Regional Direction and Delivery Committee

NOTICE IS GIVEN

that the next meeting of the **Regional Direction and Delivery Committee** will be held in **Mauao Rooms, Bay of Plenty Regional Council Building, 87 First Avenue, Tauranga** on:

Tuesday, 19 February 2019 commencing at 9.30 am.

Fiona McTavish
Chief Executive
8 February 2019

BAY OF PLENTY REGIONAL COUNCIL TOI MOANA

Regional Direction and Delivery Committee
Terms of Reference

The Regional Direction and Delivery Committee has a core function of policy formulation and implementation and monitoring of Regional Council strategy and policy.

Delegated Function

To set the strategic direction for the Region by formulating policy that clearly identifies Council's role and direction on issues. This will be achieved through the development and approval of Council strategy and policy.

To set the operational direction for approved Regional Council policy and strategy and monitor how it is implemented. This will be achieved through the development of specific operational decisions which translate policy and strategy into action.

Membership

Chairman and all councillors.

Quorum

In accordance with Council standing order 10.2, the quorum at a meeting of the committee is not fewer than seven members of the committee.

Term of the Committee

For the period of the 2016-2019 Triennium unless discharged earlier by the Regional Council.

Meeting frequency

Six-weekly.

Specific Responsibilities and Delegated Authority

The Regional Direction and Delivery Committee is delegated the power of authority to:

- Approve and review statutory and non-statutory policy, plans and strategies for:
  - the management of resources in the region;
  - identifying and promoting community aspirations;
  - defining and delivering on Council's roles;
- Approve and review operational policy and plans;
- Develop and review bylaws;
- Receive reporting on consenting, compliance and enforcement;
- Receive reporting from state of the environment monitoring;

- Receive any annual reporting of organisational programmes;
- Enter into contracts on matters within its Terms of Reference to a maximum value of $700,000 (excluding GST) for any one contract, subject to and within the allocation of funds set aside for that purpose in the Long Term Plan or Annual Plan or as otherwise specifically approved by Council;
- Approve submissions on matters relating to the Regional Direction and Delivery Committee's areas of responsibility that are not delegated to staff;
- Establish subcommittees and hearing committees and delegate to them any authorities that have been delegated by Council to the Regional Direction and Delivery Committee, including those under section 34 of the Resource Management Act 1991, and to appoint members (not limited to members of the Regional Direction and Delivery Committee);
- Delegate to hearings commissioners under section 34A of the Resource Management Act 1991 to exercise the powers, functions duties in relation to any authorities that have been delegated by Council to the Regional Direction and Delivery Committee;
- Establish working groups to provide advice to the Regional Direction and Delivery Committee on its areas of responsibility.

Note:

- The Regional Direction and Delivery Committee reports directly to the Regional Council.
- The Regional Direction and Delivery Committee is not delegated the power of authority to:
  - Approve the Regional Policy Statement and bylaws;
  - Review and adopt the Long Term Plan and Annual Plan;
  - Develop and review funding, financial, audit and risk policy and frameworks;
  - Approve Council submissions on Maori related matters except where submissions may have a wide impact on Council's activities;
  - Develop, approve or review non statutory policy for the Rotorua Te Arawa Lakes.

Public Forum

1. A period of up to 15 minutes may be set aside near the beginning of the meeting to enable members of the public to make statements about any matter on the agenda of that meeting which is open to the public, but excluding any matter on which comment could prejudice any specified statutory process the council is required to follow.

2. The time allowed for each speaker will normally be up to 5 minutes but will be up to the discretion of the chair. A maximum of 3 public participants will be allowed per meeting.

3. No statements by public participants to the Council shall be allowed unless a written, electronic or oral application has been received by the Chief Executive (Governance Team) by 12.00 noon of the working day prior to the meeting and the Chair's approval has subsequently been obtained. The application shall include the following:

   - name of participant;
   - organisation represented (if any);
   - meeting at which they wish to participate; and matter on the agenda to be addressed.

4. Members of the meeting may put questions to any public participants, relevant to the matter being raised through the chair. Any questions must be asked and answered within the time period given to a public participant. The chair shall determine the number of questions.

Membership

Chairperson:	P Thompson
Deputy Chairperson:	A von Dadelszen
Councillors:	Chairman D Leeder, N Bruning, W Clark, J Cronin, S Crosby, D Love, T Marr, M McDonald, J Nees, A Tahana, L Thurston, K Winters

Recommendations in reports are not to be construed as Council policy until adopted by Council.

Agenda

1 Apologies

2 Public Forum

3 Acceptance of Late Items

4 General Business

5 Confidential Business to be transferred into the Open

6 Declarations of Conflicts of Interests

7 Previous Minutes

8 Reports

Resolution to exclude the public

THAT the public be excluded from the following parts of the proceedings of this meeting.

The general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter, and the specific grounds under section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution are as follows:

General Subject of Matter to be Considered	Reason for passing this resolution in relation to this matter	Grounds under Section 48(1) LGOIMA 1987 for passing this resolution
9.1 Public Excluded Regional Direction and Delivery Committee Minutes - 11 December 2018	Good reason for withholding exists under Section 48(1)(a)	Refer to the relevant section of the open meeting minutes
9.2 Tauranga Harbour Coastal Hazards Study	Good reason for withholding exists under Section 48(1)(a)	To protect this information so it doesn't damage public interest

Previous Minutes

Minutes of the Regional Direction and Delivery Committee Meeting held in Mauao Rooms, Bay of Plenty Regional Council Building, 87 First Avenue, Tauranga on Tuesday, 11 December 2018 commencing at 9.32a.m.

Present:

Chairman: P Thompson

Deputy Chairman: A von Dadelszen

Councillors: Chairman D Leeder, J Cronin, T Marr, L Thurston, D Love, N Bruning, A Tahana, J Nees, W Clark, S Crosby, K Winters, M McDonald

In Attendance: F McTavish (Chief Executive); N Poutasi (General Manager, Strategy & Science); C Ingle (General Manager, Integrated Catchments); S Omundsen (General Manager, Regulatory Services); D Phizacklea (Regional Integrated Planning Manager); H Creagh (Rotorua Catchments Manager); R Donald (Science Manager); S Lamb (Natural Resources Policy Manager); A Miller (Compliance Manager – Primary Industry & Enforcement); S Mellor (Compliance Manager – Urban, Industry, and Response); G Corbett (Biosecurity Manager); R Burton (Freshwater Team Leader); J Low (Water Policy Team Leader); C Brewer (Team Leader, Urban, Industry, and Response); S Macdonald (Community Engagement Team Leader); N Newman (Principal Advisor); N Green (Senior Planner, Water Policy); G Kroon (Senior Policy Analyst, Water Policy); R Irving (Senior Regulatory Project Officer); S Pickles (Regulatory Compliance Specialist); J Durham (Committee Advisor)

Apologies: Chairman D Leeder and Cr A Tahana (both for lateness)

1 Apologies

Resolved

That the Regional Direction and Delivery Committee:

1 Accepts the apologies for lateness from Chairman D Leeder and Cr A Tahana tendered at the meeting.

Thompson/von Dadelszen
CARRIED

2 Public Forum

Nil.

3 Acceptance of Late Items

Nil.

4 General Business

Nil.

5 Confidential Business to be transferred into the Open

Nil.

6 Declaration of Conflicts of Interest

Cr von Dadelszen and Cr McDonald declared an interest in relation to the Plan Change 13 update within Agenda Item 12.2 (Mount Maunganui Industrial Area Regulatory Compliance Update).

Cr Thompson and Cr Nees declared an interest in relation to the Plan Change 9 update within Agenda Item 12.3 (Freshwater Futures Update report).

7 Previous Minutes

7.1 Regional Direction and Delivery Committee Minutes - 30 October 2018

Resolved

That the Regional Direction and Delivery Committee:

1 Confirms the Regional Direction and Delivery Committee Minutes - 30 October 2018 as a true and correct record.

Von Dadelszen/Thompson
CARRIED

8 Reports

8.1 Final Regional Targets for Swimmable Rivers and Lakes

PowerPoint presentation (Objective ID A3089589)

David Phizacklea (Regional Integrated Planning Manager) outlined requirements under the National Policy Statement for Freshwater Management for swimmability targets to be finalised by 31 December 2018. The targets were the same as the interim targets approved in March 2018.

Points of clarification included:

- Water quality monitoring for swimming was carried out from November to March each year.
- Lake Rotoehu would have ongoing issues due to naturally occurring phosphate.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Final Regional Targets for Swimmable Rivers and Lakes.

2 Approves the final Regional Targets of 95.7% for specified rivers and 85% for specified lakes to be swimmable by 2030 as required by the National Policy Statement for Freshwater Management.

3 Directs staff to make the final Regional Targets publicly available by 31 December 2018, provide the final targets to the Ministry for the Environment in the required format, and work with the Ministry for the Environment should any further work be required.

Thompson/Crosby
CARRIED

8.2 National Policy Statement for Freshwater Management Implementation Programme

PowerPoint presentation (Objective ID A3089589)

James Low (Water Policy Team Leader) and David Phizacklea (Regional Integrated Planning Manager) outlined the need to defer timelines for the National Policy Statement for Freshwater Management (NPS-FM) Implementation Programme.

9.45am – Cr Tahana joined the meeting.

Key points included:

- Central Government continued to develop freshwater policy.
- Several councils had deferred their timelines to allow time for Central Government to reach certainty on freshwater requirements and consider proposed changes and implications.
- Council's annual plan review would provide another opportunity to review progress and commence implementation once certainty was available.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, National Policy Statement for Freshwater Management Implementation Programme.

2 Unanimously rescinds its 30 November 2017 implementation timetable.

3 Adopts and publicly notifies an amended schedule for implementing the National Policy Statement for Freshwater Management as set out in this report, signalling completion by 31 December 2030.

4 Notes the ability to deliver the National Policy Statement for Freshwater Management Implementation Programme quicker through the annual plan and long term plan processes.

Thompson/Nees
CARRIED

8.3 Reducing Contaminant Loads to Waihi and Maketu Estuaries: Estimated Limits and next steps

PowerPoint presentation (Objective ID A3089590)

Nicki Green (Senior Planner, Water Policy), Rob Donald (Science Manager), and David Phizacklea (Regional Integrated Planning Manager) summarised the history and next steps for reducing the contaminant loads to Waihi and Maketu Estuaries.

Key points included:

- The estuaries' current health was declining and action was needed in the short term.
- Additional modelling would reduce uncertainty in the estimated contaminant loadings.
- Kaimoana was generally safe to consume from the Maketu Estuary, provided there had not been heavy rainfall in the 5-7 days prior to collection. It was Toi Te Ora's responsibility to provide warnings in such circumstances.

Staff follow-up:

- Provide further information on nutrient loads from Lake Rotorua and how it related to nutrient loads in the Lower-Kaituna.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Reducing Contaminant Loads to Waihi and Maketu Estuaries: Estimated Limits.

2 Gives approval for staff to discuss the estimated contaminant load limits and potential pathways to achieving them over time with the community during planned engagement for Plan Change 12. This will include discussion about:

a. timeframes and shorter term targets towards achieving limits;
b. review periods for limits, targets and methods;
c. benefits and risks for estuary values;
d. ability to make improvements (e.g. confidence about methods and their effectiveness);
e. the costs and benefits (social, economic and environmental); and
f. affordability.

Von Dadelszen/Love
CARRIED

8.4 Lowland Drainage Scheme Water Quality and Ecology - Implications and Actions

Nicki Green (Senior Planner, Water Policy), Nic Newman (Principal Advisor), Alex Miller (Compliance Manager – Primary Industry & Enforcement), and Rob Donald (Science Manager) outlined key actions and considerations undertaken as part of the integrated approach, and endeavours undertaken to implement best practice.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Lowland Drainage Scheme Water Quality and Ecology - Implications and Actions.

2 Approves the way ahead expressed in this report, that is:

a. land management offices will work with landowners to address hot spots;
b. to address drain and canal water quality issues and integrated management solutions primarily through the Plan Change 12 process; and
c. to support immediate actions that are in progress, such as, enabling fish passage at some sites, supporting drain management trials, and progressing drain discharge monitoring.

3 Approves discussion of the matters covered in this report during planned engagement for the Plan Change 12 process (Rangitaiki and Kaituna-Pongakawa Waitahanui Water Management Areas).

4 A further report be prepared on the regulatory implications arising from this report.

Thompson/von Dadelszen
CARRIED

Change to Order of Business

To ensure all Members would be available to consider Agenda Item 9.2 (Lake Rotorua Integrated Framework Update), Agenda Item 8.5 (Update on the Proposed Regional Pest Management Plan) would be considered next.

8.5 Update on the Proposed Regional Pest Management Plan

PowerPoint presentation (Objective ID A3079221)

10.30am – Cr Marr left the meeting.

10.30am – Cr Thompson left the meeting and vacated the Chair, Cr von Dadelszen assumed the Chair.

Stephen Lamb (Natural Resources Policy Manager) and Greg Corbett (Biosecurity Manager) outlined consultation undertaken on the Proposed Regional Pest Management Plan and the late submissions received from iwi. Concern was raised over tāngata whenua's capacity to engage on issues.

10.34am – Cr Thompson joined the meeting and resumed the Chair.

10.35am – Chairman Leeder joined the meeting.

10.37am – Cr Marr joined the meeting.

Councillors requested consideration be given to including Land Trusts within Council's iwi/hapū database to ensure tāngata whenua were aware of relevant matters.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Update on the Proposed Regional Pest Management Plan.

2 Is satisfied that consultation undertaken for the Proposed Regional Pest Management Plan meets the requirements of section 72 of the Biosecurity Act.

Bruning/Thurston
CARRIED

Chair's Announcement

Greg Corbett (Biosecurity Manager) was congratulated on receiving the Minister's Biosecurity Award following 35 years of dedicated work in the field.

Change to Order of Business

Agenda Item 9.2 (Lake Rotorua Integrated Framework Update) would be considered following the adjournment.

10.49am – the meeting adjourned.

11.09am – the meeting reconvened.

9 Public Excluded Section

Resolved

THAT the public be excluded from the following parts of the proceedings of this meeting.

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General Subject of Matter to be Considered	Reason for passing this resolution in relation to this matter	Grounds under Section 48(1) LGOIMA 1987 for passing this resolution
9.2 Lake Rotorua Integrated Framework Update	**Good reason for withholding exists under Section 48(1)(a)**	**To carry out commercial activities**

Thompson/von Dadelszen
CARRIED

10 Reports Continued

10.1 Mount Maunganui Industrial Area Regulatory Compliance Update

Reece Irving (Senior Regulatory Project Officer), Steve Pickles (Regulatory Compliance Specialist), and Sarah Omundsen (General Manager, Regulatory Services) outlined the state of the Mount Maunganui Industrial Area.

Key points included:

- The national standard defined PM10 exceedances as averaged over a 24 hour period, so a single spike would not create a notifiable exceedance.
- The PM10 national standard was based on World Health Organisation advice.
- There was no known safe limit of PM10.
- One more PM10 exceedance within the region would breach the national standard and trigger notification to the Minister and an investigation.
- All PM10 monitoring data was public. Staff noted spikes could be caused by false positives, and verification was necessary.

Staff follow-up:

- Staff to investigate if Port of Tauranga was undertaking private monitoring.
- The Ministry of Transport's Shipping Emissions Policy Paper was due 11 February 2019 and would be circulated to Councillors by email.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Mount Maunganui Industrial Area Regulatory Compliance update.

Thompson/Love
CARRIED

Change to Order of Business

To accommodate presenters, Agenda Item 12.4 (Regulatory Compliance: 2017/2018 Annual Report) was considered next.

10.2 Regulatory Compliance: 2017/2018 Annual Report

Stephen Mellor (Compliance Manager – Urban, Industry, and Response), Chris Brewer (Team Leader, Urban, Industry, and Response), Alex Miller (Compliance Manager – Primary Industry & Enforcement), and Sarah Omundsen (General Manager, Regulatory Services) answered questions in relation to the Annual Report and summarised Council's enforcement procedures when a property was non-compliant.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Regulatory Compliance: 2017/2018 Annual Report.

2 Compliments staff on the report.

Love/Cronin
CARRIED

10.3 Freshwater Futures Update

PowerPoint presentation (Objective ID A3083650)

Rebecca Burton (Freshwater Team Leader), Glenys Kroon (Senior Policy Analyst, Water Policy), and David Phizacklea (Regional Integrated Planning Manager) outlined freshwater work underway.

As Cr Thompson and Cr Nees had declared an interest in relation to the Plan Change 9 update in the report, they abstained from discussion.

12.48pm – Cr Thompson vacated the Chair, and Cr von Dadelszen assumed the Chair.

Key points included:

- An update was provided on Plan Change 9 appeals, including deadlines and the appeal process. Councillors would continue to be updated on progress.

12.51pm – Cr von Dadelszen vacated the Chair, and Cr Thompson resumed the Chair.

- The list of 1,196 At Risk Catchments identified nationally had been reduced to 28 catchments, with the Ministry for the Environment (MfE) seeking to further refine that to 20.
- Staff would advise Councillors of work underway on urban waterways against MfE principles.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Freshwater Futures Update.

Thompson/Winters
CARRIED

11 Information Only Reports

11.1 Integrated Catchment Management Update

The report was taken as read.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Integrated Catchment Management Update.

Cronin/Thurston
CARRIED

11.2 Housing Capacity Targets and Urban Growth Update

The report was taken as read.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Housing Capacity Targets and Urban Growth Update.

2 Notes that the Bay of Plenty Regional Policy Statement will be changed prior to 31 December 2018 to insert a new Policy UG 25B with targets for housing development capacity for the western bay sub-region, as contained in Appendix 1 to this report.

Nees/McDonald
CARRIED

11.3 Update - Community Funding Requests 2015-2018

Stephanie Macdonald (Community Engagement Team Leader) updated Councillors on Community Funding Requests and projects underway.

Key points included:

- Councillors requested funding focus on achieving action.
- Staff would continue to provide updates on Environmental Enhancement Fund projects, particularly Envirohub.

Resolved

That the Regional Direction and Delivery Committee:

1 Receives the report, Update - Community Funding Requests.

Thompson/Leeder
CARRIED

12 Consideration of General Business

Nil.

13 Public Excluded Section

Resolved

THAT the public be excluded from the following parts of the proceedings of this meeting.

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General Subject of Matter to be Considered	Reason for passing this resolution in relation to this matter	Grounds under Section 48(1) LGOIMA 1987 for passing this resolution
9.1 Public Excluded Regional Direction and Delivery Committee Minutes - 30 October 2018	**Good reason for withholding exists under Section 48(1)(a)**	**Refer to the relevant clause of the open meeting minutes**

Thompson/Thurston
CARRIED

The meeting closed at 1.13pm

CONFIRMED 19 FEBRUARY 2019: _____
Chairperson

Reports

Receives Only – No Decisions

Report To: Regional Direction and Delivery Committee

Meeting Date: 19 February 2019

Report From: Namouta Poutasi, General Manager, Strategy & Science

Annual Reports from the University of Waikato Science Chairs

Executive Summary

Council has established strong science and research relationships with the University of Waikato through the Chair in Lake and Freshwater Science, and the Chair in Coastal Science. These two roles are Professorships funded by the Bay of Plenty Regional Council and formalised through a Memorandum of Agreement.

The Annual Reports from Professors Baisden and Battershill are attached. These reports confirm the view that the Chairs are proving to be very beneficial to Council by providing robust and independent science advice to further support its management activities.

Each of the Chairs will be available to present updates on their research projects and activities, and future planned research activity.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Annual Reports from the University of Waikato Science Chairs.

1 Purpose of Report

The purpose of this report is to update Council on the research projects and activities being undertaken by the Chair in Lake and Freshwater Science, and the Chair in Coastal Science. The Annual Reports provided by each Chair are attached as Appendix 1 and 2.

2 Background

Council has established strong science and research relationships with the University of Waikato through the Chair in Lake and Freshwater Science, and the Chair in Coastal Science. These two roles are Professorships funded by the Bay of Plenty Regional Council and are formalised through a Memorandum of Agreement as described below.

The agreement was re-negotiated in 2018 and is in place until 31 December 2024, it has the following objectives:

2.1 To foster and develop independent, strategic and applied science within integrated zones, catchment and mountains-to-the-sea approaches to support policy and management in lake, freshwater and coastal ecosystems within the Bay of Plenty region.

