excess rainfall so that property and people are protected from flood damage, and to minimise the adverse effects of stormwater run-off on the District's lakes and waterways.*

The Council undertakes the following tasks to:

- *Provide and maintain a stormwater drainage network of piped and open channels across the District and where appropriate stormwater treatment infrastructure. Maintain stormwater systems and operate to manage drainage of excess rainfall.*
- *Develop and implement programmes to progressively improve stormwater systems in areas that experience localised flooding usually resulting from extreme rainfall episodes.*
- *Manage an integrated approach to planning and maintaining a stormwater system that includes: ecosystems, people, urban design, communities and businesses, as well as cultural, amenity and social values. Regulate property owner responsibilities to utilise public stormwater facilities to assist in the provision of a fully functional stormwater system.*

The Long Term Plan sets out the expected level of service, performance targets, funding and projected capital expenditure.

2.5 These activities achieve community outcomes by providing a community stormwater system in a sustainable manner that mitigates the effects of excessive rainfall, contributes to improved water quality in the lakes, and minimises the impact of flooding on people, their properties and their livelihoods. The effects of climate change are likely to increase the intensity and frequency of heavy rainfall events and potential flooding will need to be addressed.

2.6 In urban areas where the highest concentration of impervious surfaces is found, the stormwater network is therefore essential to achieve the district, regional and national objectives and to fulfil the Council's statutory requirements.

2.7 Stormwater Catchments and Sub-Catchments

The Rotorua Urban Area Catchment (RUA Catchment) has been divided into 29 stormwater catchments for the purposes of managing the stormwater catchment. These relate to the main catchments as shown on the Map below and as set out in Table 1 below.

Table 1 - Catchments

Main Catchments	Urban Stormwater-Catchments
Waingaehe Stream	1, 2
Waitawa Area, including Kaipakau Stream	3, 4, 5, Part of 6
Puarenga Stream	Part of 6, 7
Utuhina Stream	11, 12, 13, 14, 15, 16
Waiowhiro & Waikuta Streams	18, 19, 20, part of 21, 22
Ngongotaha Stream	23, 24, 25, part of 27
Waiteti Stream	26, part of 27, part of 28
Central Area - Directly to Lake Rotorua	8, 9, 10
Koutu Area - Directly to Lake Rotorua	17
Ngongotaha Area - Directly to Lake Rotorua	Part of 27
Waiteti Area - Directly to Lake Rotorua	29

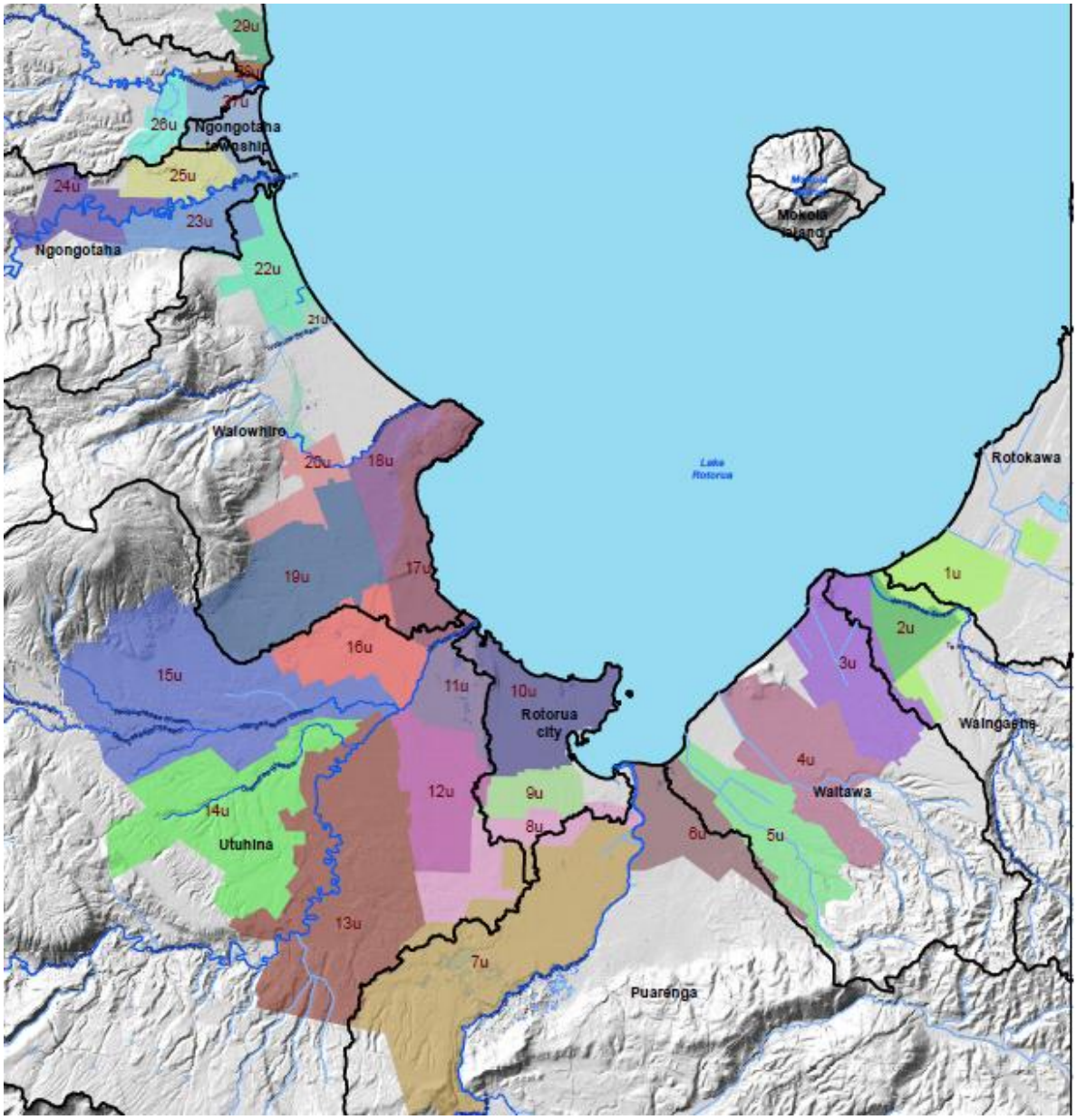


Figure 1 – Rotorua Urban Stormwater Catchment

3. EXISTING ENVIRONMENT

3.1 Introduction

3.1.1 The Rotorua Urban Stormwater Catchment comprises the area described in 2.7 above. It comprises mainly the lower parts of seven main catchments, of which four (Waiowhiro, Utuhina, Puarenga and Waitawa) comprise 80% of the land in the RUA land. There are also discrete areas that drain directly to the lake. The catchment area has an area of 312.16km^2 in total, including 2.70km^2 in the Rotorua city centre.

3.2 Lake Rotorua

3.2.1 Lake Rotorua is a large relatively shallow lake (average 20 metres depth). It has high nutrient inputs from the surrounding farmland and urban area, which have reduced the lake water quality over recent decades. This can limit the lake's popularity for contact recreation, but the lake's size, accessibility to Rotorua and good facilities make it popular for commercial boating, rowing and trout fishing.

3.2.2 Lake Rotorua is the largest of the Rotorua lakes and is a taonga of Te Arawa. It is economically the most important of the Rotorua lakes for tourism and recreation. The trout fishery is of international significance. The lake also has important landscape and scenic values. The Rotorua urban area follows the southern portion of the shoreline.

3.2.3 The lake has a number of streams but only one outflow through the Ohau Channel. Geothermal inputs to the lake occur directly from hot springs that emerge along the southern shore and from water which flows via the Puarenga and Utuhina Streams from Whakarewarewa and Kuirau Park geothermal areas.

3.2.4 The main issue for the lake has been an increase in phosphorous and nitrogen levels since the 1960s due to increased pastoral farming and urbanisation and the discharge of treated wastewater from 1973 to 1991 which led to a deterioration in water quality. However, the influence of the volcanic geology and outflows from geothermal areas is also significant, resulting in higher levels of some chemical compounds such as arsenic.

3.2.5 Nutrient load inputs have reduced since the discharge of treated wastewater was removed from the lake and discharged by spray irrigation to the forest. More recently the focus of measures to address declining water quality has been on reducing nitrate loss from farmland which is entering the lake from streams and springs. Water from groundwater and springs entering the streams and lake has been aged at between 25 and 170 years meaning that improvements in water quality may take many years to be measurable.

3.3 Geology and Soils

3.3.1 The Rotorua District geology is dominated by the Taupo volcanic zone calderas with the Okataina, Rotorua, Kapenga and Reporoa calderas being the primary formations. The Rotorua urban area is located on the southern end of the Rotorua caldera. The Rotorua caldera was formed by large ignimbrite eruptions and the subsequent collapse of the eastern

part of the original ignimbrite Mamaku Plateau. Tephra from more recent eruptions overlies the ignimbrite sheet and was ejected during the formation of the Rotorua caldera.

3.3.2 Lake Rotorua is surrounded by gently sloping former lake bed and shoreline deposits. In places, former lake shores exist as a line of terraces high up on the encircling tephra-covered hillsides, approximately 100 m above the present lake level. Beyond are the old cliffs which mark the rim of the caldera. Within the caldera rhyolite domes form Mt Ngongotaha, Mokoia Island, Pukeroa Hill, Kawaha and Hinemoa Points.

3.3.3 The parent materials from which the soils of the Rotorua District are derived consist mainly of volcanic deposits and may be divided into three broad groups. The first group is air fall tephra which originated from volcanic sources in the Rotorua and Taupo districts. Redeposited tephra, the second group, derived from Kaharoa ash or Taupo pumice, is evident as deposits of colluvium, water sorted alluvium or as lake deposits. This material was eroded from hills and, in the case of the latter two soils, re-deposited through water action. The third group of deposits is peat. This soil occurs in small basins around Lake Rotorua. Generally these peat soils are shallow and laid over alluvium derived from Taupo Pumice or lake deposits.

3.3.4 Land to the east, south and west of Lake Rotorua contain pockets of Holocene sediments which are the primary source of soft or very soft soils. These soils are overlain by more recent sediments which are highly variable and have been deposited by different geomorphologic processes. The Holocene sediments can be divided into three environments which provide the conditions for the formation of very soft to soft soils: Lake Rotorua and the swamps and stream deltas around the edges of the lake.

3.3.5 A more detailed description of the geology and soils of the catchment is contained in section 1.2 of the CMP.

3.4 Geothermal Systems

3.4.1 The Rotorua geothermal field underlies much of Rotorua City and the southern margin of Lake Rotorua (refer Figure 2 below). There are geothermal surface features along the lake edge at Ohinemutu, from Sulphur Point around to Ngāpuna, as well as in Kuirau Park, Whakarewarewa, through the Arikikapapa Golf Course area and at Lake Rotokawa. These natural features are important culturally and provide an important tourist attraction. In addition, geothermal resource is used for direct and indirect bathing and heating purposes.

3.4.2 The Puarenga and Utuhina Streams have significant inflows of geothermal water by the time they flow into the lake. This affects the water quality in the lower reaches of the streams.

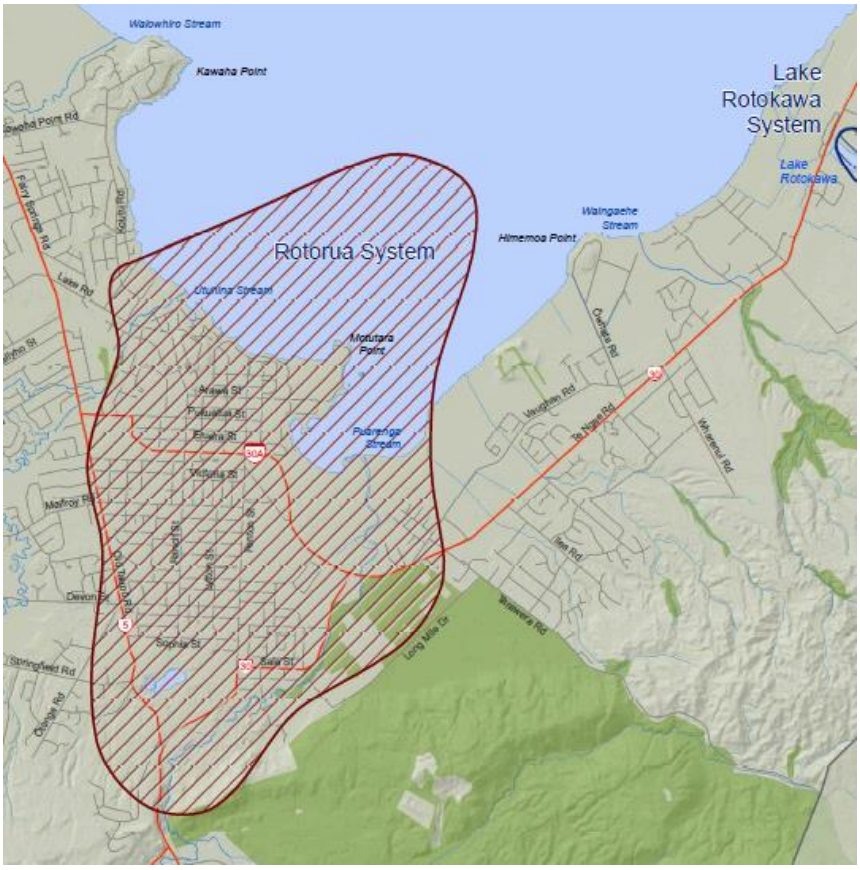


Figure 2 – Rotorua Geothermal System (Planning Map 212)

3.5 Urban hydrology and drainage

3.5.1 The Rotorua Urban Area catchment takes in the southern half of the Rotorua caldera and comprises parts of 7 catchment areas as well as some low lying areas that discharge by piped or open drains directly to the lake. Streams contribute 60% of the inflows to Lake Rotorua. The lake then drains through Ohau Channel to Lake Rotoiti and through the Okere/Kaituna River to the sea at Maketu. To reduce fluctuations in the lake level of Lake Rotorua, it is controlled within a range of 0.61m by stop logs at Ohau Channel. As much of the developed land around the lake edge is low lying, the level of the lake affects groundwater levels and streams discharging to the lake. The outflow from streams and drains may be affected by high lake levels, wave action, and erosion.

3.5.2 The stream catchments range in area from the Waingaehe at 11.07ha to the Puarenga at 82.72km^2: The Ngongotaha has the next largest catchment, followed by the Waiteti Stream and the Utuhina Stream. The Utuhina has two main tributaries, the Mangakakahi and the Otamatea. The Waitawa area includes two minor waterways, known as the Lynmore and Basley Drains, being ephemeral in nature. There are also discrete areas that drain directly to the lake.

3.5.3 The RUA catchment has an area of 312.03km^2 in total, including 2.70km^2 in the Rotorua city centre. Approximately one third of stormwater discharges directly to the lake by surface or subsurface drainage systems. The other two thirds discharge to streams before entering the

lake. Most stormwater is discharged from the area between the Puarenga and Utuhina Stream which includes the City Centre.

3.5.4 The CMP contains detailed descriptions of the streams and their hydrology.

3.6 Climate

3.6.1 Rotorua district has a warm, temperate climate. The warmest months are January, February and March, where the average temperature can reach 27°C, while the coolest months are June, July and August, where the minimum temperature ranges between 9°C-13°C. Rotorua has an annual average of 2117 sunshine hours and an average annual rainfall of 1400mm. Rainfall is spread out throughout the year, with the winter months receiving slightly more. Rotorua is situated inland from the coast and is sheltered by high country to the south and east, resulting in less wind than many other places in New Zealand.

3.6.2 Climate change is anticipated to have the following effects:

- Increase in winter temperature by 2 to 3°C
- Decrease in rainfall by up to 5%
- Increase in rainfall intensity by 4.3 to 8% per 1°C increase
- Drought frequency to increase four fold
- No change to risk from ex-tropical storms

3.7 Land use pattern

3.7.1 The Rotorua urban area occupies the southern part of the Rotorua caldera. The city developed around the villages of Ohinemutu and Whakarewarewa and extended west, south and east to the hill slopes of the caldera.

3.7.2 Land use within the RUA catchment is summarised as follows:

Table 2 – Land Use

Land Use	Area (km^2)	% Including Rural	% Excluding Rural
Residential	25.21	8.1	35
City Centre/ Commercial	4.59	1.5	6.4
Industrial	5.75	1.8	8
Reserves	28.39	9.1	39.4
Roads	8.12	2.6	11.3
Rural/ Lakes A	239.96	76.9	

3.7.3 Residential land – this makes up 25.21km^2 or 8.1% of the 312.03km^2 in the catchment. The traditional residential development has been on the flatter parts of the city south and west of the City Centre. Higher density residential areas are located immediately south of the city centre, but most of the residential areas are limited to more than 40% site coverage for amenity purposes and to enable stormwater soakage to ground. New subdivision has been occurring in Ngongotaha, Pukehangi, Lynmore, and along Vaughan Road. Land for future residential development is zoned south of Pukehangi Road and east of Wharenui Road.

There are otherwise limited areas of residential land available for greenfields development within the urban area and infill is occurring throughout the residential zones.

3.7.4 Commercial land – There is 4.59km^2 of commercial land which comprises 1.5% of the catchment. Most of this land is in the city centre but there are major suburban centres at Ngongotaha, West End and Te Ngae. Smaller local shopping centres are located throughout the urban area, with new centres recently developed on Te Ngae Road, Tarawera Road and Fairy Springs Road. There is further provision for a shopping centre in the Wharenui Road development area.

3.7.5 Industrial land – 5.75km^2 or 1.8% of the catchment is industrial zoned land. Most industrial land is located at Ngāpuna, Ngongotaha and around Old Taupo Road/ Fairy Springs Road. All industrial areas contain a mix of timber processing and general industry and stormwater runoff in some areas may potentially be contaminated. It is proposed that high risk sites zoned industrial will be excluded from this CSC so that each site must be managed to ensure compliance with Regional Council standards prior to discharge to Council's stormwater network.

3.7.6 Reserves – the reserves within the catchment comprise 28.39km^2 or 9% of the catchment. Reserves are largely in grass or planting but include large buildings such as the Events Centre and the Bathhouse and paved areas such as around the Soundshell and Lakefront jetty. The reserves also contain much of the stormwater infrastructure such as retention dams, drains and discharge outlets.

3.7.7 Rural land – although the catchment is largely developed, there is 239.96km^2 of rural land, being 76.9% of the catchment. Most of the rural land is located between Vaughan Road and the lake and west and east of State highway 5 north of Kawaha Point Road. Pockets are located around the fringes of the urban area. Some of the land is low lying or has high groundwater tables.

3.7.8 Roads – 8.12km^2 or 2.6% of the catchment is contained in roads, which are a significant contributor of stormwater to the catchment. Vehicles drop oils on to the road surface and these are washed into nearby streams and drains. All roads throughout the RUA are within the scope of this consent, across all zones.

3.7.9 The land described above is zoned in the District Plan for the purposes identified and any development is subject to performance standards. These include minimum floor levels and limits on building size and impervious site coverage, as well as requirements for disposing of stormwater.

3.8 Regionally Significant Infrastructure

3.8.1 The RUA catchment contains regionally significant infrastructure (as defined in the BOP Regional Policy Statement), including:

- Rotorua International airport;

- The regional strategic transport network as defined in the Bay of Plenty Regional Land Transport Plan and state highways as defined in the National State Highway Classification System;
- The national electricity grid, as defined by the Electricity Governance Rules 2003;
- Facilities for the generation and/or transmission of electricity where it is supplied to the national electricity grid and/or the local distribution network.
- Broadband and strategic telecommunications facilities, as defined in section 5 of the Telecommunications Act 2001;
- Strategic radio communications facilities, as defined in section 2(1) of the Radio Communications Act 1989;
- Local authority water supply network and water treatment plants;
- Local authority wastewater and stormwater networks, systems and wastewater treatment plants;
- Pipelines for the distribution or transmission of natural or manufactured gas or petroleum and other energy sources;
- Rotorua public hospital.

3.8.2 The management of stormwater is an essential part of protecting and providing regionally significant infrastructure to the district. The implications of the RPS on the management of effects on this infrastructure are discussed further below.

3.9 Contaminated Land

3.9.1 The Regional Council database identifies a number of sites as contaminated or potentially contaminated within the catchment. Most of these sites are located within the industrial zones of the city and the contamination relates to industrial processes. Other sites affect existing or past commercial sites which were used for service stations, sheep dips and waste disposal. Development and use of sites in the industrial and commercial zones is subject to specific controls on site coverage and services. High risk sites will be separately managed and are excluded from the scope of this consent.

3.10 Future Growth

3.10.1 According to work undertaken by Infometrics, under the baseline scenario, the Rotorua District population is projected to grow from 76,200 in 2020 to 90,800 in 2051, an increase of 14,600 people and an annual average growth rate of 0.6% per annum. Under the low growth scenario, the population is projected to grow by 3900 people to 80,0000 in 2051. Under the high growth scenario, the population would grow by 28,900 people to 105,200 in 2051[2].

3.10.2 There is enough infill capacity within existing suburbs to supply the medium forecast population growth through infill housing in existing zoned residential land. However, an additional area has been rezoned to the south-west of the urban area adjoining Pukehangi Road and additional land is being investigated as part of the current Future Development

[2] Infometrics, Rotorua District Employment, Population, Household and Visitor Projections – March 2020

Strategy for residential development in Ngongotaha, Lynmore/Owhata and between Vaughan Road and the Lake.

3.10.3 In addition to these areas, land at the end of Wharenui Road that was rezoned for residential and commercial activities by a plan change in 2004 is currently under development.

3.10.4 No new land has been zoned for industrial use, but business and innovation park zoning for the Scion campus, Eastgate Industrial park and the wood processing/mountain bike park at Waipa may result in more intensive development. In addition, the current Future Development Strategy work is identifying additional areas for industrial and commercial expansion and these will be confirmed through the FDS process.

4. DESCRIPTION OF THE STORMWATER NETWORK

4.1 Introduction

4.1.1 The Council manages stormwater and land drainage for the following reason:

"To manage the drainage of excess rainfall so that property and people are protected from flood damage, and to mitigate the adverse effects of stormwater run-off on the District's lakes and waterways."[3]

4.1.2 The catchment area comprises seven main catchment areas with a combined land area of approximately 4200ha. For management purposes the RUA catchment has been divided into 29 stormwater catchments that drain into Lake Rotorua or to streams that eventually drain into the lake.

4.1.3 The Rotorua Urban Area Land Drainage System consists of a network of pipes and drainage channels linking to streams flowing through the urban area or directly to the lake. The upper catchments are steep while catchments closer to the lake have flat to low gradients. In the lower catchments the water table is relatively high and there may be natural springs that also influence drainage.

4.1.4 Stormwater runoff from the urban area can contain contaminants that adversely affect the water quality in the waterways and lake, freshwater habitats, and cultural, recreational and aesthetic values, as well as increased runoff having physical impacts such as erosion, scour and deposition.

4.1.5 This chapter provides a description of the existing built infrastructure and the characteristics of the catchments, issues and proposed works.

4.2 Stormwater infrastructure Overview

4.2.1 The existing infrastructure generally comprises the following components:

Table 3 – Summary of Infrastructure[4]

Reticulated mains	284km
Manholes	5,539
Open drains	153km
Pump stations	2

4.3 Urban Stormwater Catchments

4.3.1 The Rotorua Urban Area stormwater catchment is managed through 29 stormwater catchments, some of which cross stream catchment boundaries. The stormwater catchment and stream catchment boundaries are shown in the map in Appendix A. These stormwater catchments provide the basis for the CMP. Full descriptions are contained in the CMP.

[3] Rotorua Lakes Council Long Term Plan 2021/31, page 61

[4] Rotorua Lakes Council Stormwater Asset Management Plan (AMP) 2021-2031, p7

4.3.2 The land use in each stormwater catchment is provided in Table 4 below.

Table 4 - Stormwater-Catchment Land Use (%)

Catchment	Residential	Rural/ Lakes A	Road	Commercial	Industrial	Reserve
Waingaehe	10	83	2	-	-	5
Waitawa Area	47	33	8	6	3	3
Puarenga	2	27	2	<0	4	13
Utuhina	16	67	5	<0	2	10
Waiowhiro	28	49	8	<0	4	11
Ngongotaha	2	75	2	<0	<0	21
Waiteti	2	88	2	<0	<0	8
Lake Rotorua direct (City)	10	<0	17	22	<0	51
Lake Rotorua direct (Ngongotaha)	38	<0	11	<0	34	17

4.4 Locations of discharges

The points of discharge are located in stormwater catchments as set out in Table 5 below.

Table 5 - Outlets by Stormwater Catchment

Stormwater catchment	Stream catchment	Area (km^2)	Annual Runoff Rational method $1000m^3/s$	Outlets to Streams	Outlets to lake	Outlets to drains	Other Outlets	Total outlets
1u	Waingaehe	1.2	565	11	8	-		19
2u	Waingaehe	0.6	199	-	1	3		4
3u	Drain to lake	1.8	605	-	2	1		3
4u	Drain to lake	1.9	661	-	1	-		1
5u	Waitawa	1.5	699	2	1	-	1 land	4
6u	Waitawa/ Puarenga	1.3	722	3	2	-		4
7u	Puarenga	4.5	1719	18	-	-	6 geothermal	24
8u	Drain to lake	1.1	438	-	-	-		-
9u	Drain to lake	0.5	321	-	1	3		4
10u	Drain to lake	1.4	388	-	11	-		12
11u	Utuhina	0.8	207	7	1	1		10
12u	Utuhina	1.4	583	1	-	1		2
13u	Utuhina	4.4	1456	45	-	-		45
14u	Utuhina	2.9	962	32	-	-		32
15u	Utuhina	4.2	1571	35	-	-		35
16u	Utuhina	1.3	1123	4	-	-		4
17u	Drain to lake	1.2	456	-	20	-		20
18u	Waiowhiro	0.8	261	4	2	-		6
19u	Waiowhiro	2.3	1048	-	-	-		-
20u	Waiowhiro	0.6	276	15	-	-		15
21u	Waiowhiro	0.3	119	2	2	2		6
22u	Drain to lake	0.8	378	-	6	-		6
23u	Ngongotaha	0.9	243	16	1	-		17
24u	Ngongotaha	0.8	163	8	-	-		8
25u	Ngongotaha	0.6	261	-	-	-		-
26u	Waiteti	0.4	104	2	-	-		2
27u	Ngongotaha/ Waiteti	0.8	426	4	10	-		14
28u	Drain to lake	0.2	57	-	1	-		1
29u	Waiteti	0.2	79	1	3	-		4
Total				**210**	**73**	**11**	**7**	**301**

4.5 Ownership of sites

The land on, over or through which the stormwater network is connected is a mix of Crown, Council and privately owned land including land in Māori title.