2.2 To encourage, support and undertake research that has management and restoration objectives, including the development of nationally or internationally significant collaborations, programmes, and/or centres attracting appropriate levels of external funding focussed on lake, freshwater and coastal science and management.

2.3 To encourage co-operation between the University and territorial and regional governments, and engage with community and iwi led initiatives that will benefit from scientific input and support.

2.4 To build knowledge and human capital in areas of environmental science, restoration and management through outreach, engagement, undergraduate teaching and postgraduate research and training.

2.5 To appoint and maintain research teams operating as national and international leaders and science communicators in their fields, and to act in an expert capacity as scientific and technical advisors to the Council.

Professor Troy Baisden is the holder of the Chair in Lake and Freshwater Science. Troy specialises in understanding the flow of nutrients, water and carbon through ecosystems and the resulting impacts in freshwater. He spent the last decade at GNS Science's National Isotope Centre, ensuring New Zealand has access to challenging isotope techniques combined with the 'big-picture' understanding required to apply them to the nation's most important environmental issues. He is also an Investigator in Te Pūnaha Matatini, the Centre of Research Excellence on networks and complexity.

The Chair in Coastal Science is held by Professor Chris Battershill. Chris is an expert in marine ecology and environmental science and was previously Principal Scientist and Research Team Leader (Supporting Sustainable Use of Marine Biodiversity) at the Australian Institute of Marine Science (AIMS). Chris has also worked for a range of organisations in New Zealand including NIWA and the Taranaki Regional Council.

3 Achievements of the Chairs

A summary of the achievements of the Coastal Chair against the Objectives in the agreement is given in Appendix 3. This confirms the view that the Chair is proving to be very beneficial to Council by providing robust and independent science advice to further support its management activities.

4 Implications for Māori

One of the Objectives of the Memorandum of Agreement is to engage with community and iwi led initiatives that will benefit from scientific input and support. The Chairs place particular emphasis on engaging and working with Māori and bringing 'western science' together with traditional Māori knowledge and techniques. It is expected that

this work will gain momentum as Council increases its efforts to consider Mātauranga Māori in its monitoring and decision making.

5 Council's Accountability Framework

5.1 Community Outcomes

The Chairs contribute to most of the Community Outcomes in the Long Term Plan 2018-2028, but particularly to the 'Freshwater for life' and 'A healthy environment' outcomes.

5.2 Long Term Plan Alignment

The work of the Chairs is supported under the Science Activity, the Rotorua Catchments Activity, and the Tauranga Harbour Activity in the Long Term Plan 2018-2028.

Current Budget Implications

This project is currently supported within the budget for the Annual Plan 2018/19.

Future Budget Implications

Future support for the Chairs is provided for in Council's Long Term Plan 2018-2028.

Rob Donald
Science Manager

for General Manager, Strategy & Science

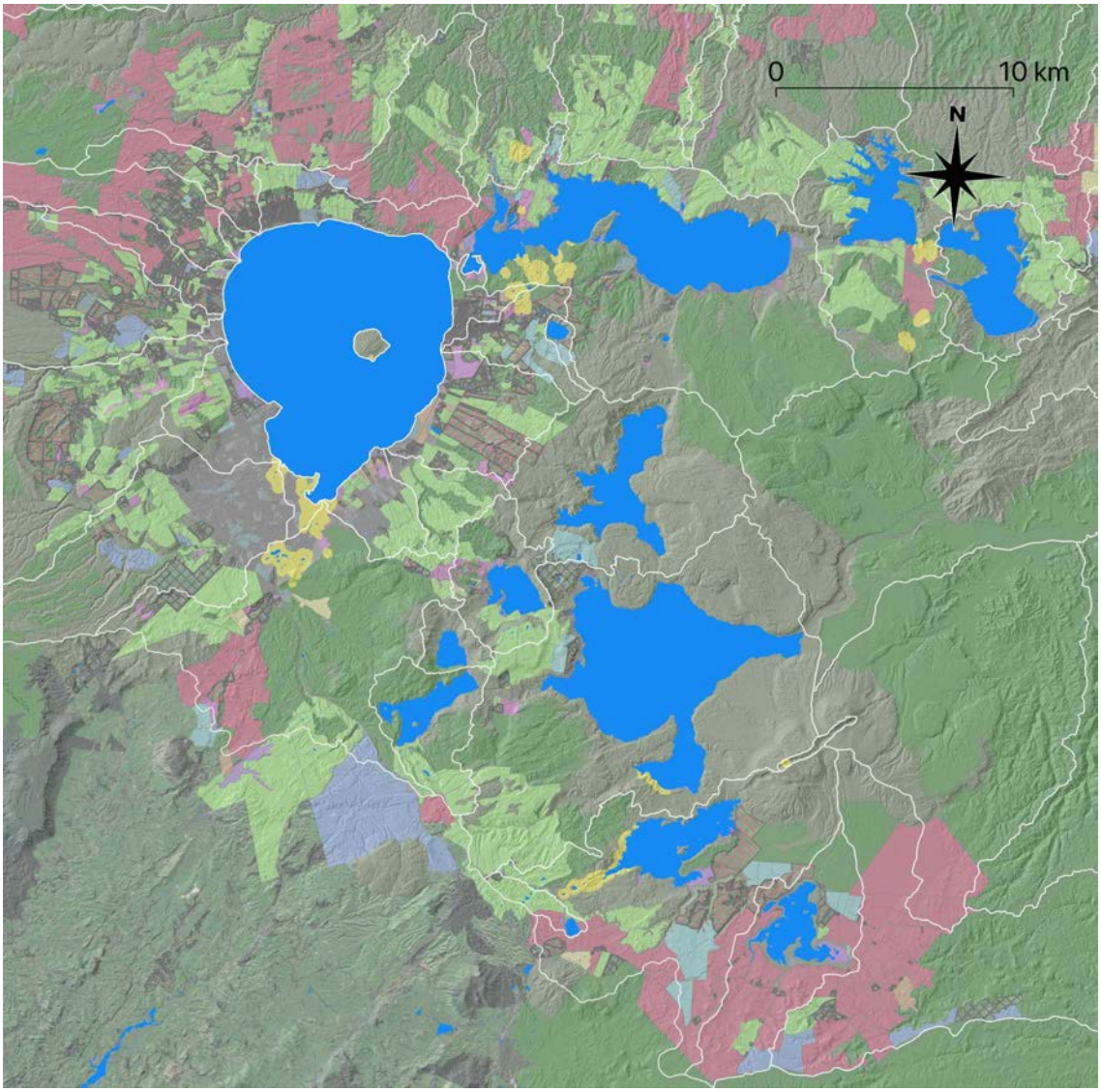
7 February 2019

APPENDIX 1

Chair In Lake and Freshwater Science Annual Report 2017-2018

Bay of Plenty Regional Council Chair in Lake and Freshwater Science

Annual Report for the period 1 June 2017 to 30 June 2018



BOPRC 2017 land use, geothermal areas (yellow), catchments (white), and LIDAR topography

Prepared for Bay of Plenty Regional Council

Environmental Research Institute
Te Pūtahi Rangahau Taiao
THE UNIVERSITY OF WAIKATO

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Summary 2017-2018:

The following report summarises the activities of the Bay of Plenty Regional Council (BOPRC) Chair in Lake and Freshwater Science at the University of Waikato (UoW). Prof Troy Baisden took up the Chair from 14 November 2017. This annual report covers the period 1 July 2017 – 30 June 2018, and also contains information for the previous 12 months not reported while the Chair was vacant. This report concludes by describing future directions for the Chair's programme to meet BOPRC's expectations to expand the role to cover lake, freshwater and catchment research, as well as inform, engage, and support iwi and hapu and the community about environmental science.

Funding for the Chair supports a number of staff and students directly and indirectly, including:

- Professor Troy Baisden (Chair)
- Dr Mat Allan (Research Fellow)
- Dr Jonathan Abell (Subcontractor)
- Chris McBride (Research Officer)

Other staff who undertake projects contracted separately related to the Rotorua lakes include:

- Dr Grant Tempero (Research Officer)
- Dr Moritz Lehmann (Research Fellow)
- Dr Adam Hartland
- Professor Brendan Hicks
- Associate Professor Nick Ling
- Ian Kusabs

In addition the following people have had involvement with BOPRC as post graduate students:

- Chris McBride (half-time PhD study ongoing)
- Chris Eager (MSc completed October 2017)
- Kohji Muraoka (PhD ongoing)
- Wang Me (PhD completed 2017)
- Shane Grayling (MSc underway)
- Laura Francis (PhD underway)

Overview

The Bay of Plenty Regional Council Chair in Lake and Freshwater Science at the at the University of Waikato (hereafter referred to as the "Chair"), has been in existence continuously since 2002. The Chair was previously titled Lake Restoration, and was changed in the appointment process that led to Prof Troy Baisden taking up the position from 14 November 2017. The Inaugural Chair was Prof David Hamilton, who held the role until March 2017. The Chair is currently supported through a Letter of Intent extending the previous Memorandum of Agreement (MOA) covering the period 2012–2017. A new MOA is pending approval with Bay of Plenty Regional Council at the time of this report. Since 2002, the funding, scope and volume of work undertaken by the Lakes Chair has expanded.

This 'annual' report officially covers the period 1 June 2017 to 30 June 2018. It also aims to capture activity and science delivery during the previous 12 months, not included in the financial report to 30 June 2017 because the Chair was vacant at the time of reporting. To outline the programme being established by the new Chair, this report also contains up-to-date details of a strategic workplan, external funding and associated activity.

The current annual report combines projects funded directly by the Bay of Plenty Regional and those funded from other sources. Funding also occurs from a number of other sources to support research on the Rotorua Te Arawa Lakes. This includes, for example, other funding support from the University of Waikato (e.g., student scholarships and post-doctoral support), MBIE and the Lake Tarawera Ratepayers' Association as follows:

- Research Programmes funded by the MBIE Endeavour fund and aligned to the Chair's team during the 2017–2018 reporting period include:
    1. Enhancing the health and resilience of New Zealand lakes (Lakes Resilience)
    2. Natural Tracers of Fast Contaminant Dynamics (FaCTs)
- An annual donation is received by the Lakes Chair from Lake Tarawera Ratepayers' Association (LTRA) to support analyses associated with stream monitoring, buoy support and to recognise ongoing provision of advice to LTRA.

Looking to the future, the Chair's team had roles in four MBIE Endeavour Programmes funded in September 2018 and will be aiming to submit a major MBIE Endeavour Research Programme

proposal in March 2019 for the Lakes Ecosystem Research New Zealand (LERNZ) team to supersede the current Lakes Resilience Programme.

Since arriving at UoW as Chair, Troy Baisden has played a role in coordinating delivery of other UoW research and advice, such as:

- Accelerating development of eDNA methods for catfish monitoring
- Potential impacts of catfish on lake nutrient cycling in Rotorua.
- Professor Brendan Hicks is a member of the Fisheries Technical Advisory Group.
- Review of reports and presentations, and coordination of Prof Warwick Vincent's visit to the University and other research organisations associated with the Plan Change 10 Science Review.

In addition, through initial engagement with BOPRC and stakeholders, it has been identified that major goals of the Chair's programme should be to conduct and communicate research in ways that build knowledge and human capital in the Regional Council, in the community, within iwi and hapū, and across New Zealand. This is being achieved through direct engagement with Te Arawa Lakes Trust and other organisations in the Rotorua Te Arawa Lakes region, and through improving messages about freshwater in the New Zealand media and on social media.

This report is organised to provide summaries of research projects undertaken first, as in past reports. Following that, a brief summary of media and engagement activity is provided. Finally, a summary is provided outlining activity expected in 2017–2018 and beyond, including relationships to MBIE Endeavour funded projects announced in September 2018.

Projects undertaken by the University of Waikato to 30 June 2018.

Monitoring and Modelling

1. ***Lake monitoring buoys***

   Chris McBride

   We have operated six autonomous lake monitoring stations on Lakes Rotorua, Rotoiti (Narrows), Rotoehu, Tarawera, Rerewhakaaitu and Okaro, with support from JFB Environmental and BoPRC. Data are available in near-real-time via BoPRC's website. The Rerewhakaaitu profiler buoy was refurbished in mid-2017, and the Okaro buoy was rebuilt with upgraded equipment in December 2017. At Tarawera, intermittent failures of a key sensor chain have resulted in substantial gaps to the record over the past two years, however, data continuity at other sites has generally been very good (~ >90%), over the 2-year period reported here. Data from these buoys continues to be a valuable resource for understanding short- and long-term dynamics in the Rotorua Lakes. For example, data from the Lake Rotorua monitoring buoy have been critical in improving the performance of the lake models used for PC10 Science Review module 5 (see below). Data from these sites are also contributing to global-scale limnological studies through the Global Lake Ecological Observatory Network (GLEON).

2. ***Lake Rotorua long-term loads and DYRESM-CAEDYM modelling***

   Chris McBride, Mat Allan, David Hamilton

   Two substantial reports were produced for the Plan Change 10 Science Review (Module 5: 'Re-run the lake model'). The first report presented a comprehensive synthesis of historical data from Lake Rotorua's catchment, and from the lake itself. The objective of this study was to estimate, as consistently as possible, change in nutrient loading (nitrogen and phosphorus) to the lake, and water quality arising from those changes (e.g., catchment intensification, changing wastewater treatment practices).

   The second report leveraged the synthesis of catchment inputs from the first study, to re-run and improve upon existing versions of the DYRESM-CAEDYM Lake Rotorua model, which has previously been used to investigate likely lake responses to changes in catchment loading, climate change, and alum dosing. We also applied a 'matrix' approach to hypothetical scenario simulations of catchment nitrogen and phosphorus loading.

   Both reports are presently in review.

3. ***Lake Tarawera modelling***

Jonathan Abell (Ecofish Research), Chris McBride and David Hamilton (Griffith University)

A project to model water quality of Lake Tarawera using 1-D DYRESM-CAEDYM to estimate sustainable nutrient loads has been led by Jonathan Abell (Ecofish Research), along with Chris McBride (UoW) and David Hamilton (Griffith University). A draft report is complete and presently with the co-authors for finalising.

4. **Te Arawa Rotorua Lakes external loads project**

Chris McBride, P. Verberg (NIWA)

In 2014, a project was commenced to estimate external (catchment) loads for all BoP lakes using consistent methodology, largely based on Overseer load estimates, but also accounting for hydrological connections between lakes, as well as geothermal and atmospheric loading. After an initial iteration the project was placed on hold due to large differences between estimates from Overseer V5 and V6, and a lack of availability of Overseer V6 estimates for some catchments. BoPRC have since completed estimates for all catchments using Overseer V6.2.3, and these have been incorporated into final budgets. The report is being finalised at present, and will be used for an analysis of internal loading to each lake using mass balance methods (P. Verburg, NIWA).

5. ***Modelling nutrient loads from the Puarenga Stream catchment to Lake Rotorua***

Wang Me

Wang Me has completed her PhD on the contribution of nutrient loads from the Puarenga Stream catchment to Lake Rotorua. This research used SWAT modelling to look specifically at the nutrient reductions achieved from diversion of Rotorua city's treated sewage from the forestry blocks in Whakarewa. This research is reported as ERI report 98 and the references immediately below.

References

Me, W. 2017. Modelling temporal dynamics of discharge and nutrient loading from a mixed land use catchment, and interactions with a eutrophic, temperate lake under climate change. PhD thesis, University of Waikato, Hamilton.

Me W, D. P. Hamilton DP, McBride CG, Abell JM, Hicks BJ. 2018. Modelling hydrology and water quality in a mixed land use catchment and eutrophic lake: Effects of nutrient load reductions and climate change. Environmental Modelling and Software 109: 114–133.

Rotorua Lakes Remote Sensing

6. Towards Automated Processing and Comparison to Historical Archive

Moritz Lehman and Mat Allan

Lehmann and Allan have reprocessed the Landsat 5, 7 and 8 archive of satellite data over the Rotorua lakes, encompassing the period from 1999 till summer 2018. A precursor to this work investigated water colour classification on a national scale, applying NASA atmospherically corrected data (Lehmann et al 2018). This work was completed to compare “in house” atmospheric correction procedures against standard NASA procedures. Standardisation of these corrections greatly accelerates near real-time responses to algal bloom events, and also improves cost effectiveness, consistency and confidence. The study enables steps toward more routine algorithms applied to higher spectral resolution sensors such as the recently launched Sentinel 3. As outlined below, this pre-requisite work combined with additional satellites greatly increase the potential to use remote sensing to investigate and communicate the location and causes of algal and cyanobacterial blooms in space and time.

7. Towards Near Real Time Monitoring of Algal Blooms

Mat Allan and Troy Baisden

The European Sentinel 2 and 3 satellite programmes have now become fully operational, greatly enhancing the frequency and quality of satellite data routinely available. Combined with operational US satellites (Landsat 8 and MODIS), routine overpasses are finally sufficient to allow consistent imagery to monitor algal blooms in the relatively cloudy Rotorua Lakes. Improved availability of imagery via Google Earth Engine now enables rapid and efficient searching and distributing recent images from all satellite platforms. The potential of the technology was demonstrated when cyanobacteria blooms in Lake Tarawera raised considerable concern during the 2018 Waitangi Day holiday weekend. Imagery showing the apparent origin of the bloom in Wairua Arm, and its extent could be rapidly made available to concerned residents and BOPRC. Allan has implemented the Rotorua lakes chlorophyll a prediction algorithm (Allan et al 2015) within Google Earth Engine, which allows semi-automated visualisation of Landsat 8 estimated chlorophyll a concentration shortly after image capture. This GEE interface is web based, and will a small amount of training, may be used by council GIS technical staff to visualise water quality derived from Landsat 8. There is obvious potential to extend the algorithm to all satellites. Following international examples, we expect this capability to enhance communication about blooms and their causes.

8. Improving Routine Remote Sensing of Lake Temperature

Mat Allan

Also, since the last Lakes Chair Annual Report, Allan has published work which uses Landsat imagery to estimate surface water temperature (Allan et al 2016), investigating atmospheric correction procedures which enable routine correction with RMSE of about 1°C, and non-routine correction of 0.5°C. The non-routine procedures are not yet automated and require radiosonde data to be collected at time of image capture. This application is valuable for monitoring and calibrating models in lakes where monitoring buoys are not present or may not represent the all areas of the lake, such as bays and arms distant from the buoy.

Biogeochemistry and Contaminant Tracing

9. Tracing Hot Spots and Hot Moments of Nitrate Contaminant Input to Freshwater

Troy Baisden and Simon Stewart

With agreement from BOPRC, the $1M MBIE Smart Ideas contract, "*Tracing Hot Spots and Hot Moments of Nitrate Contaminant Input to Freshwater*" has been transferred from GNS Science to UoW, with field areas now intending to focus in the Rotorua Te Arawa Lakes and Waituna catchment (Southland). The intent of the project is to develop the use of new tracers capable of identifying hot spots and hot moments of nitrogen cycling processes leading to nitrate mobilization or removal that can be identified as 'control points' for land management activity. To do so, the project develops additional isotope tracers (water stable isotopes, dissolved inorganic carbon isotopes, and isotopomers in dissolved nitrous oxide) to support the use of dual-isotope nitrate to understand the sources and fate of contaminant nitrate. This programme was funded in the 2017 round and will be referred to by the short title Fast Contaminant Tracers (or FaCTs). The novated research contract was signed in April 2017 and Simon Stewart started as a 0.5 FTE post-doc on the project after the completion of his PhD in May 2017. An MSc student, Claire Eyberg, started in July. Due to winter focus in Southland and delays getting staffing in place, effort in Rotorua Lakes has so far been on getting sampling underway. The use of water isotopes as a screening tool will accelerate from November when a $45k autosampler arrives to allow the university's existing water isotope analyser to be used for this purpose. It is important to note that these isotope tracers will likely provide new insights enabling management of nitrate source and removal processes, but will take at least 2-3 years of development before practical application of the research to policy and/or management.

10. ***Biogeochemical Characterisation of an Alum Dosed Stream: Implications for Phosphate Cycling in Lake Rotoehu***

    Chris Eager and Adam Hartland

    Through a BOPRC funded MSc thesis supervised by Adam Hartland, Chris Eager investigated the geochemistry and biogeochemistry of the alum-dosed Waitangi Springs inflow, a transect into the lake, and the chemistry of sediment cores. The results highlighted possible reasons for the ineffectiveness of alum dosing in Rotoehu, and will inform a Technical Advisory Group meeting to be held on 30 October 2018.

    Eager's work focused on monitoring and modelling the physicochemical and geochemical dynamics across the mixing zone from the Waitangi Springs geothermal stream outlet across Te Wairoa Bay to the main lake body. A combination of approaches was used: two field experiments with fixed location and transect measurements, laboratory analysis and geochemical speciation modelling with PHREEQC. Sharp changes in physicochemical water properties across the mixing zone within the bay: pH, O_2 and dissolved reactive phosphorus values increased with distance from the stream outlet, whereas major ion concentrations, temperature and conductivity values decreased. Initial in-stream phosphorus stripping through alum dosing is effective in reducing the DRP load by ~50 % of background concentration. However, elevated levels of iron in amorphous hydrous ferric hydroxides $Fe(OH)_{3(am)}$ are also likely to be contributing to natural phosphorus binding capacity, as indicated by preliminary research by Ben Shirley in 2015. Sediment core data also indicated that settled $Al(OH)_{3(am)}$ floc and $Fe(OH)_{3(am)}$ particulates were primarily concentrated within the inner portion of Te Wairoa Bay near the Waitangi Springs outlet, where submerged macrophytes also influence the aquatic chemical environment through photosynthesis. This work highlights the complexity of biogeochemical processes within aquatic freshwater ecosystems, and emphasises the need to account for the significant spatial and temporal heterogeneity of physicochemical parameters in the development of effective lake remediation strategies.

Invasive Fish and Food Webs

11. Ohau Channel Diversion Wall Fisheries Panel Meeting

Brendan Hicks

Brendan Hicks has participated in these meetings annually since 2008. This panel reviews the monitoring programme that aims to assess the effects of the Ohau Channel Diversion Wall on trout, common smelt, taonga fish species and the rest of the fish community. Specific projects investigated the changes in wild rainbow trout migration, smelt abundance, morihana (goldfish) and kōura (freshwater crayfish). UoW research used otolith microchemistry to trace rainbow trout origins and boat electrofishing for evaluate changes in fish abundance in the Ohau Channel. Recent contracts include ERI reports 116, 105, and 86.

12. Ohau Channel Diversion Wall Consenting

Brendan Hicks

Hamilton, Lehman and Hicks compiled evidence on water quality and fisheries that was incorporated into the Assessment of Environmental Effects (AEE) report by Beca Ltd for the reconsenting process for the Ohau Channel Diversion Wall. On the basis of the evidence put forward, in 2017 the wall was re-consented for a further 35 years without the need for a hearing process. The AEE did not acknowledge the individual University of Waikato authors of Appendix 2: Water quality and fisheries assessment.

Reference

Hamilton DP, Lehman MK, Hicks BJ. 2016. Appendix 2: Water quality and fisheries assessment. Appendix pages 13-35 in Beca Ltd, University of Waikato, Wildland Consultants Ltd, Ian Kusabs and Associates Ltd. AEE Ohau Channel Diversion Wall Reconsenting. 8 December 2016, prepared for Bay of Plenty Regional Council for submission to Bay of Plenty Regional Council.

13. Brown bullhead catfish in Lake Rotoiti

Brendan Hicks, Mat Allan

Following the confirmation of brown bullhead catfish in Te Weta Bay, Lake Rotoiti by a weed harvester in March 2016 and aggressive campaign has been mounted to understand the distribution, movement, ecological effects and recruitment of catfish. Initial response by Bay of Plenty Regional Council (BOPRC) was to contract extensive fyke net capture at a large number of sites in Lake Rotoiti, the Ohau Channel, and Lake Rotorua by the Biosecurity Team of BOPRC. Shane Grayling is currently doing a part-time Master of Science degree to the

University of Waikato, jointly supervised by Brendan Hicks and Cindy Baker of NIWA. The focus of Shane's research is to use acoustic tracking to determine the movements of catfish. In a separate MSc study, Laura Francis is investigating the impact of catfish on kōura populations through catch rates, diet, isotope tracking and the use of whakaweku (fern bundles, a matauranga Maori sampling technique). This research is scheduled for completion in February 2019.

Another potential risk of catfish in the Rotorua lakes is from their contribution to lake nutrients. This was evaluated by Brendan Hicks and Mat Allan on a separate contract (ERI report 115). Standard technique for establishing the presence of catfish is to use fyke netting, which contractor Geoff Ewert has done extensively, providing excellent information on catfish distribution in Lake Rotoiti and the Ohau Channel. However, at low abundance nets can fail to catch catfish where they in fact are, so we have an active contract to look at the feasibility of environmental DNA (eDNA) to determine presence or absence of catfish. This research is looking very promising and will be completed by 31 October 2018 (ERI report 120).

14. Kōura population assessment in lakes and streams

Brendan Hicks, Ian Kusabs

Brendan Hicks has been working with Ian Kusabs on extending techniques originally developed for sampling kōura in lakes to sampling kōura populations and streams. This important work is based on Ian Kusabs incorporation of mātauranga Maori from Ngāti Pikiao kaumatua Willie Emery. This technique uses a whakaweku (fern bundle) tied to an individual stake, and has proved highly successful for monitoring kōura populations in streams that are too deep for effective electrofishing (Kusabs et al. 2018). This research was partly conducted in the Te Wairoa Stream, Lake Tarawera catchment.

Reference

Kusabs IA, Hicks BJ Quinn JM, Perry WL, Whaanga H. 2018. Evaluation of a traditional Māori harvesting method for sampling kōura (freshwater crayfish, *Paranephrops planifrons*) and toi toi (bully, *Gobiomorphus* spp.) populations in two New Zealand streams. New Zealand Journal of Marine and Freshwater Research. Online first https://doi.org/10.1080/00288330.2018.1481437.

Ecotoxicology and aquatic/environmental impacts of alum dosing or discharges

15. Alum dosing of the Utuhina Stream, Puarenga Stream, and Waitangi soda Springs, Lake Rotoehu

Nick Ling, Brendan Hicks

Research has been conducted into the effects of alum dosing at three sites: Utuhina Stream and Puarenga Stream, Lake Rotorua, and Waitangi soda Springs, Lake Rotoehu. Nick Ling has been primarily responsible for this (ERI reports 81, 82, 83, 101, 102, 103). Sampling is conducted annually at preset monitoring sites, and shows limited or no detectable effect of the dosing on trout, bullies, kōura, and macroinvertebrates. This research is ongoing; samples have been collected for 2018 and analyses are being conducted.

16. Supplemental ecotoxicological review of alum applications to the Rotorua Lakes

Grant Tempero

Grant Tempero has prepared a supplementary report (ERI report 117) to the original 2015 ERI Report 52, "Ecotoxicological Review of Alum Applications to the Rotorua Lakes" as part of the Plan Change 10 Science Review conducted by Professor Warwick Vincent. The report addressed several questions relating to the toxicological effects of long term alum doing of Lake Rotorua. It was concluded that based on resent toxicological testing conducted by the USEP, current continuous low level alum dosing of inflows to Lake Rotorua were unlikely to have chronic impacts on downstream biota. Also, pH increases above pH 9 due to algal blooms were unlikely to result in toxicological impacts from aluminium speciation. However, further evaluation of potential toxic effects during phytoplankton driven diel pH cycling was recommended.

17. Lake Rotorua and Rotoehu: Total and Non-crystaline Aluminium Content in Bottom Sediments

Grant Tempero

Grant Tempero evaluated the total and non-crystalline aluminium content in bottom sediments and reviewed the evidence of environmental effects of alum applications to the Rotorua Lakes in 2015 (ERI reports 89). Sediment total aluminium content, and the proportion of amorphous (non-crystalline) aluminium were determined from 15 sediment cores in Lake Rotorua and seven cores from Lake Rotoehu. Analysis of the Lake Rotorua cores found no accumulation of aluminium in 13 of the 15 cores, and moderate accumulation of amorphous aluminium in the other two cores which were located nearest the outflow of the Utuhina Stream. In contrast,

high concentrations of aluminium were located in the vicinity of the discharge point of the Waitangi Soda Spring in Lake Rotoehu, but abruptly declined further out into the main basin of the lake. It was recommended that an additional sediment survey be conducted around Kawaha Point and the area north of Sulphur Bay in Lake Rotorua to determine if these areas are accumulating aluminium derived from alum flocculent. Grant Tempero plans to prepare a project proposal for this work shortly.

18. Proposed treated wastewater discharge to the Te Arikiroa Thermal Channel and Sulphur Bay

Brendan Hicks, Nick Ling, Jonathan Abell, David Hamilton

A University of Waikato team (Chris Dada, Brendan Hicks, Nick Ling, David Hamilton, and Jonathan Abell) assessed the effects of proposed treated wastewater discharge to the Te Arikiroa Thermal Channel and Sulphur Bay (Lake Rotorua) for Rotorua Lakes Council. This was a client report for Rotorua Lakes Council. Though this was not a contract with BOPRC, the wastewater discharge has potential implications for lake management.

Summary of Engagement and Media activity

From 14 November 2017 when Troy Baisden took up the role as Chair, he made a concerted effort to maximise engagement with BOPRC, Te Arawa Lakes Trust, and Rotorua Te Arawa Lakes stakeholders. Based on advice from the Science Media Centre, it was identified and consulted with BOPRC and stakeholders that time should be prioritised for public-facing commentary to the media focussed on solutions for freshwater issues, using successes and potential in the Rotorua Lakes as key examples. An important goal of media engagement is filling an observed gap between the polarised positions of industry and conservationists, so that the public get a better sense of the progressive steps that are able deliver solutions, historically and in the future. The following activities have been undertaken as a result.

The following have been organised with BOPRC or directly with stakeholders:

- Presentation to Lakes Water Quality Society AGM 29 January 2018, Piako Rugby League Club, Mourea.
- Brief introduction and attendee, Lake Tarawera Ratepayers AGM and Wastewater Reticulation meeting. 14 January 2018.
- Guided Land Treatment Collective Conference Tour of Rotorua Lakes, speaking at multiple sites on 9 March 2018.
- Participated in Primary Producers Collective's site visits with Prof Warwick Vincent, Reviewer for PC10 Science Review (12 July 2018) and attended earlier PC10 Science Review update for primary sector and Lakes Water Quality Society on 22 February 2018.
- Attended and made a presentation to BOPRC Science Team meeting in Whakatane, 1 August 2018.

Regular engagement through Te Arawa Lakes Trust Environment Manager Nicki Douglas has resulted in the following.

- Prof Baisden and BOPRC Integrated Catchments Manager Pim de Monchy attended the Nature Conservancy's New Zealand Symposium with Nicki Douglas in Auckland on 12 March 2018.
- Prof Baisden recommended that the Royal Society of New Zealand place fellowship recipient Dave Bach (St. Mary's School, Rotorua) at Te Arawa Lakes Trust for 6 months, noting that the Trust is at the heart of a range of reasons why people in the region care about science.
- Funding has been awarded for a Te Pūnaha Matatini Centre of Research Excellence (CoRE) summer scholarship to be hosted at the Trust to use data science techniques to better understand what human capability exists within the Trust's beneficiary register, how this may be drawn on to accelerate the Cultural Values Framework, and how effective past investment in education has been. Baisden, as a Principal Investigator in the CoRE will act as academic supervisor for the project.

Effort has been made to create publicly accessible content, including internet video and/or print media accessible throughout the Bay of Plenty.

- Publication of "Six ways to improve water quality" in The Conversation, which was syndicated in regional newspapers and other media. https://theconversation.com/six-ways-to-improve-water-quality-in-new-zealands-lakes-and-rivers-95049
- Inaugural Professorial Lecture at the University of Waikato, "Finding Solutions for Our Freshwater" with extra effort to capture a high quality recording and make it available online. https://www.youtube.com/watch?v=VWD4ehHrAJk
- Organised for a range of presentations from the Lakes Resilience Symposium recorded and available online. https://www.lernz.co.nz/tools-and-resources/Videos-and-presentations/lake-resilience-programme-presentations
- Established a public Facebook page, https://www.facebook.com/LakesProf/, and blog https://land2water.blogspot.com

The following are given as examples of being responsive to requests from the Science Media Centre and directly from journalists. These responses have been designed to provide consistent messages of achievable solutions and improvements to freshwater through land management.

https://www.sciencemediacentre.co.nz/2018/10/08/freshwater-agenda-expert-reaction/

https://www.sciencemediacentre.co.nz/2018/10/04/river-water-quality-report-expert-reaction/

https://www.newstalkzb.co.nz/on-air/larry-williams-drive/audio/troy-baisden-murky-report-highlights-state-of-new-zealand-waterways/

https://www.stuff.co.nz/business/farming/103994563/biosecurity-and-sustainable-farming-fund-big-winners-in-budget

https://www.sciencemediacentre.co.nz/2018/08/24/irrigation-efficiency-not-so-efficient-expert-reaction/

https://theconversation.com/six-ways-to-improve-water-quality-in-new-zealands-lakes-and-rivers-95049

Summary of work plan priorities and recent external funding

Reorient Chair's Programme to Catchments & Tracers focus (1-3 years)

After establishing a good working knowledge of existing research and stakeholder concerns, work is getting underway to further reorient Chair's team to catchment research. This work will further extend recent efforts to understand loads delivered in streams to lakes in space and time, with the use of models such as the Soil and Water Assessment Tool (SWAT). The major new element of the work will be greater use of the natural differences in isotopes and trace elements to better understand sources of contaminants. Work in the FaCTs Smart Ideas programme will form an important basis for determining nitrogen sources, while geochemical tracers capable of distinguishing agricultural, groundwater and geothermal phosphorous sources will assist in determining sources in lakes such as Tarawera. A summer scholarship intern has been hired to work specifically on defining the N isotope composition of geothermal inflows. The use of water isotopes to separate water sources from different rainfall events, seasons and elevations may yield some early payoffs, while other tracer systems take a number of years to develop. Many are likely to have significant long-term pays offs resulting from a better understanding of water and nutrient sources, given the need for considerable reductions in nutrient loads to lakes. In the short term, effort will be placed into confident ability to model land-use scenarios for small catchments such as Ōkaro and extend these to all the lakes believed to flow into Lake Tarawera through surface and groundwater.

Given the size and importance of the $219M per annum MBIE Endeavour Fund, recently won and future Endeavour proposals will play a major role in leveraging BOPRC's funding of the Chair's team into a significant research of national scope.

Major Endeavour Research Programme

The current MBIE Lakes Resilience Programme ($5.1M over 4 years) ends in September 2019. A proposal for a new programme of similar scope will need to be submitted by 6 March 2019. The effort will be the major priority for the Chair until submission. The focus of the programme is expected to extend much of the best work in the Lakes Resilience programme in logical directions with a greater level of integrated, whole-catchment management of nutrients. We also expect to extend ecological science related to managing native species in food webs by taking better account of aquatic corridors. For example, in the case of native fish this includes lake habitat and spawning streams, as well as riparian vegetation that serves as habitat for fish larvae. Engagement with Councils and stakeholders on ideas proposed by the research team will begin from October.

Recent Endeavour Funding including the Chair's Research Team

The Chair took the step of being included as a link for engagement and advice, without research time in two proposals that have been funded by MBIE Endeavour in September 2018. This is intended to provide a more consistent point of engagement with detail-oriented science programmes for regional stakeholders, with a particular focus on simplifying consultation efforts for Te Arawa Lakes Trust. These projects are:

- Funding of $1M over 2 years for *An isotopic toolkit for cadmium management: from agrisystems to ecosystems*, led by Dr Adam Hartland at the UoW. The project uses new instrumentation at the University of Otago to define sources of cadmium reaching freshwater and sediments from historic superphosphate application. The project intends to include two of the Rotorua Te Arawa Lakes.
- Funding of $11.5M over 5 years for *Advancing New Zealand's carbon inventory: forest, grassland, and urban environments* led by Sara Mikaloff-Fletcher at NIWA. This programme also includes a substantial UoW science component focused on measurement of pastoral carbon dioxide exchange in the Waikato. The overall project aims to use top-down flux measurements to better understand land-based carbon dioxide emissions and sinks with a major site at Maunga Kakararamea (Rainbow Mountain). There is a major opportunity to understand carbon dioxide sinks on the basis of land productivity and emerging capability to differentiate forests or pastures of differing productivity using remote sensing of nitrogen status. Because this is likely to correlate with management of nitrate leaching, there is a strong opportunity for synergies with catchment management for freshwater outcomes.

A member of the Chair's team, Dr Mat Allan, has also been funded in two projects will bring benefits to lakes research and that take advantage of his lake modelling and remote sensing expertise, respectively.

- Funding of $1M over 3 years for *Freshwater bioremediation using native mussels (kāeo) - focussed on 3 shallow eutrophic lakes*, led by Dr Sue Clearwater at NIWA.
- Funding of $1M over 3 years for *Eye on lakes: national monitoring of cyanobacterial blooms* led by Prof Ian Hawes at the University of Waikato.

These commitments emphasise the ongoing potential of $1 to $15M proposals typically funded by the Endeavour Fund to contribute to large scale applied research of significant value to the Bay of Plenty Region.

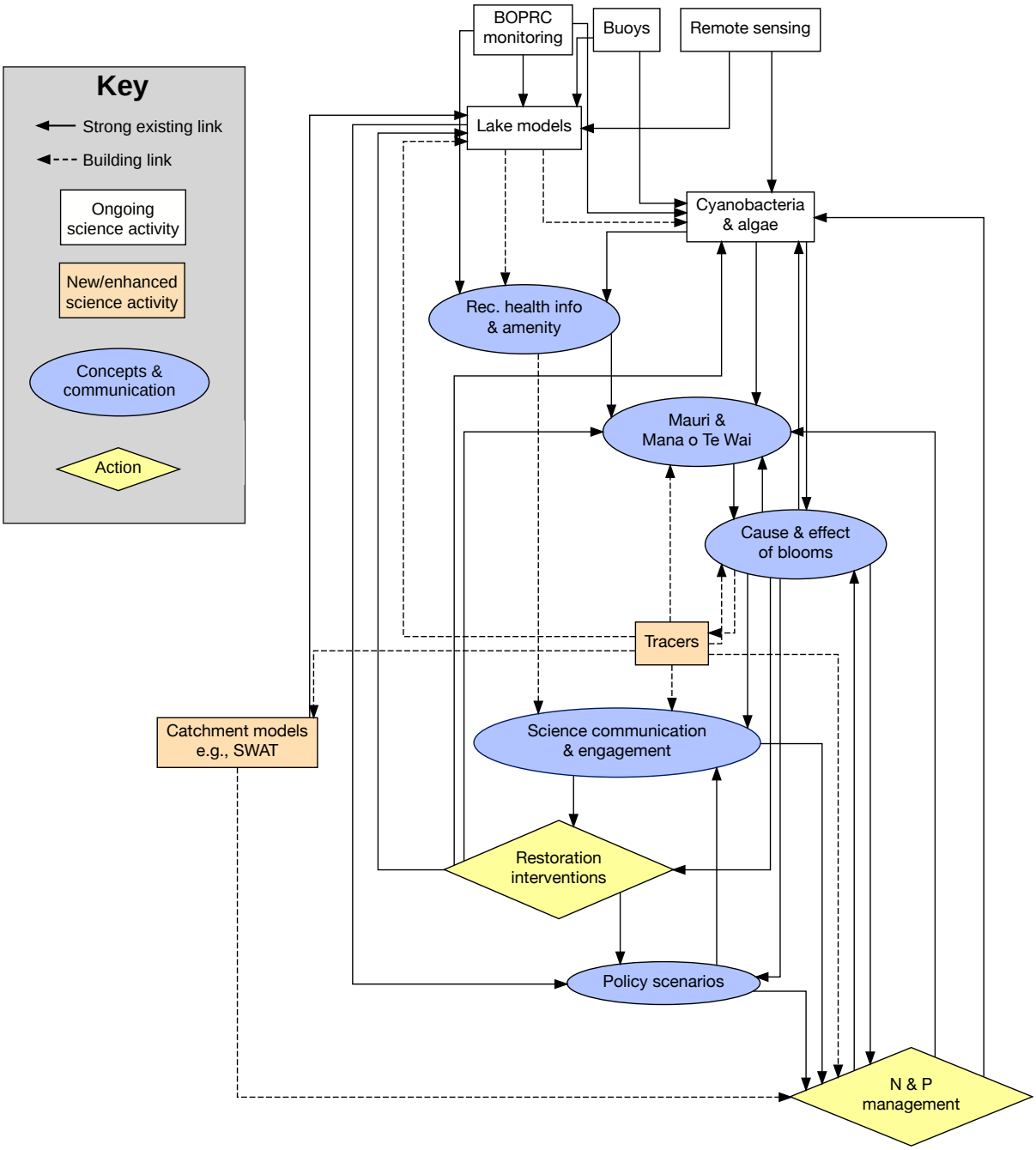


Diagram showing the evolution of linkages involving the Chair's programme.