4.6 Existing consents

4.6.1 The Council holds some 39 consents that relate to the discharge or diversion of stormwater, and associated works. Some of these have always been held by the Council, while others have been transferred over time. A list of these existing consents is contained in Appendix D.

4.6.2 Some of these consents have expired but the expired consents have remained in effect under section 124 of the RMA until this application process has been completed.

4.7 Value of investment

The Council's total stormwater and land drainage infrastructure was valued at $229,000,000 in 2022[5]. This includes some infrastructure outside the urban area catchment.

4.8 Value of operational costs

The stormwater infrastructure in the District involves an annual operating cost of approximately $5.5m (in 2022/2023) with planned capital expenditure of $90 million over the 10 years from 2021-2031[6].

4.9 Stormwater Management Issues

4.9.1 Key issues affecting the management of stormwater quantity in the catchment are:

- Flooding due to high lake levels, high stream levels, lack of stream maintenance which leads to high stream levels, secondary flowpaths, and lack of capacity due to age or design level
- Lake levels – Lake Rotorua is managed within an authorised range. Ground near the lake edge is often low lying and high lake levels affect groundwater levels and stream levels. Flooding may occur when high rainfall coincides with high lake levels and outlets are blocked.
- Low gradient pipes – although the upper parts of the catchments can be steep, the lower parts are flat and this affects their efficiency.
- Lake wave action can lead to sand build-up blocking outlets of drains and streams.
- Debris can block inlets and cause flooding.
- Lack of capacity, specially to enable new development.
- Stream maintenance – the Council is not responsible for stream maintenance as this is a function of the Regional Council under the Upper Kaituna Catchment Control Scheme. Clearing vegetation and repairing erosion is required to ensure that high stream levels do not block outlets to streams. Maintenance is not always carried out on a regular enough basis to avoid flooding.

[5] Rotorua District Council Stormwater Asset Management Plan 2021-2031, page 7
[6] Rotorua Lakes Council Stormwater Asset Management Plan 2021-2031, page 42

The issues of high lake levels, high stream levels, stream maintenance and streambank erosion are under the control of BOPRC and are outside the management role of the Council. The separation of management roles is an issue to be addressed through liaison with the Regional Council.

4.9.2 Key issues that can arise from stormwater runoff to the waterbodies in the catchment include:

- Runoff from industrial and contaminated sites leading to heavy metal contaminants in stream and lake water
- Runoff from roads increasing TPH in stream and lake water
- Increased flood events carrying sediment loads and contaminants
- Loss of riparian vegetation and lower base flows leading to increased temperatures.

4.9.3 An description of the individual catchments is provided in section 6 and an overview in Appendix B sets out the key issues and ways in which they will be addressed for each catchment. Full details are set out in the separate CMP. This section provides a short summary of the characteristics, issues and proposed works across the RUA catchment.

4.10 Extreme events

4.10.1 Flooding around the lake edges will occur as a result of heavy rainfall coinciding with high lake levels. This is likely to increase with climate change.

4.10.2 However, higher risk but low probability events would result from the Ohau Channel blocking due to volcanic or seismic activity. Seiches could also result in severe flooding.

4.11 Stormwater management – operational requirements

4.11.1 Regular maintenance of streams is required to keep hydraulic performance at the required level. The Council controls discharges only to the point of discharge to streams except for discharges in the Waitawa area or to Lake Rotorua. The Regional Council is responsible for maintaining the six streams within the RUA. This includes vegetation clearance, weed control and repairing erosion along the banks. A lack of maintenance can result in ponding and flooding when drain outlets are blocked by high stream levels. The same situation applies to Lake Rotorua as the lake level is controlled by the Regional Council. High lakes levels coinciding with high rainfall events can also lead to flooding.

4.11.2 For the Waitawa area and drains, works within the waterway are required to clear vegetation, sediment build up, and weed control. Tree roots, sedimentation, weed growth and erosion can adversely affect the efficiency of the infrastructure. Maintenance required includes clearance of weeds, sediment, rubbish and tree roots from debris tracks, drain and stream channels. This involves work by hand or machinery, depending on access. Away from waterways, debris screens and cesspits must be kept clear to enable their efficient operation.

4.11.3 Work is undertaken in accordance with the Council's Stormwater Maintenance Manual.

4.12 Stormwater infrastructure – Proposed Work

4.12.1 Projects are currently proposed to upgrade the infrastructure in ten of the stormwater catchments. The programme of works and their timing is subject to confirmation as investigations proceed, with confirmed projects set out in Table 6 below. Modelling, detailed design and prioritising is being undertaken as part of the Stormwater Programme.

4.12.2 Additional projects will be required to service growth areas. These projects will be undertaken within the framework of the comprehensive stormwater consent, the scope of which is set out in section 7 below.

4.12.3 The works currently proposed are set out in Table 6 as follows:

Table 6 – Proposed Works

Catchment	Description of Project	Estimated Cost	Programmed completion date
15	Linton Park Detention Pond Refurbishment of existing detention bund to comply with new building regulations and increased storage capacity.	$12M	December 2023 (work is now underway)
4	Morey Street East and West Detention Dams to enable the development of about 1,000 lots within the Ngāti Whakaue Tribal Land at Wharenui Road.	$15M	December 2023 (work is now underway)
13, 14, 15	Several detention ponds and stormwater network upgrades within the greater Utuhina catchment. These works will mitigate existing flooding problems, address climate change and enable development of the PC2 area and infill development within the urbanised areas of Catchment 13, 14 and 15.	$39.30M	Stage 1 – October 2026 Stage 2 – July 2027 Stage 3 – June 2028 (Detailed Feasibility Study underway)
4	Stormwater Conveyance upgrades of the Kaipukau catchment to address flooding issues and climate change and enable development of the Owhatiura South Block and other areas	$5.0M	December 2025
18	Stormwater detention pond and stormwater network upgrade to address flooding issues and climate change and enable development within the Frank Street and part of Waikite Rugby Club.	$3.32M	December 2027
13	Stormwater detention ponds to address flooding issues and climate change and enable infill development within Catchment 13 of the stormwater system.	$15.26M	December 2027
17	Stormwater network upgrades to address flooding issues and climate change and enable development at Bennetts Road.	$3.47M	December 2027

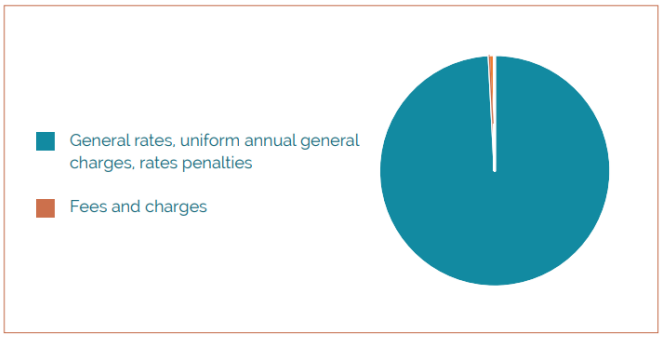
Catchment	Description of Project	Estimated Cost	Programmed completion date
8, 9, 12	Stormwater network upgrades including a new stormwater pump station – to address flooding issues and climate change and enable development at Whakatau Street, Glenholme area, Lytton Street and Victoria Street.	$21.13M	June 2028
7	Stormwater network upgrades to address flooding issues and climate change and enable intensification at White Street, Marguerita Street and Fenton Street.	$17.99M	June 2028
8, 9	Stormwater network upgrade to enable development of the Recycling Centre at Te Ngae Road.	$2.08M	June 2028
8	Stormwater network upgrade to enable development of the Rotorua Racecourse (subject to planning approvals).	$2.48M	December 2028

4.13 Project Funding

4.13.1 The project list in Table 6 refers to works proposed through the Rotorua Stormwater Master Plan April 2021. This Master Plan was developed to identify stormwater upgrade works required to enable development within the Eastern and Western Catchments.

4.13.2 Funding is allocated in the Rotorua Lakes Council Long Term Plan 2021-2031 as below. (pages 61-65).

How we will fund this activity



Capital Expenditure

Project Type	Project Header Description	2021/22	2022/23	2023/24	2024-2031	Total Budget
Growth	Stormwater Network Expansion	7,393,000	3,500,000	3,000,000	11,500,000	25,393,000
Growth	Wharenui Estate (CIP funded)	3,000,000	6,000,000	5,953,300	-	14,953,300
LOS	Stormwater Network Enhancements	500,000	500,000	500,000	3,500,000	5,000,000
Renewal	Stormwater Network Renewal	3,000,000	3,000,000	3,000,000	21,000,000	30,000,000
Total		**13,893,000**	**13,000,000**	**12,453,300**	**36,000,000**	**75,346,300**

4.14 Modelling

4.14.1 Stormwater modelling is scheduled across the urban catchments with a timeframe of 5 years for high priority modelling and 10 years for all catchments. Stormwater modelling in Ngongotaha area is planned to be carried out (by external consultants) in next 18 months.

4.14.2 Catchments that have been modelled in relation to specific proposed developments are set out in Table 7 below.

Table 7 – Modelled Catchments

Catchment	Comment	Model Build Software
1-6 plus 11-16	Masterplan model covering catchments 1 to 6 in the east and catchments contributing to Utuhina Stream in the west	TUFLOW
3	Catchment 3 (work underway – March 2023)	InfoWorks ICM
4	Catchment 4	InfoWorks ICM
5	Catchment 5	InfoWorks ICM
6	Catchment 6	InfoWorks ICM
7	Catchment 7	InfoWorks ICM
8	Catchment 8	InfoWorks ICM
9	Catchment 9	InfoWorks ICM
12	Catchment 12	InfoWorks ICM
14	Catchment 14	InfoWorks ICM
15	Catchment 15	InfoWorks ICM
18	Catchment 18	InfoWorks ICM
23-27	Ngongotaha catchments	TUFLOW

4.14.3 Catchment modelling is programmed to assess the feasibility of proposed stormwater enabling works within specific catchments and this is shown in Table 8 below (refer also Table 6.)

Table 8 – Programmed Modelling

Catchment	Description of proposed stormwater enabling works	Programmed start of modelling work
4	Stormwater conveyance upgrades of the Kaipukau catchment to address flooding issues and climate change and enable development of the Owhatiura South Block and other areas.	January 2024
7	Stormwater network upgrades to address flooding issues and climate change and enable intensification at White Street, Marguerita Street and Fenton Street.	April 2025
8	Stormwater network upgrade to enable development of the Rotorua Racecourse (subject to planning approvals.)	April 2025

Catchment	Description of proposed stormwater enabling works	Programmed start of modelling work
8, 9	Stormwater network upgrade to enable development of the Recycling Centre at Te Ngae Road.	April 2025
8, 9,12	Stormwater network upgrades including a new stormwater pump station to address flooding issues and climate change and enable development at Whakatau Street, Glenholme area, Lytton Street and Victoria Street.	April 2025
13	Stormwater detention ponds to address flooding issues and climate change and enable infill development within Catchment 13 of the stormwater system.	April 2024
13, 14, 15	Several detention ponds and stormwater network upgrades within the greater Utuhina catchment. These works will mitigate existing flooding problems, address climate change and enable development of the PC2 area and infill development within the urbanised areas of Catchment 13, 14 and 15.	June 2023
17	Stormwater network upgrades to address flooding issues and climate change and enable development at Bennetts Road	April 2024
18	Stormwater detention pond and stormwater network upgrade to address flooding issues and climate change and enable development within the Frank Street and part of Waikite Rugby Club.	April 2024

5. DESCRIPTION OF THE RECEIVING ENVIRONMENT

5.1 Introduction

5.1.1 Stormwater from the Rotorua Urban Area discharges into seven main catchment areas which flow into Lake Rotorua. In addition, numerous drains and piped outlets discharge directly to the lake. The lake discharges through the Ohau Channel to Lake Rotoiti. The Okere/ Kaituna River takes the outflow from Lake Rotoiti to the sea, with more direct outflow from Lake Rotorua with the Ohau Diversion Wall in place. Therefore the receiving environment comprises the six streams, the Waitawa areas and Lake Rotorua, with potential downstream effects on Lake Rotoiti and the Okere/ Kaituna River.

5.2 Lake Rotorua

5.2.1 Lake Rotorua is one of 12 lakes in the District that are part of a major restoration project undertaken under the joint guidance of Te Arawa Lakes Trust, Regional Council, and the district Council with funding from the Government. The increase in phosphorous and nitrogen levels since the 1960s has led to a deterioration in water quality. The influence of the volcanic geology and outflows from geothermal areas is also a significant factor.

5.2.2 The target TLI for Lake Rotorua has been set at 4.2 and in 2014 this was achieved due to successful in-lake interventions, climatic conditions and some on farm changes. Some of the projects undertaken have included dosing the Puarenga and Utuhina Streams with alum to lock the phosphorous. Overall, the trend in lake water quality varied over time with the most recent TLI of 4.3 in 2021. As part of the lake restoration project, the Council provides and manages stormwater infrastructure. Stormwater from streams has the potential to increase nutrient and sediment loadings in the lake.

5.2.3 There are some 73 outlets direct to the lake.

5.3 Kaituna Catchment Control Scheme

5.3.1 The Kaituna Catchment Control Scheme includes the catchments of Lakes Rotorua and Rotoiti as well as the catchment of Kaituna River. The whole catchment area covers 1,250 square kilometres (125,000 ha). The area affected is shown in Figure 3 below.

5.3.2 The Upper Kaituna Catchment Control Scheme was put in place in the 1970s by the then Bay of Plenty Catchment Commission to address three objectives:

- Alternative ways to reduce nutrient input from sewerage,
- Alternative methods of controlling the levels of Lakes Rotorua and Rotoiti, and
- Soil conservation and water management in the catchment.

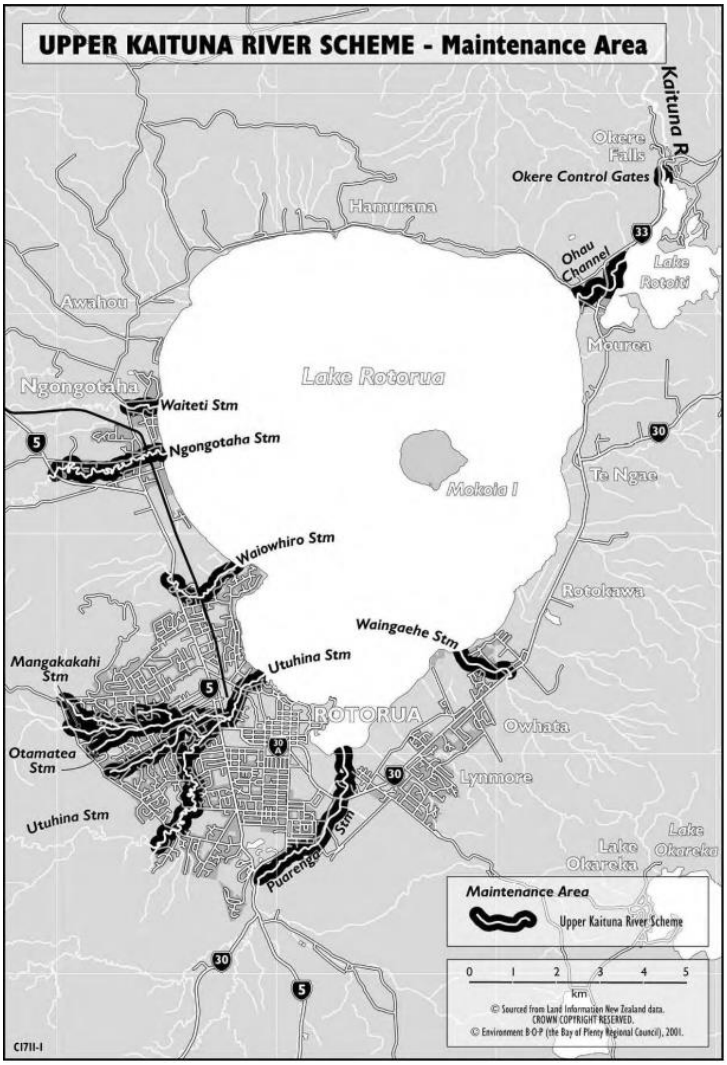


Figure 3 – Upper Kaituna Catchment Control Scheme

5.3.3 The removal of direct discharge of treated wastewater to the lake addressed the first point. In relation to lake levels, prior to the scheme being put in place there were considerable fluctuations. Low lake levels resulted in reduced access to jetties and boat ramps, as well as adverse effects on the shoreline, while high levels resulted in erosion of the lake edge, flooding of low lying lakeside areas as well as drainage systems backing up and flooding further inland. Downstream effects of reducing flood storage were considered. Control measures were put in place at the Ohau Channel (stop logs) with gates at the Okere outlet to Lake Rotoiti.

5.3.4 Specific works were required on a number of streams flowing into the lakes. Most of these works involved stream clearing but works to alleviate flooding of low lying areas were required in locations adjacent to the Puarenga, Utuhina, Waingaehe and Ngongotaha Streams. Flood protection stopbanks were constructed on the Waingaehe, Puarenga, Utuhina and Waiowhiro Streams through the Rotorua urban area. Stream clearing, straightening and construction of floodways on Ngongotaha and Waiteti Streams were also undertaken to minimise flooding.

5.3.5 Since the scheme was put in place, the lake has been managed within a range of 0.610m. Flooding resulting from very high lake levels has been reduced and recreational use has been improved.

5.3.6 In relation to soil conservation, severe erosion was occurring along the streams flowing into the lake. Activities including land retirement and planting (conservation and production) as well as fencing off stream margins and lake margins were undertaken. These control measures have reduced sediment loads, phosphorus and nitrogen into the lake.

5.4 Okere/ Kaituna

5.4.1 The Kaituna River starts at the outlet of Lake Rotoiti at Okere Arm and enters the sea at Te Tumu near Maketu. It passes through a steep, narrow gorge, well known for its white water rafting, before meandering through the alluvial terraces of the mid Kaituna River and the peat and sand deposits of the lower Kaituna basin. Lakes Rotorua and Rotoiti contribute a large proportion of the everyday flows. The Mangorewa River is a majority tributary, which contributes greatly to flood flows in the Kaituna River.

5.5 Streams

5.5.1 There are nine major inflows to Lake Rotorua, of which seven are located within the Rotorua Urban Area Catchment. These inflows contribute 60%[7] of the inflow to the lake. The stormwater catchments located within each catchment, the total catchment area and mean flow of streams is set out in Table 9. Their characteristics are briefly described in the following paragraphs. There are 210 outlets to these catchments in the RUA. Full details are contained in the CMP and the NIWA report (2015).

Table 9 - Mean Flow

Waterway	Stormwater-Catchments	Catchment km^2	Mean flow m^3/s
Waingaehe	1, 2	9.6	0.24
Waitawa Area	3, 4, 5, part 6	10	-
Puarenga	Part 6, 7	74.8	1.48
Utuhina	11, 12, 13, 14, 15, 16	59.6	1.88
Waiowhiro	17, 18, 19, 20, 21, 22	4.4	0.32
Ngongotaha	23, 24, 25, part 27	73.3	1.53
Waiteti	26, part 27, part 28	71.0	1.11

5.5.2 Waingaehe Stream

The Waingaehe Stream Catchment drains just mainly agricultural land (forestry and livestock). It has been identified as containing a locally significant habitat for trout.

Upper Kaituna stream works were first undertaken on the Waingaehe Stream in 1974 after extensive flooding of residential property located adjacent to the original stream channel. The works primarily aimed at diverting flood flows away from residential property. A flood

[7] Refer NIWA report 2015, for further details

control scheme, including stop bank construction, was implemented from the junction with State Highway 30 (Te Ngae Road) down to Lake Rotorua. The stream channel was widened from SH 30 to a point 120m downstream. From that point a floodway channel to the lake was built. That channel diverts water from the streams original course westward, under Robinson Avenue and to the lake some 400m to the south-west of the original mouth. A number of drop structures, a weir and several culverts were constructed at that time. The original stream channel is maintained by an intake structure and culvert to accommodate normal flows.

5.5.3 Waitawa Area

The Waitawa area consists of two watercourses, described as the Waitawa (Lynmore) and Basley Drains. They have very low base flows, such that the Basley drain is ephemeral in upstream reaches and largely stagnant downstream. It has no identified ecological values.

5.5.4 Puarenga Stream

The Puarenga Stream flows through the Whakarewarewa thermal area which is the focus for Whakarewarewa Village and Te Puia. Upstream of the Whakarewarewa Village, the stream has a more natural environment. Below the Village, the stream is heavily influenced by natural geothermal outflows from Whakarewarewa thermal area and from this point downstream it is considered a thermal stream with acidic, warm water, ranging in temperature from 14 -22^{o}C. The stream enters Lake Rotorua at Sulphur Bay which has very high values for indigenous vegetation and habitats and fauna. There are extensive geothermal flats which are used by large numbers of indigenous birds, including a breeding colony of black-billed gull, shags, over-wintering dabchick, and scaup. The ecology of the Puarenga changes significantly at Whakarewarewa Village due to large scale natural geothermal inputs. Upstream the stream provides habitat for threatened little shag colony and it is a locally significant trout habitat, potentially containing brook char.

The Puarenga Stream has significant cultural values, with three marae - Te Pakira, Hinemihi, and Hurunga O Te Rangi - situated along its banks, as well as the tourist attractions of Whakarewarewa Village and Te Puia.

5.5.5 Utuhina Stream

The Utuhina Stream drains a catchment of from the west of Rotorua through residential and industrial areas to discharge into Lake Rotorua west of the City Centre. The two main tributaries within the RUA are the Mangakakahi Stream and the Otamatea Stream. The stream is identified as providing habitat for blue duck as well as being a regionally significant trout habitat and fishery values.

There are stop banks on the western bank downstream of Lake Road to the lake as well as sections of floodwall along the right bank. The design requirement is a 1% AEP level of protection to the adjacent land.

5.5.6 Waiowhiro Stream

The Waiowhiro Stream drains the south-east flanks of Mt Ngongotaha to discharge north of Kawaha Point. The stream has been identified as a locally significant trout habitat in the RWLP. The Waikuta Stream falls into this catchment.

5.5.7 Ngongotaha Stream

The Ngongotaha Stream drains the northern slopes of Mt Ngongotaha and part of the Mamaku Plateau. It discharges into Lake Rotorua several kilometres north of Rotorua City. The stream is a nationally significant trout habitat and fishery values.

A flood control scheme was built in 1985 in the lower 740m by the then Bay of Plenty Catchment Commission. This involved stopbanks and flood spillways across several meander bends. In 1987 stream widening and clearing of vegetation was undertaken up to SH5. A community led programme of clearing willow and blackberry and planting native grasses and trees has been underway since about 2001. These works have all had significant impacts on the hydraulic characteristics of the stream.

5.5.8 Waiteti Stream

The Waiteti Stream rises west of Ngongotaha and enters the lake north of the village. It is a regionally significant trout habitat and fishery values.

5.6 Other Outlets

There is one discharge to land and 6 discharges to geothermal areas.

5.7 Ecological values

5.7.1 The Regional Council water classification standards in Schedule 9 of the RNRP identifies eight water quality classes of which four are relevant to the RUA Catchment. Lake Rotorua is Managed State, which refers to a lake with degraded water quality that does not meet its TLI. The streams in the RUA catchment are classified as Aquatic Ecosystem, Drain Water Quality and Regional Baseline. These are identified in Table 10 below. These are defined as follows:

- Aquatic Ecosystem – rivers and streams that are not Natural State (River) and provide habitat for indigenous fish species or trout. The intent is to protect water quality sufficiently to maintain healthy and diverse aquatic ecosystems. However, it is recognised that some streams or their lower reaches cannot be set standards that are not practicable or achievable.
- Regional Baseline refers to streams that have not been classified but the expectation is that an acceptable water quality will be maintained.
- Drain Quality applies to drains that are part of a drainage scheme but which do not have identified ecological values and have baseline standards to discharge to open water in drains.

5.7.2 The RWLP also identifies the habitat values applying to the waterbodies of the region. For the RUA catchment, the habitat values are shown in Table 10 below.

Table 10 - Water Quality Classification and Habitat Values

Waterway	BOPRC Classification	Values
Waiteti	Aquatic ecosystem	Important habitats of trout - Regionally significant trout habitat and fishery values
Ngongotaha	Aquatic ecosystem	Important habitats of trout- Nationally significant habitat and fishery values
Waiowhiro	Aquatic ecosystem	Important habitats of trout - Locally significant trout habitat
Utuhina	Aquatic ecosystem	Habitat of threatened indigenous fauna, the blue duck Important habitats of trout - Regionally significant habitat and fishery value
Puarenga	Aquatic ecosystem	Habitat of threatened indigenous fauna, the Hemo Gorge Little Shag Colony Important habitats of trout - Locally significant habitat and fishery values – may have brook char
Waitawa	Regional Baseline/ Drain water	None identified
Waingaehe	Aquatic ecosystem	Important habitats of trout - Locally significant habitat and fishery values

5.8 Water Quality

5.8.1 As part of the research for the application, NIWA (2015) were commissioned to prepare an assessment of the environmental effects of the RUA stormwater on water quality. It involved sampling and analysis of grab samples of stormwater, stream water, sediment, macroinvertebrate populations and lake mussels and compares results against previous studies.

5.8.2 The NIWA study results are discussed in more detail in section 11 below. However, it identified the following points in relation to the stormwater discharges and to the existing freshwater receiving environment:

<u>Stormwater Quality</u>

- Stormwater from industrial areas contained the highest concentrations of heavy metals.
- Overall nutrient levels in stormwater were relatively low.
- In drains, four sites exceeded the acute levels for zinc and for arsenic for aquatic species in freshwater, although the latter was probably due to geothermal sources. Eight sites exceeded the proposed high level for TPH in freshwater.
- Government Gardens stormwater pond outlet and the Waitawa drain exceeded the acute level for copper as well.