Overall, the Chair's programme will focus developing a new proposal for a national research programme on lakes and their catchments, as described above. At the same time, work will be

underway to develop new capability in tracer science, extending capability in catchment modelling, while maintaining capacity in remote sensing, buoy-based monitoring and lake modelling. It should be emphasised that new and extended capabilities will take several years to develop, partly because the Chair's team is also maintaining existing capabilities and has spent much of the last year delivering modules for the PC10 Science Review.

As new and extended capabilities are being developed, communication and engagement with the community is an ideal way to ensure pieces of work remain connected. The network diagram (above) shows interconnections between elements of work for the Chair's programme. The analysis in the diagram demonstrates that communication about algal and cyanobacterial blooms, including recreational health, appears likely to serve as a nexus for immediate communication that emphasises the need to manage nitrogen (N) and phosphorous (P) in all lakes, and also points to the value of restoration interventions already in place.

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Ling, N. 2017. Utuhina Stream monitoring 2016: In-stream alum dosing effects on fish and aquatic invertebrates. **ERI Report No. 101**. Client Report prepared for Environment Bay of Plenty. Environmental Research Institute, Faculty of Science and Engineering, The University of Waikato, Hamilton, New Zealand.17 pp.

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Breakdown of Bay of Plenty funding allocation over the 12-month period 1st July 2017 to 30th June 2018

Summary of Contract - Bay of Plenty Regional Council Funding

1st July 2017 to the 30th June 2018

(All figures exclude GST)

	Budget	Actual	Difference	Notes
Income from Environment Bay of Plenty	214,925	214,925	-	**1**
Prof Salary 80%	90,000	90,000	-	**2**
Senior Research Fellow 50%	39,425	39,425	-	**3**
Post-Doctoral Support	55,500	55,500	-	**4**
Dr Jonathan Abell (Ecofish Subcontract)	30,000	25,429	4,571	**5**
Student Study Awards				**6**
Total Costs	214,925	210,354		
Balance	-	4,571		

Notes:

1. During the period July 2017- June 2018 Financial Year invoicing has been based on actual costs to account for several changes of staff within the University of Waikato.
2. Professor David Hamilton left the University in March 2017 and the position was filled by Professor Troy Baisden in November 2018.
3. Chris McBride has continued to fill the position of Senior Research Fellow
4. Post-doctoral Support has been undertaken by Dr Mat Allan from October 2017 – his commitment during this period has been at 85% FTE not the fully 100%
5. Dr Jonathan Abell was subcontracted by the University of Waikato to undertake a project on 1-D Make Modelling for the Bay of Plenty.
6. No direct funding for students linked to the Chair Position have been made during this reporting period.

Breakdown of University of Waikato funding allocation over the 12-month period 1st July 2017 to 30th June 2018

Summary of Contract - University of Waikato Funding

1st July 2017 to the 30th June 2018

(All figures exclude GST)

		Actual Costs	Notes
Full overheads costs on the 80% Prof Salary BoPRC Contribution		99,000	
Technician 50% Salary Costs Full overhead costs on 100% of the Technician Role UoW and 50% Technician BoPRC		-	1
Full overhead cost for the Senior Research Fellow		43,368	
Full overhead cost on the Post Doctoral Modelling position		60,500	
	Total Costs	202,868	

Notes:

1. The UoW-funded Technician Role has recently been advertised and interviews have taken place. We hope to fill the position shortly.

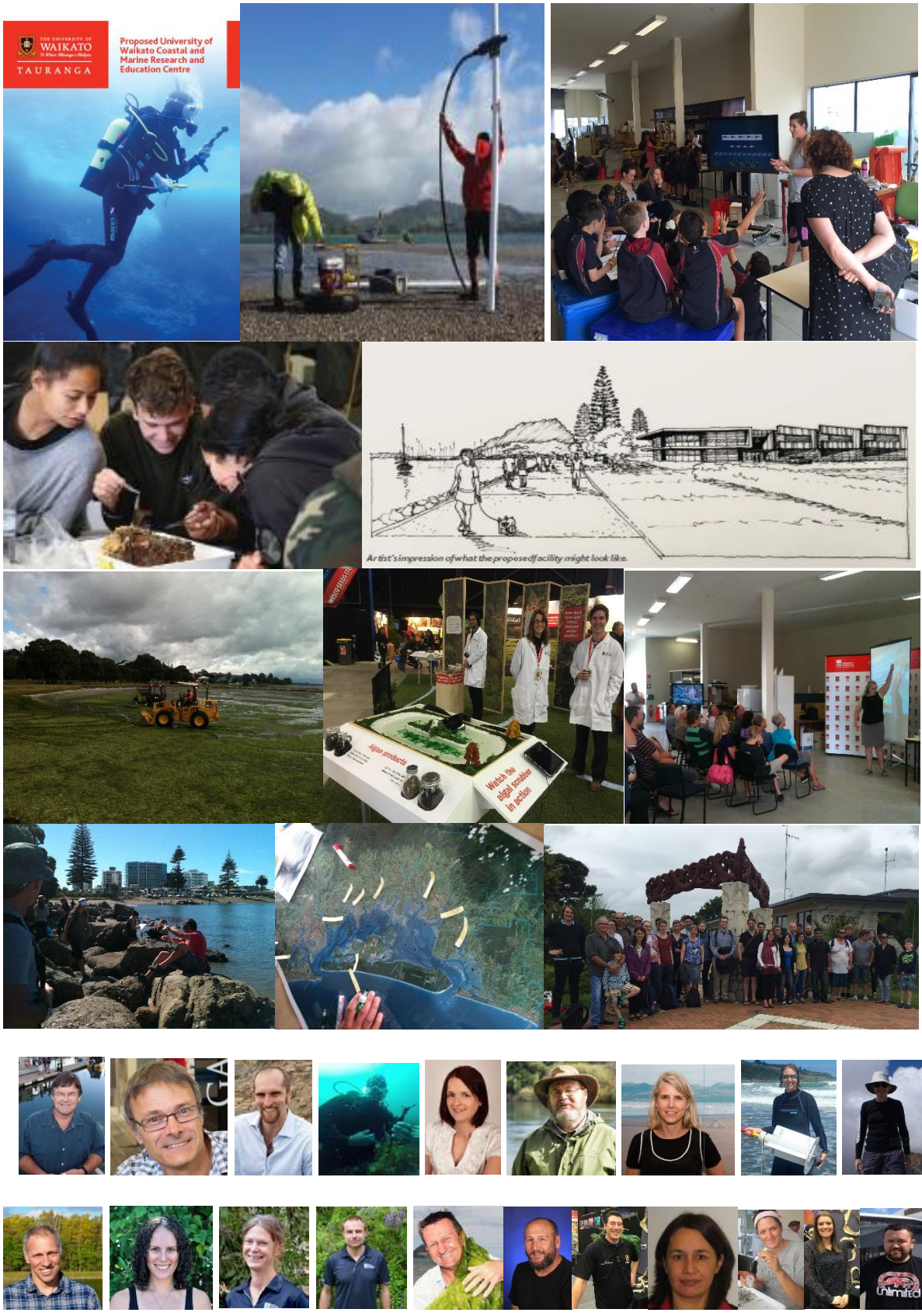
APPENDIX 2

Coastal Chair Report 2017 to 2018

Bay of Plenty Regional Council Chair in Coastal Science

Annual Report for the period 1st June 2017 to the 30th June 2018

TOITU TE MOANA, TOITU TE TANGATA
Sustainability of the Sea, Sustainability of the People


THE UNIVERSITY OF WAIKATO
TAURANGA
Proposed University of Waikato Coastal and Marine Research and Education Centre
Artist's impression of what the proposed facility might look like.
Algae products
Watch the algal scrubber in action

Coastal Science Chair Research Summary 2017-2018

The following report summarises the activities of the Bay of Plenty Regional Council Chair in Coastal Science at the University of Waikato (UoW).

Executive Summary

My role as inaugural Bay of Plenty Regional Council Chair of Coastal Science, is to lead research of regional New Zealand relevance in fields of ecosystem sustainability in the face of burgeoning urban influence with a focus on the Moana a Toi (Bay of Plenty). The role is designed to have tangible scientific, cultural and socio-economic outcomes. I combine multi-disciplinary coastal marine research with innovation. Research fields are broad: biochemistry, coastal geomorphology to macro ecology. A unifying theme is a solutions oriented focus on human interaction with the coast, integrating Mātauranga Māori.

During this cycle I have led four major research initiatives:

1. the 'wrap-up' year for the German/New Zealand Research and Training program INTERCPOAST of 55 PhD's (DFG, €7.5m; NZ stakeholders $2m+, 2011-2018), including a 'flagship' celebration listing in the 40 year Anniversary event of NZ/German Science attended by the German President, Frank-Walter Steinmeier and the German Ambassador to NZ Gerhard Thiedemann;
2. the launch of a circular economy research platform based on seaweed biotechnologies that remediate water quality while leading to commercialisable environmental ventures;
3. the successful proposal of a new national BSc degree with marine sustainability majors to be run fully in Tauranga;
4. Championing the University commitment to a new fit-for purpose marine research facility in Tauranga.

These initiatives have resulted in successful acquisition of funding for a further 11 research staff to be based in Tauranga dedicated to marine research and training. This brings the Tauranga based University of Waikato coastal science staff numbers to 20 (with a further 7 coastal staff from Hamilton visiting regularly. In addition, I had 20 postgraduate research students in 2017 (Chief for 12), and have 13 currently (Chief for 8).

Over the last year we have grown the coastal marine facility in Tauranga (now doubling in size by 2019 with over $750k in new research equipment investment); as well as initiating a research platform in the former Raukokere School. External research funding has grown from approximately $1m per year to now over $4m. Environmentally oriented marine biotechnology has been championed within New Zealand bringing a focus on environmental remediation/agricultural innovation with New Zealands' first international marine biotechnology convention held in Tauranga (sponsored by BoPRC) 'Blue2Green'. The lead theme 'TOITU TE MOANA, TOITU TE TANGATA: Sustainability of the Sea, Sustainability of the People', epitomises the mission of this element of endeavour. The convention and associated research in this cycle were instrumental in the successful capture of Entrepreneurial University (TEC) funding for algal biosciences ($13m).

Highlights

Knowledge transfer activities including hui and workshops

- Workshops have been initiated invoking discussion of the effects of mangrove management (removal) as it is clear that the remnant mangrove habitat is of poor quality and significantly compromises trophic cascades as evidenced by changes in infaunal composition and stingray feeding activity.
- Combined research initiatives emanating from Manaaki Taha Moana and Oranga Taio Oranga Tangata (two major MBIE funded programs involving the Manaaki te Awanui and the University of Waikato) have highlighted issues with nutrient enrichment in Tauranga Harbour and adjacent catchments. Combined with a solutions-oriented approach invoking marine biotechnology and algal biosciences (culminating in the 'Blue2Green' Marine Biotechnology Convention 2017), a concept for remediation of water quality utilising sea lettuce and other macro algae was submitted to Tertiary Education Commissions' Entrepreneurial University scheme. As a consequence, a $13m program has been awarded with co-investment from the University of Waikato. This has permitted recruitment of 5 new staff to be based at the Coastal Field Station in Tauranga and investment in over $1m of new research equipment. Research will build on and enhance restoration programs initiated through BoPRC, OTOT (and MTM).
- The INTERCOAST program is in its final year. It will leave a legacy of over 55 PhD students and over 60 projects focused on Tauranga Moana and other estuarine systems in New Zealand. The results of 9 years of research are being written up in two dedicated Journal volumes (in addition to other contributed papers already in process): Geo-Marine Letters and Estuarine and Coastal Shelf Science.
- We have been successful in CUAP accreditation of a new BSc degree with majors in Sustainability and Environmental science both underpinned by Mātauranga. The new degree will be launched in 2019 with teaching based at the new city campus and undergraduate labs held around Tauranga Harbour/Bay of Plenty region and at the marine facility, in addition to new teaching labs to be built adjacent to the new campus.
- As a consequence of the success of the initiatives listed above and the sustained acquisition of external funding together with growth in research capacity and post graduate training, a fit-for-purpose coastal marine facility dedicated to urbanised coasts as a national facility has been secured. The new facility will be built within the next 5 years in Tauranga to facilitate further coastal research. It will incorporate a cultural and outreach centre with a public aquarium complex designed for education.
- Extended education and research initiatives are now being consolidated in regional New Zealand based on the success of the Bay of Plenty Coastal Science model (East Cape, East Coast North Island, Taranaki).

Key Research Science and Technology Advancements

- Heightened understanding of the role of subtidal estuarine habitats as nursery grounds for taonga species and a more complete awareness of the full trophic cascade dynamic in Bay of Plenty estuaries from microbial dynamics through to apex predators.
- Launch of a national significant restoration and water quality remediation program
- New insight into land sea connectivity and the dynamics of estuary productivity that now incorporates meso and apex predators.
- Review of marine spatial planning (Seachange) outcomes (Tai Timu Tai Pari Hauraki Gulf Marine Spatial Planning for Sustainable Seas National Science Challenge)

Training/Teaching/Mentoring/Workshops/Conferences/Symposia

- In addition to the new BSc degree being approved in Tauranga with majors in marine

sustainability and aquaculture and the 'Blue2Green' Convention (150 registrants, 9 countries), a wide variety of other dissemination activities have been carried out: a new course with marine elements in evolutionary biology taught in Hamilton A semester; presentations given at least once a month to groups such as Rotary, University of the Third Age, Probis etc. In addition lectures and conference presentations are provided at all the major New Zealand meetings and internationally (see below). Press articles are frequent (see media dissemination).

- Engagement with regional and national stakeholders (environmental management /stewardship) is frequent through reports to councils, boards and researchers within these agencies. In addition regular dissemination occurs to relevant iwi collectives through Manaaki te Awanui, FoMA, Te Whanau Apanui.
- Evidence of impact and uptake is from: 4 new PhD scholarships funded by TEC, 4 new PhD scholarships and 1 new MSc scholarship funded by BoPRC, 4 new Technical positions, 3 new research positions funded by TEC and 4 new academic positions funded by the University for roll out of the new BSc degree in Tauranga.

Research Platform Contributions

MBIE Estuarine Program Oranga Taio Oranga Tangata Tauranga Moana

We have repeated sampling of key MTM/OTOT intertidal stations for infaunal species abundance has now concluded a further full seasonal cycle to provide extended continuity for examining intertidal ecology in areas of significant urban influence. This data is now to be combined with a subtidal survey of biogenic reef stability and abundance of fish populations. These parameters have been measured by multi-beam mapping of channel floors and a campaign using Baited Underwater Remote Video Systems (BRUVS). In addition the importance of sting ray behaviours in bioturbating sedimentary systems has become obvious to an extent that the impact of this activity on estuarine productivity can be recalculated. Allied with this is the clear negative influence of mangrove removal on limiting useable habitat for this species.
In this cycle, *Atrina* beds have been a specific target as they are important Taonga species and the habitat they characterise is an important nursery environment for a range of fish species. The latter is now a focus of a bioremediation program with Caine Taiapa as the PhD researcher.

Coastal Marine Field Station

The Coastal Marine Field Station was founded in late 2011 and I have been responsible for its continued funding and expansion since, with growth from 1.5 FTE staff and three students at the beginning of 2012, to 6 staff 2 Post Doc's and 10 post graduate students domiciled at the facility, together with 4 staff from Manaaki te Awanui as full time resident collaborators and supporting over 30 other students throughout the year as at end 2017. The facility is now expanding again to accommodate the Entrepreneurial University program of an additional 3 Academic and 2 Technical staff (see EU RC), together with 2 academic and technical staff to support growth in new undergraduate and postgraduate courses as at mid 2018. A major new fit-for-purpose facility is in planning phases with public consultation for a new site facilitated through the Tauranga City Council and Regional Councils in 2017/18. The field station, soon to be a major marine facility, has supported over 60 research projects in this cycle, been host to at least 6 international scientists/yr (research stays/sabbaticals), and supports research teams from other universities and CRI's (at least one group per month). We founded/hosted the House of Science (see HoS RC) until it grew too large and we support numerous wananga/workshops and public events (eg

MBIE launch of NZ's regional economic plan). The facility is the NZ base for INTERCOAST and regional iwi projects (see IC/iwi RC).

Research Funding Generation

I have led the acquisition and delivery of over $3,700,000 in research funding within this cycle for which I was the lead author/scientist. In addition I have championed acquisition of a further €7m DFG funding for INTERCOAST with my German counterpart Prof K Huhn (see IC RC) and @$NZ1m in PhD cohort funding for marine science with colleagues since 2012. (Note: the DFG normally fund only one cycle of an IRTG, but on successful review in 2013 by an international panel, we succeeded in gaining a further cycle of support). Funding has come from a wide variety of sources including MBIE (Manaaki taha Moana and Oranga Taio Oranga Tangata estuarine programs with colleagues Manaaki te Awanui; also an MBIE funded Kaikoura earthquate marine environmental recovery program); numerous Regional Council awards (Bay of Plenty, Taranaki, Auckland); Ministries (MfE, MNZ, MPI) and a range of companies - particularly Port of Tauranga and Zespri. In all, over 25 significant funding awards have been made over this cycle and all have involved student research funding. The Entrepreneurial University program was submitted in 2017 and is successful. This will generate over $9m in research funding from Tertiary Education Commission with contribution from the University of Waikato and additional industry leverage expected in 2018 (total $13m). In addition, the University of Waikato has funded projects initiated and led by me for strategic development every year, accounting for an additional @$500+ over the cycle.

INTERCOAST

I lead the NZ team for INTERCOAST (IC) an International Research and Training Group (IRTG) funded through two cycles by the Deutsche Forschungsgemeinschaft (DFG), MBIE, NZ Royal Society, and regional stakeholders (@€7m + @$NZ3m since 2012). IC is identified as MBIE's 'flagship international program' (40 Year Science Anniversary NZ Germany, 2017). I am responsible for all NZ activities, student wellbeing (55), direct supervision of 10 PhD's, and funding acquisition including DFG reviews/renewal and NZ student German research stays. I finance and host every second annual workshop. To date the program has delivered 55 PhDs 2011-2018, 4 PD's and 6 MSc's working on over 60 projects, all with both New Zealand and German content. The program has been introduced to Angela Merkel and the German President, with regular workshop attendance by the German Ambassadors. For each project within IC, physical and biological science is spliced with social science and environmental law, in a marine context, with a northern/southern hemisphere comparative approach. Research is embedded in human interactions with our coasts, hence highly relevant to NZ and international science. Additionally, for NZ, we harness state-of-the-art high tech submarine surveillance gear (Marum) eg electromagnetic profilers and seabed deployed geotechnical landers. The importance of Mātauranga as NZ's unique contribution to the program is paramount. NZ workshop extensions are held on regional marae.

TEDx Invitation 2017

Invitation and recognition of international perspective in marine biotechnology and conservation. Invited to present TEDx talk on sponges and their chemistry (drug leads from the sea, ancient chemistry, coastal sedimentation/pollution and conservation). The presentation was in a new trial format (first) over a fast moving interview style. This is an example of demand for public speaking, and an ability to communicate complex science in a way that is enjoyable and understandable. The subject material highlights a research sector that I have become associated with internationally, and in this PBRF cycle, have increasingly championed. The aim of my approach is to enhance the publics' appreciation of all elements of the value of biodiversity and its conservation. I exemplify the importance of innovation (marine) to our countries sustainable marine bioindustries' future by bringing focus to the need to conserve remaining diversity.

https://www.youtube.com/watch?v=MPR-FoIns-U&feature=youtu.be
Also relevant to this research contribution category, is invitation to two of the 'Coast New Zealand' TV documentaries (Series 2 and 3) where I was asked to comment on the biodiversity of the Bay of Plenty and North Taranaki Coast and the rich sponge communities present, and in the latest series, to comment on coastal recovery post Rena. The range of expertise spans ecology, ecotoxicology and marine biotechnology, but central to all facets of my research is the biochemical capacity for survival. This is the message I deliver.