:

- The stormwater drains are not streams and do not have permanent flows and the effects identified were generally restricted to the drains and not the freshwater receiving environment.

Receiving Freshwater Quality

- Stream water – zinc exceeded proposed recommended US EPA acute guideline values in Waiowhiro and Utuhina Streams

5.8.3. Council has progressively implemented Rotorua Urban Water Quality Monitoring Programme (Refer Appendix H). While samples numbers to date are low and results should therefore be treated with caution, the average results provide an indication of urban stream water quality and CBD stormwater quality (Refer Table 11 below).

The values highlighted in red exceed proposed trigger levels. Results support the findings in the NIWA study and indicate elevated levels of heavy metals in stormwater from the CBD and in Waitawa, Mangakakahi and Utuhina streams. Some of our freshwater is geothermally influenced and heavy metal concentrations will be elevated naturally – high arsenic is a good indicator of the presence of naturally-occurring geothermal in the freshwater.

Elevated E coli indicates contamination and exceeds safe swimming levels in a number of streams.

Table 11 Average Water Quality

Catchment	pH	SS	E Coli dry days	E Coli wet days	As	Cu	Pb	Zn	NH4-N	DIN	DRP
		mg/l	mpn	mpn	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Waikawau Stream	6.6	2	203	510	0.036	0.001		0.02	0.18	1.4	0.23
Kaipakau Stream	7.2	9	1530	3850		0.002		0.01	0.01	0.1	0.02
Waitawa Stream	7.2	79	198	2753		0.009	0.007	0.08	0.04	1.2	0.09
Puarenga Stream at Hemo	6.7	11	367	1681	0.01	0.001	0.0003	0.00	0.02	0.9	0.04
Puarenga Stream at Sala	6.5	16	284	1685	0.04	0.002	0.0007	0.01	0.10	1.0	0.05
Mangakakahi Stream (Utuhina tributary)	6.7	18	466	3313	0.01	0.017	0.029	0.07	0.06	0.7	0.03
Otamatea Stream (utuhina tributary)	6.5	16	651	2033	0.007	0.002	0.0011	0.02	0.02	1.2	0.02
Utuhina Stream at Lake Road	6.5	24	683	2967	0.006	0.003	0.0015	0.03	0.05	0.6	0.03
Waiowhiro Stream	6.9	14	358	303							
Waikuta Stream	6.9	4	530	570							
Ngongotaha Stream	7.0	27	9382	1340							
Waiteti Stream	7.0	4	-	370							
CBD stormwater outlets	6.7	33	1600	15883		0.006		0.12	0.02	0.1	0.02

Overall, monitoring undertaken to date indicates that stream water quality is good in some places and poor in other places. The monitoring does not identify the location nor source of contaminants. The urban stormwater quality monitoring programme and approach has been developed with a specific objective to identify locate and mitigate contaminants.

6. OVERVIEW OF CATCHMENTS

6.1 Introduction

This section sets out a brief overview for each catchment in relation to:

- Description
- Hydrology
- Specific Characteristics
- Existing Consents
- Quantity Issues
- Quality Issues
- Proposed Actions

6.2 Waingaehe Catchment (Catchments 1 & 2)

6.2.1 Description

The Waingaehe Catchment has an area of 9.6km^2 and comprises stormwater Catchments 1 and 2. Outside the urban area it principally drains rural land used for pastoral farming and forestry. Within the urban catchments, land is used for residential, reserve and road reserve. Although a sub-catchment of the stormwater catchment includes the Rotorua Regional Airport and the Eastgate Business Park, this sub-catchment does not drain into the Waingaehe Stream and therefore these two areas fall into the Rotokawa Stormwater catchment and are managed under a separate resource consent (61893). There is minimal commercial or industrial land in this catchment.

6.2.2 Hydrology

The catchment drains to the Waingaehe Stream which is identified as an Aquatic Ecosystem in the RNRP, having locally significant habitat and fishery values. In addition to the stream, there is a network of drains that discharge to the lake. A diversion canal provides for overflow from the stream.

6.2.3 Specific characteristics

There are high groundwater tables throughout Catchment 1, especially along the lakefront and around Cooper and Willow Avenues, and in the centre of Catchment 2. Flooding occurs as a result of high groundwater levels and when lake levels are high.

6.2.4 Current resource consents

There are two current consents for stormwater management in this catchment:

Table 12 – Waingaehe Catchment - Existing Consents

Consent No.	Description and Location of Discharge	Max. Rate of Discharge	Expiry
20207	Discharge stormwater from a residential subdivision at Holden's Bay into the Waingaehe Stream Floodway	1000 l/s	*
20220	To divert water from a drain and to discharge it to another drain at Hannah's Bay for the purposes of improving drainage in a subdivided area.	960 l/s	*

6.2.5 Quantity Issues

Key issues affecting stormwater quantity in this catchment are as follows.

Lake Rotorua 2% AEP design level is 281.18m. High lake levels can result in flooding of lake edge properties.

The stormwater drain along the eastern boundary of the catchment, close to Hannah's Bay, is subject to sedimentation and growth of weeds and needs regular maintenance. The infrastructure in Charles Road has a high water table and this affects some properties.

The pipes to Lake Rotorua are subject to siltation which restricts the flow capacity and causes local flooding from time to time at the lower reaches. High lake levels during winter further restrict the hydraulic capacities of these stormwater pipes. Maintenance is required to maintain free flow conditions.

The Waingaehe Stream flow diversion structure directs overflow volumes to a man-made drain along the western side of the catchment, while the original stream is restricted by a 600 mm diameter pipe at the diversion to protect the downstream properties from flooding. This diversion structure is located just below Te Ngae Road opposite the end of Charles Rd. The diversion channel needs regular cleaning to remove trees and vegetation.

Erosion of streambanks is not an issue in this catchment.

6.2.6 Quality Issues

Key issues affecting stormwater quality in this catchment are as follows.

Monitoring has shown that only Arsenic gives a higher reading, being "Low" rather than "below Low" in the lake and is "High" in the drain (site 69). The source is likely to be geothermally influenced rather than anthropogenic.

There was no change (increase) in nutrient concentrations due to runoff from the urban catchment.

Biological monitoring show no changes in dissolved oxygen, periphyton growth or macroinvertebrate community in the Waingaehe Stream through the urban catchment. Like many other RUA streams, the lower reach has low velocity, absence of flow heterogeneity

and fine substrates which affect habitat, so effects on habitat are principally from natural sources rather than urban stormwater. In the lake at the stream mouth mussels showed no levels of contamination above accepted limits.

It is considered to be a low risk catchment as there is no industrial or commercial land use.

6.2.7 Proposed Actions

Modelling:
Modelling has been completed as part of TUFLOW Masterplan model covering catchments 1 to 6 in the east.

Proposed Works:
No major works proposed.

6.3 Waitawa Catchment (Catchments 3, 4, 5 and part 6)

6.3.1 Description

The Waitawa Catchment has an area of 10km^2 and comprises stormwater catchments 3, 4, 5 and part 6. It is predominantly in residential use but contains small areas of commercial land and road reserve, with minor areas in industrial and reserve land. Future development is planned through the Wharenui Road residential and commercial zones and the Owhatiura development area between Vaughan Road and the lake, as well as ongoing subdivision above Lynmore.

6.3.2 Hydrology

The Waitawa catchment consists of two watercourses, described as the Waitawa (Lynmore) and Basley Drains. Otherwise the catchment discharges to the lake through drains and pipes. Weirs reduce velocity and scouring in UC4 and there are detention ponds in the upper catchments of UC5 and Part 6 as well as Neil Hunt Park itself. There are no identified ecological or fishery values in the drains.

6.3.3 Specific characteristics

Generally the soils in the catchments have good drainage. Only the sides of the East Lake Drain in catchment 4 have poor soils and may be prone to lateral spread during a significant earthquake. There are high groundwater tables near the lake, especially from Carrol Place. There is a geothermal area near the Puarenga Stream. Flooding occurs as a result of high groundwater levels and when lake levels are high.

6.3.4 Current resource consents

There are five current consents for stormwater management in this catchment:

Table 13 – Waitawa Catchment - Existing Consents

Consent No.	Description and Location of Discharge	Max. Rate of Discharge	Expiry
60472	Discharge stormwater to land in circumstances where it may enter Lake Rotorua from a Vaughan Rd Subdivision.	828 l/s except when the 20% Annual Exceedance Probability (AEP), 10 minute rainfall event is exceeded.	30/06/2015
62383	Discharge stormwater from a 2 hectare urban residential catchment around Forest Place, Lynmore, to land where the stormwater may enter water in the catchment of Lake Rotorua. This consent replaced consent 22535.	318 l/s except when the design rainfall event of a 10 year return event, 10 minute storm event is exceeded.	30/4/2014*
65378	Discharge stormwater from Lynmore Rise.	No rate of discharge given.	30/4/2028
60084	Pipe an existing open drain adjacent to Owhata Road, so that it can be covered.		31/10/2033
63426	Installation and use of a box culvert structure (near Vaughan Rd) on the bed of a modified watercourse tributary of Lake Rotorua.		30/11/2040

6.3.5 Quantity Issues

Key issues affecting stormwater quantity in this catchment are as follows.

Lake Rotorua 2% AEP design level is 281.18m. High lake levels can result in flooding of lake edge properties which are undeveloped at this stage.

In Catchment 3, erosion is a key issue. The open channel and natural watercourse between Scott Avenue and Brent Rd is subject to erosion. There is a 900 diameter pipe at Vaughan Rd Extension which ends abruptly at the open drain and has to be inspected regularly to ensure that downstream property is protected. The Owhata Drain is subject to erosion and some sections have therefore been piped.

In Catchment 4, erosion occurs at the downstream side of the culvert under Vaughan Rd. The drain which takes stormwater from the area above Morey Street through to Te Ngae Rd needs requires regular maintenance. Further down, the channel is lined with timber/rock. Where it runs through private property, residents fence it and this leads to blockages from the build-up of debris.

In eastern drain system in Catchment 5, maintenance of the stormwater inlet on Te Ngae is required to keep it clear of debris. Erosion occurs at the outlet of the culvert under Te Ngae Rd which threatens a number of cables, water mains and footbridge. Inspection is required after heavy rain events.

In the western drain system, the inlet screen of the pipe-culverts under Te Ngae Rd regularly blocks during major rain events due to debris from native bush just upstream of the inlet and flooding affects Neil Hunt Park, Lynmore School, and the State Highway, as well as Larcy Rd. The Selwyn-Larcy Drain is timber lined for the last approximately 70m but the balance is poorly formed and under capacity. Access is restricted and residents regularly dump garden refuse near the stream which leads to blockage.

Flooding can arise throughout the catchment in relation to under capacity of drains and pipes and this is made worse by debris build up. Flooding can be significant and is in part due to inadequate management of runoff from rural land in the upper catchment, outside the urban area.

6.3.6 Quality Issues

Industrial and commercial areas together with high traffic numbers on Te Ngae Road pose contamination threats to the environment. Higher levels of zinc and copper have been found in storm flows in the Waitawa and Basley Stream system and in catchment 3. Total suspended sediments have exceeded criteria in stormwater in the Waitawa Stream. Monitoring has shown that Arsenic, Zinc and TPH are high in sediments in drains, including the Ngāpuna and Lynmore Drains. Pathogens exceed safe swimming levels in the Kaipakau Stream.

There was no change (increase) in nutrient concentrations due to runoff from the urban catchment.

Biological monitoring show no substantial changes in dissolved oxygen and periphyton growth. Macroinvertebrate community returned a severe pollution grading for the Basley Drain and Moderate for the Waitawa Stream. However, this was assessed as due to low velocity, irregular flow and fine substrate rather than resulting from urban stormwater. No mussels were collected.

It is considered to be a high risk catchment due to industrial and commercial land uses in the catchment.

6.3.7 Proposed Actions

Modelling:
Modelling has been completed as part of TUFLOW Masterplan model covering catchments 1 to 6 in the east.

Proposed Works:

Table 14 – Waitawa - Proposed Works

Catchment	Description of Project	Estimated Cost	Programmed completion date
4	Morey Street East and West Detention Dams to enable the development of about 1,000 lots within the Ngāti Whakaue Tribal Land at Wharenui Road.	$15M	December 2023 (work is now underway)
4	Stormwater Conveyance upgrades of the Kaipukau catchment to address flooding issues and climate change and enable development of the Owhatiura South Block and other areas	$5.0M	December 2025

6.4 Puarenga Catchment (Catchments part 6 and part 7)

6.4.1 Description

The Puarenga Catchment has an area of 74.8km^2 and comprises stormwater catchments part 6 and 7. Much of the catchment is rural but in the urban catchment most land use is reserve. There is significant industrial/ business land around Ngāpuna, White and Scott Streets, Scion, Waipa Valley and the Peka Block. There are also small areas residential and road reserve. The waste water treatment plant also is located in this catchment.

The Puarenga Stream flows through the Whakarewarewa thermal area which is the focus for Whakarewarewa Village and Te Puia. The stream enters Lake Rotorua at Sulphur Bay which has very high values for indigenous vegetation and habitats and fauna. There are extensive geothermal flats which are used by large numbers of indigenous birds, including a breeding colony of black-billed gull, shags, over-wintering dabchick, and scaup. The ecology of the Puarenga changes significantly at Whakarewarewa Village due to large scale natural geothermal inputs. Upstream of Whakarewarewa the stream provides habitat for threatened little shag colony and it is a locally significant trout habitat, potentially containing brook char. The Puarenga Stream has significant cultural values, with three marae - Te Pakira, Hinemihi, and Hurunga O Te Rangi - lcoated along its banks, as well as the long established tourist attractions around Whakarewarewa Village and Te Puia. Other significant natural areas include the geothermal features in and around the Rotorua Golf Club.

Future development of the Scion Innovation Park, Waipa Valley Business Park and the Peka block industrial area will increase the proportion of land used for commercial and industrial purposes.

6.4.2 Hydrology

The Puarenga Stream flows through the Whakarewarewa thermal area and below that point the stream is heavily influenced by natural geothermal outflows. From this point downstream it is considered a thermal stream with acidic, warm water, ranging in

temperature from 14 -22°C. The stream enters Lake Rotorua at Sulphur Bay. Upstream of the Whakarewarewa Village and the Waipa valley, which is developed for industrial and commercial activities, the stream has a more natural environment.

Within Catchment 6, two drains discharge directly to the lake and four main drains discharge to the Puarenga Stream. Neil Hunt Park serves as a detention pond with Catchment 5.

The Puarenga Stream forms the eastern boundary of Catchment 7 with a large number of stormwater outlets discharging to it. The upper parts of the catchment around Mokoia Drive and Moncur Drive are very steep and drain to the water bodies within the Rotorua Golf Club opposite Te Puia. These ponds serve as natural detention dams. Overflow from these ponds discharges by a drain to the stormwater system and finally into the Puarenga Stream by a 1500mm dia main.

Fenton Street acts as a cut-off bund for the portion of the catchment around Sumner, Tilsley, Holland and Robertson streets. A major stormwater pump station at Tilsley Street lifts stormwater across Fenton St to Marguerita St and from there it is piped to the open drain on the other side of Te Ngae Rd and discharges to the Puarenga Stream.

6.4.3 Specific characteristics

There are high groundwater tables in Catchment 6 near the lake. Geothermal conditions influence the lower part of catchment 6 and parts of catchment 7. The upper catchment 6 and all of catchment 7 have good free draining soils.

6.4.4 Current resource consents

There are five current consents for stormwater management in this catchment:

Table 15 – Puarenga Catchment - Existing Consents

Consent No.	Description and Location of Discharge	Max. Rate of Discharge	Expiry
20186	Discharge stormwater from an industrial subdivision into the Puarenga Stream where an Esplanade Reserve is to be created upon a subdivision.	764 l/s	*
20225	Discharge stormwater from a residential subdivision. Discharge is at the corner of Old Taupo Rd and Moncur Drive.	2800 l/s	*
24034	Discharge stormwater to the Puarenga Stream from a 3.6 hectare urban/industrial subdivision - due to relaying of SW mains in Hona Road.	518 l/s	30/6/2004*
60536	a) To dam water; b) carry out large scale earthworks; c) place and use a SW drop structure and associated	4.4 m3/s except when the 24 hour 1% Annual Exceedance	31/03/2020

Consent No.	Description and Location of Discharge	Max. Rate of Discharge	Expiry
	erosion protection works within the bed of the Puarenga Stream; d) discharge treated urban SW to the Puarenga Stream - from Te Ngae Rd catchment.	Probability (1 in 100 year) design storm event is exceeded.	
50825	Remove flood debris and disused structures and disturb the bed and place erosion and flood protection structures, all in the Puarenga Stream adjacent to the Wahiao Drive Bridge, Whakarewarewa.		31/10/2031

6.4.5 Quantity Issues

Key issues affecting stormwater quantity in this catchment are as follows.

Lake Rotorua 2% AEP design level is 281.18m. High lake levels can result in flooding of lake edge properties. In addition, flooding from stream backing up can occur in the Ngāpuna industrial areas, on Te Ngae Road and, due to under capacity, in the Robertson, Tilsley and Holland Street area, and elsewhere.

In catchment 6, high stream levels cause ponding at Hamiora Place when the flood gate on the Puarenga Stream fails to shut due to debris blockage. The flood gates require regular maintenance, as does an existing overland flow path through the reserve on the upstream side of Te Ngae Rd. The stormwater system draining Hamiora Place has a high geothermal content and pipe systems have been upgraded with HDPE / PVC. Manholes and cast iron lids require ongoing replacement.

In Catchment 7, there are issues relating to lack of capacity, debris blockage and erosion due to runoff from steep areas. The White St SW system experiences surface flooding on a regular basis. Debris build up causes potential flooding in the Gwendoline Street area where several drains converge. A bypass pipe has been installed in parallel to the open drain but debris buildup can lead to blockages. Runoff from the top end of the catchment above built-up areas (e.g. Wychwood Crescent, Sloane Ave and Kerswell Terrace) results in significant damage downstream and requires regular cleaning. The same maintenance is required at Centennial Park.

The area between Robertson, Holland, Tilsley and Sumner streets is served by a large SW pump station at Tilsley Street. Regular maintenance of the stormwater system and the pumps is required to ensure they function to prevent flooding. However, flooding of all these areas does occur from time to time.

Outlets from the stormwater pipes draining Tihi o-tonga (e.g. along Exeter Place) cause erosion due to the high velocities of the SW as they drain steep catchments.

The areas around Marguerita Street, Froude Street and Tryon Street have high levels of Hydrogen Sulphide requiring upgrading with appropriate materials.

6.4.6 Quality Issues

Key issues affecting stormwater quality in this catchment are as follows.

Monitoring is limited but has shown that only Arsenic in stream sediments exceeds levels. The source is likely to be geothermally influenced rather than anthropogenic.

There was no change (increase) in nutrient concentrations due to runoff from the urban catchment.

Biological monitoring is also limited but identified no substantial effects on dissolved oxygen through the urban catchment.

It is considered to be a high risk catchment due to industrial and commercial land use.

6.4.7 Proposed Actions

Modelling:

Modelling has been completed as part of TUFLOW Masterplan model covering catchments 1 to 6 in the east, as well InfoWorks ICM modelling of Catchments 6 and 7.

Modelling is also proposed in relation to stormwater network upgrades to address flooding issues and climate change and enable intensification at White Street, Marguerita Street and Fenton Street.

Proposed Works:

Table 16 – Puarenga – Proposed Works

Catchment	Description of Project	Estimated Cost	Programmed completion date
7	Stormwater network upgrades to address flooding issues and climate change and enable intensification at White Street, Marguerita Street and Fenton Street.	$17.99M	June 2028

6.5 Utuhina Catchment (Catchments 11, 12, 13, 14, 15 & 16)

6.5.1 Description

The Utuhina Catchment has an area of 59.6km^2 and comprises stormwater catchments 11, 12, 13, 14, 15 and 16. Outside the urban area it principally drains rural land used for pastoral farming and forestry. Within the urban catchment, land is predominantly used for residential activities but with some reserve, road reserve, commercial and industrial land in the catchment.

The catchment is drained by a number of waterways which join the Utuhina Stream, with some direct discharges to the lake.

The future development relates to residential development above Pukehangi Road and intensification of residential land use through infill throughout the urban area. Parts of the Springfield Golf Course and Rotorua Racecourse have also been identified for potential residential development in the Spatial Plan.

6.5.2 Hydrology

The catchment largely drains to the Utuhina Stream which is identified as an Aquatic Ecosystem in the RNRP, having regionally significant habitat and fishery values and habitat of threatened indigenous fauna, the blue duck. Tributaries of the Utuhina Stream include the Otamatea and Mangakakahi Streams. Piped discharges feed into the streams and, in addition to the stream, there are some outlets that discharge to the lake at Ohinemutu.

6.5.3 Specific characteristics

The upper parts of the catchment have good drainage characteristics and the lower parts have higher water tables and poorer drainage closer to the lake. The catchment includes the significant geothermal areas around Kuirau Park, Ohinemutu and the mouth of the Utuhina Stream.

6.2.4 Current resource consents

There are twelve current consents for stormwater management in this catchment:

Table 17 – Utuhina Catchment - Existing Consents

Consent No.	Description and Location of Discharge	Max. Rate of Discharge	Expiry
24861	Stormwater discharge during earthworks construction and eventually from a combined urban and rural catchment, with the discharge adjacent to Hoyte Pl.	943 l/s except where the design storm of a one in ten return event is exceeded.	31/8/2006*
25035	Discharge stormwater from a residential subdivision to an unnamed tributary of the Mangakakahi Stream (Hodgkins St Extension).	3.07 m3/s except when the design rainfall event of a 2% Annual Exceedance Probability (1 in 50 year), 20 minute duration storm is exceeded.	20/07/2013*
25038	Discharge water to land such that water may enter the Utuhina Stream from residential subdivision at Matipo Ave.	153 litres per second at Outlet E except when the design rainfall of a 5 year, 15 minute storm event is exceeded.	31/10/2012*

Consent No.	Description and Location of Discharge	Max. Rate of Discharge	Expiry
60017	Discharge stormwater onto or into land in circumstances which may result in that stormwater entering the Mangakakahi Stream. Off Paul Street, Rotorua.	327 l/s except when the 5 year, 10 minute storm event is exceeded	31/07/2014*
60052	Discharge stormwater to the Mangakakahi Stream from a sub-division on the east side of Pukehangi Rd (Caulfield Place).	288 l/s except when the 1 in 5 year return period, 10 minute duration, rainfall event is exceeded.	31/01/2019
60118	Discharge stormwater (from a nine lot residential subdivision) onto or into land in circumstances which may result in that stormwater entering the Utuhina Stream - Florey Subdivision.	196 l/s except when the 5 year 10 minute storm event is exceeded.	30/06/2014*
61904	Discharge stormwater from a residential subdivision (Baxendale) to land in circumstances where it may enter the Utuhina Stream.	1250 l/s except where the design rainfall event of a ten minute one in ten year storm is exceeded.	28/02/2013*
62821	Discharge stormwater from Riverholm subdivision via two outfall structures into the Utuhina.	Outfall 1: 308 l/s Outfall 2: 133 l/s Except for when the design storm of 2% AEP (Annual Exceedance Probability) 20 min duration is exceeded.	30/11/2014*
66575	Stormwater outfalls and permanent discharge of stormwater from Lake Road (as a result of Lake Road 4-laning).	• 3.44 m^3/s from the 1600mm diameter outfall except where the 10% AEP designed event is exceeded. • 0.3 m^3/s from the 900mm diameter outfall except where the 10% AEP design event is exceeded.	31/10/2046
50827	Remove vegetation and carry out works in the bed and riparian area to		30/11/2031

Consent No.	Description and Location of Discharge	Max. Rate of Discharge	Expiry
	form a flood overflow path on a 900m section of Mangakakahi Stream, adjacent to Riri and Pururu Street.		
50861	Place and operate a flood detention dam on the Mangakakahi Stream, on Linton Park adjacent to Riri and Pururu Streets.		30/11/2031
63539	Install and use an additional box culvert structure, and associated stream widening on the bed of the Otamatea Stream at Ford Rd.		30/4/2041

6.5.5 Quantity Issues

Key issues affecting stormwater quantity in this catchment are as follows.

Lake Rotorua 2% AEP design level is 281.18m. High lake levels can result in flooding of lake edge properties, including Ohinemutu. There is also potential for ponding in central residential areas due to high levels in the stream flooding adjacent land. Detention ponds at Linton Park, Springfield Golf Course and elsewhere have been provided for through the catchment but there is limited capacity available.

The Utuhina Stream and its tributaries have low grades and meander through the catchment. Bank stability is compromised by vegetation and erosion repairs have been undertaken.

The low gradient pipes, culverts and open drains to the Utuhina Stream require regular maintenance to prevent flooding. Tree roots, fallen trees and debris lead to blockages which can lead to flooding in heavy rain events. Where this is in the stream beds, clearing is the responsibility of BOPRC.

In geothermal areas including Ohinemutu the stormwater network is subject to an aggressive geothermal environment and high maintenance is required. There is a high water table, comprising hot geothermal heated water. In some areas, including Kuirau Park, thermal lakes provide storage. Outlets from geothermal lakes require regular maintenance due to blockage by debris.

Erosion occurs at drains and the pipe outlets to the stream and require regular maintenance. A treatment device is located at the eastern end of Pererika Street.

Debris can block pipes collecting runoff from higher parts of the catchment such as Mountain Road. Catchment 16 includes inputs from Tallyho and Riri Streets and Amies Road with silt collected from industrial areas discharges.

Lack of access and under capacity systems are also issues to address.

6.5.6 Quality Issues

Key issues affecting stormwater quality in this catchment are as follows.

Monitoring has shown that zinc and copper are above criteria in the Mangakakahi Stream base and storm flow. TSS is also above criteria in stormwater in the Utuhina Stream. Higher levels of arsenic result from geothermal influences rather than anthropogenic sources. Pathogens exceed safe swimming levels.

There was no change (increase) in nutrient concentrations due to runoff from the urban catchment.

Biological monitoring show reduced habitat in the downstream sections but are considered to be related to lower flows and natural causes rather than urban stormwater. Mussels showed higher levels of lead concentrations above accepted limits.