Blue2Green Convention Convenor

Leading New Zealand's realisation of the potential of Marine Biotechnology. I led New Zealands first dedicated marine biotechnology conference which exemplifies continued international facilitation and networking to enhance realisation and uptake in fields of marine biotechnology. Genetic resources, Wai262 and Treaty/Biodiversity Convention were key themes.
I am on the board of the International Marine Biotechnology Association and am Vice President of the Australia New Zealand Marine Biotechnology Society, an organization we created in 2016. The B2G convention was the NZ first and an international event with delegates from 9 countries attending. The aim of the organization is to link previously unconnected scientists in fields spanning molecular and microbial science, materials science with marine biologists and aquaculture scientists. From experience, this creates novel science and opens up opportunity. Our focus is on research that provides sustainable agricultural outcomes from novel bioactives research founded on marine chemical ecology (see Zespri RC). An example of a networking outcome is the successful acquisition of Entrepreneurial University funding for marine macro-algal biotechnologies and industry development where we have attracted some of the world's best scientists to New Zealand to be based at the marine facility in Tauranga. The project develops a circular economic model based on bioremediation of water quality by algae leading to new bioproducts that in turn benefit the environment (agrifeeds and soil amenities). Nine nations attended the meeting and two Memoranda of Intent have been signed for bilateral collaboration (China and Korea).

Macro Algal Biosciences and the Entrepreneurial Program

I am lead scientist in the inception and development of a successful application to Tertiary Education Commission under the new Entrepreneurial University scheme. The proposal of 'Macroalgal Biotechnology Enterprises' has been awarded just over $4m with a contribution from the University of Waikato of over $9m and leverage funding from a venture capital company (Quayside Holdings Ltd) currently in further development. The program is designed to create a niche marine biotechnology platform for New Zealand and brings three high profile academics to Tauranga and the new marine facility in development. Creation of the program demonstrates successful activity emanating from strategic development of marine biotechnology themes within New Zealand and collaborative outreach to Australia, Korea and China in particular (MOU's in place). The program was strengthened during the Blue2Green convention (see B2G RC), that was designed to promote the opportunity for New Zealand in translational science harnessing marine biotechnologies for agricultural sector outcomes (eg PSa-V/ Zespri research utilising novel seaweed metabolites). The program is expected to produce a number of spinoff companies and create a critical mass of marine biotechnologists for the region and New Zealand based on remediating water quality while providing new bioproducts such as agrifeeds that reduce methane production in cattle and soil amenities that bind nitrogen and phosphorus. The program has very strong resonance with regional iwi as it provides an educational and research platform based around bioremediation leading to new venture. It is designed with Moana a Toi iwi.

Zespri PSa-V Research

Contracts have been awarded by Zespri for research into new remedies for resolving issues with the pathogen PSa that is threatening the kiwifruit industry of New Zealand. I am the leader of this

work which is an example of translational science drawing on my experience in biomedicinal discovery from marine sources (National Cancer Institute US, AMRAD, Pharmasea) and applying the bioinformatics to other sectors; in this case the agricultural sector. The innovative step is combining knowledge of mode of action of bioactive marine metabolites with knowledge of the species' source of 'hit' compounds. This has been successful with two pilot phases funded ($154k) and a new staged program awarded in 2017/2018 for over $900k that includes proof of concept and commercial scale up of the generation of PSa bioactives from seaweeds. Again the seaweeds of interest provide a dual function of enhancing water quality and can be grown in land based culture systems. This program provides synergy with the Entrepreneurial University venture (see EU). This program resonates strongly with iwi, many of who have invested in kiwifruit farms especially in the eastern Bay of Plenty, and for who organic/natural remedies that dont pollute the soil are essential. Bioproduction of seaweeds that elicit the target metabolites for use against PSa are also likely to be grown on long lines associated with the expansion of Bay of Plenty Aquaculture (Whakatoea and Te Whanau Apanui sea farms). Collaborations expand with the founder iwi for these aquaculture ventures.

National Science Challenge Innovation Theme Leadership

During this cycle, I have been a part of the establishment group for the Sustainable Seas National Science Challenge since its inception, with particular effort directed to the Valuable Seas Theme. I led the Innovation portfolio within that theme across the first two rounds of contestable funding offered by the Challenge (specifically Project 2.2.2 within the Challenge - two rounds of $1.5m each in contestable funding). I convened and led an independent peer review panel to examine submitted proposals for both RfP rounds. The panel included internationally recognized experts with marine biotechnology, marine industry and aquaculture experience (NZ Pharmaceuticals, Ferrier Institute, NZ Bioprocessors Ltd, PEPANZ, Marine Mining), together with leaders in marine related contestable funding agencies such as SeaFood Innovation Limited, Aquaculture Direct, Thought Strategy and Creative HQ. The request for proposals that we created aimed at attracting cutting edge innovative projects that had a strong likelihood to advance both science and economic opportunity for New Zealand. The Valuable Seas contestable program embraced the MBIE call for mechanisms that would enhance sustainable wealth creation from our seas. Projects led by Maori consortia were of strong interest. Within the PBRF cycle, a number of projects awarded are creating strong regional and iwi opportunity (eg. developing anti-diabetic products from Kina - Huataukina to Iwi).

National Research Activities

I have been invited to the College of Assessors for MBIE Smart Ideas and Endeavour Program reviews throughout this PBRF cycle. I review publication submissions for a variety of journals (primarily PlosOne, Marine Biotechnology, PeerJ, Marine Biology, Marine Ecology Progress Series, Journal of the Marine Biology Association UK) and have been on the Editorial Board of Marine Biology for most of the review period. I review a paper a month on average throughout the PBRF cycle. I have examined over 20 MSc and PhD theses within the review period for all Universities in New Zealand, University of Western Australia, James Cook University, Southern Cross University and Flinders University. I have reviewed two major MBIE funded programs for MBIE: Wild Fish 2030 Plant and Food Nelson; Scampi Aquaculture Cawthron Institute - the latter I was review chair. I have been invited as an independent review panel member for the University of Otago's Marine Science program. I have been invited to review five Professorial appointments for University's of Auckland, Otago, Victoria and Curtin. I have been appointed to the review panel of Sea Food Innovations Ltd in the last year of this PBRF cycle in recognition of growing impact in the field of marine biotechnology.

Specific Research Projects of Relevance

1. INTERCOAST and Estuarine Research

Chris Battershill NZ INTERCOAST Program Leader and PhD supervisor

During the 2017-2018 period INTERCOAST PhD research has progressed to plan. Subtidal channel substrate and biogenic character has been mapped for the major channel areas in Tauranga Harbour (Biondo and Singer). Work has been extended by Suzanne Coers (co-supervised by Battershill with Alexander Bartholomae) and the project by Merle Bollen has been completed on Undaria invasion ecology. In addition modelling work on dispersal plumes of marine invertebrates within the harbour have been completed as has examination of freshwater upwelling inside the estuary and along Matakana Island (Stuart). Ecohydrology research continues with de Ruiter and Bryan. The 2017 workshop was held in Bremen in August. A highlight for this cycle was the celebration of the 40 yr NZ/German research alliance with INTERCOAST listed as the flagship program by the new Minister of MBIE. The German President was in attendance.

2. Oranga Taiao, Oranga Tangāta – Knowledge and Toolsets to Support Co-Management of Estuaries – Subcontract with Massey University – In-Kind Co funding from BoPRC

Chris Battershill, Caine Taiapa, Phil Ross, Dave Culliford

We have contributed to the four-year MBIE programme, Oranga Taiao, Oranga Tangāta which started 1st October 2015. The central objective of the research programme is to empower iwi/hapu to be stronger partners in the co-management of estuaries, by providing improved knowledge/tools/processes. We are have contributed further to Research Aim Three: *Ecological Understanding, Modelling and Analysis* in particular undertaking the following critical steps:

3.1 – Survey the sub-tidal water column in the Tauranga Harbour

3.2 – Survey the sub-tidal benthic zone in the Tauranga Harbour

3.3 – Survey of the sub-tidal water column for fish and other species

3.4 – Survey and map Tauranga Harbour for the distribution of sea lettuce and seagrass.

In this cycle work was carried out using Remote Baited Underwater Video systems to examine fish populations in the harbour in a repeat program to that carried out in 2016/2017. The work includes surveys of stingrays and their feeding dynamics linked to infauna and was extended to examine possible presence of invasive paddle crabs. This work continues and has been highly effective. A separate analysis examining feeding activity adjacent to trimmed mangrove areas suggested that removal of mangroves had an adverse effect on feeding intensity.

3. Rena Scientific Sampling

Phil Ross, Rex Fairweather, Dave Culliford

We have continued to undertake a sampling programme on the Astrolabe Reef (Otaiti). During the 2017-2018 year we have undertaken the collection of samples, processing of samples at sea and bringing the samples to shore for analysis. We have undertaken bi-annual sampling and reporting as well as habitat mapping. The effects of the Rena wreck *in situ* are mostly limited to

the region of the debris field apart from TBT legacies which appear to be more widely distributed. Investigations of possible imposex abnormalities in gastropods are underway.

4. ***Marine Biosecurity Maintenance*** **- Bay of Plenty Regional Council**
   Kaeden Leonard, Rex Fairweather, Dave Culliford, Chris Battershill, Marnie Campbell, Chad Hewitt with the BoPRC team.

An extension was made to continue the Marine Pest Surveillance in the Tauranga Harbour: Monitoring and Assistance. Funding was provided to continue surveying and monitoring for the presence, absence and spread of *Sabella spallanzanii* (Mediterranean Fanworm), *Styela cava* (the Clubbed Tunicate), *Musculista senhousia* (Asian Date Mussel) and *Eudistoma elongatum* (Australian Tunicate) within the Bay of Plenty Region.

Funding from this project has also been provided to fund a Masters student in the area of Marine Biosecurity (now complete). Incursions of small fan worm are being regularly discovered and removed. A research group has now been assembled to focus on marine invasion science within the Bay of Plenty Region led by Professors Hewitt and Campbell with the appointment of a new PostDoc (Dr Kaeden Leonard) in late 2016. A package of MBIE projects is being prepared for submission in the 2016/17 funding round to examine how marine adventives gain a foothold in new areas, and how their establishment may be mitigated. SIF funding has been successfully acquired to permit chemical ecological investigation of the triggers for settlement of marine invasives and to permit understanding of how they compete for space. The MBIE Smart Idea proposal has been successful and will start late 2018.

5. **Biodiversity in the Bay of Plenty**
   Sam McCormack, Chris Battershill, Ian Hogg, Michelle Kelly-Borges (Rena Legacy PhD Funding)

This research examines the systematics and biogeography of sponges (Demospongiae) within the Bay of Plenty region representing coastal systems that are expected to be influenced by changing current systems and for which there is a current paucity of information on benthic encrusting biodiversity, especially the Porifera. The study addresses several fundamental questions relating to sponge systematics. Research will examine three levels of biodiversity research with increasing steps of focus; (1) a broad taxonomic review of all sponge taxa from the eastern and western seaboards over a 200 km coastal range spanning approximately 2^{o} of latitude, (2) a nested study of adventive species along a transect from near shore to offshore sites, (3) a nested inner harbour study comparing composition of species across habitat types (urban to rural influence), (4) a focused systematic revision of the poorly defined Callyspongiidae family using molecular and morphological techniques. The study draws on findings from recently completed MSc research that identified an extraordinarily high biodiversity of sponges from within Tauranga Harbour, with almost 30% undescribed, signalling a strong influence from cosmopolitan species. Two papers will be submitted by late 2018.

6. **The Ecology of Apex Predators in an Urbanised Estuary: Habitat use, Seasonality and Effects of Pollutant Exposure in Tauranga Harbour.**
   Helen Cadwallader, Chris Battershill, Malcolm Francis, Clinton Duffy Commonwealth PhD funded

Coastal areas worldwide are becoming increasingly impacted by rapid urbanisation and industrialisation, putting increasing pressure on the associated ecosystems. Predators such as the elasmobranchs (sharks and rays) that inhabit these areas may be particularly at risk from anthropogenic stressors such as pollutants, due to their slow growth and long lifespans.

Knowledge of the use of impacted areas by these animals, such as their seasonal movement cycles and site fidelity, is required in order to effectively measure this risk. The study has progressed on track utilising a number of methods including quantification of feeding activity, acoustic telemetry and conventional identification tagging in order to identify: 1) seasonal patterns and 2) site fidelity of the coastal stingray *Dasyatis brevicaudata* in the Tauranga Harbour. In addition, toxicological measurements will be taken from *D. brevicaudata* individuals within the heavily urbanised southern Tauranga Harbour and compared with those from the less impacted northern Tauranga Harbour and Ohiwa estuary in order to identify any impacts. Movement behaviour and toxicological contamination information will be combined in order to provide a framework for risk assessment of the potential impact of human pressures on elasmobranch species in urban estuarine environments in New Zealand and internationally. The project comes to completion in mid-2019.

This research project has already had a significant outcome in conservation of stingrays with the species' now banned from recreational cross bow and other competitive fishing target lists throughout New Zealand.

7. **The marine demosponge *Tethya burtoni* in a changing ocean; the effects of sedimentation and sea surface temperature increase**
Fenna Beets, Chris Battershill, MSc

This project has been completed in the cycle with Fenna gaining a First Class Honours. Using this common sponge as a proxy for biogenic reef forming benthic invertebrates, it was possible to examine how respiration was affected by temperature changes and varying degrees/types of sedimentation (examining both changes likely in response to climate shifts as well as understanding effects of increasing sedimentation be it from terrestrial runoff or dredging). Aquaria based experiments were conducted while ancillary *in situ* data investigated current day temperature and sedimentation in various *T. burtoni* habitats. Experiments addressed the immediate respiration response of *T. burtoni* under four sediment concentration treatments (ambient loads; 20 and 100 mg l-1, storm proxy loads; 500 and 1000 mg l-1) and four sediment grain size classes (<500-250 µm, <250-125 µm, <125-63 µm, <63 µm) at 500 mg l-1 respectively. A third experiment investigated the effects on respiration of long-term exposure (20-days) to fine sediments (<63 µm) at a storm proxy load (500 mg l-1). The fourth experiment investigated the effects of IPCC projected sea surface temperature increases of low change; 2°C and high change; 4°C. Temperature treatments were based on the Bay of Plenty mean annual sea surface temperature; 18°C and summer maxima; 23° while IPCC projections were added to the summer maxima giving treatments of 25°C and 27°C.

High sediment loads at storm proxy concentrations significantly reduced the respiration rate of *T. burtoni* while ambient concentrations had no significant effect. The two finest sediment grain size classes also reduced respiration rates while the two coarser grain sizes did not. These results suggest a protective response to reduce further clogging of the aquiferous system. Sedimentation results in situ found that *T. burtoni* habitats experience varying amounts of sedimentation, though grain size compositions show similarity across sites. The temperature experiment indicated that 25°C and 27°C both had a significant impact on the survival of *T. burtoni*, with significant disease prevalence and morphological changes while the 18°C and 23°C had no significant effect on survival however some signs of physiological stress were present in the latter. These results suggest that a temperature threshold between 23°C and 25°C may exist and that in the absence of adaptation, *T. burtoni* may be compromised under future increases in sea surface temperature. The relevance of this is that it is likely most biogenic communities characterised by sponges are under stress close to a tipping point. As sponges can process over 4tonnes C km^2day^1, the potential loss of carbon flux from the water column to the benthos is considerable.

8. **Seasonal habitat use and the trophic role of bronze whaler sharks (*Carcharhinus brachyurus*) in the coastal waters of the Bay of Plenty.**

Melissa Kelllett, Chris Battershill, Malcolm Francis, Clinton Duffy, MSc

Research into apex predators as the top end of the trophic cascade in Tauranga Harbour and surrounding coasts is nearing completion for this MSc project in this cycle. The coastal environments of the Bay of Plenty provide a variety of habitats supporting a wide range of marine organisms, including a significant elasmobranch species diversity. Bronze whaler sharks (*Carcharhinus brachyurus*) are known to utilise these habitats during the summer months, but little is known about their ecology during the remainder of the year, in particular their trophic role across a range of marine ecosystems over different seasons. Using stable isotope analysis of blood and tissue samples collected over a six month study period, this research examines temporal habitat use by bronze whaler sharks to investigate putative seasonal movements between pelagic and coastal food webs, along with their role as top level predators within these systems. The research is the first use of stable isotope analysis to investigate habitat use and the ecology of bronze whaler sharks in estuarine and open coast trophic cascades, providing much needed information on the ecology of this regionally important species.

As a result of this study, Tauranga Harbour has been identified as an internationally significant nursery for this species of shark. In two cases the same shark was recaptured at the same location almost exactly a year following the first tagging event. Satellite tags on two sharks showed that their range extended to the 1000m coastal depth contour and the fish ranged as far north as Great Barrier Island to return to Tauranga harbor a year later.

9. **Bay of Plenty Sea Invasives and Grass Research**

<u>Masters students projects (Tauranga based students)</u>

- Student: Staci King. Project title: “Post-harvest treatment methods for an invasive polychaete *Sabella spallanzanii* in marine aquaculture.” Supervisors: Marnie Campbell, Chris Battershill, Phil Ross. Project description: Establishing how *Sabella spallanzanii* reacts to potential treatment options. Behavioural study occurred to note how this species reacts to different stimuli. Funding sources: Waikato Regional Council, Ministry of Primary Industries. Completed August 2017.

<u>Phd Students</u>

- Student: Stine Sorenson. Project title: “Seagrass vulnerability and resilience: The threat of sedimentation.” Supervisors: Marnie Campbell, Merilyn Manley-Harris, Chris Battershill. Project description: Examined the influence of sediment on seagrasses in the Tauranga Harbour. Funding sources: Port of Tauranga, Waikato Regional Council. This project has been upgraded to a PhD study.

- Student: Ross Martin. Project title: “Remote sensing of estuarine seagrass health.” Supervisors: Marnie Campbell, Lars Brabyn, Chris Battershill. Project description: Investigation about the suitability to use drones to monitoring seagrass health. Various locations will be investigated including the Bay of Plenty and Coromandel. Funding sources: Waikato Regional Council, New Zealand Coastal Society.

10. **Estuarine research Projects (Supervised primarily by Conrad Pilditch).**

University of Waikato Student Research (Conrad Pilditch is Chief Supervisor)

Completions this cycle:

1. Rebecca Gladstone-Gallagher (PhD): Detrital subsides and soft sediment ecosystem function.
2. Emily Douglas: Macrofaunal biodiversity and denitrification in estuarine sediments
3. Clarisse Niemand (INTERCOAST PhD): Effects of *Ulva* mats on benthic communities
4. Bradley Monahan (MPhil): Bivalve larval dispersal in Tauranga Harbour
   Bradley has developed a larval tracking model for Tauranga Harbour and has combined predicted dispersal pathways with those measured in a field study.

Continuing PhD's this cycle:

1. Tarn Drylie (PhD): Ecological functioning of estuarine soft sediment: projecting into the future
2. Tarn has been working on emerged intertidal systems examining rates of primary production to determine whether systems under turbidity stress can offset production losses at low tide. Tarn's research is complimenting a new MBIE Endeavour grant to Cary/Pilditch/Battershill/Vopel looking at the effects of ocean acidification on nutrient processing in soft sediments.
3. Steph Mangan (PhD): Multi-stressor impacts on soft sediment ecosystem function
4. Steph has recently joined our group from the UK and is funded by the 'Tipping Points' project in Sustainable Seas. She will be working primarily at the experimental sites in Tauranga Harbour set up as part of the nation-wide experiment investigating how increasing turbidity and nutrient in estuaries impact nutrient processing sediments.
5. Vera Rullens (PhD): Bundles of ecosystem services provided by infaunal shellfish beds
6. Vera has recently joined our group from the Netherlands and is funded by the 'Linking Ecosystem Function to Services' project in Sustainable Seas. Like Steph her work will be based in Tauranga Harbour quantifying the many ecosystems services delivered by shellfish beds (cockles & pipis) beyond food for humans.
7. Dana Clark (PhD): Drivers of change in estuarine microbenthic communities
8. Dana is employed as a scientist at Cawthron but has recently enrolled in a PhD at Waikato. Dana's research is aligned with the 'Tipping Points' project in Sustainable Seas and will focus on analysing national level databases for drivers of change in microbenthic estuary communities, developing national level health indexes and exploring new molecular based tool for monitoring.