It is considered to be a high risk catchment due to industrial and commercial land use.

6.5.7 Proposed Actions

Modelling:

Modelling has been completed as part of TUFLOW Masterplan model covering catchments 1 to 6 in the east and catchments 11-16 contributing to Utuhina Stream in the west as well InfoWorks ICM modelling of Catchments 12, 14 and 15.

Modelling is also proposed in relation to stormwater network upgrades to address flooding issues and climate change and enable intensification at White Street, Marguerita Street and Fenton Street.

Proposed Works:

Table 18 – Utuhina – Proposed Works

Catchment	Description of Project	Estimated Cost	Programmed completion date
8, 9, 12	Stormwater network upgrades including a new stormwater pump station – to address flooding issues and climate change and enable development at Whakatau Street, Glenholme area, Lytton Street and Victoria Street.	$21.13M	June 2028
13	Stormwater detention ponds to address flooding issues and climate change and enable infill development within Catchment 13 of the stormwater system.	$15.26M	December 2027
13, 14, 15	Several detention ponds and stormwater network upgrades within the greater Utuhina catchment. These works will	$39.30M	Stage 1 – October 2026 Stage 2 – July 2027

Catchment	Description of Project	Estimated Cost	Programmed completion date
	mitigate existing flooding problems, address climate change and enable development of the PC2 area and infill development within the urbanised areas of Catchment 13, 14 and 15.		Stage 3 – June 2028 (Detailed Feasibility Study underway)
15	Linton Park Detention Pond Refurbishment of existing detention bund to comply with new building regulations and increased storage capacity.	$12M	December 2023 (work is now underway)

6.6 Waiowhiro Catchment (Catchments 18, 19, 20 and part 21)

6.6.1 Description

The Waiowhiro Catchment has an area of 13.63km^2 and comprises urban catchments 18, 19, 20 and part 21. It comprises predominantly rural land with some residential land use and a mix of roading, reserves, and industrial and commercial land use. The Waiowhiro Stream drains the south-east flanks of Mt Ngongotaha and discharges north of Kawaha Point. The stream has been identified as a locally significant trout habitat in the RNRP.

The future land use change relates to the further development of commercially zoned land tourist activities, along SH5 around Skyline as well as infill housing through the residential zoned land.

6.6.2 Hydrology

Urban Catchment 18 comprises two distinct areas bounded by the watershed along Koutu Rd and the old railway and Koutu Drain: the southern area consists of a series of pipes and open drains up to Kawaha Point Dr Culvert from where it enters a series of pipes that discharge into the Waiowhiro Stream, and the northern area drains the higher lying parts of Kawaha Point via separate SW systems to the Waiowhiro Stream and the lake.

Urban Catchment 19 drains the Western Heights area and there are twin 2.5 x 1.5m culverts under Fairy Springs Rd which discharge to the Koutu Drain and from there to the Waiowhiro Stream.

Urban Catchment 20 comprises part of Western Heights and the tourism activities through to Skyline. There are several large culverts under Fairy Springs Rd which discharge into the Waiowhiro Stream at 11 points.

The southern part of Urban Catchment 21 drains the State Highway into the Waiowhiro Stream.

6.6.3 **Specific characteristics**

There are high groundwater tables in the low lying areas of Catchment 18 at the end of Ian Street and Bellevue Rd.

6.6.4 **Current resource consents**

There are six current consents for stormwater management in this catchment:

Table 19 – Waiowhiro Catchment - Existing Consents

Consent No.	Description and Location of Discharge	Max. Rate of Discharge	Expiry
20211	Discharge stormwater from a residential subdivision into the Waiowhiro Stream at 3 points of discharge. a) 170 metres upstream of Waiowhiro Stream mouth (600mm diam. pipe) b) 320 metres upstream of the mouth (600mm diam. pipe) c) 550 metres upstream of the mouth (450mm diam. pipe).	a) 504 l/s b) 530 l/s c) 345 l/s	*
24670	Discharge stormwater to the Waiowhero Stream from an urban/rural catchment (outfall at end of Amokura Street).	2000 l/s except when design rainfall of a 10% annual expected probability storm event is exceeded.	31/5/2006*
25019	Discharge stormwater (from an urban subdivision at Gemini Place) to land in circumstances which may result in that stormwater entering water.	334 l/s except when the design rainfall event of a 5 year 10 minute storm event is exceeded.	31/03/2013*
63485	Discharge stormwater and to use a discharge structure in, on, under and over the bed of the Waiowhiro Stream; Amokura Street.	2000 l/s except when the design rainfall of a 10% annual expected probability storm event is exceeded.	31/12/2040
61112	Replace two culverts with a new culvert on the bed of a tributary of the Waiowhiro Stream, to reduce the potential for flooding in a residential area at Steeles Lane.		31/3/2036
63379	Extend and use a culvert in an unnamed tributary to the Waiowhero Stream.		31/8/2041

6.6.5 Quantity Issues

Key issues affecting stormwater quantity in this catchment are as follows.

The Waiowhiro Stream is heavily affected by high lake levels and stream bank erosion occurs along its lower reach. Maintenance of the stream falls under the Regional Council through the Upper Kaituna Catchment Control Scheme. The Waiowhiro Stream receives all stormwater from Catchments 19 and 20. It is subject to silting, erosion, vegetation encroachment. The stream section downstream from the railway bridge meanders and has a low gradient with significant vegetation growth on its banks (e.g. willows), which forms a natural hydraulic constraint and causes slow backwater conditions during high flow events.

Stream modelling shows that significant attenuation of peak flows occurs at the Railway Bridge and that flooding will occur on the low lying properties at the end of Barnard Rd. The Barnard Road/Darroch Street area is also low lying with poor drainage. Significant surface flooding in high rain events occurs regularly. The sewer pump station at the end of Barnard Rd gets flooded during significant events. This is the main issue to be addressed.

The low lying areas at the back of Bellevue and Frank Streets are also subject to seasonally high groundwater levels.

Flood flows and wave action with high lake levels have in the past eroded a significant amount of the foreshore reserve at the mouth of the Waiowhiro Stream. Riprap was used to re-establish the foreshore and to stabilise it. Erosion of the stream banks occurs and vegetation control (tree root encroachment into waterway) and debris removal requires regular maintenance.

Throughout this catchment, the open drain systems need regular clearing out for silt and for vegetation control, debris clearing and erosion repair from time to time. Pipe inlets can block and in some locations an overland flow path is required. Access for maintenance can be difficult.

The concrete channel between Maisey Place and Tui Rd requires regular clearing to remove industrial waste. Access is difficult.

6.6.6 Quality Issues

Key issues affecting stormwater quality in this catchment are as follows.

Industrial and commercial areas as well as high traffic numbers on Fairy Springs Road pose contamination threats to the environment.

Monitoring has identified that all heavy metals in the stream and lake are below “Low” and in the drains are below “High”. No effects that were more than minor were identified by NIWA.

There was no change (increase) in nutrient concentrations due to runoff from the urban catchment.

Biological monitoring show reduced habitat in the downstream section but are considered to be related to lower flows and natural causes rather than urban stormwater.

Mussels from the mouth of the Waiowhiro Stream showed higher levels of lead concentration than accepted limits.

It is considered to be a high risk catchment due to industrial and commercial land use.

6.6.7 Proposed Actions

Modelling:

- InfoWorks ICM modelling of Catchment 18 has been completed.
- Catchment modelling is programmed to assess the feasibility of proposed **s**tormwater detention pond and stormwater network upgrade to address flooding issues and climate change and enable development within Frank Street and part of Waikite Rugby Club.

Proposed Works:

Table 20 – Waiowhiro – Proposed Works

Catchment	Description of Project	Estimated Cost	Programmed completion date
18	Stormwater detention pond and stormwater network upgrade to address flooding issues and climate change and enable development within Frank Street and part of Waikite Rugby Club.	$3.32M	December 2027

6.7 Ngongotaha Catchment (Catchments 23, 24, 25 and part 27)

6.7.1 Description

The Ngongotaha Stream Catchment has an area of 74.82km^2 and includes urban catchments 23, 24, 25, part of 27. Outside the urban area it largely drains pastoral land as including some plantation forestry. Within the urban area it is largely reserve land, with smaller areas of residential and limited industrial and commercial land.

There are limited future residential development opportunities.

6.7.2 Hydrology

The Ngongotaha Stream drains the northern slopes of Mt Ngongotaha and part of the Mamaku Plateau. It discharges into Lake Rotorua several kilometres north of Rotorua City. The stream has nationally significant trout habitat and fishery values. All stormwater drains into the stream.

A flood control scheme was built in 1985 in the lower 740m by the then Bay of Plenty Catchment Commission. This involved stopbanks and flood spillways across several meander bends. In 1987 stream widening and clearing of vegetation was undertaken up to SH5. A community led programme of clearing willow and blackberry and planting native grasses and

trees has been underway since about 2001. These works have all had significant impacts on the hydraulic characteristics of the stream.

Stop banks between Ngongotaha Rd and the lake are intended to minimise any flooding and protect infrastructure up to 1% AEP. BOPRC identified the potential for 3.0 m^3/s to spill over the banks at Brake Road during 1% AEP events. However, the actual overflow may be as high as 11.8 m^3/s when including a climate change factor.

As the water level within the Ngongotaha Stream rises, the resulting backwater significantly reduces the capacity of the stormwater system outlets and the capacity of the piped system is exceeded during the 50 and 100 year ARI events. The remaining runoff flows as overland flow along roads and secondary flow paths, eventually ponding east of Oakland Place. High water levels in the Ngongotaha Stream restrict ponding from discharging back into the stream via the existing 450 mm diameter culvert under Western Road. When the ponding water level north of Western Road reaches RL 285.2 m, water overtops the road and flows back into the Ngongotaha Stream. The flood level at Oakland Place is largely controlled by this flow across Western Road.

6.7.3 Specific characteristics

The catchment geology is described as deep, well drained loam over Sandy Loam, Groundwater generally flows in an easterly direction parallel to the stream, towards Lake Rotorua.

6.7.4 Current resource consents

There are currently four resource consents for stormwater measures in this catchment:

Table 21 – Ngongotaha Catchment - Existing Consents

Consent No.	Description and Location of Discharge	Max. Rate of Discharge	Expiry
20314	Discharge stormwater from a residential subdivision at Western Road to the Ngongotaha Stream.	292 l/s	*
25076	Discharge water from a 9.8 hectare area of a residential subdivision located on the northern side of Western Rd into Ngongotaha Stream.	1056 l/s except when the 10 year, 10 minute duration, design rainfall event is exceeded.	30/04/2014*
63042	To authorise stormwater diversion and discharge to water being the Ngongotaha Stream, associated with a residential development site at Western Rd, Ngongotaha.	2.980 m^3/s except when the design rainfall event of a 2% AEP 10 minute storm event is exceeded	30/11/2040
63719	Discharge treated stormwater to Lake Rotorua associated with the establishment of a residential subdivision, Ngongotaha.	0.59 cubic metres per second except where the 10% AEP 10 minute design storm is exceeded.	30/6/2026

6.7.5 Quantity Issues

Key quantity issues for this catchment relate to flooding and high streams levels:

- Ngongotaha Stream overtopping its banks in the urban area, specifically at Brake Rd
- Flooding along Western Rd, specifically through the Pioneer Subdivision above the design levels for the flow paths.
- Flooding at Brookdale Drive.
- High stream levels preventing stormwater networks to discharge effectively.

The Ngongotaha Stream receives all stormwater for Catchment 23 and maintenance is required to address erosion, sediment build up and growth of willow trees. Drains can be flat and therefore not efficient, leading to high water levels. All drains need to be kept clear and clean to avoid blockage. On properties between Okona Cres and Paraone St, low lying areas can be subject to surface ponding after prolonged wet periods.

The subdivision at Western/Pioneer/Oakdale roads is low lying and has poor soakage. Springs may be fed from higher ground at the northern boundary. During high flood levels the Ngongotaha Stream has overtopped its banks near Brake Rd and there is a secondary flow path through the Western Rd Subdivision to manage these flows

Flooding along Western Rd subdivisions, including Pioneer Rd and Oakland Place, as well as Brookdale Rd, is a major concern. Flooding of properties along Western Rd, Oakland Pl, Brookdale and Streamdale Drives has occurred on two recent occasions: 2012 and 2018. The April 2018 event was 1:100 year storm and resulted in extensive flooding of 38 houses along the Ngongotaha Stream which spilled over its banks at Brake Rd and inundated properties along Western Rd, Pioneer Rd and Oakdale Place. Brookdale and Streamdale drives also suffered flooding damage.

6.7.6 Quality Issues

Key issues affecting stormwater quality in this catchment are as follows.

Commercial land use and high traffic numbers on SH5 and Ngongotaha Rd pose potential threats to the environment.

All heavy metals were below “Low” limits. Mussels from the mouth of the Ngongotaha Stream contained metal concentrations at 10-11% of the recommended limits but this is not considered significant. Pathogens exceed safe swimming levels.

There was no change (increase) in nutrient concentrations due to runoff from the urban catchment.

The catchment is considered low-risk due to the small percentage of industrial and commercial land use.

6.7.7 Proposed Actions

Modelling:

- Modelling has been completed as part of TUFLOW model covering catchments 23-27.
- No future modelling is proposed.

Proposed Works:

Major works include the proposed Ngongotaha Flood Mitigation works being implemented by BOPRC.

6.8 Waiteti Catchment (Catchments 26 and parts 27 & 28)

6.8.1 Description

The Waiteti Stream rises west of Ngongotaha and enters the lake north of the village. It is regionally significant for trout habitat and fishery values. The Waiteti Stream Catchment includes urban catchments 26 and parts of 27 and 28. Much of the catchment is rural , with the urban area made up of reserve, residential and road reserve.

Future residential development of land next to the Waiteti Stream and upstream of Hamurana Rd is proposed as part of the State Housing Accord Programme, as well as land parcels to the west of Ngongotaha Rd bounded by the old railway line and the Waiteti Stream.

6.8.2 Hydrology

The old railway divides the catchment in two. The southern part comprises residential development on higher land to the south of the railway lines, with lower farmland next to the railway that gets flooded during significant events. The northern part drains to the Waiteti Stream via a poorly drained swampy area. The residential area between the Ngongotaha Rd and the Lake drains to both the Waiteti Stream and the lake.

6.8.3 Specific characteristics

The land at the end of Kingsley and Bruce Streets, bounded by the old railway, is low lying and then flows through a culvert and a swampy area to discharge into the Waiteti Stream.

6.8.4 Current resource consents

There is currently one resource consent for stormwater measures.

Table 22 – Waiteti Catchment - Existing Consents

Consent No.	Description and Location of Discharge		Expiry
61816	Replacing an undersized culvert structure with a 1450mm x 600mm concrete box culvert, and associated erosion protection works, on the bed of an unnamed ephemeral tributary of the Waiteti Stream.		30/11/2037

6.8.5 Quantity Issues

Key issues affecting stormwater quantity in this catchment are as follows.

Ponding of water next to the old railway embankment at the end of Kingsley and Bruce Streets makes regular maintenance to ensure that the culvert remains open.

Erosion occurs along the Waiteti Stream and a number of areas have been repaired with rip rap. The northern side of stream and some of the south side properties have "riparian rights" (i.e. own right to stream) and repair of erosion is not the responsibility of BOPRC or RDC. Fallen trees have been identified in the stream from time to time.

In general, no flooding related issues are noted for these urban catchments.

6.8.6 Quality Issues

Key issues affecting stormwater quality in this catchment are as follows.

There is no indication that stream bank erosion is increasing with urban development.

There was no change (increase) in nutrient concentrations due to runoff from the urban catchment.

The monitoring of periphyton indicates deterioration in the downstream direction. However, NIWA considered that habitat limitations were largely unrelated to urban stormwater but rather result from low velocity, flow variability and fine substrates.

Mussels from the mouth of the Waiteti Stream contained metal concentrations at 8-15% of the recommended limits and was not considered significant.

High traffic numbers on Ngongotaha Rd presents potential threats through generation of heavy metals from wear of tyres, oil spilling on to the road, etc. However, the catchment is considered low-risk due to the absence of industrial and small percentage of commercial land use.

6.8.7 Proposed Actions

Modelling:

- Modelling has been completed as part of TUFLOW model covering catchments 23-27.
- No future modelling is proposed.

Proposed Works:
No proposed major works.

6.9 Other Catchments (Catchments 8-10, 17, 21, 22, 27-29)

6.9.1 Description

Urban catchments 8, 9, 10, 17, 21, 22, 27, 28, and 29 discharge directly to Lake Rotorua. These catchments have a generally small rural component and a larger residential, commercial and industrial component. It is not expected that land use will change significantly for those areas already developed, although redevelopment projects (e.g. Lake Front) and some intensification may occur in the central area. The corridor between Fairy Springs and Ngongotaha may see more commercial development on the lake side and more tourism facilities on the west side of the State Highway impacting on urban catchments 21 and 22.

6.9.2 Hydrology

These catchments are drained by networks of drains to the Lake at locations around the lake edge. They are affected by high lake levels, low grades, geothermal activity, erosion and wave action. They may link into other catchments such as secondary flow from UC8 to UC7 and 12. There is a debris trap between Te Ngae Road and Amohia Street extension as well as near Memorial Drive.

6.9.3 Specific characteristics

These catchments are generally close to the lake and are generally flat. The lake level influences water tables, as well as outlet pipes discharging to the lake significantly. In addition, the soils closer to the lake are generally not conducive to soakage. Part of UC 9 and 10 are affected by geothermal and hot ground.

6.9.4 Current resource consents

There are currently two resource consents for stormwater related mechanisms:

Table 23 – Other Catchments - Existing Consents

Consent No.	Description and Location of Discharge	Maximum Rate of Discharge	Expiry
24415	Discharge stormwater (behind Pak 'n Save) to an open drain from an urban and commercial 21.8 hectare catchment - from Rotorua Central Development.	5 m^3/s except where the design event of a 50 year storm is exceeded.	30/3/2012*

Consent No.	Description and Location of Discharge	Maximum Rate of Discharge	Expiry
60644	Discharge treated stormwater into Lake Rotorua via four outfalls - from the Rotorua CBD. *This consent replaced consent 22535.*	Q1: NZMS 260 U16 9548 3621; 3 cubic metres per second; Sec 2 SO 59891 Tarawera SD (Rotorua District) Q2: NZMS 260 U16 9563 3614; 5.4 cubic metres per second; Pt Sec 2 Blk I Tarawera SD (Rotorua District) Q3: NZMS 260 U16 9620 3560; 1.3 cubic metres per second; Lot 3 Sec 2 Blk I Tarawera SD (Rotorua District) Q4: NZMS 260 U16 9580 3528; 5.7 cubic metres per second; Lot 2 DPS 19558 Blk I Tarawera SD (Rotorua District)	30/09/2010*

6.9.5 Quantity Issues

Key issues affecting stormwater quantity in this catchment are as follows.

The lake level has a significant impact on ground water levels, and during high lake levels the water table has a major impact on the efficiency of soakage systems, drains and stormwater pipes. Wave action also causes sand to block some outlets. The low gradients of much of the area have a negative impact on the hydraulic efficiency of stormwater systems. The large sediment traps in the CBD requires regular maintenance. Some SW systems experience heading up due to the hydraulic head losses through these traps. Surface flooding of roads associated with secondary flow paths.

Properties along the lake front are at risk of flooding, including the Waikuta wetland and subdivision, the Lake Front and a large portion of Ohinemutu, and lakeside properties along Parawai Rd and around Ngongotaha Stream mouth. Runoff from Mount Ngongotaha can affect Ngongotaha Road and the drains may be blocked.

High volumes of Hydrogen Sulphide occur throughout the area, along the State Highway. at Ohinemutu, and in the Government Gardens Area. Recent upgrades have been undertaken in Queen's Drive, the Energy Events Car Park, as well as the system servicing the museum and in the vicinity of the Polynesian Spa, and at the intersection of Amohau St and Fenton St.

6.9.6 Quality Issues

Key issues affecting stormwater quality in this catchment are as follows.

Commercial areas are located in the CBD and along main roads such as Fenton St, Malfroy Rd, and Lake Rd pose contamination threats to the environment. Industrial and commercial areas located around Lake Rd and along Ngongotaha Rd also pose contamination threats to the environment. High traffic numbers add to the potential risk. The catchment, especially UC10, is considered high-risk due to the presence of industrial and commercial land use.

Sampling showed no adverse effect on the lake, but heavy metals in the drains in UC10 were above acceptable levels. There were no mussels at the lakefront, but this could be due to geothermal influence rather than urban stormwater. In the lake at the stream mouth mussels showed no levels of contamination above accepted limits.

It is considered to be a low risk catchment as there is no industrial or commercial land use.

6.8.7 Proposed Actions

Modelling:

- Modelling has been completed as part of InfoWorks ICM model covering catchments 8, 9, and 27.
- Catchment modelling is programmed to assess the feasibility of proposed stormwater enabling works within the following catchments:

Table 24 – Other Catchments – Proposed Modelling

Catchment	Description of proposed stormwater enabling works	Programmed start of modelling work
8	Stormwater network upgrade to enable development of the Rotorua Racecourse (subject to planning approvals.)	April 2025
8, 9	Stormwater network upgrade to enable development of the Recycling Centre at Te Ngae Road.	April 2025
8, 9,12	Stormwater network upgrades including a new stormwater pump station to address flooding issues and climate change and enable development at Whakatau Street, Glenholme area, Lytton Street and Victoria Street.	April 2025
17	Stormwater network upgrades to address flooding issues and climate change and enable development at Bennetts Road	April 2024

Proposed Works:

The following major works are proposed:

Table 25 – Other Catchments - Proposed Works

Catchment	Description of Project	Estimated Cost	Programmed completion date
8	Stormwater network upgrade to enable development of the Rotorua Racecourse (subject to planning approvals).	$2.48M	December 2028
8, 9	Stormwater network upgrade to enable development of the Recycling Centre at Te Ngae Road.	$2.08M	June 2028
8, 9, 12	Stormwater network upgrades including a new stormwater pump station – to address flooding issues and climate change and enable development at Whakatau Street, Glenholme area, Lytton Street and Victoria Street.	$21.13M	June 2028
17	Stormwater network upgrades to address flooding issues and climate change and enable development at Bennetts Road.	$3.47M	December 2027

7. STATUS OF ACTIVITIES

7.1 Consent is required under Rule DW R8 of the Regional Natural Resources Plan (RNRP) for a comprehensive stormwater catchment consent, for the range of discharges to land or water. In addition, consent is required for works in bed of streams and the lake bed under Rule DW R36. Some activities may be Permitted but the consent seeks authorization for all components of the stormwater management system. No consents are needed under the Regional Air Plan.

7.2 The Rotorua Urban Area Stormwater Catchment management system consists of the following main components:

- Pipelines
- Open ended culverts
- Manholes
- Subsoil drains
- Open drains
- Timber lined drains
- Silt traps
- Pump stations
- Inlet / outlet structures, and
- Flood retention dams.

There are over 300 outlets of which 210 are discharges to streams, 73 to Lake Rotorua, 11 to drains or channels, 6 to geothermal areas and one is to land.

7.3 The following rules allow works as permitted activities (all subject to compliance with conditions specified):

Rule LM R1	Earthworks – The disturbance of land and soil as a result of earthworks, where the activity does not exceed the limits in Table 28 in any 12 month period
Rule LM R7	Land and soil disturbance by vegetation clearance – includes clearance of vegetation in ephemeral flow paths that is causing erosion or is blocking water flow, and includes removal of willows
Rule DW R1	Discharge of aquatic herbicide over water for weed control
Rule DW R22	Discharge of stormwater to land soakage
Rule WQ R14	Diversion of stormwater (surface runoff)
Rule WQ R15	Damming and diversion of flood waters by existing flood control structures
Rule WQ R16	Damming of surface runoff water
Rule BW R1	Use of specified existing lawfully authorised structures, including flood control or water level structures
Rule BW R11	Monitoring and sampling structures in, on, under or over the bed of a river, stream or lake

Rule BW R12	Culverts constructed by district councils within urban areas – use, erection, reconstruction, placement, alteration or extension of a culvert, under the LGA

These rules cover many of the day to day maintenance works within the RUA. However, as consent is required for the management of the stormwater as a whole, all works are covered by the application.

7.4 Table 26 sets out the activities covered by this application, which are discretionary under the RNRP. They include existing established stormwater infrastructure together with maintenance, repair and upgrade and future works to service additional development in the Rotorua Urban Catchment.

Table 26 – Activities covered by this Application

Activity	Detail
Discharge of Stormwater to Water	• Discharges to open drains, streams and Lake Rotorua from land used for residential, reserve, commercial, and industrial or trade purposes, including discharges from contaminated sites, and roads
Discharge of Stormwater to land	• Discharges to detention ponds, swales and soakaways
Works within the bed of Lake Rotorua, Waitawa area and watercourses	Construction, installation, replacement and maintenance of structures and associated activities, including: • inlet and outlet structures • diversion of stormwater • damming surface runoff • Scour protection • Energy dissipation devices • Fish passages • Debris screens • Flood protection works, stopbanks, floodgates, spillways and detention dams and weirs • Piping watercourses, artificial lining, channeling and widening • Pipeline crossings of streams/ watercourses • Culverts • Treatment devices and systems • Pump stations • Mitigation works and ecological enhancement works
Maintenance Activities Including repair and replacement	• Repair and replacement of stormwater infrastructure such as silt traps, treatment devices and systems • Debris removal • Litter removal • Sediment removal

Activity	Detail
	• Clearance of sediment from outlets to the lake or streams
Minor earthworks	• Sediment removal • Stream realignment, diversion • Placement of riprap and other stream bank protection • Repair of erosion and scour
Monitoring	Installation of permanent and temporary sampling and monitoring devices for monitoring stream flow, depth and water quality in, on, under or over the bed of the lake or stream, or in riparian areas
Vegetation clearance and planting	• Removal of vegetation, trees, roots in stream bed and riparian area • Weed control by aquatic herbicide • Planting riparian margins

7.5 Consent for the activities listed in section 7.4 above is requested under rule DW R8 as a Discretionary Activity. It will cover existing and proposed future works to maintain, repair, upgrade and provide for stormwater management infrastructure within the Rotorua urban Area as described in the application.

7.6 The NES for Assessing and Managing Contaminants in Soil to Protect Human Health 2011 manages activities where contaminated soil may pose a risk to human health. Activities involving earthworks are controlled by the NES. For this application, sites that are identified as contaminated or potentially contaminated have been identified and the potential implications are considered below. However, the need for consent in relation to this NES would only be triggered if works were proposed on a site identified as contaminated or potentially contaminated. It is anticipated that the consent process and conditions will address any requirements of the NES. (refer also section 9 below)

7.7 The NES for Freshwater was gazetted at the same time as the NPS FM 2020. The NES contains rules in Part 3 in relation to ”other activities that relate to freshwater”. These rules relate to wetlands, reclamation of rives and fish passage across specific structures. The activities include the construction and maintenance of wetland utility structures, specified infrastructure and natural hazard works. Activities addressed include vegetation clearance, earthworks and discharges of water. Where new infrastructure triggers any requirement for consent under the Freshwater NES Management this it is anticipated that the conditions will encompass the requirements of the NES. (Refer also section 9 below)

8. STATUTORY REQUIREMENTS

8.1 As a Discretionary Activity, the resource consent application must be assessed against Sections 104 and 104B of the Act. Section 104B provides that the consent may be granted or refused, and, if consent is granted, that conditions may be imposed on the consent under Section 108.

8.2 Section 104 requires that, subject to Part 2 of the Act, Council has regard to the following matters:

- *Any actual and potential effects on the environment of allowing the activity; and*
- *any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and*
- *Any relevant provisions of a national policy statement, a regional policy statement or proposed regional policy statement, a plan or proposed plan; and*
- *Any other matter the consent authority considers relevant and reasonably necessary to determine the application.*

8.3 Section 104(2) allows the Council the discretion to disregard any adverse effects on the environment where the Plan permits an activity with that effect (the "permitted baseline").

8.4 Section 104(3)(b) requires that, if a person has given their written approval to the proposal, the Council cannot consider any adverse effects on that person. No written approvals have been provided.

8.5 Under Section 95A of the Act, applications for resource consent must be notified if the adverse effects on the environment are considered to be more than minor. An assessment under section 95D will determine whether the adverse effects are more than minor and hence whether public notification is required by the Act.

8.6 Under Section 95D the consent authority must determine whether the adverse effects of the activity are likely to be more than minor. When determining this, a consent authority, subject to Section 95A(2)(a), must disregard any effects on persons who own or occupy the land in, on, or over which the activity will occur, and/or any land adjacent to that land. The scope of effects is considered in Sections 6 and 11 of this assessment.

8.7 In terms of Section 95E a consent authority must also decide whether a person is an "affected person" in relation to the activity, if the adverse effects of an activity on the person are minor or more than minor (but are not less than minor). This is discussed further in Section 14 of this assessment.

8.8 If the potential effects are minor or more than minor (in the case of the owners of the site of any land adjacent) then under section 95E the Council must decide if there are any affected persons or order holders. If there are any affected parties then, if they do not

provide written approval, then the application must be served on them, as part of the limited or public notification process.

8.9 It is noted that public notification is requested by the Council as set out in section 14.

8.9 When considering an application for a discharge, section 105 requires that the decision maker has regard to the following matters:

- the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
- the applicant's reasons for the proposed choice; and
- any possible alternative methods of discharge, including discharge into any other receiving environment.

9. REGULATORY FRAMEWORK

9.1 Introduction

9.1.1 Resource Consent is required from the Bay of Plenty Regional Council (BOPRC). This section considers the statutory framework which applies to the RUA stormwater network and the relevant plan provisions that need to be considered.

9.1.2 Section 104(1)(b) of the RMA requires consideration of the relevant provisions of:

- A national environmental standard
- Other regulations
- A national policy statement
- A regional policy statement, and
- Any plans or proposed plans.

In addition section 104(1)(c) enables the Council to consider any other matter the consent authority considers relevant and reasonably necessary to determine the application.

9.1.3 In addition Schedule 4 of the RMA requires that an AEE must include an assessment of the activity against:

(a) any relevant objectives, policies, or rules in a document; and

(b) any relevant requirements, conditions, or permissions in any rules in a document; and

(c) any other relevant requirements in a document (for example, in a national environmental standard or other regulations).

9.1.4 This section provides the information required by the RMA in this respect.

9.2 National Environmental Standards

9.2.1 Section 104(b)(i) requires Council to have regard to national environmental standards. There are eight National Environmental Standards which relate to contaminated soils, fresh water, marine aquaculture, air quality, human drinking water, plantation forestry, telecommunications facilities and electricity transmission. Those relevant to this application are:

- NES for Sources of Human Drinking Water 2007,
- NES for Assessing and Managing Contaminants in Soil to Protected Human Health 2011,
- NES for Freshwater Management 2020.

9.2.2 **NES for Sources of Human Drinking Water 2007**

The **NES for Sources of Human Drinking Water 2007** requires that discharge consents are not granted where there will be a risk of contamination of drinking-water sources. The Rotorua Urban Area Catchment does not directly affect downstream water takes as the receiving environment is Lake Rotorua in the first instance. However, the potential effect is considered in section 11 below.

9.2.3 **NES for Assessing and Managing Contaminants in Soil to Protect Human Health 2011**

The **NES for Assessing and Managing Contaminants in Soil to Protect Human Health 2011** manages activities where contaminated soil may pose a risk to human health. Activities involving earthworks are controlled by the NES. For this application, sites that are identified as contaminated or potentially contaminated have been identified and the potential implications are considered below. However, the need for consent in relation to this NES would only be triggered if works were proposed on a site identified as contaminated or potentially contaminated.

9.2.4 **Freshwater NES 2020**

9.2.4.1 The NES for Freshwater was gazetted at the same time as the NPS FM 2020. The NES sets requirements for activities that may pose a risk to freshwater and freshwater ecosystems. The MfE Website summarises the intent as:

- protect natural inland wetlands
- protect urban and rural streams from in-filling
- ensure connectivity of fish habitat (fish passage)
- set minimum requirements for feedlots and other stockholding areas
- improve poor practice intensive winter grazing of forage crops
- restrict further agricultural intensification until the end of 2024
- limit the discharge of synthetic nitrogen fertiliser to land, and require reporting of fertiliser use.

9.2.4.2 The NES contains rules in Part 3 in relation to ”other activities that relate to freshwater”. These rules relate to wetlands, reclamation of rives and fish passage across specific structures. The activities include the construction and maintenance of wetland utility structures, specified infrastructure and natural hazard works. Activities addressed include vegetation clearance, earthworks and discharges of water.

9.2.4.3 Where new infrastructure triggers any requirement for consent under the Freshwater NES Management this it is anticipated that the conditions will encompass the requirements of the NES.

9.3 National Policy Statements

9.3.1 Section 104(b)(iii) requires Council to have regard to national policy statements. There are currently national policy statements relating to freshwater management, highly productive land, renewable energy generation, electricity transmission, urban development and the NZ coastal policy statement. Of these three are relevant to consider:

- NPS for Electricity Transmission 2008.
- NPS Urban development 2020.
- NPS for Freshwater Management 2020.

9.3.2 **National Policy Statement on Electricity Transmission**

The National Policy Statement on Electricity Transmission was gazetted on 13 March 2008:

To recognise the national significance of the electricity transmission network by facilitating the operation, maintenance and upgrade of the existing transmission network and the establishment of new transmission resources to meet the needs of present and future generations, while:

- *managing the adverse environmental effects of the network; and*
- *managing the adverse effects of other activities on the network.*

It is relevant in ensuring that the operation, maintenance, upgrading, and development of the electricity transmission network is not compromised by other activities.

9.3.3 National Policy Statement on Urban Development 2020

The National Policy Statement on Urban Development 2020 came into effect on 20 August 2020 and is relevant to assessing the application.

Table 27 - National Policy Statement on Urban Development 2020

Objective 1	New Zealand has well-functioning urban environments that enable all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety, now and into the future.
Objective 6:	Local authority decisions on urban development that affect urban environments are: a. integrated with infrastructure planning and funding decisions; and b. strategic over the medium term and long term; and c. responsive, particularly in relation to proposals that would supply significant development capacity.
Objective 8	New Zealand's urban environments: a. support reductions in greenhouse gas emissions; and b. are resilient to the current and future effects of climate change.
Policy 1	Planning decisions contribute to well-functioning urban environments, which are urban environments that, as a minimum: a. have or enable a variety of homes that: (i) meet the needs, in terms of type, price, and location, of different households; and (ii) enable Māori to express their cultural traditions and norms; and b. have or enable a variety of sites that are suitable for different business sectors in terms of location and site size; and c. have good accessibility for all people between housing, jobs, community services, natural spaces, and open spaces, including by way of public or active transport; and d. support, and limit as much as possible adverse impacts on, the competitive operation of land and development markets; and e. support reductions in greenhouse gas emissions; and

	f. are resilient to the likely current and future effects of climate change.
Policy 6	When making planning decisions that affect urban environments, decision-makers have particular regard to the following matters: a. the planned urban built form anticipated by those RMA planning documents that have given effect to this National Policy Statement b. that the planned urban built form in those RMA planning documents may involve significant changes to an area, and those changes: (i) may detract from amenity values appreciated by some people but improve amenity values appreciated by other people, communities, and future generations, including by providing increased and varied housing densities and types; and (ii) are not, of themselves, an adverse effect c. the benefits of urban development that are consistent with well-functioning urban environments (as described in Policy 1). d. any relevant contribution that will be made to meeting the requirements of this National Policy Statement to provide or realise development capacity. e. the likely current and future effects of climate change.
Policy 9	Local authorities, in taking account of the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) in relation to urban environments, must: a. … [relates to plan making] b. … [relates to plan making] c. provide opportunities in appropriate circumstances for Māori involvement in decision-making on resource consents, designations, heritage orders, and water conservation orders, including in relation to sites of significance to Māori and issues of cultural significance; and d. operate in a way that is consistent with iwi participation legislation.

In planning and maintaining the stormwater management system in the Rotorua Urban area, the effects or climate change have been taken into account and the requirement for well-functioning urban environments. preparing this application. The consultation strategy seeks to enable involvement by iwi and hapu in the decision making process.

9.3.4 National Policy Statement for Freshwater Management 2020

9.3.4.1 The National Policy Statement for Freshwater Management 2020 replaced the previous NPS-FM 2014 (amended 2017) in September 2020. It was further amended in January 2022 and February 2023. The NPS-FM provides national direction for the management of freshwater under the RMA. It recognises the significance of water to all New Zealanders and Te Mana o te Wai and requires that freshwater within a region must be maintained or improved. Achieving the outcomes in the NPS must be achieved over specified timeframes. In general it seeks to achieve the following[8]:

[8] MfE Website NPS Freshwater Management

- *Manage freshwater in a way that 'gives effect' to Te Mana o te Wai:*
    - *through involving tangata whenua*
    - *working with tangata whenua and communities to set out long-term visions in the regional policy statement*
    - *prioritising the health and wellbeing of water bodies, then the essential needs of people, followed by other uses.*
- *Improve degraded water bodies, and maintain or improve all others using bottom lines defined in the Freshwater NPS.*
- *An expanded national objectives framework:*
- *Avoid any further loss or degradation of wetlands and streams, map existing wetlands and encourage their restoration.*
- *Identify and work towards target outcomes for fish abundance, diversity and passage and address in-stream barriers to fish passage over time.*
- *Set an aquatic life objective for fish and address in-stream barriers to fish passage over time.*
- *Monitor and report annually on freshwater (including the data used); publish a synthesis report every five years containing a single ecosystem health score and respond to any deterioration.*

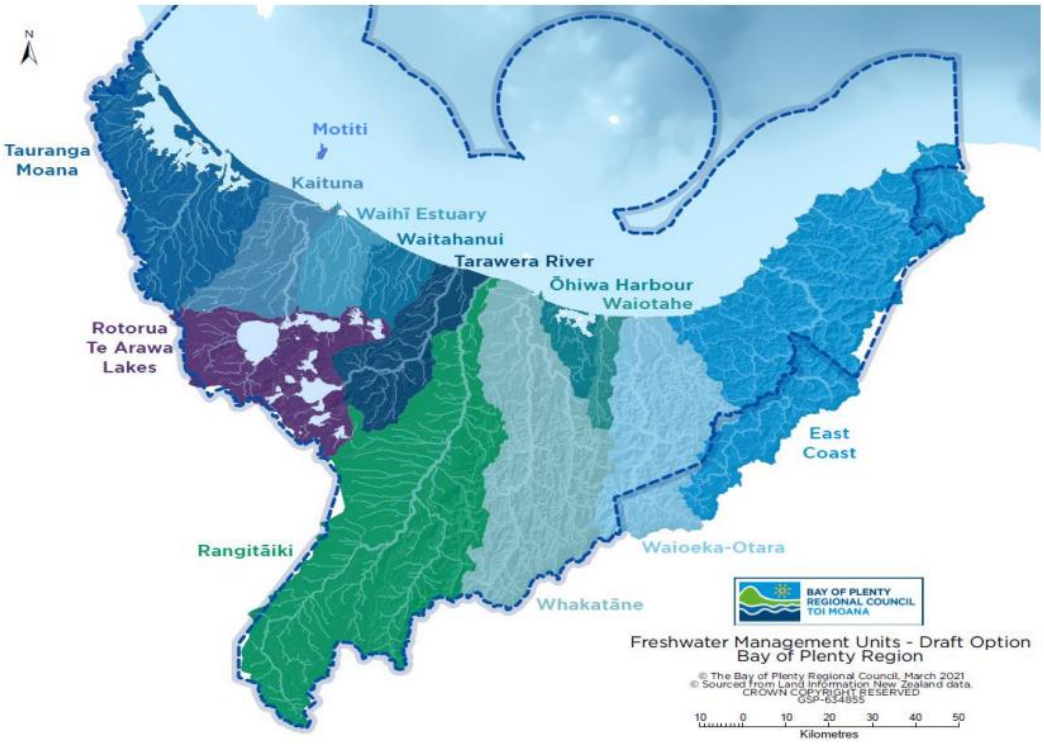


Figure 4 Freshwater Management Units (Draft)

9.3.4.2 At a regional level, BOPRC is revising its Regional Policy Statement and Regional Natural Resources Plan to give effect to the NPS. BOPRC is consulting with communities and tangata whenua and is proposing a number of draft Freshwater Management Units (FMUs) throughout the region (Figure 4). When considering the health of our freshwater it is

important to consider all the interrelated components of the whole catchment drained by a river from the mountains to the sea - ki uta ki tai. The draft management units relate primarily to freshwater catchment boundaries, reflect co-governance and rohe boundaries and are at a scale that may have a common management approach. Additional freshwater values and environmental outcomes for this FMU are currently being developed. Rainwater runoff from the Rotorua urban environment is a component of the draft Rotorua Te Arawa Lakes FMU.

9.3.4.3 At an iwi and rohe level, the Rotorua Te Arawa Lakes are a taonga (treasure) to the people of Te Arawa. The Te Arawa Lakes Trust (TALT) represents the interests of Te Arawa hapu and whanau in relation to the 2006 Settlement. TALT have partnered with BOPRC and RLC to protect and restore the Rotorua Lakes. Rainwater runoff from the Rotorua urban environment is a component of the Te Arawa Rotorua Lakes Programme.

9.3.4.4 At a local Level, Council provides stormwater network to convey the rainwater that falls on the urban environment to freshwater bodies, which this application relates to. One of Council's priorities is supporting the protection and restoration of the natural environment. Rainwater runoff from the Rotorua urban environment is a component of the natural environment in our District.

9.3.4.5 Key components of freshwater ecosystems include aquatic life, biodiversity, habitats, water quantity and flows, ecological process, and water quality. Urbanisation is one of many human activities that are impacting our freshwater.

9.3.4.6 Fundamental to the NPS-FM is Te Mana o Te Wai:

(1) Te Mana o te Wai is a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. It protects the mauri of the wai. Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community.

(2) Te Mana o te Wai is relevant to all freshwater management and not just to the specific aspects of freshwater management referred to in this National Policy Statement.

There are six principles relating to Te Mana o Te Wai:

(a) Mana whakahaere: the power, authority, and obligations of tangata whenua to make decisions that maintain, protect, and sustain the health and well-being of, and their relationship with, freshwater

(b) Kaitiakitanga: the obligations of tangata whenua to preserve, restore, enhance, and sustainably use freshwater for the benefit of present and future generations

(c) Manaakitanga: the process by which tangata whenua show respect, generosity, and care for freshwater and for others

(d) Governance: the responsibility of those with authority for making decisions about freshwater to do so in a way that prioritises the health and well-being of freshwater now and into the future

(e) Stewardship: the obligations of all New Zealanders to manage freshwater in a way that ensures it sustains present and future generations

(f) Care and respect: the responsibility of all New Zealanders to care for freshwater in providing for the health of the nation.

The obligations in relation to Te Mana o Te Wai are:

(a) first, the health and well-being of water bodies and freshwater ecosystems

(b) second, the health needs of people (such as drinking water)

(c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

9.3.4.7 There is one Objective in 2.1 and 15 policies in 2.2 which require:

Table 28 - National Policy Statement for Freshwater Management 2020

Objective 1	The objective of this National Policy Statement is to ensure that natural and physical resources are managed in a way that prioritises: (a) first, the health and well-being of water bodies and freshwater ecosystems (b) second, the health needs of people (such as drinking water) (c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.
Policy 1	Freshwater is managed in a way that gives effect to Te Mana o te Wai.
Policy 2	Tangata whenua are actively involved in freshwater management (including decision making processes), and Māori freshwater values are identified and provided for.
Policy 3	Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments.
Policy 4	Freshwater is managed as part of New Zealand's integrated response to climate change.
Policy 5	Freshwater is managed (including through a National Objectives Framework) to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved, and the health and well-being of all other water bodies and freshwater ecosystems is maintained and (if communities choose) improved.
Policy 6	There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted.

Policy 7	The loss of river extent and values is avoided to the extent practicable.
Policy 8	The significant values of outstanding water bodies are protected.
Policy 9	The habitats of indigenous freshwater species are protected.
Policy 10	The habitat of trout and salmon is protected, insofar as this is consistent with Policy 9.
Policy 11	Freshwater is allocated and used efficiently, all existing over-allocation is phased out, and future over-allocation is avoided.
Policy 12	The national target (as set out in Appendix 3) for water quality improvement is achieved.
Policy 13	The condition of water bodies and freshwater ecosystems is systematically monitored over time, and action is taken where freshwater is degraded, and to reverse deteriorating trends.
Policy 14	Information (including monitoring data) about the state of water bodies and freshwater ecosystems, and the challenges to their health and well-being, is regularly reported on and published.
Policy 15	Communities are enabled to provide for their social, economic, and cultural wellbeing in a way that is consistent with this National Policy Statement.

The management and monitoring of stormwater within the Rotorua Urban Area seeks to give effect to the objective and policies and through the CMP will adapt to future policy changes implemented by BOPRC.

9.3.4.8 Sub part 1 of Part 3 sets out the obligations on regional councils. This includes the requirement to include an objective to describe how the management of freshwater will give effect to Te Mana o Te Wai. Sub-part 2 refers to the National Objectives Framework. Monitoring frameworks must be developed and trends must be assessed. BOPRC is currently working to meet the national direction contained in the NPS-FM. However, some provisions are included in the NRP without requiring a Schedule 1 process.

9.3.4.9 Target attribute states and environmental outcomes are set in Appendix 2A and section 3.12 enables the Regional Council to impose conditions on resource consents to achieve target attribute states or any nutrient outcomes needed to achieve target attribute states. Monitoring trends is required and the monitoring strategy proposed and enabled through this application will complement the Regional Council's methods for monitoring.

9.3.4.10 Subpart 3 contains specific requirement is a set of policies relating to wetlands and rivers. The loss of natural inland wetlands must be avoided and values protected except in relation to wetland utility structures, specified infrastructure or natural hazard works in the RM (NES Freshwater) Regulations 2020. Within the Rotorua urban area there are natural wetlands and constructed wetlands which form part of the stormwater network. Specified

infrastructure as defined in the NPS form part of the activities to which this application relates.

9.4.3.11 Clause 3.22(1) requires a policy to be included in the NRP in relation to the loss of extent or values of natural inland wetland. It is anticipated that conditions will be included in accordance with the NPS outcome requirements. This also relates to effects on streams and the maintenance of fish passage, noting that most of the streams within the urban area are managed by the Regional Council under the Kaituna Catchment Control Scheme.

9.4.3.12 Overall, through this consent process the ongoing management of the Rotorua urban area stormwater will be undertaken in accordance with the NPS Freshwater.

9.4 BOP Regional Policy Statement (RPS)

9.4.1 The Bay of Plenty Operative Regional Policy Statement (the RPS) provides the regional level framework for considering the application. The RPS promotes the sustainable management of the Region's natural and physical resources. The policies are intended to complement each other and provide a robust, integrated approach to promoting the sustainable management of these resources.

9.4.2 The RPS requires consideration of the effects of activities on matters of national importance, on matters of significance to Māori, and ensuring that development is coordinated with infrastructure. Relevant Objectives and policies are as follows:

Table 29 – BOP Regional Policy Statement

Objective 6	*Provide for the social, economic, cultural and environmental benefits of, and the use and development of nationally and regionally significant infrastructure and renewable energy.*
Policy EI 3B	*Protecting nationally and regionally significant infrastructure*
Objective 7	*Provide for the appropriate management of:* (a) *Any adverse environmental effects (including effects on existing lawfully established land uses) created by the development and use of infrastructure and associated resources;* (b) *Any reverse sensitivity effects on established, consented or designated infrastructure.*
Policy EI7	*Managing the effects of infrastructure development and use*
Objective 13	*Kaitiakitanga is recognised and the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) are systematically taken into account in the practice of resource management*
Policy IW3B	*Recognising the Treaty in the exercise of functions and powers under the Act*
Policy IW4B	*Using consultation in the identification and resolution of resource management issues*
Objective 17	*The mauri of water, land, air and geothermal resources is safeguarded and where it is degraded, where appropriate, it is enhanced over time*
Policy IW5B	*Adverse effects on matters of significance to Māori*

Policy IW6B	*Encouraging tangata whenua to identify measures to avoid, remedy or mitigate adverse cultural effects*
Policy IW 2B	*Recognising matters of significance to Māori*
Policy WQ 3B	*Setting and applying instream flows and allocation limits for taking freshwater*
Objective 18	*The protection of historic heritage and outstanding natural features and landscapes from inappropriate subdivision, use and development*
Policy MN 8B	*Managing effects of subdivision, use and development*
Objective 19	*The preservation of the natural character of the region's coastal environment (including coastal marine areas) wetlands, lakes and rivers and their margins*
Policy MN 1B	*Recognize and provide for matters of national importance*
Objective 21	*Recognition of and provision for the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga*
Policy IW2B	*Recognising matters of significance to Māori*
Objective 23	*A compact, well designed and sustainable urban form that effectively and efficiently accommodates the region's urban growth*
Policy UG 8B:	*Implementing high quality urban design and live-work-play principles*
Policy UG 11B	*Managing the effects of subdivision, use and development on Infrastructure*
Policy UF 9B	*Coordinating new urban development with infrastructure.*
Objective 27	*The quality and mauri of water in the region is maintained or, where necessary to meet the identified values associated with its required use and protection, enhanced*
Objective 28	*Enhance the water quality in the lakes of the Rotorua district and other catchments at risk*
Policy WL 3B:	*Establishing limits for contaminants entering catchments at risk*
Objective 31	*Avoidance or mitigation of natural hazards by managing risk for people's safety and the protection of property and lifeline utilities*
Policy NH 11B	Providing for climate change

Therefore, as well as protecting or preserving natural character and other values there is a responsibility to protect infrastructure, especially regionally significant infrastructure. This would include protecting it from adverse effects of flooding and climate change, as well as ensuring that urban areas are functioning effectively.

9.5 Bay of Plenty Regional Natural Resources Plan

9.5.1 The BOP Regional Natural Resources Plan (RNRP) is the plan which requires consents for the RUA stormwater discharges. Discharges to water and land are considered in Section DW which identifies as issues:

22. *The lack of integrated and comprehensive management of stormwater may increase adverse effects on the environment.*
23. *There is the potential for stormwater to transport contaminants, which adversely affect receiving environments.*
24. *Excessive rates and volumes of stormwater discharged from point sources can lead to erosion and scour.*

25. *Increased volumes of stormwater are being diverted, concentrated and discharged to streams, rivers, lakes and coastal waters from developed areas as a result of the creation of impermeable surfaces that reduce the natural infiltration of rainwater, and a lack of reuse of stormwater.*
26. *The heritage values of streams, rivers (including modified watercourses) and lakes can be degraded where such watercourses are used as treatment and disposal systems for contaminated stormwater, or increased volumes of stormwater are discharged to receiving water bodies from urban areas.*
27. *The piping and diversion of small streams as part of urban development adversely affects the habitats of indigenous fish species, the natural character of those streams, and can lead to increased flooding in lower reaches of the catchment.*

9.5.2 Issues identified in the RNRP in relation to stormwater relate to:

- Contamination of stormwater, especially from industrial sources. Stormwater from urban areas may contain sediment, metals, nutrients, and Total Petroleum Hydrocarbons.
- Flooding from inadequate infrastructure including pipe sizes.
- Damage or destruction of heritage values
- Stormwater from roading may contain heavy metals and Total Petroleum Hydrocarbons especially from high traffic areas
- Land disturbance activities such as earthworks, vegetation disturbance, and quarries

9.5.3 Integrated management of land use and stormwater is consistent with the major aim of the plan. Objective 30, Policy 50 and Method 136 seek to achieve integrated management of land use and stormwater. Other objectives, policies and methods seek to improve the quality of stormwater discharged, address the effects of erosion and scour, minimise the volume of stormwater discharged and encourage Low Impact Design to achieve integrated management and reduce adverse effects or urban areas.