Current external funding secured to work in region

1. †National Science Challenge Sustainable Seas (2016-2019)
   Pilditch has secured $650 000 over 3.5 years for projects related to estuarine tipping points and quantifying soft sediment ecosystem services. As part of this funding two PhD students have been appointed and it is anticipated at Tauranga Harbour will be a focal area for research. Bryan is also involved in the tipping points project.
2. †MBIE Endeavour Fund (2016-2019)
   Cary/Pilditch/ Battershill have secured $1 million to examine effects of ocean acidification on nutrient processing in marine sediments. Some of the field component (led by Pilditch) will be conducted in Tauranga Harbour as will outreach to iwi (led by Battershill)

3. †MfE Managing the Upstream – Estuaries State and Values Project (2016-2018) Pilditch is sub-contracted to this NIWA/Cawthron led project and has participated in workshops and expert opinion toward the development of indicator of ecosystem health.

11. **Estuarine research Projects (Supervised primarily by Karin Bryan).**

University of Waikato Student Research (only those for which Bryan is Chief Supervisor)

PhD

Ben Stewart INTERCOAST PhD BoPRC Scholarship

Investigating groundwater – derived nutrient fluxes in Tauranga Harbour, New Zealand.

In this cycle, ben and Karin have developed a domain decomposition model for Tauranga harbour using Delft 3D (Deltares, 2018). The model has been calibrated and validated to survey data collected in 2017 and includes the latest changes in bathymetry around the harbour mouth. Seasonal model scenarios were run using Delft3d-FLOW to assess the changes in salinity and residence times in the harbour. A timeseries of discharge data from all the rivers and creeks into the southern basin as well as rainfall, evaporation and wind have been input into the model. Salinity variations in the model have been compared to spatial and seasonal measurements from CTD data, which was collected by Alex Port between 2012 -2013. This has revealed a good agreement between the model outputs and measured data, however large uncertainties and outlier data are seen during periods of very high discharge, especially close to the Wairoa River. To assess the residence times and circulation of the harbour, the Delft3D-Water quality module (DELWAQ) was used. Conservative tracer simulations were carried out over each season to investigate the residence times of different areas and water masses within the harbour. This revealed a seasonal relationship with shorter residence times in the winter (due to more rainfall and higher freshwater flows from land) compared to the summer (particularly in the upper regions of the harbour). We also conducted experiments on the conditions during climate extremes of El Niño and La Niña. To do this we developed a probability model based on the Southern Oscillation index and associated wind, discharge and rainfall to select years with a strong El Niño and La Niña. Scenarios were run for both summer and winter and revealed shorter residence times in the harbour during La Niña conditions especially in winter. The summer El Niño scenario demonstrated much longer residence times, especially in the upper regions of the harbour. This is a significant finding as longer residence times (particularly in El Niño years with less surface water discharge) combined with high nutrient inputs from a continual source of Submarine groundwater discharge may be an important driver of algal bloom events, even when river inputs cease. This paper is currently being prepared for publication.

Further work is also being conducted with the model to assess Submarine groundwater discharge in the harbour. We have been able to input Radium (^{223}Ra,^{224}Ra,^{226}Ra), a natural radionuclide tracer of groundwater, as a decayable tracer using the DELWAQ module. This is used alongside a conservative tracer. This shows promise as a useful method to further asses the timescales of water movement in the harbour and including potential groundwater sources in the harbour hydrodynamics. While radium is a powerful and integrative tool to measure submarine groundwater discharge, it is active only in salt water (due to ion exchanges). This makes it challenging to separate and quantify the fresh water component of submarine groundwater discharge, as mixing occurs in the subterranean estuary. While estimates were made using a radium mass balance for the first body of work it was unknown how much was derived from fresh groundwater as both saline and fresh groundwater processes were accounted for. A salt water mass balance alongside the

salinity measurements and salinity variations are being used with this numerical model to assess the likely contribution of fresh groundwater. This is currently being investigated.

12. **Estuarine research Projects (Supervised primarily by Julia Mullarney).**
University of Waikato Student Research
Research topic: Sediment connectivity in Tauranga Harbour

PhD student: Peter de Ruiter

In order to investigate hydrodynamics as well as sediment connectivity in Tauranga Harbour, they have developed a hydrodynamic model of both the northern and southern basin in Delft3D. Boundary conditions for the model are based on the NIWA tidal model and Tauranga Airport climate station. Model bathymetry is based on LiDAR data provided by the BoPRC, as well as multibeam data and LINZ navigational charts. The first version of the model has been calibrated and validated based on field data collected during our field campaign in Tauranga Harbour in November 2015. The bathymetry and model grid files for this version of the model have been provided to the Bay of Plenty Regional Council (to Simon Allard and Mark Ivamy in December 2016/January 2017). The results of this work were included in a proceedings paper and presented at the Australasian Coasts & Ports Conference in Cairns (June 2017). In this paper, we use the hydrodynamic model to investigate the influence of entrance constriction on hydrodynamics and intertidal morphology in a number of subestuaries of Tauranga Harbour. We are currently drafting a more extensive scientific paper that will investigate the links between entrance constriction, fetch-alignedness, hydrodynamics, intertidal profile hypsometry and rates of infilling within up to six subestuaries within Tauranga Harbour. The grid of the hydrodynamic model is currently being refined to provide a resolution of 25 m in the key areas of interest, in addition to developing a 3D version of the model. As part of these developments, we will work on setting up the sediment transport module of the model. Further research will stay focused on sediment transport throughout the estuary, in order to better understand sediment exchange between different regions within Tauranga Harbour.

Coastal Chair Publications and Other Outputs

Key Note Presentations:
INTERCOAST 2017 (Bremen) Co-Convener
Qing Dao Ocean University Blue Carbon 2018 20-22 June
Toi Oho Mai Annual Conference 2018 8 June
China Delegation University Overview 2018 8-9 May
Rangatahi Me Taiao
University of Waikato Open Day 16 March 2018
Harbour Forum 3 March 2018
NZ Coastal Conference 16 Nov 2017
NZ German 40yr celebration MBIE 6 Nov 2017
TEDx 7 October 2017
Aquaculture Conf 20 Sept 2017
INTERCOAST 28 August 2017
Blue2 Green Convention 8 August 2017
BBC Coast Documentary Bay of Plenty and Rena Environmental Recovery.

Reports of relevance: Bay of Plenty Regional Council Coastal Chair report; Whakatane District Council Dredging Impact report; Bay of Plenty Regional Council Micro-Plastics Report; Mangroves and Stingrays Report.

Coastal Chair Publications this cycle:

David R. Schiel, Tony Ayling, Michael J. Kingsford, **Christopher N. Battershill**, J. Howard Choat, Neil L. Andrew, Kendall D. Clements, Avril L. Ayling, Linda L. Leum, Mark Poynter and Geoffrey P. Jones. 2018. Change in the rocky reef fish fauna of the iconic Poor Knights Islands Marine Reserve in north-eastern New Zealand over 4 decades. Marine and Freshwater Research https://doi.org/10.1071/MF18037 1-12.

Heyward A, Colquhoun J, Cripps E, McCorry D, Stowar M, Radford B, Miller K, Miller I, **Battershill C.** 2018. No evidence of damage to the soft tissue or skeletal integrity of mesophotic corals exposed to a 3D marine seismic survey. Marine Pollution Bulletin 129:8-13.

Bollen, M., **Battershill, C. N**., Pilditch, C. A., & Bischof, K. (2017). Desiccation tolerance of different life stages of the invasive marine kelp *Undaria pinnatifida*: Potential for overland transport as invasion vector. Journal of Experimental Marine Biology and Ecology, 496, 8 pages. doi:10.1016/j.jembe.2017.07.005

Kulgemeyer, T., Müller, H., Dobeneck, T. V., Bryan, K. R., de Lange, W. P., & **Battershill, C. N**. (2017). Magnetic mineral and sediment porosity distribution on a storm-dominated shelf investigated by benthic electromagnetic profiling (Bay of Plenty, New Zealand). Marine Geology, 383, 78-98. doi:10.1016/j.margeo.2016.11.014

Battershill C N, Stocker L J, Page M J 2018. Ascidiacea. IN New Zealand Coastal Marine Identification Guide. In production.

Battershill, C. N. (2017). Marine biotechnology in Aotearoa: just the beginning. In Blue2Green Marine Biotechnology Convention 2017. Conference held in Tauranga, New Zealand.

Other Publications of relevance supported by the Bay of Plenty Regional Council

Badesab, Firoz ; Von Dobeneck, Tilo ; Briggs, Roger M. ; Bryan, Karin R. ; Just, Janna ; Müller, Hendrik. 2017. Sediment dynamics of an artificially deepened mesotidal coastal lagoon: An environmental magnetic investigation of Tauranga Harbour, New Zealand. Estuarine, Coastal and Shelf Science, 15 July 2017, Vol.194, pp.240-251

de Ruiter, Peter J. Mullarney, Julia C. Bryan, Karin R. Winter, Christian 2018. The influence of entrance constriction on hydrodynamics and intertidal morphology within estuarine basins. Australasian Coasts & Ports 2017 Conference: Working with Nature 2018-05-02T21:37:54Z#2017#2018-05-02T21:37:54Z#2017

Joensuu, M. Pilditch, C. A. Harris, R. Hietanen, S. Pettersson, H. Norkko, A. 2018Sediment properties, biota, and local habitat structure explain variation in the erodibility of coastal sediments. Limnology and Oceanography, January 2018, Vol.63(1), pp.173-186
Kohlmeier, D ; Pilditch, C A ; Bornman, J ; Bischof, K. 2017. Adjustment of photoprotection to tidal conditions in intertidal seagrasses. Marine Biological Association of the United Kingdom. Journal of the Marine Biological Association of the United Kingdom, May 2017, Vol.97(3), pp.571-579.

Jones, Hannah F. E.; Pilditch, Conrad A.; Hamilton, David P.; Bryan, Karin R. 2017. Impacts of a bivalve mass mortality event on an estuarine food web and bivalve grazing pressure. New Zealand Journal of Marine and Freshwater Research, 03 July 2017, Vol.51(3), p.370-392.

Jorat, M ; Moon, Vicki ; Hepp, Daniel ; Kreiter, Stefan ; de Lange, Willem ; Feldmann, Sebastian ; Mörz, Tobias. 2017. Subseafloor Investigation of Sediments at Southern Tauranga Harbour, New Zealand, before Capital Dredging. Journal of Coastal Research, Mar 2017, Vol.33(2), pp.227-24

Macpherson, David ; Fox, Bethany R. S. ; De Lange, Willem P. 2017. Holocene evolution of the southern Tauranga Harbour. New Zealand Journal of Geology and Geophysics, 02 October 2017, Vol.60(4), p.392-409.

Monahan, Bradley John; Pilditch, Conrad A; Bryan, Karin R; Mullarney, Julia C. 2017 Transport and retention of benthic marine invertebrates in the Southern Tauranga Basin. 2018-05-18T02:37:47Z#2018-05-18T02:37:47Z#2018#2018-04-22T04:25:37Z

Mullarney, Julia C.; Pilditch, Conrad A. 2017 The differential response of kelp to swell and infragravity wave motion. Association for the Sciences of Limnology and Oceanography2017-07-23T23:00:32Z#2017#2017-07-23T23:00:32Z#2017

Staudt, Franziska ; Mullarney, Julia C. ; Pilditch, Conrad A. ; Huhn, Katrin. 2017. The role of grain-size ratio in the mobility of mixed granular beds. Geomorphology, 1 February 2017, Vol.278, pp.314-328.

Stewart, B T; Bryan, K R; Pilditch, C A; Santos, I R. 2018 Submarine Groundwater Discharge Estimates Using Radium Isotopes and Related Nutrient Inputs into Tauranga Harbour (New Zealand) Estuaries and Coasts Volume 41, Issue 2, pp 384–403

Funding for the Chair supports a number of people directly and indirectly, including:

- Prof Chris Battershill (Chair)

Others who have undertaken projects related to the Coastal Chair and fully domiciled in the Bay of Plenty at the Field Station (funded externally through contracts include):

- Prof Ian Hawes (Academic)
- Professor Ralf Slothauser
- Dr Kaeden Leonard (Post Doc)
- Dr Phil Ross (Research Fellow)
- Dr Simon Muncaster (Academic/Research Associate)
- Mr David Culliford (Technical Officer, now Facility Manager)
- Mr Rex Fairweather (Technical Officer)
- Ms Soli Weiss (Administrative Officer)
- Ms Alice Morrison (Field technician)
- Ms Deborah Leonard (Laboratory technician EU)

Other Academic staff supported by the enterprise (Field Station and ancillary field support) created around the Coastal Chairs position in Tauranga include:

- Professor Chad Hewitt
- Professor Marnie Campbell
- Mr Shane Stuart
- Professor Conrad Pildich
- Associate Professor Karin Bryan
- Dr Willem de Lange

- Dr Vicky Moon
- Dr Julia Mullarney
- Professor Nick Ling
- Dr Steve Bird
- Associate Professor Michele Prinsep

Regular visitors supported by the Chair's activities include:

- Professor David Schiel
- Professor Alexander Bartholomae (INTERCOAST)
- Professor Rocky de Nys

Also supported at the Coastal Marine Field Station is Manaaki te Awanui and associated collaborative research:

- Mr Caine Taiapa (now a PhD candidate)
- Ms Waiaria Rameka
- Dr Kiamaia Ellis

Entrepreneurial University Staff fulltime Coastal Field Station:

- Dr Marie Magnusson
- Dr Rebecca Lawton
- Dr Chris Glasson
- Ms Deborah Leonard

New Waikato University Staff fulltime Coastal Field Station for the new BSc degree:

- Dr Joanne Ellis Marine ecology/estuarine systems and statistics (starts 2019)
- Dr Shari Gallop Marine biogeochemistry (starts late 2018)
- Dr Simon Muncaster
- Dr Steve Bird
- New Chemistry Lecturer/Senior Lecturer (starts 2019)
- New Lab Tech (starts 2019)
- New Field Tech (starts 2019)

Post Graduate Students Full Time Tauranga

MSc

- Mellissa Kellett (Bronze Whaler Sharks)
- Carlos Moraes (fish reproduction)
- Ryan Koverman (flounder ecology)
- Nikki Fothergill (sealion ecology)
- Reagan Fairly (restoration ecology)
- Jane Cope (Toheroa ecology)
- Fenna Beats (benthic carbon flux)
- Staci King (morphometrics)

PhD

- Helen Cadwallader (stingray ecology)
- Sam McCormack (benthic ecology)
- Caine Taiapa (Horsemussel ecology)
- Vanessa Taikato (Toheroa ecology)
- Sarah Lockwood (volunteering in catastrophies Rena and Christchurch)
- Matt Benion (Toheroa disease)
- Stine Sorenson (Seagrass)

PhD INTERCOAST

- Merle Bollen IC (PhD in progress, INTERCOAST)

- Manuela Biondo IC (PhD in progress, INTERCOAST)
- Anja Singer IC (PhD in progress, INTERCOAST)
- Susanne Coers (PhD in progress, INTERCOAST)
- Tobias Kulgemeyer (PhD in progress, INTERCOAST)
- Ben Stuart (PhD ongoing)
- Bradley Monahan (PhD ongoing)
- Mariana Cussioli (PhD ongoing)
- Peter de Ruiter (PhD ongoing)
- Pham Thi Lien (PhD ongoing)

Financial Report

Summary of Contract - Bay of Plenty Regional Council Funding

1st July 2017 to the 30th June 2018

(All figures exclude GST)

	Budget	Actual	Difference	Notes
Income from Environment Bay of Plenty	171,045	171,045	-	
Prof Salary 100%	171,045	172,215	- 1,170	1
Total Costs	171,045	172,215		
Balance	-	(1,170)		

Notes:

1. Funding for Professor Chris Battershill is not fully covered by the Chair agreement

Summary of Contract - University of Waikato Funding

1st July 2016 to the 30th June 2017

(All figures exclude GST)

	Actual Costs	Notes
Full overheads costs on the 100% Prof Salary BoPRC Contribution	189,437	
Total Costs	189,437	

APPENDIX 3

Lake and Freshwater Chair Achievements 2017-18

Lake and Freshwater Chair achievements

Chair Objectives	Progress and comments
2.1 To foster and develop independent, strategic and applied science within integrated zones, catchment and mountains-to-the-sea approaches to support policy and management in lake, freshwater and coastal ecosystems within the Bay of Plenty region.	The Chair and university scientists have worked across a range of disciplines to improve our understanding of the effects of land use activities on water quality and ecology. An example is the water quality modelling of Lake Rotorua. This integrates climate, catchment land-use, nutrient losses, stream and groundwater flows and in-lake processes to provide predictions of the future state using a range of land-use and intervention scenarios. The modelling work has been used to inform policy development and the interventions framework to support the restoration of Lake Rotorua. The next iteration of this modelling is to more closely identify and support initiatives related to land uses compatible with the identified sustainable state of Lake Rotorua.
2.2 To encourage, support and undertake research that has management and restoration objectives, including the development of nationally or internationally significant collaborations, programmes, and/or centres attracting appropriate levels of external funding focussed on lake, freshwater and coastal science and management.	The research conducted under the Chair is focused on assisting Council with its management and restoration objectives. The University of Waikato operates the Environmental Research Institute (ERI), which is a multi-disciplinary centre of excellence. The ERI takes a collaborative approach to environmental research. Its purpose is to develop insights and expertise related to improving and sustaining the quality of the natural and physical environment. A major area of research being embarked upon is the connection between the eight Tarawera lakes and the effect of land use on water quality in the catchments.
2.3 To encourage co-operation between the University and territorial and regional governments, and engage with community and iwi led initiatives that will benefit from scientific input and support.	Professor Baisden sits on the Technical Advisory Group for the Rotorua lakes. He attends a number of meetings convened by the Regional Council, but also Lakes Water Quality Society, Te Arawa Lakes Trust and many other organisations and community groups, relating to the management of the Rotorua lakes. The Community outreach via the chair has been significant with regular public seminars to present science findings and involvement in a range of community meetings, conferences and events.
2.4 To build knowledge and human capital in areas of environmental science, restoration and management through outreach, engagement,	The Chair funding supports four key researchers, including Professor Baisden. A number of post graduate students are completing studies specifically on environmental projects in the BOP Region.

undergraduate teaching and postgraduate research and training.	
2.5 To appoint and maintain research teams operating as national and international leaders and science communicators in their fields, and to act in an expert capacity as scientific and technical advisors to the Council.	The University of Waikato is recognised nationally and internationally for its research on lake management and restoration. Research tools developed by the university including the lake monitoring buoys and remote sensing of water quality have provided data to support lake management decisions as well as provide data vital to lake model calibration. The lake modelling expertise developed by the university in the BOP region has now been applied to a number of applications in the Rotorua programme to assist council with their water management planning.

Coastal Chair achievements

Chair Objectives	**Progress and comments**
2.1 To foster and develop independent, strategic and applied science within integrated zones, catchment and mountains-to-the-sea approaches to support policy and management in lake, freshwater and coastal ecosystems within the Bay of Plenty region.	The Coastal Chair works with a range of specialists including ecologists, coastal morphologists, modellers, chemists, lawyers and social scientists. This approach can be seen in the range of projects and initiatives that the Chair is involved with, for example; • The INTERCOAST partnership with the University of Bremen - this has left legacy of over 55 PhD students and at least 60 projects focused on Tauranga Moana and other estuarine systems in New Zealand; • The launch of a 'circular economy' research platform based on seaweed biotechnologies that remediate water quality; • The successful proposal of a new national BSc degree with marine sustainability majors to be run fully in Tauranga; • Championing the University commitment to a new fit-for purpose marine research facility in Tauranga. The quality and scope of the science and information produced, together with an extensive international network of expertise, is of significant relevance to the Regional Council.
2.2 To encourage, support and undertake research that has management and restoration objectives, including the development of nationally or internationally significant collaborations, programmes, and/or	Over 25 PhD and MSc students are now domiciled at the Coastal Field Station at Sulphur Point or use it in support of field work. This is in addition to other students from Waikato University and elsewhere (including INTERCOAST) who base their research in the Bay of Plenty. A great deal of this work is supported by the Regional Council, but also from scholarships from the Port company, strategic investment from the University and increasingly MBIE.

centres attracting appropriate levels of external funding focussed on lake, freshwater and coastal science and management.	New work includes studies on; • Apex predators (sharks and rays). • Pollutant uptake in kaimoana. • Estuarine health (mangroves, sea lettuce and seagrass). • The use of marine and freshwater algae such as sea lettuce to scrub pollutants from waste water. The Chairs research group is now well placed to integrate research results into coastal spatial planning models and link with lakes and river research (through the Lakes and Freshwater Chair).
2.3 To encourage co-operation between the University and territorial and regional governments, and engage with community and iwi led initiatives that will benefit from scientific input and support.	Relationships between the Coastal Chair, Tauranga Moana and Moana a Toi iwi, industry, the Regional Council and a number of the District Councils continue to flourish. This is demonstrated by co-investment in facilities and equipment (e.g. Manaaki te Awanui, Ngati Makino, Opotiki District Council, DML Ltd, Port of Tauranga, Priority One and others). Other research organisations that continue to collaborate and invest in the Coastal Chair activity include the University of Bremen (Germany), Bay of Plenty Polytechnic and Te Whare Wananga o Awanuiarangi, University of Canterbury, NIWA and Cawthron Institute. Professor Battershill has presented on invitation to a range of public seminars and forums with over 400 public presentations/interviews since 2011.
2.4 To build knowledge and human capital in areas of environmental science, restoration and management through outreach, engagement, undergraduate teaching and postgraduate research and training.	Recent activity includes; 4 new PhD scholarships funded by TEC, 4 new PhD scholarships and 1 new MSc scholarship funded by BoPRC, 4 new Technical positions, 3 new research positions funded by TEC and 4 new academic positions funded by the University for roll out of the new BSc degree in Tauranga.
2.5 To appoint and maintain research teams operating as national and international leaders and science communicators in their fields, and to act in an expert capacity as scientific and technical advisors to the Council.	The Coastal Chair was an integral part of INTERCOAST which was a research partnership between the University of Waikato and the University of Bremen, Germany. Additional research effort has been leveraged from this partnership bringing new activity into the Bay of Plenty.

Report To: Regional Direction and Delivery Committee

Meeting Date: 19 February 2019

Report From: Sarah Omundsen, General Manager, Regulatory Services

The Regional Waste and Resource Efficiency Strategy. An independent review of strategy implementation and effectiveness.

Executive Summary

The implementation of the Regional Waste and Resource Efficiency Strategy (2013) and its functions and regional impact were recently reviewed by Karen Summerhays from the independent consultancy People & Place. The full report is attached to this agenda as an appendix.

The strategy review was commissioned by BoPRC. After five years of implementing the current strategy (2013-2023), the volunteer members of the Waste Resources Advisory Group (WRAG) felt the hours spent striving to achieve the strategy aims of waste reduction and waste as a resource were being ineffectively used.

In researching her report, Karen undertook extensive interviews of WRAG members as well as other interested parties. Key findings from the interviews and community engagement were that Regional Councils have no legislated mandate for waste management and therefore the Bay of Plenty Regional Waste Strategy was under-resourced.

The report recommends it is an appropriate time for the Regional Council to consider whether it should continue to have an active role in regional waste management. If the role is to continue, the current Waste and Resource Efficiency Strategy should be fully reviewed, the implementation of the strategy re-defined and sufficient resourcingbe allocated to successful and meaningful strategy outcomes.

Recommendations

That the Regional Direction and Delivery Committee:

1 **Receives the report, The Regional Waste and Resource Efficiency Strategy. An independent review of strategy implementation and effectiveness.**

2 **Confirms that Regional Council continue to play a role in regards to waste and resource efficiency, and continues to implement the strategy in the region, and directs staff to report back to a future committee meeting:**

a. With a budget outline that would allow resourcing to implement the Strategy. The resourcing should identify an adequate level of staff time and sufficient funds to effect a regional impact and support some larger scale projects.

b. With an assessment of whether the WRAG is the best way for the strategy to be implemented, and if not, suggest alternative ways for implementation.

1 Introduction

The current Bay of Plenty Regional Waste and Resource Efficiency Strategy was adopted by BOPRC in 2013. In six Key Focus Areas, the Strategy outlines visions, goals, new initiatives and what success in achieving these would look like.

In the first year of the strategy (2013/2014), approximately $75,000 was ear-marked for regional waste and resource projects. The strategy identifies that this is the approximate annual budget available through the life of the strategy, subject to annual plan processes.

A key driver of the aspirations of the strategy was establishing the Waste Resources Advisory Group (WRAG). This group has been made up of a mixture of local government agencies, Not-for-Profit organisations, District Health Board, business, industry and volunteer group representatives. There have been between 10 and 14 professionals volunteering their time in the WRAG each year with the aim of driving the aspirations of the strategy.

Implementing the strategy has primarily meant distributing a contestable public fund to assist community based waste reduction and resource recovery projects. These have included supermarket food waste collection, building demolition waste repurposing, community worm farming projects, marae recycling education through Para Kore and a number of co-funded Tauranga City Council initiatives. To date approximately $50,000 has been distributed annually, although in the 2017/18 financial year, as a result of insufficient resource to administer the fund, it was not used.

Since the adoption of the strategy over five years ago there have been changes in the regional waste and resource efficiency scenario. The members of the WRAG, who are tasked with driving the regional strategy, have made it clear the strategy and the role of the WRAG, as well as the amount of funding BoPRC contributes to the strategy goals, needs to be reviewed and ideally increased.

BoPRC recently engaged the services of Karen Summerhays from People & Place to undertake a five year review of the Waste and Resource Efficiency Strategy and the role of the WRAG in implementing the strategy in the region. Karen undertook extensive consultation with WRAG members in preparing her report which led to a number of recommendations being put forward for the RDD council committee to make a decision upon.

2 The national picture regarding waste management

The Local Government Acts 1974 and 2002 and the Waste Minimisation Act 2008 give powers to local government to manage waste. In these pieces of legislation, importantly the Waste Minimisation Act, territorial authorities are tasked with preparing

a waste management and minimisation plan (WMMP) which has policies and methods for achieving waste minimisation and management within the district and showing how the plan implementation will be funded.

Territorial authorities receive a large part of their WMMP's funding from central governments Waste Disposal Levy fund which is distributed according to the population in a TLA district. Half of the Waste Disposal Levy collected nationally is distributed in this way. The other half of the Levy is invested in the contestable Waste Minimisation Fund which is available to large scale regional or national waste minimisation activities.

Regional Councils have no legislative mandate for waste minimisation activities in their territories, outside the requirements to consent and monitor landfill and waste disposal sites. No central government funding is received to promote the activities of a regional waste minimisation strategy, which is why few RC's in New Zealand maintains a role in waste reduction activities. The People & Place report gives a broad overview of Regional Council roles in Chapter 7, part 7.1.

3 Analysis of Options

During interviews and feed-in to the People & Place review of the Regional Waste and Resource Efficiency Strategy, several key recommendations were made. These include:

- Regional Council needs to consider and define its role in regard to waste and resource efficiency in the region. Consideration needs to be given to the fact there is no legislative responsibility for regional councils to be involved in waste minimisation strategies.

- If the RDD committee determines the Regional Council should maintain an active role in waste and resource efficiency, a review of the strategy should be undertaken to clarify regional direction and take into account changing legislation regarding waste management.

- The council needs to allocate sufficient resource to ensure the strategy can be successfully implemented with meaningful outcomes. Waikato Regional Council have been operating a budget of approximately $130,000 per annum to implement their Regional Waste Strategy, as well as having a dedicated staff member focussed on strategy implementation. Similar resources would be appropriate to have real impact in the Bay of Plenty.

- The future of the WRAG needs to be reconsidered. It should either have broadened representation, functions and roles, with meeting and group co-ordination possibly outsourced, unless sufficient staff resource is made available internally. An entirely alternative assemblage to what currently exists could also be considered.

4 Key Decision Points

As specified in section 7.3 of the People & Place report, the WRAG recommends to the RDD committee to make a decision on:

1. **The continued role of BoPRC in regards to waste and resource efficiency, and continuing to implement the strategy in the region.**

If Regional Council's Waste Strategy is confirmed to continue, the committee should direct staff to proceed with:

2. a review of the current Waste Resource Efficiency Strategy, taking into account new legislation and allowing for the changing waste sector environment.

3. Providing a budget outline that would allow realistic resourcing to implement the Strategy. The resourcing would identify an adequate level of staff time and sufficient funds to effect a truly regional impact and support some larger scale projects.

4. Determine whether the WRAG is the best way for the strategy to be implemented, and if not, suggest alternative ways for implementation.

Staff recommend that Council continue to play a role in waste and resource efficiency, and the implementation of the strategy. If the Committee agrees, staff will report back to a future meeting with a detailed proposal.

5 Community Views

The community views taken into account are mostly sourced from interviews with current and past members of the WRAG, seeking their opinion on the effectiveness of the strategy implementation to date. Their views have been summarised according to topic throughout the People & Place Report. The key views have been summarised in the Analysis of Options outlined above.

6 Implications for Māori

The Regulatory Compliance team responsible for implementing the Waste Resources Efficiency Strategy actively sought to engage with tangata whenua when developing the current strategy. The role of tangata whenua and kaitiaki is to protect the natural and physical environment, waahi tapu and other sites of cultural significance to ensure community and cultural sustainability is achieved.

Māori have an important role to play in waste reduction and this has been supported by the WRAG fund financing Pare Kore marae waste minimisation and recycling schemes throughout the region. Iwi have been invited to be more actively involved in the Waste Strategy implementation by taking seats on the WRAG, and will continue to be invited to actively be part of waste and resource efficiency projects.

7 Conclusion

The Bay of Plenty Regional Waste and Resource Efficiency Strategy was adopted 5 years ago and a group of 10 to 14 representatives from community groups, local government, businesses, charities and not-for-profits formed as the Waste Resource Advisory Group (WRAG) to implement the strategies Key Focus Areas.

The WRAG has been working with an annual budget of $50,000 which has been distributed as a contestable fund to small community based projects. The WRAG have increasingly felt under-valued and feel Regional Council's resourcing of the Waste Strategy has not kept paced with the size of projects that could be implemented in the region. The Regional Direction and Delivery Committee is therefore asked to

determine the relevance of the current Waste Strategy, the role Regional Council has to play in waste and resource efficiency, and direct staff to return with a review of the strategy, an outline of realistic resourcing to implement it and the continued role of the WRAG.

Reece Irving
Senior Regulatory Project Officer

for General Manager, Regulatory Services

8 February 2019

APPENDIX 1

People and Place WRAG Report 5 Years On

PEOPLE + PLACE

FIVE YEARS ON - A REVIEW OF BOPRC WASTE AND RESOURCE EFFICIENCY STRATEGY

Prepared for the Bay of Plenty Regional Council

4TH JANUARY 2019

KAREN SUMMERHAYS

Client Name	**Bay of Plenty Regional Council (BOPRC)**
Report Name	***Five years on - A review of BOPRC Waste and Resource Efficiency Strategy***
Date of report	**January 2019**
Author	**Karen Summerhays – People + Place**
Purpose	**To provide an overview/critique of the current and future operations of the Waste Resources Advisory Group (WRAG).** **Observations regarding the Bay of Plenty Waste and Resource Efficiency Strategy (2013)**

Contents

1 Executive Summary

The Waste Resources Advisory Group (WRAG) was established as part of Focus Area A of the Bay of Plenty Regional Council (BOPRC) Waste and Resource Efficiency Strategy (WRES) in 2013. It was seen as a key component of achieving the strategy vision of "Working together towards a resource efficient region". Since the WRES was adopted there have been substantial changes within the sector and the associated legislation. The functions and value of the WRAG has also been questioned and attendances at WRAG meetings have been declining.

This report seeks to provide background information regarding the establishment and functions of the WRAG. It provides an overview of the feedback, provided by members of the WRAG, with regard to its own effectiveness and some general observations of the relevance of the WRES in 2019. It concludes with contextual information for consideration and recommendations from the WRAG.

Regional Councils have no legislated mandate in waste management, apart from administering resource consents for facilities (managed landfill sites including clean-fill sites) in accordance with their natural resources plans and the Resource Management Act. Previously, the BOPRC (along with the Waikato Regional Council (WRC)) have taken a strategic and coordinating role in waste management and resource efficiency. These can play a substantive role in reducing the region's economic, social and environmental impacts, in particular our regional carbon footprint.

Whilst there have been successes as the result of the $50,000 annual funding allocated by the WRAG, they were mostly on a small, local scale. A clear message throughout the consultation undertaken whilst researching this report was that $50k per annum is not sufficient to enable large scale regional change.

There was general recognition of the potential value of a regional waste sector group and the WRAG asks the Council to consider future resourcing, broadening representation in the group, its functions and roles, outsourcing the coordination role or the establishment of an alternative assemblage entirely.

Overall there was a high level of concern expressed regarding the effectiveness of the WRAG and whether it was a good use of professional time. There was also a strong feeling that to be effective in a regional context the resourcing (both human and financial) had to be realistic.

Above all there was a call for the BOPRC to define its role in waste and resource efficiency and from there make appropriate policy changes and if applicable, provide sufficient resources to achieve identified regional outcomes.

In August 2018 Karen Summerhays from People + Place was engaged by the BOPRC to undertake interviews with a number of members of the WRAG (past and present) and other identified people who could provide relevant information (see Appendix 1). This report is drawn from previous material and from the conversations the author has had with those people and the comments are generalised to allow a free and frank commentary.

2 Waste Resources Advisory Group (WRAG) - Background

The Waste Resources Advisory Group (WRAG) is seen as a key component of achieving the strategy vision of "Working together towards a resource efficient region".

The Terms of Reference for the WRAG identifies the purpose of the group is to support the successful implementation of the *Bay of Plenty Waste and Resource Efficiency Strategy* through the provision of advice on annual planning processes and ongoing strategy review to ensure its relevance.

It was intended that the WRAG be made up of members representing local and central government, business and industry leaders, District Health Boards, community and iwi groups who have direct relevant expertise in the waste and resource recovery sector. Both the Waikato Regional Council and the Ministry for the Environment are identified as specific members to provide cross regional and national perspective respectively.

The WRAG is to deliver an annual report to the relevant BOPRC committee to provide a summary of activities and outcomes of initiatives undertaken in the previous 12-months and outline key initiatives for the next 12-months. It will indicate projected funding requirements for the WRAG to undertake work, and identify potential sources for that funding.

The group is to meet at least three times a year. There have been two meetings in 2018:

- The first in March, after which this review was instigated at the request the Regional Council. WRAG members had questioned whether the group was achieving the goals set out in the Terms of Reference, and the extent and application of resource available to drive the strategy.
- The second in December where the draft report was provided to the WRAG members for comment and input. After consideration of the report the WRAG has provided recommendations to be considered by the BOPRC Regional Direction and Delivery Committee. These recommendations are specified in Part 7.3 of this report.

3 WRAG actions within the Waste and Resource Efficiency Strategy (WRES)

Commentary from WRES (2013) (abridged):
Waste Resources Advisory Group (WRAG):
An advisory group with a leadership and operational role to play in implementing the strategy includes membership from a range of business, community and Council organisations. It is important that the WRAG has a broad membership, including public, private and community representatives.

Successful delivery will require the active involvement of members.

The group will prioritise, deliver and report on waste and resource efficiency initiatives. In this regard the group should be led but not constrained by initiatives identified in the Strategy when opportunities arise that are consistent with the vision and goals, the group is free to pursue them.

Bay of Plenty Regional Council will organise and fund the administration of the group, while group members are expected to support actions as appropriate. Members will also be responsible for communicating to and from their own organisations.

The strategy is intended to guide the WRAG in decision making under a guiding principle: Cost effective local solutions converts waste to resource.

3.1 Focus Areas - Introduction

Within the WRES, six Key Focus Areas are identified. Key Focus Area 'A' specifically relates to the WRAG and its role in overseeing Strategy delivery. The listed actions, and measures of success identified are not the responsibility of the WRAG to deliver but rather to monitor progress and facilitate where possible.

This section of the report provides an outline of achievements since the adoption of the WRES (2013) but is not an analysis of the effectiveness of those actions. WRAG members were invited to add their organisation's contribution to the delivery of the WRES 2013 to the list of achievements.

3.2 Focus A: Foster collaboration, partnerships and promote forward planning.

Commentary from WRES (2013) (abridged):
Establish a waste resources advisory group (WRAG) that:

- Develops its own terms of reference, and leadership structure
- Prioritises, delivers and reports on the initiatives identified in this Strategy
- Identifies communication needs to engage the wider community
- Makes submissions to relevant planning, regulatory documents
- Identifies, co-ordinates and seeks funding for activities
- Identifies and responds to trends, needs and opportunities that affect waste management
- In conjunction with the Civil Defence Emergency Management Group determine the need for and, if necessary, develop a plan for waste management in emergency situations
- Work with Waikato Regional Council on cross-regional education and promotion initiatives

- Promote the environmental benefits of compost and vermicompost in agriculture
- Investigate and support local initiatives

What does success look like?

- Group with representatives from a range of sectors is established and meets regularly
- Group able to report successes in developing new initiatives to reduce waste, improve information availability
- Forward planning for future needs
- Efficiencies in waste management and minimisation activities identified
- Continuation of current initiatives
- Plan developed for waste management in emergency situations
- Group identifies and submits to relevant planning and funding opportunities

Outline of achievements since the adoption of the WRES 2013:

- WRAG established and operating for 5 years.
- Disaster Waste Management Plan is in development in conjunction with CDEM. We are working on this with Waikato Regional Council and Environment Canterbury. To date around $170k of council and Ministry CDEM funds have been committed to the project.
- Have a proven history of working with Waikato RC on cross regional projects, although these have not necessarily focussed on educational and promotional initiatives.
- Undertook a joint Rural Waste stocktake in 2014 in conjunction with WRC.

3.3 Focus B: Improve Data and Information management.

Commentary from WRES (2013) (abridged):

Potential new initiatives:

- Develop and maintain a regional (or cross-regional) waste network to collate and make data available
- Develop protocols with private industries involved in waste collection, transport and disposal/ recycling to enable information to be provided in a commercially sensitive way
- Develop or adopt a template to achieve consistent reporting
- Coordinate waste assessments
- Alignment with national initiatives
- Investigate mandatory waste tracking and the Liquid and Hazardous Waste Code of Compliance (WasteTrack)

What does success look like?

- A reliable waste data network that meets all obligations is established and populated with data
- Information is available from the network to councils, community and business sectors, while protecting commercial sensitivities
- Information enables progress to be measured and gaps to be identified
- Information is used to inform future opportunities
- The Regional Council and TAs have detailed information about the generation, collection and disposal of liquid and hazardous wastes
- An annual report for waste and resource efficiency is published by WRAG and enables tracking of progress and identification of opportunities. The report is provided to the Regional Council's Operations, Monitoring and Regulation Committee, now the Regional Direction and Delivery Committee.

Outline of achievements since the adoption of the WRES 2013:

- Mandatory waste tracking is currently being investigated as part of the BoPLASS project.
- Annual Reports were presented to council in 2014/15/16, but these have slipped away since then.

3.4 Focus C: Review of regulatory environment

Commentary from WRES (2013) (abridged):

Potential new initiatives

- Review and identify best practice in bylaw to promote consistency where appropriate
- Review Regional Water and Land Plan provisions relating to waste at plan review time
- Develop and implement best practice for consenting and compliance including data collection and revised definitions for clean-fills, managed/controlled fills using the Technical Guidelines for the disposal to land of residual waste and their material
- Lobby Central Government to broaden levy collection to include managed fills

What does success look like?

- WRAG provide feedback/submissions to bylaw and plan reviews
- Increasing confidence of industry that TAs and Bay of Plenty Regional Council regulatory provisions are fit for purpose and applied consistently
- Reliable consistent data provided by all sectors
- Waste disposal and minimisation activities do not cause environmental harm
- Improved consent and permitted activity compliance is achieved

Outline of achievements since the adoption of the WRES 2013:

- Bylaw review for consistency was undertaken in conjunction with the Waikato BOP Waste Liaison Group
- Central Government lobbying is undertaken via WasteMINZ which is supported by BOPRC through a paid membership

3.5 Focus D: Increase product stewardship, resource efficiency and beneficial reuse.

Commentary from WRES (2013) (abridged):

Potential new initiatives:

- Investigate development of region wide sector focused waste reduction and resource efficiency initiatives, for example C&D sector
- Engage with private sector to discuss voluntary measures to reduce quantities of recyclable material in kerbside and commercial waste
- Facilitate and encourage new proposals to reduce or beneficially reuse waste
- Work with existing agencies such as Bay of Connections and local economic development agencies to incorporate waste minimisation opportunities into the thinking of business leaders
- Advocate for and support additional product stewardship schemes or broadening the scope of existing schemes
- Investigate procurement opportunities that support waste minimisation goals by influencing existing groups such as BOPLASS, farm advisors (compost/vermicompost)
- Investigate greater local provision of waste management initiatives

What does success look like?