Table 30 – BOP Natural Resources Regional Plan Objectives

Objective 30	*Integrated and comprehensive management of stormwater within a catchment or sub-catchment framework, where practicable*
Objective 31	*Improvement, where necessary, to the quality of stormwater discharged to the environment.*
Objective 32	*Erosion and scour caused or exacerbated by stormwater discharges is avoided, remedied or mitigated*
Objective 33	*The volume of stormwater from urban areas and other sources that utilise stormwater systems that discharge to streams, rivers and lakes is minimised*
Objective 34	*Streams and rivers are not used as treatment systems for contaminated stormwater*
Objective 35	*Stormwater is discharged to land, where appropriate*
Objective 36	*No net increase of nitrogen or phosphorus to lake catchments as a result of stormwater discharges, especially from new urban development.*

Objective 37	*Stormwater discharges avoid, remedy or mitigate adverse effects on the ecological, natural character, landscape, recreational, and Māori cultural values of streams, rivers and lakes.*

9.5.4 Comprehensive Stormwater Consents ('CSC') are a means of implementing integrated management of stormwater within a catchment. Rotorua has been identified as a priority catchment in the BOPRC Stormwater Strategy for the Bay of Plenty Region. A CSC may cover a range of stormwater management activities within the specified area, including, but not limited to, stormwater discharges, associated structures such as culverts, maintenance of open stormwater drains, treatment devices, and damming and diversion of water. A CSC may be broad or limited and is applied for under Rule DW R8 as a discretionary activity. Consent conditions would allow district councils to manage stormwater within the overall parameters without requiring individual consents and set limits on the quality and quantity of stormwater discharges to the environment.

9.5.5 Policy 51 encourages district councils to provide an integrated framework:

To encourage city and district councils and roading authorities to plan, design, construct and maintain urban stormwater management systems within an integrated and comprehensive framework that:

(a) Avoids or mitigates adverse effects on rivers, streams, wetlands and aquatic ecosystems.

(b) Considers the total stormwater catchment, or sub-catchment as appropriate, including the interaction between different land uses in the catchment, and the effects of the discharge flow rate and volume on the existing hydrological system.

(c) Retains or establishes appropriate vegetation adjacent to natural water bodies, riparian margins and wetlands wherever practicable.

(d) Avoids the use of natural waterways as treatment systems for contaminated stormwater.

(e) Where necessary, improves the quality of stormwater discharged to the environment.

(f) Minimises the quantity of urban stormwater discharged to streams, rivers and lakes.

(g) Avoids, and where practicable and achievable remedies, the adverse effects on aquatic habitats from the piping of small streams and modified watercourses.

9.5.6 Method 136 encourages councils to develop long-term stormwater planning strategies that:

(a) Address the adverse environmental effects of stormwater on water quality, natural hydrological systems, and aquatic habitats.

(b) Integrate urban planning and the provision of stormwater infrastructure for present and future urban growth.

(c) Include catchment based approaches to stormwater management.

(d) Take into account the need to protect identified sensitive ecological areas.

(e) Address the different management issues for residential, commercial, industrial and roading stormwater.

(f) Address appropriate stormwater management and treatment.

(g) Identify and map existing stormwater systems and areas where there is a high risk of stormwater contamination, and maintain accurate records of inputs of potentially contaminated stormwater into these systems.

(h) Monitoring of discharges to stormwater systems.

9.5.7 It is noted that as a consequence of the NPS FM policy DW P6 was changed to read as follows:

When considering any application for a discharge the consent authority must have regard to the following matters:

(a) the extent to which the discharge would avoid contamination that will have an adverse effect on the life-supporting capacity of fresh water including on any ecosystem associated with fresh water; and

(b) the extent to which it is feasible and dependable that any more than minor adverse effect on fresh water, and on any ecosystem associated with fresh water, resulting from the discharge would be avoided; and

(c) the extent to which the discharge would avoid contamination that will have an adverse effect on the health of people and communities as affected by their contact with fresh water; and

(d) the extent to which it is feasible and dependable that any more than minor adverse effect on the health of people and communities as affected by their contact with fresh water resulting from the discharge would be avoided.

This policy applies to the following discharges (including a diffuse discharge by any person or animal):

(a) a new discharge; or

(b) a change or increase in any discharge –

of any contaminant into fresh water, or onto or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering fresh water.

Paragraph 1 parts a. and b. of this policy do not apply to any application for consent first lodged before the National Policy Statement for Freshwater Management takes effect on 1 July 2011.

Paragraph 1 parts c. and d. of this policy do not apply to any application for consent first lodged before the National Policy Statement for Freshwater Management 2014 takes effect on 1 August 2014.

***Note:** This policy was inserted to meet the requirements of the National Policy Statement for Freshwater Management 2011.*

***Note:** This policy was amended to meet the requirements of the National Policy Statement for Freshwater Management 2014 and National Policy Statement for Freshwater Management 2014 (amended in 2017).*

9.5.8 The application for resource consent and the associated CMP have been prepared to be consistent with the requirement to achieve the outcomes sought through these objectives, policies and methods.

9.6 Rotorua District Plan

9.6.1 Under the Operative (ODP) District Plan, most of the network of pipes and drains is either provided for by permitted activities under the activity list or as being consistent with the purposes of the LGA 2002. Some facilities are located within road reserves or reserves, and pump stations have been designated.

9.6.2 In the ODP, most relevant provisions are in Part 2 District Wide matters EIT Energy, Infrastructure and Transport and include:

Objective EIT-O1 Infrastructure that provides for the economic, cultural, social and environmental wellbeing of the Rotorua district, the region and New Zealand.

Objective EIT-02 - Infrastructure that avoids, mitigates or remedies the adverse effects on the character and amenity of the area.

Objective EIT-O3 - Land use, subdivision and development that do not adversely affect the operation, maintenance, upgrading of and access to existing infrastructure.

Policy EIT-P2 - Recognise the technical and operational requirements and constraints of infrastructure when considering the actual and potential adverse effects, including cumulative effects of infrastructure on the environment.

Objective NATC-P2 - Avoid, remedy or mitigate adverse effects of subdivision, use and development on riparian margins and water bodies to maintain or enhance natural character, ecological functions, biodiversity, water quality, and aquatic habitats.

Objective SUB-O1 - Subdivision layout and design contributes to improvements in water quality through the management of riparian margins, stormwater treatment and wastewater treatment.

Policy SUB-O13 - Subdivision occurs in a manner that integrates safely and efficiently with existing strategic infrastructure.

Policy SUB-P20 - Require that applications for subdivision demonstrate an effective system for the collection, treatment and disposal of stormwater suitable for the intended use, existing building, roads, shared access, reserves, or works created by subdivision.

9.6.3 The ODP identifies in Planning Map 209 Lake Rotorua Flood Level the 1 in 50 year (2% AEP) flood level, which is set at 281.18m.a.s.l. Within the identified area, which is shown in more detail on the 300 (Urban) Series maps, specific rules in the Residential and City Centre Zones require that the building platform is set above the stated maximum lake level. Non-compliance requires resource consent as a restricted discretionary activity. In other zones, floor levels must be considered where resource consent is required.

9.6.4 The existing stormwater infrastructure and activities for which consent is sought are consistent with the policy framework set out above.

9.7 Statutory Acknowledgements

9.7.1 A Statutory Acknowledgement is a formal acknowledgement by the Crown of the mana of tangata whenua over a specified area. It recognises the particular cultural, spiritual, historical and traditional association of iwi with the site, which is identified as a statutory area. Under the Act, regional and district councils are required to have regard to statutory acknowledgements in resource consent decision making.

9.7.2 There are three statutory acknowledgements to be considered: Te Arawa (Lakes) Statutory Acknowledgement, in relation to Lake Rotorua, the Affiliate Te Arawa Iwi and Hapū Statutory Acknowledgement, in relation to the Ngongotaha and Waiteti Streams and part of the Kaituna River, and Ngāti Rangiwewehi in relation to part of the Kaituna River.

9.7.3 The Te Arawa Lakes Settlement Act 2006 and the Te Arawa Lakes Deed of Settlement contains various statutory acknowledgements and recognises the relationship of Te Arawa with water, including the streams and rivers fed by aquifers that flow into the Te Arawa Lakes. It recognises the management of water as a significant issue to Te Arawa from environmental, social, cultural and economic perspectives and highlights the responsibility to protect the mauri of ancestral waters to ensure its life supporting qualities are sustained for future generations.

9.7.4 Te Arawa (Lakes) Statutory Acknowledgement relates to the Crown stratums (that is, the space occupied by water and the space occupied by air) above the beds of lakes including Lakes Rotorua and Rotorua. In addition, the Affiliate Te Arawa Iwi and Hapū Statutory Acknowledgement relates to the Waitetī Stream and Ngongotahā Stream.

9.8 Iwi Management Plans

9.8.1 Iwi Management Plans that relate to the application area must also be considered. The following iwi management plans are listed by BOPRC and have been considered in the preparation of this application:

- Te Arawa Lakes Trust - Tūāpapa o ngā o Te Arawa
- He Mahere Pūtahitanga – CNI Iwi Management Plan, 2018
- Ngāti Rangiwewehi Iwi Environmental Management Plan 2012
- Te Rautaki Taiao a Raukawa- Raukawa Environmental Management Plan 2015
- Ngāti Kea Ngāti Tuara Iwi Environmental Management Plan 2016
- Te Runanga o Ngāti Pikiao Iwi Resource Management Strategy Plan, 1993
- Nga Tikanga Whakahaere Taonga o Ngāti Pikiao Whanui Iwi Resource Management Plan, 1997
- Tuhourangi Tribal Authority- Enhanced Iwi Environment Resource Management Plan

9.8.2 Te Arawa Lakes Trust - Tūāpapa o ngā o Te Arawa

Te Arawa Lakes Trust, the governance entity charged with managing and administering the Te Arawa Lakes settlement on behalf of Te Arawa, developed Te Tūāpapa o ngā Wai (TTONW) as

a values-based framework that articulates Te Arawa values in relation to the long term aspirations for and management of the Te Arawa Lakes, surrounding land and waterways.

The framework sets forth a holistic and values based foundation, called Te Whakapapa o te Wai, for the management of the Te Arawa lakes along with two Guiding Principles that are a 'bridge' between Te Whakapapa o Te Wai and tangible actions. These principles are:

1. Value the role that TALT and Te Arawa have to play regarding the Te Arawa lakes

2. Value Te Ao Māori.

The framework recognises the following values (p. 14 of TTONW):

Wai

- Is multi-layered, multi-faceted and multi-dimensional
- Is a state and value which has wider contextual meaning such as rhythm and flow (includes biorhythmic flow)
- Is our 'connector ' to our past, present and future as well as to each other.

Physical representation: lakes, rivers, streams, groundwater aquifers, geothermal

Wai Ariki / Waiariki

- Is iconic – refers to God-given empowerment (literal translation: water of the gods)
- Is more than water – it is the rhythm ma ii te Ariki
- Expresses the values of wai, regardless of type.
- Shapes behaviour where different places have different uses: Puna, wāhi tapu, to tohi, mahinga kai, wahi horoi Ngati

Wai Ora / Waiora

- The health benefits that derive from our Waimaori
- As part of water classification, Waiora is the purest form of water
- Gives life and sustains wellbeing.

How this relates to the aspirations for the Lakes:

- The cultural health and wellbeing of our lakes and everything they support is improved (e.g. kai)
- The health and wellbeing of our people is improved including social, cultural and economic.

Wai Rua / Wairua

- The flow of life – the spiritual attributes of wai (and everything that entails/ embodies / means)
- An intrinsic quality that is ever present
- Our beliefs, our faith, our spirit, our attitudes – enhances growth and provides balance
- Dimension of two waters (internal and external – wai rua)

How this relates to the aspirations for the Lakes:

- The connections between Te Arawa whānau, hapū and iwi and our lakes is enhanced.

Wai Ata / Waiata

- The rhythm of wai as embodied and transmitted through waiata, including our whenua, whakapapa, hitori, wāhi tapu, kai, ngā ingoa, ngā korero / pakiwaitara, ngā taniwha kaitiaki.

How this relates to the aspirations for the Lakes:

- Te Arawa cultural identity is celebrated
- Te Arawa whānau know who they are and where they come from
- Sites of significance are identified and protected.

These values both recognise and seek to provide for the cultural health and wellbeing of the lakes, the authority/mana of Te Arawa, the spiritual attributes of wai interconnected with Te Ao Māori (Māori world view) and also the mana whenua of Te Arawa are all intrinsic cultural factors. These values also provide a valid framework by which to assess cultural effects when dealing with resource consent applications.

Objectives include:

Te mā o te wai e rite ana kia kite i ngā tapuwae ā te kōura. ‘

The quality of the water is such that you can see the foot steps of the koura.

- Land and freshwater planning and management:
  - Affords greater priority to the natural limits of the Lakes; lands; and, freshwater that feeds into the Lakes. o Recognises the values and interests of mana whenua.
  - Recognises the intergenerational knowledge and experience of mana whenua.
  - Values the role of Te Arawa as a Treaty partner.
  - Values the role of TALT as Lakebed owner.
  - Encourages collective responsibility for the care and use of land and water.

- Restore and enhance the health and diversity of ecosystems and habitats in and around Te Arawa Lakes. This includes:
  - Enhancing and creating wetlands and Lake riparian habitats.
  - Enhancing ecological corridors within and across Lake catchments.
  - Enhancing mahinga kai / kai roto stocks.
- Take a targeted approach to improving the habitats in and around Te Arawa Lakes. This includes prioritising efforts in areas that are culturally significant to Te Arawa hapū and Iwi and/or have high ecological value.
- No further degradation or loss of wetlands and significant Lake riparian habitats around the Lakes and their catchments.

9.8.3 As stated, where available, all iwi management plans relating to the Rotorua urban area/ lake catchment have been considered through this process. Appendix I contains the relevant

provisions of the iwi management plans that have been considered in the preparation of this application.

9.8.4 Common themes to be considered in relation to the effects of activities on water include:

- Relationship of iwi/ hapū with water to be recognised and provided for
- Consultation with iwi / hapū
- Recognition of mauri of water and maintain/ restoring the mauri
- Protection of habitat for taonga species and other customary resources
- Identifying water that is of cultural importance
- Taking a holistic approach to catchment management
- Ensure monitoring and compliance is required.

9.9 Any Other Matters

Any other matter that is reasonably necessary may be considered in making a decision, enabling other (non-RMA) strategies and documents to be considered. This includes the Council's Annual and Long Term Plan, the BOPRC Stormwater Guidelines, and other documents that have been discussed elsewhere in this application.

9.9.1 Local Government Act 2014

The Council has statutory responsibility under section 10 of the Local Government Act 2002 (LGA) to meet current and future needs of the community for local infrastructure which includes stormwater collection and management. In addition, the Council is required to have an infrastructure strategy as part of the long term plan under section 101B of the LGA. This CMP supports this requirement.

The Council also has an Asset Management Plan: Stormwater Drainage to ensure that Land Drainage and Stormwater assets are managed in the most cost effective manner.

9.9.2 Building Act 2004

The management of stormwater is necessary to comply with the Building Regulations 1992 to prevent surface water from a 2% probability event from entering residential and communal buildings.

9.9.3 Council Policies and Bylaws

The Council's Stormwater and Land Drainage Policy sets objectives, regulates public and private drains and easements, protects infrastructure against building encroachment, and sets standards for design of new stormwater systems.

The Water Services and Trade Waste Bylaw 2012 regulates water, sewage and stormwater for a number of objectives, including regulating discharges into the Council stormwater network and protecting lake water quality.

The Rotorua Civil Engineering Industry Standards (RCEIS) sets engineering standards for levels of service for new subdivision and development.

9.9.4 **Rotorua Te Arawa Lakes Strategy**

The Te Arawa Lakes Trust, BOPRC and the Council are together working on the restoration of the Rotorua lakes. The Lakes Rotorua and Rotoiti Action Plan 2009 identifies that the Council will improve nutrient removal in stormwater by implementing the Water Services Bylaw and control more tightly high risk facilities and trade waste discharges. The comprehensive stormwater consent is part of the Council's response. The stormwater network is therefore integral to the project.

9.9.5 **NZTA Stormwater Treatment Standard for State Highway Infrastructure May 2010**

NZTA has prepared a Treatment Standard for State Highway Infrastructure which provides guidance and standards for the management of stormwater in relation to State highways. NZTA's philosophy is stated to be:
"To provide best practice for both stormwater quantity and quality control that, in the absence of local requirements or where local requirements are limited, New Zealand Transport Agency will undertake to demonstrate environmental responsibility."

The Standard provides detailed design guidance for stormwater management practices for state highways in relation to:

- Sources of contaminants from roads
- Stormwater management concepts
- Choosing stormwater management devices for roads
- Stormwater management objectives
- Stormwater management practice design
- Financial considerations
- Principles of Retrofitting stormwater treatment
- Construction guidance
- Maintenance issues
- Costing issues

9.9.6 **Rotorua District Council Water Services and Trade Waste Bylaw 2017**

The Trade Waste Bylaw provides a mechanism to regulate discharges including trade waste, hazardous substances, wastewater, geothermal fluids and stormwater. It also enables compliance with the LGA and RMA. The purpose is set out on page 1 of the Bylaw. Protecting lake water quality and defining the obligations of owners, occupiers and the public in relation to the public water supply, wastewater network infrastructure and stormwater network infrastructure are also identified as purposes.

The Bylaw requires that high risk facilities must have a licence under the bylaw to discharge to the stormwater network infrastructure. Pre-treatment may be required to regulate the quality, quantity and rate of discharge.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

1.1 Introduction

10.1.1 This section provides an assessment of the actual and potential effects of the RUA stormwater network on the existing environment in accordance with the RMA. The Fourth Schedule of the RMA requires that an application must contain an assessment of the effects of the activity on the environment that addresses the following matters, subject to any requirements of the regional plan:

(a) any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects:

(b) any physical effect on the locality, including any landscape and visual effects:

(c) any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity:

(d) any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations:

(e) any discharge of contaminants into the environment, including any unreasonable emission of noise, and options for the treatment and disposal of contaminants:

(f) any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations.

10.1.2 In accordance with the definition of effects in the Act, both positive and negative effects on the environment, including social, economic and cultural effects, must be considered. In addition, where appropriate, cumulative effects are also considered, being those that could arise over time or in combination with other effects.

10.1.3 Urban stormwater can adversely affect water quality and water quantity, which in turn affect ecological aquatic habitat, public health, and cultural, heritage, recreation, landscape and amenity values. Most activities covered by this application are existing permitted or consented activities. Changes are proposed to address or improve areas where there are currently problems with the stormwater network. Additional land is identified for residential growth. The development of this land plus infill may lead to increased runoff. However, the mechanisms proposed through this application and the CMP will ensure consistent management of stormwater through the RUA.

10.1.4 The physical effects of flooding and overland flow can affect properties and services, and the safety of people and communities. Repeated storm events can result in effects on water quality that have been identified as falling into three specific classes:

- Short term changes in water quality during and after storm events

- Long term water quality impacts from repeated stormwater discharges
- Physical impacts of erosion, scour and deposition which alter aquatic habitats.

10.1.5 This assessment of actual and potential effects on the environment relies specifically on the draft CMP and reports which are referenced. The reports should be referred to for more detailed discussion and information on the existing environment and discussion about the potential effects on the environment.

10.2 Water Quality

10.2.1 The RNRP specifies three outcomes in relation to the water quality classifications, after reasonable mixing. While all the streams are classified "Aquatic Ecosystem", the Waitawa area drains are classified as Regional Baseline/ Drain water. The required outcomes are as follows:

- Aquatic Ecosystem – "No more than minor adverse effects"
- Regional Baseline/ Drain water – "Any significant adverse effects"

Lake Rotorua is "Managed State" and the outcome is the same as Regional Baseline/ Drain water – "any significant adverse effects.

10.2.2 The study undertaken by NIWA (2015) specified parameters against which water quality would be assessed in relation to these outcomes. Table 2-12 from the report is attached to this volume as Appendix C. The study evaluated stormwater, stream and lake water, sediment and biological metrics in relation to macroinvertebrate community indices and mussel contaminants.

10.2.3 Overall, the study concluded that the effect of the discharge of RUA stormwater on water quality in the receiving waters is minor. Urban stormwater contributes concentration of dissolved heavy metals to the receiving environment but is a less significant source of total suspended sediments and nutrients on a catchment scale. Treatment options are therefore better focussed on heavy metal concentrations than nutrients and sediment. This section sets out the conclusions from that study.

10.2.4 Stormwater

The NIWA (2015) study examined sampling from 1999 to 2001 that had been reported on in other reports. The lack of national guidelines for assessing potential adverse effects was noted. RDC stormwater grab sampling was reviewed in relation to the earlier studies and the results were summarised as follows:

- Contaminants of concern appear to be limited to copper and zinc, both requiring dilution of between 2 and 8 fold in the receiving environment to comply with recommended criteria.
- 2014 stormwater monitoring revealed similar concentrations of zinc and copper but lead showed pronounced decreases consistent with it being a legacy contaminant (since removal from petrol in NZ).
- Stormwater from industrial areas contained the highest concentrations of heavy metals.

- Nutrients and total suspended solids do not appear a significant issue for urban stormwater management, being below the regulatory limit of 150g/m^3.
- There was insufficient date to determine whether temperature and bacteria in urban stormwater are having adverse effects on receiving waters.

10.2.5 Stream water

Sampling was undertaken at 28 stream sites, including some sites outside the RUA catchment. The results showed:

- The limiting contaminant in RUA stormwater is zinc, which requires a 2 to 8 fold dilution in receiving waters to comply with recommended acute guideline 0.22g/m3.
- Calculated and measured storm flow concentrations of zinc indicated insufficient dilution to comply occurs in Waiowhiro, Utuhina, Rotorua City, Puarenga and Waitawa area catchments. Sufficient dilution for zinc compliance is available in the Waiteti, Ngongotaha and Waingaehe catchments.
- Copper and lead concentrations were below recommended acute guidelines for all major catchments.
- Under base flow conditions, measured stream concentrations of copper, lead and zinc were below ANZECC chronic guideline values for all major catchments.
- There are no receiving water TSS concentration standards to assess compliance.
- Bacteria were not monitored in streams during storm events but concentrations in stormwater indicate that contact recreation standards would be exceeded on occasions. However, it is unlikely that contact recreation activities would occur during storm events.
- Long term monitoring upstream and downstream of urban stormwater discharges of the Mangakakahi Stream showed that heavy metals were the only concentrations that increased significantly as a result of urban stormwater.

10.2.6 Lake Rotorua

- Measured concentrations of zinc in streams require 2 to 4-fold dilution for lake receiving waters to comply with the recommended acute guideline value.
- CORMIX modelling of the Utuhina and Government Gardens outflows indicate that under most scenarios the required dilution is achieved within a relatively small mixing zone and therefore adverse effects from stormwater discharges on Lake Rotorua are considered unlikely.
- Nutrient loads from urban land use are generally less than agricultural land use. Therefore, conversion of agricultural land to urban land use is not expected to increase nutrient loads to the lake.
- Overall, the Lake Rotorua receiving environment showed minor impacts from stormwater discharges, but these are confined to stormwater discharge points (i.e. river mouths) and therefore it is possible to consider them acceptable with respect to mixing zones (further work would be need to ascertain what is acceptable). Points of concern were the absence of mussels from the lake front (i.e. does this reflect less sampling effort, geothermal conditions or stormwater discharges) and the slow reduction of lead in mussel tissue near the Utuhina River mouth. This may reflect very slow ‘flushing’ of

historic lead from the catchment, or ongoing sources (industrial) and warrants further investigation.

10.2.7 Sediment quality

Sediment quality was analysed to determine the cumulative and long term impacts of urban stormwater on receiving waters and habitats. The results are as follows:

- In streams, all sediments contained zinc, copper, lead and total petrol hydrocarbons (TPH) at concentrations below the ANZECC ISQG 'low' values and were compliant.
- There was little indication of increasing heavy metal concentrations in stream sediments along a gradient of increasing catchment urbanisation.
- Puarenga stream sediments exceeded the arsenic ISQG low value at the upper two sites and the high value at the lower site. The origin of these elevated concentrations is most likely geothermal.
- In drains (open water courses and the sediment ponds in the Government Gardens), zinc high value guidelines were exceeded at four sites, almost certainly related to anthropogenic sources.
- Four sites in drains also exceeded the high value guidelines for arsenic. This is most likely due to geothermal inputs, although elevated (above low values\) of copper and chromium indicate some anthropogenic component.
- No sites exceeded the high values for chromium, copper or lead.
- Eight sites exceeded the proposed high value for TPH.
- Non-compliant drains were in the Government Gardens and industrial catchments.
- Elevated contaminants were either confined to the drains or if conveyed downstream were rapidly dispersed.

In Lake Rotorua heavy metal and TPH concentrations in sediments were all compliant ie less than low values.

10.2.8 Overall, therefore, the study by NIWA identified that the discharge of urban stormwater is having minor impacts on receiving waters within the RUA. Although concentrations of heavy metals routinely exceed acute toxicity guidelines during storm flows, the integrated measure of stream quality using MCI scoring indicated that these exceedances are probably having a minimal adverse effect on stream health. Lake Rotorua receiving environment showed no sign of adverse effects with respect to the accumulation of contaminants in sediments or biota, in the vicinity of urban stormwater discharges.

10.2.9 The main issue identified was the high contaminant concentrations found in open channels that drain some of the commercial and industrial catchments. The effects appeared to be confined to the channels but additional measures are recommended in the following section to mitigate the level of contamination.

10.3 Effects on Ecological Values

10.3.1 Stormwater runoff over impervious surfaces to watercourses can result in contaminants entering receiving waters. Accumulation of these contaminants (primarily sediment, heavy

metals and hydrocarbons) can affect aquatic habitats during initial rainfall. Contaminants can build up over time and degrade habitat. The study by NIWA also investigated the effect of stormwater discharges on habitat health. The cumulative effects of long-term discharges can result in adverse effects on habitats. In addition, physical impacts of scour or erosion can degrade aquatic habitats.

10.3.2 A survey of periphyton mat cover was undertaken. All sites complied with the 30% maximum value with the exception of the Basley Stream which is essentially a drain. The presence of periphyton in streams did not appear to be related to urban stormwater discharges as of the eight stream sites that had more than 30% periphyton mat cover, six were upstream of the stormwater discharge point.

10.3.3 Macroinvertebrate community indices (MCI) showed a good range of stream quality scores, ranging from 61 (poor) to 133 (excellent). In general excellent classifications related to sites upstream of stormwater discharges. Of the 27 stream sites monitored in the RUA:

- 8 sites (30%) classified as excellent or excellent good
- 9 sites 33 % classified as good or fair good
- 7 sites 26% classified as fair or fair poor
- 3 sites 11% classified as poor

Four of the sites did not meet the proposed assessment criteria. These were the most downstream sites of the Waiteti, Waiowhiro and Utuhina Streams as well as the Basley Stream. The low scores appear to reflect habitat limitations unrelated to the stormwater discharge, such as current velocity, flow habitat and substrate.

Lower MCI scores generally related to moving from upstream to downstream sites with increasing urban stormwater. However, with the exception of the Waiowhiro which was poor throughout, MCI scores comply with assessment criteria.

10.3.4 High rates of compliance indicate that exceedance of acute water quality guidelines eg zinc during storm events is not having a significant adverse effect on stream biota. By comparison with the 2001 study, there was a high level of consistency between the results indicating that stream water quality is stable and has not been adversely impacted by urban stormwater in the 13 year period.

10.3.5 The study also examined mussels collected from Lake Rotorua to determine whether bioaccumulation of stormwater contaminants was an issue. The study identified that mussels collected from the Utuhina and Waiowhiro outlets showed enrichment of lead, while the Utuhina showed a minor enrichment of cadmium. However, the level of concentrations in the Utuhina Stream mussels was similar to in 2001. Therefore there has been no increase in contaminant “availability” over this time.

10.3.6 By comparison with food standards guidelines for human consumption, only the mussels from the Utuhina Stream outlet exceeded maximum limits for arsenic, cadmium and lead.

10.3.7 The higher levels of level in mussels near the Utuhina Stream outlet mirrored higher levels in mussels near the Government Gardens outlet in 2001/02. However, no mussels were found there in 2014. The issue of lead concentrations in this part of the lake was flagged by NIWA as an issue requiring further investigation.

10.3.8 Dissolved oxygen generally ranged from 90 to 100% saturation. The lowest value was for the Waitawa upper catchment which had a DO saturation of 73%, but 600m downstream it was 96%. The amount of DO in urban stormwater is typically 5g/m3 and it rarely poses a direct threat to in-stream conditions. Therefore, the direct impact of urban stormwater runoff on DO conditions in receiving waters is not thought to be substantial.

10.3.9 Overall, the integrated measure of stream quality using MCI scoring showed that exceedances in heavy metals was having minimal adverse effects on stream health. Lake Rotorua receiving environment showered no signs of adverse effects with respect to the accumulation of contaminants in sediments or biota, in the vicinity of urban stormwater discharges.

10.4 Stream bank stability

10.4.1 The NIWA study also identified that out of 28 stream sites, 16 showed no sign of stream bank erosion and 11 had less than 10%.

10.4.2 There was no indication of increasing stream bank erosion with increasing urban influence. This suggested that the hydrologic disturbance associated with urban runoff is not having major effect on stream bank stability.

10.5 Nutrient Loads

10.5.1 The Te Arawa Rotorua Lakes project is focussed on reducing the amount of nitrogen and phosphorus in the lake waters. The 2003 study by Macaskill determined that the annual stormwater loads of TN and TP contributed 2% and 5% respectively of the total loads of N and P entering Lake Rotorua.

10.5.2 The NIWA study observed that TN and TP loads from urban areas are generally less than those coming from pasture catchments. Urbanisation typically has occurred on open pasture in the RUA. No increase in loads was therefore expected by NIWA.

10.5.3 Grab sampling of stormwater [9]identified that concentrations of nitrate-nitrogen during storm flows were generally much lower for all monitored streams. In the Mangakakahi Stream, nitrate and nitrate nitrogen concentration decreased significantly between the upstream (0.94g/m3) and downstream (0.47g/m3) sites. Urban stormwater appears to be a less significant source of total suspended sediments and nutrients on a catchment scale than the input from rural land. Treatment of urban stormwater is therefore unlikely to improve water quality outcomes in the receiving environment.

[9] CMP section 4.2

10.5.4 Analysis of sediments identified that urban runoff has no measurable effect on sediment nutrient concentrations.

10.6 Water Quantity

10.6.1 Impervious surfaces created as a result of urban development such as roofs, driveways and carparks intercept rainfall and prevent infiltration directly to ground. The resultant runoff flows at much higher rates and in larger quantities than corresponding undeveloped catchments and alters the hydrological regime of the catchment. The effects of the alterations to the hydrological cycle may include:

- Increased flooding hazard - through the increased rate and volume of runoff from impervious surfaces.
- Increased stream bank erosion - through increased peak flows and more frequent high flows causing instability of stream banks.
- Increased erosion on land and in the vicinity of stormwater outlets through the concentration of flows.

This application relates to an existing stormwater infrastructure to which improvements are proposed. There are some areas of additional land for residential development which will be subject to integrated management with the balance of the RUA. Section 4 above describes the existing infrastructure and areas where there are current issues with flooding, ponding and erosion or scour. Additional details are contained in the CMP.

10.6.2 Flood Risk – Lake Rotorua

The level of Lake Rotorua impacts on the ability to manage flooding of low-lying lakeside areas. The ODP (Map 209) and the CMP identify areas potentially affected by a 1 in 50 year event. While levels can be reduced in response to predicted heavy rainfall events, this requires a sufficient lead in time. The Council has an Emergency Procedures Manual to manage evacuation of affected land should an event occur. However, it is more appropriate to avoid flooding as the first preference. Measures include:

- Using District Plan rules to require building platforms and floor levels of new buildings to be set above the 2% AEP.
- Maintaining and upgrading infrastructure to meet the design standards.
- Maintaining outlets and clearing sand build up along the lake shore to maximise the efficiency of the system.

10.6.3 Flood Risk – Streams

Ponding and flooding from streams arise due to high stream levels which block outlets and inadequate capacity of the network. This can result in flooding of roads and residential and business premises with consequential financial costs and disruption to the community.

At present these effects arise from time to time. Some effects cannot be avoided altogether, but ongoing improvements and maintenance to the system will minimise the frequency of events.

Measures to address the potential effects of flooding from streams include:

- Using and requiring use of low impact design tools.
- Using District Plan rules to require building platforms and floor levels of new buildings to be set above the 1% AEP.
- Keeping streams free from vegetation and debris. Some of this responsibility rests with BOPRC through the Kaituna Catchment Control Scheme and liaison is required with the Regional Council to ensure critical areas are addressed to avoid flooding.
- Maintaining and extending stop banks in identified areas.
- Upgrading pipes and drains and associated structures where the capacity is insufficient.
- Provision of detention ponds and other infrastructure to increase storage capacity in the catchment and reduce peaks.

10.7 Cultural values of streams and Lake Rotorua

10.7.1 Water ways are of great significance to iwi and ensuring that the mauri (life force / health and wellbeing) of the waterbodies is enhanced or, at a minimum, not negatively affected is fundamental to managing effects on water appropriately.

10.7.2 As a first priority, it is important to avoid as far as possible and mitigate where avoidance is not possible adverse effects on water quality. The study undertaken for this application has identified that the actual and potential adverse effects on the water quality in the streams and lake is not significant and is less than minor. Measures are recommended to ensure that water quality is maintained and, where possible, enhanced.

10.7.3 The other requirement is to ensure that infrastructure is designed and located to ensure that sites of significance and values associated with those sites are not adversely affected.

10.7.4 The Te Arawa Lakes Settlement Act 2006 and the Te Arawa Lakes Deed of Settlement contains various statutory acknowledgements and recognises the relationship of Te Arawa with water, including the streams and rivers fed by aquifers that flow into the Te Arawa Lakes.

10.7.5 The Te Arawa Lakes settlement legislation recognises the management of water as a significant issue to Te Arawa from environmental, social, cultural and economic perspectives and highlights the responsibility to protect the mauri of ancestral waters to ensure its life supporting qualities are sustained for future generations.

10.7.6 Te Arawa Lakes Trust, the governance entity charged with managing and administering the Te Arawa Lakes settlement on behalf of Te Arawa, developed Te Tūāpapa o ngā Wai (TTONW) as a values-based framework that articulates Te Arawa values in relation to the long term aspirations for and management of the Te Arawa Lakes, surrounding land and waterways.

10.7.7 The framework sets forth a holistic and values based foundation, called Te Whakapapa o te Wai, for the management of the Te Arawa lakes along with two Guiding Principles that are a 'bridge' between Te Whakapapa o Te Wai and tangible actions. These principles are

considered in section 9 above. These values both recognise and seek to provide for the cultural health and wellbeing of the lakes, the authority/mana of Te Arawa, the spiritual attributes of wai interconnected with Te Ao Māori (Māori world view) and also the mana whenua of Te Arawa are all intrinsic cultural factors. These values also provide a valid framework by which to assess cultural effects when dealing with resource consent applications.

10.7.8 Consultation with iwi and hapū, and Te Arawa Lakes Trust has been initiated as set out in section 13 below and will continue in relation to the cultural effects associated with the management of stormwater in the urban area. A Cultural Impact Assessment will be undertaken in conjunction with all Iwi/hapū stakeholders (particularly Mana Awa / Mana Whenua) and will be provided as further information. It will also enable the final Catchment Management Plan to integrate measures to recognise and provide for cultural values and effects.

10.8 Community Effects

10.8.1 The management of stormwater is undertaken to maintain or enhance water quality in receiving streams and Lake Rotorua. It is also undertaken to avoid flooding or damage to houses, workplaces and reserves in the urban area and the regionally significant infrastructure serving the urban area. Streams and the lake are also important for recreation, social and aesthetic values.

10.8.2 Managing the stormwater network to meet appropriate water quality standards and to avoid or minimise potential flooding is a positive outcome of the consent process. Without the correct mechanisms in place, there will be disruption to the community, loss of economic return and loss of cultural, social and recreational values.

10.9 Amenity values

10.9.1 The appropriate design and location of stormwater infrastructure is dependent on the ability of the system to function during rainfall events. However, retaining attractive places for residential, business and recreational activities is important to the desirability of the RUA for the community.

10.9.2 Therefore, where practicable, consideration should be given to locating and designing infrastructure to support amenity values through the RUA.

10.10 Public Health Effects – Food Sources

10.10.1 Maintaining or enhancing water quality is essential to maintain a healthy urban environment with a network of streams and riparian areas that support habitats and trout fisheries, provide attractive riparian environments for recreation. Public health can be adversely affected where flooding overloads the wastewater network and contamination of floodwater occurs. The other effect on public health may arise from short or long term contamination affecting plants, shellfish and fish which are food sources.

10.10.2 The study by NIWA examined the effect of stormwater discharges (short and long term) on Lake Rotorua mussels. The RWLP identifies that:
"Aquatic organisms, fish and other food resource shall not be rendered unsuitable for human consumption by the presence of contaminants as a result of the discharge (refer to ANZECC Guidelines for Fresh and Marine Water Quality, 2000)."

10.10.3 The NIWA study referred to these Guidelines as well as Food Standards Australia New Zealand guideline values, plus an assessment criterion that mussels at impact sites should not contain more than 20% higher concentrations of heavy metals compared to reference site mussels.

10.10.4 NIWA identified that the highest concentrations of all metals were at the Utuhina site. Lead was particularly high with a concentration of 34mg/kg which was three times higher than at the Waiowhiro Stream. Based on their criterion of not more than 20% higher concentration, mussels from the Utuhina and Waiowhiro sites showed enrichment of lead and mussels from the Utuhina site showed minor enrichment of cadmium.

10.10.5 NIWA reviewed heavy metal concentrations at all sites and found variability in results from reference and impact sites. However, a full risk assessment was outside the scope of their study. They noted that although levels of lead and other minerals were higher than the criteria, the context of the southern part of Lake Rotorua in particular is that there is a high level of mercury and arsenic from natural (geothermal) inputs.

10.10.6 Therefore, there are higher levels of heavy metals in some locations, the effect may be limited by the general lack of suitability of shellfish for consumption. However, additional research and monitoring needs to be considered.

10.11 Public Health – Sewer Failures

10.11.1 The other risk area for public health is the impact of stormwater on the sewerage network and the wastewater treatment plant. The most likely scenario is that during heavy rainfall events stormwater can enter the sewer network and result in overflows or pump station failure.

10.11.2 The Council has identified those areas at risk and addresses issues in the first instance through capital improvements or increased maintenance. There is also a Standard Operating Procedure that requires all overflows to be attended by contractors and Council Pollution Control staff within one hour of notification. Appropriate action is taken and sampling continues until normal levels are again reached.

10.11.3 Overall, there are appropriate methods to address adverse effects on public health from sewer failure. The first response is to prevent effects arising and the second to have appropriate mechanisms in place to minimize effects.

10.12 High Risk Site Management

10.12.1 The main actual and potential adverse effects on stormwater quality are heavy metals which arise from industrial sites and from natural (geothermal) sources. The use of hazardous substances on sites within the RUA could have the potential to enter stormwater and waterbodies if not managed correctly.

10.12.2 The Council database of contaminated sites or sites identified in the BOPRC HAIL database identifies that most of these sites are located in the industrial zones. (Refer Appendix E – Industrial Sites and Contaminated Land). The use of hazardous substances is controlled through the Hazardous Substances and New Organisms Act 1996 and the District plan. In addition, the use and development of contaminated sites is managed through the NES for Assessing and Managing Contaminants in Soil to Protected Human Health 2011.

10.12.3 This application does not seek to authorise discharges of stormwater from HAIL Sites or potential HAIL sites (sites zoned Industrial or are deemed high risk (other than Council sites). These sites will be authorized separately by the Regional Council if they do not meet the permitted criteria in the NRP.

10.12.4 Through monitoring, the Council will carry out initial investigations and monitoring of the quality of stream and inflows to narrow down the location and source of contaminants if identified. Where the exceedances and Council's initial investigation indicate the contaminant source is originating from an area included in the scope of the comprehensive consent, RLC will investigate further to identify the likely source of contaminants and work to reduce or eliminate further discharge of contaminants. Where the exceedances and investigation indicate the contaminant source is likely originating from an area outside of the scope of the CSC, it is anticipated that the Regional Council will investigate further to identify the likely source of contaminants and work to reduce or eliminate further discharge of contaminants. The Council may assist with additional investigations and monitoring at BOPRCs request subject to being funded. While the investigation is underway or while specific mitigation actions are being planned and implemented, exceedances will not trigger further investigation.

10.12.5 To support investigations and the identification of potential additional HAIL sites, RLC may maintain a database of industrial properties that to the best of their knowledge carry out an activity that is on the HAIL register or identified in Schedule 4 of the BOPRC NRP as being a high risk to stormwater.

10.13 Summary

10.13.1 The key effects on the RUA of stormwater management to be addressed are maintaining or enhancing water quality to support habitat, cultural and community values. In addition managing the quantity of stormwater is essential to avoid or minimise disruption to people and property.

10.13.2 The NIWA study has identified that the adverse effects on water quality are not significant and are stable. There have been no identifiable changes in the aquatic habitat in relation to stormwater discharges to the streams and lake.

10.13.3 Overall, the adverse effects are considered to be within a range that is acceptable and is not degrading the environmental qualities of the streams and lake in the RUA or the values associated with riparian areas.

11. MITIGATION AND MONITORING

11.1 Introduction

11.1.1 Mitigation measures to ensure that the effects of the stormwater discharges remain within an acceptable range are discussed in this section. Monitoring is recommended to enable the effectiveness of the mitigation to be confirmed or changes made over time through the CMP.

11.2 Mitigation

11.2.1 The primary mechanism for mitigating the effects of stormwater on the receiving environment is the CMP. This CMP will be updated through this consent process and will then be subject to a regular process of updating in accordance with the conditions to the consent. The outcomes to be achieved by the CMP will be confirmed through the consent conditions. Full details of mitigation proposed are set out in the CMP.

11.2.2 Measures in place or proposed to manage the actual and potential adverse effects of stormwater discharges on the receiving environment are summarised as follows:

- Treatment – sediment traps and ponds, gross pollutant traps, and through the Water Services and Trade Waste Bylaw 2010 review treatment measures and effectiveness in managing the heavy metals which have been identified by NIWA and put in place appropriate management regimes.
- Infrastructure – constructing or upgrading infrastructure to provide the correct level of service
- Maintenance – systems in place to provide for the efficient management of stormwater such as stormwater infrastructure to be maintained, waterways and cesspits kept clear of vegetation and debris, and erosion of riparian areas repaired or upgraded.
- Undertake road sweeping and the removal of sediment from cesspits for the prevention of both contamination and subsequent flooding issues caused by blockages in accordance with the RLC Roading Maintenance Standards: Local Roads, 2012
- Minimising future effects of high rainfall events by requiring buildings in areas identified as being at risk of flooding to comply with minimum levels above the lake level (300mm above 50 year lake levels or 100 year flood levels for streams)
- Future Planning – requiring new development (infill, redevelopment or greenfields development) to plan and provide for stormwater disposal in accordance with the requirements of the District Plan and the Council's RCEIS. Significant new development will be required to have a zero post-development change for the 2% and 10% AEP rainfall events as per the BOPRC Guidelines as practicable.
- Low Impact Design tools will continue to be promoted to reduce stormwater runoff at source, limit the risk of flood damage, reduce the need for investment in infrastructure and reduce the risk to downstream areas and to the environment
- Catchment management – continue to encourage tree planting, gully retirement, and similar measures directly through Council projects or through resource consent processes.

- Minimise sewer overflows through the reduction of inflow and infiltration (I&I) and upgrading of the wastewater network
- Working with BOPRC to ensure that waterways are maintained to an appropriate level is essential to the effective performance of the stormwater infrastructure network.

11.2.3 Council's documents will be updated to achieve appropriate outcomes. This will include:

- Update the development code of Rotorua Lakes Council (i.e. Regional Infrastructure Technical Specifications (RITS)) to promote that the development and land use changes have a zero post-development change for the 2% and 10% AEP rainfall events as per the BOPRC Guidelines as practicable. RITS also includes specific LID requirements and examples to be used as practicable in all new developments.
- *Policies and compliance*: Ensure compliance of existing and new commercial, industrial and residential developments to Trade Waste Bylaw and Policies; Develop a policy on the use of LID.
- *Standards*: Update RITS to:
  - Identify materials that should be avoided due to contamination risks, e.g. galvanised pipes
  - Include specific LID requirements and acceptable solutions to be used as practicable in all new developments with specific attention to source control practices, provisioning of local soils and groundwater information, etc.

11.2.4 Use education to promote community awareness of stormwater and its management: develop an ongoing programme for education of children in schools, on-line, libraries, newspapers, etc.

11.2.5 The Council undertakes or requires modelling of those parts of the RUA where issues are arising or may arise with further development to identify design standards and solutions. Modelling will be required in consultation with the Regional Council which is responsible for the streams in the Upper Kaituna Catchment Control Scheme and which must feed into the work undertaken by the Council. Without updated modelling covering all urban areas along streams and appropriate flood maps RLC cannot undertake accurate risk assessments due to flooding in accordance with the Regional Policy Statement. Updating and expansion of the modelling of streams, identification and implementation of capital works for flood protection, and appropriate maintenance of streams and works are required.

11.3 Monitoring

11.3.1 Monitoring will be required as an outcome of the consent process and the parameters will be set in the conditions of consent. The attached Rotorua Urban Water Quality Monitoring Programme sets out the stream water quality monitoring programme proposed urban streams to identify the presence of contaminants higher than permitted levels or the presence of any condition likely to be injurious to health or offensive. In high priority catchments, monitoring will be undertaken 4 times a year.

11.3.3 In addition, specific monitoring measures are recommended in the NIWA report and additional measures in the CMP. This additional monitoring will be undertaken where identified through stream water quality monitoring. The focus is on effects based monitoring as this will provide a more effective regime to identify changes. Monitoring is differentiated on the basis of high risk v low risk catchments, as follows:

Table 27 – Catchments: Level of Risk

Main Catchments	Urban Stormwater-Catchments	Risk
Waingaehe Stream and lake	1, 2	Low
Waitawa Area	3, 4, 5, Part of 6	High
Puarenga Stream	Part of 6, 7	High
Utuhina Stream	11, 12, 13, 14, 15, 16	High
Waiowhiro Stream	18, 19, 20, part of 21	Low
Ngongotaha Stream	23, 24, 25, part of 27	High
Waiteti Stream	26, part of 27, part of 28	Low
Directly to Lake Rotorua	8, 9, 10, 17, part of 21, 22, part of 27, part of 28, 29	High (10) / Low

11.3.4 Measures to monitor the operation and effectiveness of the stormwater network infrastructure will include:

- Ensuring that the database of outlets is up to date
- Reviewing the CMP to identify issues to be addresses and mechanisms to do so
- Maintain a database of high rainfall events and issues
- Continue to monitor short and long term stormwater quality indicators in order to assess improved or degraded receiving environments. Additional monitoring such as temperature and bacteria indicators may need to be included. Catchments that have been identified as 'high-risk' (heavy industrial and commercial land use) and are of cultural importance will receive more attention and resourcing.

11.3.5 <u>Whole sediment monitoring:</u>

5-yearly intervals dependent on monitoring programme aims/requirements for:

- Streams
  - limited to the most urban impacted downstream sites
  - heavy metals
- Lake Rotorua
  - single composite samples at major stream outlets and at Government Gardens.
  - Useful to include lake sediments in the vicinity of open channels discharge to Sulphur Bay, and lake frontage between Government Gardens and the Utuhina Stream
  - Heavy metals

- Drain sediments
  - Where sites exceed ANZECC ISQG 'high' values, which correspond to a 50% effects probability. Although ecological values of these open drains are likely to be low, it is still unacceptable for them to exceed the guideline value. The majority of sites will be located where drains convey commercial and/or industrial land use. It is also recommended to include additional sampling to establish the extent of contamination in these drains. If contaminant concentrations display ongoing inputs as opposed to historical legacy, then regulatory intervention will be likely.
  - Heavy metals and TPH

Sediment Compliance Criteria are as follows:

- Streams and lake sediment to not exceed ANZECC ISQG 'low' values.
- Drain sediments to not exceed ANZECC ISQG 'high' values.

Trigger limits for whole (<2mm) sediment monitoring are shown below. Values in parentheses are proposed (revised) ANZECC ISQG's. Units are mg/kg, dry weight.

Table 31 - ANZECC ISQG High and Low Values Sediment Compliance

	ANZECC ISQG 'high' values	ANZECC ISQG 'low' values
As	70	20
Cd	10	1.5
Cr	370	80
Cu	270	65
Pb	220	50
Ni	52	21
Zn	410	200
TPH	(550)	(275)
PAH	45 (50)	4 (10)

11.3.6 Macroinvertebrate Monitoring:

- At key impact and reference stream sites
- 2-5 year intervals depending on monitoring goals (latter frequency is suitable for sites with stable MCI scores, the former for sites where significant degradation is evident, and/or where catchment development/changes occur.
- A key impact site could be the Utuhina Stream because it receives one-third of the city's urban stormwater. Ngongotaha and/or Waiteti could be potential 'reference' sites that have very low percent urban coverage.

The MCI Compliance Criteria are as follows:

- MCI score of at least 'good' (which includes 'good-fair') for receiving waters classified as 'aquatic ecosystem' (MCI value ≥100; or no less than 96-104*).

- MCI score of at least 'fair' (which includes 'fair-poor') for all other receiving water classifications (MCI value ≥80; or no less than 76-84*).

*NIWA recommends that 'fuzzy' boundaries of Wright-Stow and Winterborne (2003) cited in Section 6 (NIWA 2015, p82), be used due to the calculated ±10% error margin associated with biotic indices estimation.

11.3.7 Freshwater mussel monitoring:

- 5-yearly intervals dependent on monitoring aims/requirements.
- Heavy metals and possibly bacteria in mussels from key impact sites only, as reference sites showed a relatively high variation in results. Therefore, results would be compared with FSANZ guidelines. Key impact sites would also include Government Gardens area. Previous studies have shown FSANZ guideline exceedances for lead, it would therefore be beneficial to confirm the health risk, and respond accordingly.

Bioaccumulation of stormwater contaminants Compliance Criteria are as follows:

- Mussels from impact sites should not contain >20% higher concentrations than reference site range.
- Mussel accumulation of FSANZ identified contaminants shall not exceed the FSANZ maximum limit value (Table 2.9, NIWA 2015, p29). There are currently no ML values for common stormwater contaminants, copper and zinc.
    - Arsenic (inorganic) - 1 mg/kg wet weight
    - Lead - 2 mg/kg wet weight
    - Cadmium - 2 mg/kg wet weight
    - Mercury - 0.5 mg/kg wet weight (mean)

11.3.7 Stormwater Quality Monitoring:

Monitoring is proposed in accordance with the programme in Appendix H. the sampling sites and priority catchments are set out in the table below.

Table 32 - Stream, tributary and stormwater sampling sites

Stream and Tributary Sample Sites:

Site Name	Priority level	Main catchment	Rationale for Priority 1 sites	Sampling Runs	Likely geothermal influence (Y/N)
Waikawau Stream at Hannah's Bay upstream	1	Waikawau	Below industrial	Eastern	Y
Waingaehe Stream at SH30	1	Waingaehe	Below urban	Eastern	N
Waingaehe Stream at lake edge	1	Waingaehe	Above urban	Eastern	N
Waingaehe Stream tributary at lake edge	1	Waingaehe	Below urban	Eastern	N
Kaipakau Stream at Carroll Place	1	Kaipakau	Below urban	Eastern	N

Site Name	Priority level	Main catchment	Rationale for Priority 1 sites	Sampling Runs	Likely geothermal influence (Y/N)
Kaipakau Stream at 70 Morey St	1	Kaipakau	Above urban	Eastern	N
Kaipakau Stream at 28 Morey St	1	Kaipakau	Above urban	Eastern	N
Waitawa Stream at Selwyn Road	1	Waitawa	Above urban	Eastern	N
Waitawa Stream at Vaughan Road	1	Waitawa	Below industrial	Eastern	N
Drain/Stream at 366 Te Ngae Road	1	Waitawa	Above industrial	Eastern	N
Waitawa Stream East at Te Ngae Road	1	Waitawa	Above industrial	Eastern	N
Waitawa Stream West at Te Ngae Road	1	Waitawa	Above industrial	Eastern	N
Drain/Stream at Te Araki Place	1	Puarenga	Below industrial	Eastern	Y
Waitawa Stream at 87 Iles Road	1	Waitawa	Above urban	Eastern	N
Waitawa Stream at 11 Walford Drive	1	Waitawa	Above urban	Eastern	N
Waikawau Stream at Hannah's Bay downstream	2	Waikawau		Eastern	N
Puarenga Stream N at WWTP	1	Puarenga	Below urban/industrial	Puarenga	Y
Puarenga Stream at Hemo Gorge	1	Puarenga	Above urban	Puarenga	N
Puarenga Stream at 117 Sala St	1	Puarenga	Above industrial	Puarenga	Y
Puarenga Stream at 90 Sala St M1	2	Puarenga		Puarenga	Y
Waipa Stream at confluence	2	Puarenga		Puarenga	Y
Waihuahuakakahi Stream at SH5	2	Puarenga		Puarenga	Y
Kauaka Stream at confluence	2	Puarenga		Puarenga	Y
Drain/Stream at Scott St	2	Puarenga		Puarenga	Y
Puarenga Stream at Te Ngae Road	2	Puarenga		Puarenga	Y
Utuhina Stream at headworks	1	Utuhina	Above urban	Utuhina	N
Tauwhakapae Stream at Clayton Road	1	Utuhina	Above urban	Utuhina	N
Otamatea Stream at Icarus Place	1	Utuhina	Above urban	Utuhina	N
Mangakakahi Stream at Pukehangi Road	1	Utuhina	Above urban	Utuhina	N
Mangakakahi Stream at Linton Park East	1	Utuhina	Above industrial	Utuhina	N
Utuhina Stream at Old Taupo Road	1	Utuhina	Above industrial	Utuhina	N
Utuhina Stream at Lake Road	1	Utuhina	Below industrial	Utuhina	Y
Utuhina Stream at Lake edge	1	Utuhina	Below urban	Utuhina	Y
Tauwhakapae Stream at confluence	2	Utuhina		Utuhina	N
Otamatea Stream at confluence	2	Utuhina		Utuhina	N
Mangakakahi Stream at Depot St	2	Utuhina		Utuhina	N
Drain/Stream at Depot St	2	Utuhina		Utuhina	N
Drain/Stream at Tarewa Rd	2	Utuhina		Utuhina	Y
Geothermal flow from Kuirau park	2	Utuhina		Utuhina	Y
Drain/Stream at Tui Road	1	Waiowhiro	Above industrial	Northern	N
Drain/Stream at Walker Road	1	Waiowhiro	Below industrial	Northern	N

Site Name	Priority level	Main catchment	Rationale for Priority 1 sites	Sampling Runs	Likely geothermal influence (Y/N)
Waiowhiro Stream at SH5	1	Waiowhiro	Above urban	Northern	N
Waiowhiro Stream at lake edge	1	Waiowhiro	Below urban	Northern	N
Waikuta Stream at SH5	1	Waikuta	Above urban	Northern	N
Waikuta Stream at 41 Waikuta Road	1	Waikuta	Below urban/industrial	Northern	N
Waikuta Stream at 104 Parawai Road	1	Waikuta	Below urban/industrial	Northern	N
Ngongotaha Stream at SH5	1	Ngongotaha	Above urban	Northern	N
Ngongotaha Stream at Cycleway bridge	1	Ngongotaha	Below urban	Northern	N
Waiteti Stream at SH36	1	Waiteti	Above urban	Northern	N
Waiteti Stream at lake edge	1	Waiteti	Below urban	Northern	N
Drain/Stream at Paraone Street	1	Between Ngongotaha & Waiteti	Below urban/industrial	Northern	N
Drain/Stream at 11 Luke Place	2	Waiowhiro		Northern	N
Drain/Stream at Aquarius Drive Reserve	2	Waiwhiro		Northern	N
Waiowhiro Stream at Aquarius Dr Reserve Nth	2	Waiowhiro		Northern	N
Waiowhiro Stream at Aquarius Dr Reserve Sth	2	Waiowhiro		Northern	N
Ngongotaha Stream at SH36	2	Ngongotaha		Northern	N

Stormwater Sites

Site Name	Priority level	Main catchment	Rationale for Priority 1 sites	Sampling Runs	Likely geothermal influence (Y/N)
GPT outfall at Amohau St	1			Central - Commercial	
GPT outfall at Eruera St	1			Central - Commercial	
GPT outfall at Oruawhata Drive	1			Central - Commercial	
As required when triggered	1			Industrial	

12. PLANNING ASSESSMENT – PART 2 MATTERS

12.1 As set out in Part 2 of the Act, the purpose of the RMA is to promote the sustainable management of natural and physical resources. Sustainable management enables people and communities to provide for their social, economic and cultural well-being and for their health and safety, while avoiding or mitigating any adverse effects on the environment. The management of stormwater discharges on a catchment wide basis is consistent with Section 5 of the RMA as it will enable the sustainable management of the physical resource that is the stormwater supply infrastructure. In addition, an efficient stormwater disposal system is essential to the social, economic and cultural well-being of the community.

12.2 Section 6 – Matters of National Importance

Section 6 states that certain matters of national importance shall be recognised and provided for in relation to the use and development of natural and physical resources.

(a) The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, lakes, and rivers and their margins, and the protection of them from inappropriate subdivision, use and development.

Stormwater has the potential to affect the natural character of the lake and streams and their margins within the RUA. Managing stormwater discharges appropriately in terms of quality and quantity will avoid changes to the natural character of any of these environments.

(b) The protection of outstanding natural features and landscapes from inappropriate subdivision, use and development.

Lake Rotorua is identified in the District Plan as an outstanding natural landscape. Therefore, avoiding adverse effects on the lake and its margins is a requirement of the Act. The appropriate management of stormwater in terms of quality and quality is therefore an important way to give effect to section 6(b). The assessment above identifies that there are no significant changes resulting from the current and potential management of the RUA stormwater network.

(c) The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna.

Stormwater has the potential to degrade habitats of indigenous fauna. The assessment above has identified no adverse effects on habitats in the streams or lakes.

(d) The maintenance and enhancement of public access to and along the coastal marine area, rivers and lakes

In designing infrastructure public access will be maintained where this is provided. There should be no change to the effects arising from the infrastructure.

(e) The relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.

Collaboration with iwi and hapū through this process and in confirming a catchment management plan is an outcome sought through the process.

(f) The protection of historic heritage from inappropriate subdivision, use, and development.

There should be no change to the effects arising from the established infrastructure and new works will recognise and provide for historic heritage values.

(g) The protection of recognised customary activities.

There are no recognised customary activities affected.

For these reasons, it is considered that the activities within this application will be consistent with Section 6 of the RMA.

12.3 Section 7 – Other Matters

Section 7 of the RMA requires that the following matters be given particular regard to:

(a) kaitiakitanga:
(aa) the ethic of stewardship:
(b) the efficient use and development of natural and physical resources:
(ba) the efficiency of the end use of energy:
(c) the maintenance and enhancement of amenity values:
(d) intrinsic values of ecosystems:
(e) [Repealed]
(f) maintenance and enhancement of the quality of the environment:
(g) any finite characteristics of natural and physical resources:
(h) the protection of the habitat of trout and salmon:
(i) the effects of climate change:
(j) the benefits to be derived from the use and development of renewable energy.

The Lake and streams in the RUA are taonga of Te Arawa and this particular relationship must be recognised and provided for through the consent process and future management. In addition, the effect on ecosystems and the habitat of trout and indigenous fauna have been considered in the assessment of environmental effects. In designing the infrastructure and upgrades, the effects of climate change have been included in the parameters to be addressed.

12.4 Section 8 – Treaty of Waitangi

Section 8 requires the principles of the Treaty of Waitangi to be taken into account when exercising functions and powers under the RMA.

12.5 Taken overall, it is considered that the proposed application will promote the purpose of the Act as set out in Section 5 and will be consistent with Sections 6, 7 and 8 of the RMA. The continuation of the stormwater system is essential to the wellbeing of the community served. The potential adverse effects that are identified in this assessment will be less than minor, and it is considered that appropriate conditions can be imposed on the new consent.

13. CONSULTATION

13.1 Introduction

13.1.1 Consultation is not required by the Act. Clause 6(1)(f) requires that an application identifies "the persons affected by the activity, any consultation undertaken, and any response to the views of any person consulted". Clause 6(3) clarifies that:

> *to avoid doubt, subclause (1)(f) obliges an applicant to report as to the persons identified as being affected by the proposal, but does not—*
>
> *(a) oblige the applicant to consult any person; or*
>
> *(b) create any ground for expecting that the applicant will consult any person.*

13.1.2 However, consultation is an essential part of this application process, noting that the original application was lodged in 2001. The stormwater infrastructure to which this application relates is largely already established but provision for future RUA infrastructure is also sought to enable integrated management of the stormwater network. It is therefore appropriate to consult a full range of parties including iwi and hapū in the wider catchment.

13.1.3 Consultation with affected and interested parties enables the consent process to be completed with feedback to confirm and respond to potential issues and concerns. Therefore, consultation is an ongoing integral part of this application process. It is noted that input is also provided through the Local Government Act submission processes on the Council's stormwater strategy and its achievement through Annual and Long Term Plans.

13.2 Preliminary Consultation

13.2.1 An initial presentation was made to the Rotorua Project Steering Committee in 2015 which comprises representatives from iwi and other stakeholders from the Rotorua Catchment from the lake to the sea at Maketu.

13.2.2 Following that initial presentation, iwi/hapū representatives of the mana awa / mana whenua within the Rotorua Urban Area Stormwater Catchment were contacted (with a briefing on the RUA Stormwater Resource Consent Application) and meetings arranged as requested. The intention at the time was to develop the CIA in conjunction with all iwi/hapū stakeholders (particularly mana awa / mana whenua). The consultation meetings with Iwi/hapū were undertaken with the objective of agreeing the CIA development process.

13.2.3 Recognising that the application identifies 29 current catchments within seven awa/stream catchments (and two township catchments), those most immediately affected hapū/iwi, i.e. those who are mana awa / mana whenua for the catchments, were prioritised for these meetings. Table 33 shows the list of the most immediately affected hapū / iwi who were contacted in 2015- 2018.

Table 33 - Hapū / Iwi – Preliminary Contact

Catchment(s)	Entity	Hapū / Iwi
Utuhina	Te Rūnanga o Ngāti Kea, Ngāti Tuara	Ngāti Kea – Ngāti Tuara
Puarenga	Tūhourangi Tribal Authority	Tūhourangi hapū
Utuhina	Te Komiro o te Utuhina	Ngāti Whakaue ki Ōhinemutu
Waiōwhiro Ngongotahā Ngongotahā Village Waitetī	Ngā Tura Ngāti Te Ngākau Hapū Trust	Ngāti Tura Ngāti Te Ngākau
Waiōwhiro	Rotohokahoka D North 4D Trust	Ngāti Waokū
Puarenga Waitawa	Ngāti Hurungaterangi Marae Trust	Ngāpuna Hapū / Iwi
Waingaehe Waitawa	Ngāti Uenukukōpako Iwi Trust and Ngāti Te Roro o te Rangi Hapū Trust	Eastside Hapū / Iwi
Waitetī	Ngāti Ngāraranui Hapū Trust	Ngāti Ngāraranui (incl Tūteaiti and Tamahika)
All	Te Komiti Nui o Ngāti Whakaue	Ngāti Whakaue
All	Te Arawa Lakes Trust	

13.2.4 With the exception of Ngāti Ngāraranui and Te Komiti Nui o Ngāti Whakaue all of the above hapū / iwi / mana awa / mana whenua requested a meeting. Following initial contact, face to face meetings were held with those hapū / iwi / mana awa / mana whenua throughout the months of October and November. Some meetings were more formal and presentations were made (Refer Appendix G for powerpoint presentation). Some were less formal and more conversational. High level feedback was often received regarding specific storm water servicing issues in their area. However, it was understood that full feedback would not be available until after the iwi / hapū / mana awa / mana whenua had completed their full cultural assessment of the application.

13.2.5 In addition to the face to face meetings, a phone conversation was held on 19 November 2018 with the Chair of Te Komiti Nui o Ngāti Whakaue who questioned why a s.92 process was being sought instead of including hapū and iwi in the development stages. Although not pleased that engagement did not occur when it should have ie prior to preparation and lodgement, they did understand the situation and was pleased that mana awa / mana whenua and Te Komiro o te Utuhina were being approached face to face before it was lodged. It was mentioned that Te Komiti Nui may be looking to establish an environmental committee to lead CIA preparation, as well as other RMA focused work with Councils going forward.

13.2.6 A list of the meetings held in this first phase is attached in Appendix G. Issues raised at the meetings is summarised as follows:

- Confirmation of mandate for feedback from iwi/hapū
- Sufficient time must be allowed to provide hapū/iwi feedback during the section 92 process
- Provision of Cultural Impact Assessment following lodgement (through section 92) was generally not supported. Preference is always that CIAs should be provided prior to lodgement, with iwi/hapū involved before any application is prepared. However the unusual circumstance of this application and the limits of the timeline were understood and generally accepted (as long as full CIA process is undertaken during the section 92 period).
- Application should not be publicly notified until CIA/Iwi process is completed.
- Support by many for a collaborative process to develop CIA, either working with Te Komiro o te Utuhina or being part of a joint CIA process with all affected iwi / Mana Awa / Mana whenua. Te Arawa Lakes Trust have offered to facilitate the development of the CIA.
- One Mana Awa / Mana Whenua has indicated a preference to prepare their own CIA, and others will consider whether to collaborate or prepare an individual CIA closer to the time of need (based on capacity at the time).
- Raised concern about specific effects, including:
  - levels of erosion and sedimentation in the Utuhina
  - Ngāti Kea Ngāti Tuara should be part of engagement/consultation when both Councils make decisions affecting the Utuhina (and other kaupapa generally) and there seems to be a lack of understanding about what is in their Iwi Environmental Management Plan.
  - Storm water management of significant concern especially for the Rotohokahoka D North 4D block - including storm water runoff from neighbouring block, land contour and natural springs which all add to a need for effective storm water management in the area.
  - Raised concerns about the pollution of the Utuhina; the impact of climate change; the amount of erosion and the lack of planting on the banks which would help reduce erosion; the lack of noticeable storm water controls along its length; the need for better filtration at at-risk areas; how monitoring is undertaken and a preference to see more done at industrial sites.
  - Raised concerns about flooding within the Ngāpuna community that is made worse by industrial activities/development within the immediate vicinity; current inadequate capacity of the storm water pipes; development upstream affecting flooding and water quality; the regular overflow of the Ngāpuna drain impacts whānau baths.
  - Would like to partner with the appropriate local authority for monitoring of the Ngongotahā and the Waitetī – for a two-way transference of knowledge and mātauranga between Council and Mana Awa.
  - Some flooding issues on Māori land blocks in the Galvin Road / Umukaria Road area.

13.2.7 In response to the issues raised at that time, the Council identified as follows:

- The timing of consultation and commencement of discussion about a cultural impact assessment is acknowledged
- Sufficient time will be requested from BOPRC to enable a full and appropriate CIA to be prepared with feedback from all affected iwi/hapū who wish to participate.
- The individual concerns about specific issues or process have been noted by Council for investigation and reporting back and integration into future processes.

13.2.8 Consultation was ongoing and a cultural impact assessment as a collaborative work or representing individual hapū/iwi was intended to be provided prior to notification.

13.3 Iwi Consultation Update

Refer Appendix G1

13.3.1 Since the updated application document was provided to the Regional Council in 2018, further work has been ongoing in relation to consultation. A comprehensive consultation programme was agreed in late 2022 with Te Arawa Lakes Trust with Te Papa Ahurewa as the lead. This programme commenced in early 2023 and the cultural impact assessment due for completion in July 2023.

13.3.2 A hui a iwi was held in January 2023 which identified issues and concerns. The summary of the issues raised is as follows:

It was clear in this meeting that Hapū hold multiple grievances in relation to management of infrastructure and the three waters around the Te Arawa district.

We acknowledge Kahurangi White-Parsons for fronting the meeting on behalf of Rotorua Lakes Council (RLC) and the hurt that Hapū representatives shared. It was clear that Hapū in attendance were not happy with the way in which the relationship between RLC and themselves is tracking nor were they happy with the proposed consenting process. Peter, in particular outlined that TPA and or Te Arawa Lakes Trust (TALT) should tread very carefully when operating in or around this line of work.

TPA sought direction from the meeting and from those in attendance and there was unanimous support from Hapū representatives that all consenting processes and or applications should be put on hold. The reasons for this is that Hapū representatives are currently working through legislation reforms such as Three Waters, Resource Management Act reforms and the likes and want to be clear what the legislative positions are before consenting decisions are made.

Hapū encourage a thorough engagement process to outline their aspirations around the way in which RLC develops, implements, applies their plans, consents, policies and other related functions.

TPA intends to continue engaging with Hapū in relation to the identified areas, however, states that 6 meetings may not be sufficient and the deadline for these meetings may not achieve the outcomes that RLC seeks.

13.3.2 The next step of cluster meetings was programmed for March 2023 but has been subject to some delays. However, this programme will continue in parallel to the formal notification process. The feedback will be drawn into the next stages of the process and will inform the conditions and implementation of the consent.

13.4 Community Consultation Update

13.4.1 As Stage 1 of the iwi engagement and consultation programme was initiated and completed, community consultation commenced in March/April 2023. Through the Council's Let's Talk platform, information has been provided to the community on the application to consolidate the 39 existing consents in one comprehensive consent. The Council is seeking feedback and answer questions about this application ahead of the public notification by the Regional Council.

13.4.2 To date no response has been received but this will be maintained in parallel to the formal notification process.

13.5 Consultation with Bay of Plenty Regional Council Rivers and Drainage (R&D) Team

13.5.1 The Regional Council requested through the section 92 request for further information that engagement be undertaken with "*the Bay of Plenty Regional Council Rivers and Drainage (R&D) Team. R&D manage flood flows and the associated infrastructure (stop banks) across a number of waterways throughout the Rotorua Urban Area. As part of this, R&D provide an agreed level of flood mitigation for scheme members. Scheme members pay a targeted rate to access this mitigation. I understand that the level of mitigation may vary for each scheme. Therefore, it is important for RLC to understand the level of service BOPRC has agreed to and how the existing stormwater flows, and infrastructure fit with this. As the existing infrastructure and discharges are not currently authorised they may be impacting upon the level of service agreed between BOPRC and scheme members and on-going mitigation, by way of consent conditions, may be required. It is likely that this engagement will result in the imposition of consent condition(s) to avoid, remedy or mitigate these effects.*"

13.5.2 A meeting was held on 24 March 2023. The R & D Team identified concerns about the impact of stormwater management within the Rotorua Urban Area on the Kaituna Catchment Control Scheme. They set out their comments in an email dated 28 April 2023, as follows:

Inappropriate stormwater management may affect the management of the Kaituna Catchment Control Scheme: As such we have the following specific concerns regarding stormwater management within the Rotorua urban area.

- *Urbanisation (subdivision and infill developments) leads to increased stormwater volumes and peak flows as vegetation is removed and soils are compacted or covered to impervious surfaces, in return leading to increased local flood risk and a reduction of the flood carrying capacity of the receiving environment and any flood protection assets (freeboard reduction or overtopping).*
- *Urbanisation (subdivision and infill developments) leads to increased stormwater volumes being discharged to the Rotorua Lake leading to an increase in lake levels post rain events and consequently has a potential effect on the compliance with the BOPRC's Rivers and Drainage resource consent for the Ōhau Channel Weir control structure at the outlet of Lake Rotorua (RC65980).*
- *Urban development and associated activities can result in build-up of sediments which are washed off during rain events and conveyed via stormwater networks to the receiving environment (river/streams, lakes). In addition, the change in flow velocities can induce or worsen erosion of the river/stream banks. Both resulting in sediments being accumulated within the receiving environment and reducing capacity for flood flows.*

Robust stormwater management practices need to be implemented that addresses both increased stormwater volumes and change in peak flows, including:

- *Setting limits to impervious surfaces*
- *Implementing volume reduction measures, including infiltration and biofiltration practices, rainwater harvesting and re-use.*
- *Managing changes to peak level and velocities through extended detention and attenuation.*

13.5.3 The email also provided suggested draft conditions. The Council notes the comments provided by R & D and some are addressed in the updated application. More particularly, the final conditions to the consent will be considered through the next stages of the application process and confirmed when a decision is made. This will provide an appropriate mechanism for achieving the outcomes sought.

14. NOTIFICATION EVALUATION

14.1 Under Section 95A of the Act, the Council may decide, in its discretion, whether to publicly notify an application for resource consent. Section 95A sets out four steps as follows:

Step	Requirement	Response
1	Mandatory public notification if: ▪ the applicant has requested public notification or ▪ if public notification is required under section 95C (in relation to further information)	The Council requests public notification
2	Public notification is precluded in certain circumstances under section 95A(5) in relation to ▪ a controlled activity, a restricted discretionary or discretionary activity for subdivision or a residential activity ▪ a restricted discretionary, discretionary or non-complying activity for a subdivision of residential activity ▪ or a prescribed activity under section 360H(1)(a)(i)	Not applicable
3	Public notification is required if ▪ a rule or NES require public notification ▪ the adverse effects on the environment are more than minor, under section 95D	Refer section 7
4	Special circumstances require public notification	Not applicable

As the Council requests public notification, this is the process to be followed. Therefore, no further evaluation is required under sections 95B.

14.2 The Council requests in this case that the application is publicly notified. Although the adverse effects are not assessed as more than minor, the application relates to the Rotorua Urban Area as a whole and public notification is appropriate.

15. CONDITIONS

15.1 The comprehensive stormwater catchment consent will enable a two tier system for managing and authorising works in relation to the stormwater infrastructure and actual and potential effects. The main mechanism is the CMP which will provide for and manage day to day activities, as required by the BOPRC Guidelines.

15.2 Section 10.1.3 of the CMP sets out criteria for monitoring which it is suggested should form the basis of monitoring conditions.

15.3 The conditions to the consent will establish parameters for preparing the CMP and updating it, set standards for contaminants for monitoring, and impose requirements for liaison and reporting as necessary and reasonable. It is anticipated that conditions will be based on consent conditions imposed on other similar CSC consents. Draft conditions will be developed through the consultation period and consent processing period.

16. SUMMARY AND CONCLUSIONS

16.1 This application for resource consent will authorise the discharge of stormwater to Lake Rotorua and to seven main catchment areas within the Rotorua Urban Area (RUA). The discharges and associated works will be managed through one comprehensive catchment management plan. Discharges from high risk sites are not included in the application or eventual consent. Consents from greenfields sites will be transferred through a process of agreement with the Council as appropriate.

16.2 Stormwater runoff from the urban area can contain contaminants that adversely affect the water quality in the waterways and lake, freshwater habitats, and cultural, recreational and aesthetic values, as well as increased runoff having physical impacts such as erosion, scour and deposition.

16.3 With the exception of the Waitawa area, this application does not include maintenance works in or adjacent to the beds of streams. Through the Upper Kaituna Catchment Control Scheme, the Regional Council is responsible for works relating to the Waingaehe, Puarenga, Utuhina, Waiowhiro, Ngongotaha and Waiteti Streams and their tributaries within the RUA. Therefore, the application relates to the discharges up to and including the outlets to the streams but not for works in the streams themselves. This separation of function creates some issues in relation to the management of stormwater to avoid flooding due to high lake and stream levels.

16.4 Key issues affecting the management of stormwater quantity in the catchment are flooding due to high lake levels, high stream levels, lack of stream maintenance which leads to high stream levels, and lack of capacity due to age or design level. Secondary flow paths, low gradient pipes near the outlets and blockages due to debris and sand build up also lead to ponding. As stream maintenance and lake level is undertaken by the Regional Council, flooding due to high lake and stream levels is outside the control of the Council.

16.5 The key issue for stormwater quality in the catchment is runoff from industrial and contaminated sites leading to heavy metal contaminants in stream and lake water. Research was undertaken as part of this application to identify the effects of stormwater on sediments in streams, drains and the lake, on water quality, MCI scores and on mussels. In addition, grab samples of stormwater flow were analysed. These results were compared with past studies.

16.6 The investigation identified that sediment and nutrient build up is not a significant issue for stormwater quality, although there have been some changes to stream reaches. The main issue to address is the concentrations of heavy metals, in particular zinc and copper. Overall, the study concluded that the effect of the discharge of RUA stormwater on water quality in the receiving waters is minor. In addition, although concentrations of heavy metals routinely exceed acute toxicity guidelines during storm flows, the integrated measure of stream quality using MCI scoring indicated that this is probably having a minimal adverse effect on stream health. Lake Rotorua receiving environment showed no sign of adverse effects with

respect to the accumulation of contaminants in sediments or biota, in the vicinity of urban stormwater discharges.

16.7 Water ways are of great significance to iwi and ensuring that the mauri of the waterbodies is not affected is fundamental to managing effects on water appropriately. As a first priority, it is important to avoid as far as possible and mitigate where avoidance is not possible adverse effects on water quality. Consultation in relation to cultural values and effects is ongoing through this process.

16.8 Managing the stormwater network to meet appropriate water quality standards and to avoid or minimise potential flooding is a positive outcome of the consent process. Without the correct mechanisms in place, there will be disruption to the community, loss of economic return and loss of cultural, social and recreational values.

16.9 The continuation of the stormwater system is essential to the wellbeing of the community served. The potential adverse effects that are identified in this assessment will be less than minor, and it is considered that appropriate conditions can be imposed on the new consent.

16.10 The comprehensive stormwater catchment consent will enable a two tier system for managing and authorising works in relation to the stormwater infrastructure and actual and potential effects. The main mechanism is the CMP which will provide for and manage day to day activities, as required by the BOPRC Guidelines. The conditions to the consent will establish parameters for preparing the CMP and updating it, set standards for contaminants for monitoring, and impose requirements for liaison and reporting as necessary and reasonable.

16.11 The Comprehensive Stormwater Catchment consent for the RUA is consistent with Section 5 of the RMA as it will enable the sustainable management of the physical resource that is the stormwater supply infrastructure. In addition, an efficient stormwater disposal system is essential to the social, economic and cultural well-being of the community. Granting consent will promote the purpose of the Act and will be consistent with Sections 6, 7 and 8 of the RMA.

Sigma Consultants Ltd

June 2023