- New initiatives that decrease waste to landfill are established
- Increasing use of websites and resources that promote waste minimisation
- Decreasing per capita quantities of waste to disposal
- Increased product stewardship schemes
- Waste and resource efficiency initiatives are locally based for local waste

Outline of achievements since the adoption of the WRES 2013:

- Increased product stewardship, resource efficiency and beneficial reuse have been the predominant focus when assessing WRAG fund applications, but the specifics achieved are hard to pinpoint within those outlined.

3.6 Focus E: Reduce harmful impacts

Commentary from WRES (2013) (abridged):

Potential new initiatives:

- Liaise with transporters, producers and treatment/ disposal sites to identify practical options for tracking of high risk waste
- Advocacy for mandatory product stewardship for harmful wastes
- Development of a waste management plan for dealing with waste in an emergency situation
- Investigate/promote/require liquid and hazardous waste transporters to use the Liquid and Hazardous Waste Code of Compliance

What does success look like?

- Safe disposal or reuse options available for all waste products
- No harmful or hazardous waste disposed to inappropriate locations
- Transporters, producers and treatment/disposal sites work together and with the Regional Council or Ministry for the Environment to enable tracking of high risk waste
- New product stewardship schemes established.

Outline of achievements since the adoption of the WRES 2013:

- BOPRC strongly pushes for product stewardship schemes to be introduced, through contributing to the submissions made by WasteMINZ on a national level.
- Waste Track has been largely abandoned in the Bay of Plenty as it is entirely voluntary and difficult to get buy-in from waste transporters.

3.7 Focus F: stimulate research and innovation to develop new solutions

Commentary from WRES (2013) (abridged):

Potential new initiatives:

- WRAG will proactively identify opportunities
- Work with Bay of Connections and/or key groups in the economy to identify opportunities
- Applications to Waste Minimisation Fund or other funding sources
- Food waste collection investigated

What does success look like?

- Adoption of new initiatives that reduce waste to landfill or reduce the creation of waste or reduce harm form waste

- Trials and pilot scale initiatives established

Outline of achievements since the adoption of the WRES 2013:

- Good Neighbour food rescue has successfully applied for 3 rounds of WRAG funding.
- BOPRC contributed to the start-up phase of commercial vermicomposting operations of in Kawerau.

In the following chapters, information is presented by firstly providing a situational overview which captures the current state of the play. This is followed by relevant notes from the March 2018 WRAG meeting, which provided the baseline thinking for this report. Then feedback from the interviews undertaken with a number of the members of the WRAG and others who were identified as having relevant information is provided (the participants are listed in **Appendix 1**). Lastly, any opportunities identified at the December WRAG meeting are listed.

4 Make up and Functions of the WRAG

4.1 Functions:

Situation overview:

The WRAG, whose functions are outlined in 3.1, is operational but have only met twice in 2018 (March & December)

The present membership has representation from the following organisations:

- Fulton Hogan - Hendrik Metz (Chairperson)
- Bay of Plenty Regional Council - Reece Irving / Stephen Mellor
- Kawerau District Council – Tom McDowell
- Rotorua Lakes Council – (Bob Brown)
- Tauranga City Council – Rebecca Maiden
- Western BoP District Council - Ilze Kruis
- Whakatāne District Council – Nigel Clarke
- Sustainable Business Network - Glen Crowther
- Toi te Ora – Annaka Davis
- Waste Management – Dave Puschart (re-joined 9/12)
- Computer Recyclers – Neale Overend
- Waikato Regional Council – Leah Wyatt

Notes from WRAG Meeting 1/3/18:

Clarifying the roles of WRAG members and the WRAG group:

- Need to raise the profile of the Regional Waste and Resource Efficiency Strategy.
- The implementation of strategy goals needs to have accountability.
- WRAG needs to be kept informed as to what the TA's are doing with regard to waste by-laws and strategies.
- The profile of the strategy and the activities of the WRAG need to be raised in front of elected members. Without elected member support it is difficult to drive it forward.

How does the WRAG achieve the strategy goals when funding remains at $50,000? This is considered to be a minimal amount of funding to push the strategy forward.

Interview Notes:

- Overall the feedback was focused on the shortcomings of the WRAG and its ability to operate effectively.
- All of the interviewees, that were also members of WRAG, felt that the past focus of the WRAG to allocate the $50k competitive fund was "*a waste of professional time for a lot of busy people*" and that there were now other sources of funds (TLA Waste Minimisation Funds) that are accessible to small scale locally based projects/applicants. That said there was also the strongly held opinion that regionally focused projects and solutions do require support by the BOPRC and that the WRAG's role be best used to advise on strategic direction.
- The requirement for realistic resourcing the WRAG so that it can be functional e.g. designated staff and payment to those that were there in voluntary capacity, was also raised and that there was a lack of acknowledgement for 'free' expertise.
- There was also a strong feeling that the meetings were a lot of talk of problems and little about solutions and that there was little contribution from members to enact the actions.

Opportunities identified WRAG 10/12:
Empower and enable the WRAG to undertake an advisory role and advocate for regional and cross-regional solutions.
Increase the opportunity to hear from others in the sector to encourage collaboration and coordination.
Increase resourcing to allow the WRAG to be effective and broaden the representation in the group.

4.2 Terms of Reference:

Situation overview:
The original Terms of Reference (ToR) for the WRAG were written in 2014 (see **Appendix 2**). Since then the ToR have been reviewed and annually checked for relevance.

The primary roles of all members of the WRAG are to:
1. Provide feedback and advice on annual regional and district planning and review processes.
2. Monitor and review the effectiveness of the strategy.
3. Report back to their respective organisations with details of relevant projects and identify opportunities for waste and resource efficiency.
4. Provide advice on issues, or opportunities, presented to the group during the course of implementation of the strategy.
5. Identify, coordinate and seek funding for projects and activities.

Notes from WRAG Meeting 1/3/18:
The Terms of Reference (2014) were reviewed and:
- Voted as still being the valid terms to guide the WRAG in projects and decision making.
- The WRAG needs to develop a project approach to delivering the strategy.
- Membership is to be made up of a governance team who can contribute to project development and execution.
- The group should identify valid regional projects and the appropriate skilled people to drive the projects. The WRAG then allocates funds or applies for central government funding.
- The terms of reference direct the WRAG to prioritise projects that give effect to the Waste Strategy. In assessing all projects we should refer back to the ToR.

Interview Notes:

- It was noted by a number of interviewees that there is currently a disconnection between the TOR and what the WRAG is actually doing.
- There is a need to hold the members to account with regard to the roles of the WRAG and support them to make any necessary changes that will allow them to fully participate in the WRAG and its functions, was identified as a potential improvement to the ToR, as was an improvement in the reporting from all members to improve collaboration and coordination.
- If the WRAG was to become more involved and active then the meeting frequency would need to increase to three or four times a year.

4.3 Membership:

Situation overview:

The WRAG was established in 2014 following the adoption of the Regional Waste Strategy. A wide variety of people who had been present in consultations during the development of the strategy were invited to be part of the WRAG. Initially representatives from each Territorial Authority, business and industry, iwi, community and social groups and government departments were invited to participate.

Over the past 4 years membership of the WRAG has fluctuated with a core of territorial authorities (TA) and business representatives remaining.

There have been a number of members leave and attendance has been falling.

Notes from WRAG Meeting 1/3/18:

- Gaps were identified in current membership.
- To broaden the depth of experience on the WRAG additional members should be invited to join the group.
- An ideal mix for the group would be: Regional Council continues to provide administration; each Territorial Authority has representation (6 TA's), 4 industry representatives, 2 community group representatives; a Waikato Regional Council rep, MfE invited to participate on occasion and 1 Regional Councillor invited.
- It was suggested that BoPLASS Ltd, Pou Whakaaro, Envirohub, Envirowaste, Smart Environmental, Goodwood, Good Neighbour, Beyond the Bin could also offer valuable experience to the WRAG
- Action: Regional Council will develop a list of potential new candidates for the WRAG and circulate amongst the group for comment (deferred until after this report).

Interview Notes:

- It was acknowledged that including commercial operators within the membership was valuable but that value was constrained by: only including some operators with others feeling left out of the conversation and the limited amount of the information/data being provided due to commercial sensitivity.
- Voluntary members need to be resourced to participate.
- Only having two 'community based' representatives is too few. It was thought that there should be parity with the representation from industry, being four representatives.
- BOPLASS and Envirohub should be on the committee.

Opportunity identified WRAG 10/12:

The group agreed that there is a place for a 'regional advisory representative' group but only if it was resourced to be effective, representative and had clear direction of its goals.

4.4 Allocation of the competitive Fund ($50k per annum):

Situation overview:

Presently the BOPRC provides $50,000 per annum to assist the implementation of the WRES.

In the past, the funding round has opened at the beginning of the financial year and remained open for two months. The fund was advertised on the BOPRC website.

Project funding for 3 years: A total of 32 applications assessed

2014/15 - $54,495 – 6 projects (14)

2015/16 - $50,000 – 5 projects (8)

2016/17 - $29,971 – 3 projects (11)

Majority of projects align with Focus Areas A, B & D

Focus A: Foster collaboration, partnerships and promote forward planning.

Focus B: Improve Data and Information management.

Focus D: Increase product stewardship, resource efficiency and beneficial reuse.

Focus Area C: Review of regulatory environment and E: Reduce harmful impacts and F: stimulate research and innovation to develop new solutions has not featured strongly in funded projects.

The quality of applications to the fund has decreased and the numbers of applications have declined; there has been no research done to establish the reasons for this.

With the introduction of the waste levy and the associated Waste Minimisation funds held and distributed via the TLAs. Tauranga City Council undertakes competitive funding rounds which are more and more addressing the needs of local community groups and organisations. TCC has been a recipient of WRAG funding twice in the past.

WRAG fund, 2017/18

In the 2017/18 financial year, due to staff resourcing issues the WRAG did not offer a contestable community fund. When the WRAG met in March 2018 it decided, due to the shortened time frame until end of financial year that the entire fund be provided to Rotorua Lakes Council to host the Haz Mobile waste chemical collection. This service had been provided in all other major centres of the region in the past, but never in Rotorua. After undertaking due diligence however, Rotorua Lakes Council was unable to utilize the fund as they did not have capacity to organize a consented area where hazardous chemical collection could be carried out in the short time frame given. Therefore the WRAG fund was not utilized in the 2017/18 financial year.

Interview Notes:

The issues and challenges regarding the allocation of the fund attracted the most comments throughout the interviews.

- A consensus the WRAG fund is too small to be affective and the recipients' projects have more local impact than regional impact. The BOPRC runs the risk of being seen as paying lip-service to the waste challenge.
- The quality of applications could be improved and are predominantly received from not-for-profit groups desperate for support – a larger fund would attract higher quality and more meaningful applications.
- If the fund is to remain at $50k, and be allocated as it has been in the past, it would be better handled by the Environment Enhancement Fund team with the WRES setting the priorities. Alternatively consider other mechanisms to allocate competitive funds e.g. TLA WM funding rounds.
- Formalising the funding criteria to include both capital and operational applications.

- There is a risk of duplication as the TLAs waste minimisation funds can now address the needs of community groups

Support for AgRecovery Agri-chemical collection approved at WRAG meeting 10/12/18:
AgRecovery, the national not-for-profit scheme to collect unwanted / un-used agricultural chemicals and plastic waste from rural properties, is planning a regional wide collection in the Bay of Plenty in early 2019. Bay of Plenty Regional Council staff have discussed the planned collection with all the regional TLA's who are supportive, both in terms of financial support and providing appropriate collection locations. AgRecovery is able to provide each TLA with a full inventory of chemicals collected for disposal in their district, to ensure that each TA is invoiced only for chemicals from their area. There is usually a shortfall in the funds required to appropriately dispose of unknown, unlabelled and old legacy chemicals. The WRAG was asked to provide regional support for the AgRecovery collection through the WRAG fund. A vote of members granted $12,000 as a regional contribution to the AgRecovery scheme, depending on the total cost of the project.

5 Alliances and others

Situation overview:
Listed below are a number of grouping of agencies presently active in the waste sector. Predominately their membership is made up of local government representation and do not include community representation, which is a point of difference with the WRAG.

Waikato and Bay of Plenty Waste Liaison Group
This group has existed since 2002 and brings together waste management staff from local authorities in the Waikato and Bay of Plenty to discuss waste issues and initiatives.
The proposed role of this group in relation to the Strategy includes:

- Identification of potential joint projects that require regional or inter-regional coordination
- Informing the WRAG on the effectiveness of the regional waste strategy
- Monitoring region-wide projects and initiatives and informing their respective organisations on progress.

The group currently meets three times a year. Private sector representation is invited to this meeting when information is required to support the objectives of local council waste management and minimisation plans and the regional strategies.

The Upper North Island Strategic Alliance (UNISA)
Regional and metropolitan councils in the upper North Island (Auckland Council, Northland Regional Council, Bay of Plenty Regional Council, Waikato Regional Council, Hamilton City Council, Tauranga City Council and Whangarei District Council) agreed to collaborate for responding to, and managing, a range of inter-regional and inter-metropolitan issues. First and second order issues have been set out in an Agreement, with waste being recognised as a first order issue. Relationships between UNISA members will enhance the opportunity to progress waste issues between staff.

Bay of Plenty Local Authority Shared Services (BOPLASS)
BOPLASS has been set up specifically to add value to councils by assisting them to investigate, procure, develop and deliver shared services where a business case shows that they provide benefit to the (voluntary) council users by either improved levels of service, reduced costs, improved efficiency and/or

increased value through innovation. Currently there are no joint procurement or shared services arrangements relating to waste management and resource efficiency in the region.
Recently BOPLASS and WaiLASS have jointly commissioned two reports from Eunomia Research & Consulting Ltd [1] exploring collaboration opportunities for organic waste collection and processing and the other scoping the opportunities regarding cross regional waste operator licensing and data collections. The report proposes a cross regional agency to administer waste operator licensing on behalf of constituent TLAs. Both reports have been presented to BOPRC.

Sustainable Business Network (SBN)
Since 2014, the Sustainable Business Network has been leading the effort to accelerate NZ to a circular economy. SBN has established the Circular Economy Accelerator (CEA), with the support of Auckland Council, 3R Group, Fuji Xerox and the Bay of Plenty Regional Council. The CEA will speed up this transition for New Zealand.

Interview Notes:
With regard to the Waikato and Bay of Plenty Waste Liaison Group it was generally considered effective but it is limited to council staff representation and so it only considers matters of Councils (not that of operators and community). A closer alignment of WRAG outcomes with those of the Waikato and Bay of Plenty Waste Liaison Group and vice versa was also suggested and it was emphasised how important it is to maintain cross regions approach.

Many interviewees mentioned the potential for BOPLASS to take a more active role in the regional /cross-regional waste arena. Any increased involvement by BOPLASS would need to be realistically resourced. Such involvement could include:

- Undertaking regional resource efficiency research.
- Coordinate licencing waste operators and require data reporting.

It was also noted that WRAG could provide the much needed connection across the sector for community groups and innovators wishing to be heard regionally.

5.1 Potential Alternative Regional Assemblage:

The idea of a new group to replace the WRAG and the possibility to 'decouple the WRES and the WRAG' was discussed at the WRAG meeting of 10/12/18. The group generally supported the concept of a regional advisory group/forum with broader membership than the Waikato and Bay of Plenty Waste Liaison Group. This sector focused group could be modelled on other regional/community forums such as the Tauranga Moana Biosecurity Capital group. The convening of the group and its associated functions could be outsourced to an external agency already involved in the sector.

[1] "*Cross Regional Waste Operator Licensing and Data – Scoping Report*" – August 2018
"*Collaboration on Organic Waste Collections and Processing – Scoping Report*" – August 2018

6 Effectiveness of WRAG/ WRES

6.1 Observations

Situation overview:

The WRAG has met regularly which has provided networking opportunities and the sharing of information.

Since 2015 the WRAG Fund has allocated 12 grants to various organisations. The feedback from those organisations is positive with regard to how the funds supported their project.

The types of projects that have been supported:

- Good Neighbour (Tauranga): support for their operations has provided substantial food waste recovery over the last 3 years
- CReW (Whakatāne): pick-up service has increased the amount of Construction & Demolition (C&D) materials and re-usable household items that would otherwise go to landfill.
- Beyond the Bin: Funding supported the design and development of an online tool which visualises event waste statistics and data from events that participated in event waste minimisation training workshops, developed and delivered in conjunction with Tauranga City Council.
- Para Kore: assisted in the purchase of trailers to enable transfer and delivery of bins/crates to participating marae.
- Rotorua Lakes Council: Funded a worm farming evaluation.

WRES (2013) (abridged):

Review, progress and change within the waste sector can occur quickly and it is recommended that this Strategy is reviewed after 10 years, with the option of earlier review should the need be identified by WRAG.

In order to track progress WRAG needs to report to the Bay of Plenty Regional Council Regional Direction and Delivery Committee annually.

Interview Notes:

- With regard to the BOPRC having a Waste Strategy at all, some felt that it had simply 'ticked the box' and the Council needs to define their involvement in the waste arena. As shown in these comments: "*Regional Council needs to own it or leave it to the TLAs*", *"The strategy provides strategic oversight but no one is doing it", "TLAs are just getting on with it"* and *"WRAG is not advising anyone"*
- It was also acknowledged that within the governance area there is a lack of clarity of who is doing what and who is responsible for what in the waste arena. If the WRES is to be successful it requires political level buy in.
- Inadequate resourcing to support the WRES has meant '*it has been set up to fail'* was a common comment from the interviewees and some felt that the WRES had not lived up to its promises, citing having no targets and minimal staff resource as the reasons for that .
- There was consensus that the WRES needs a strategic update due to the rapidly changing legislation, in particular, the implementation of the WMA, the collection of levies and the resulting TLAs waste minimisation funds. The national and global resource and waste sector is also changing at speed including both challenges and innovations. Flexibility needs to be built into the strategy with less focus on the data reporting as that will now be a central government requirement.

- When assessing resource consent applications, Regional Councils are constrained by the provisions of the Resource Management Act and how the act has been incorporated into Regional Plan rules. Conditions in resource consents require the consent holder to mitigate the effects of potentially contaminated discharges on the environment. Regional rules currently allow landfill sites accepting a variety of materials to be developed; however applications can take up to 5 years from lodging to be processed. A role the WRAG could play in influencing regional direction would be submitting on Regional Plan Change reviews to lead to stricter parameters with regards to waste streams able to be landfilled, or otherwise having to be diverted.
- It became apparent that the larger TLAs are '*going it alone*'. They indicated they are open to share best practice on request from the smaller councils who don't always have designated staff to follow through with any advice given.
- Most interviewees acknowledge the confusion regarding the BOPRC's role in waste and resource efficiency as there is no legislative responsibility and that unlike the TLAs do not receive any of the waste levies to invest into waste and resource efficiency initiatives on a regional scale. The role of Council is addressed further in Paragraph 7.1.

6.2 Resourcing the implementation of the WRES:

Situation overview:

Presently the WRES, and consequently the WRAG, is supported by the BOPRC Regulatory Compliance Team.

There is provision of an annual fund of $50k to support the implementation of the WRES.

The WRAG is provided administration and coordination support for its meetings via BOPRC staff.

There is no designated staff for the implementation of the WRES. The Waikato Regional Council, up until recently, had a designated FTE resource to support their Waste Strategy, the roles of that position have now been incorporated in to other roles within the council regulation and environmental education teams (see **Appendix 3** for those roles and functions)

Interview Notes:

- The resource to implement needs to be of such a scale that it enables medium to large scale change
- There was consent that WRAG can't do this alone and that the strategy implementation and reporting needed a designated resource (human), to be housed within the BOPRC and especially someone who can provide input into resource consents. Providing support for central government initiatives, educating and connecting people within the sector was also seen as important.

Notes from WRAG Meeting 1/3/18:

- It was suggested that the group could be housed outside the BOPRC, possibly within an organisation such as the Sustainable Business Network or Zero Waste NZ who are already working within the waste sector on a regional and national scale.
- It was noted that the effectiveness of any entity set up relies on the comparative resourcing.

7 Considerations

7.1 The role of the BOPRC in the waste arena:

Regional Councils have no legislated mandate in waste management, apart from administering resource consents for facilities (managed landfill sites including clean-fill sites) in accordance with their Natural Resource plans and the Resource Management Act. Previously, the BOPRC (along with the WRC) have taken a strategic and coordinating role in waste management.
Generally Regional Councils have a responsibility to advocate and aim to increase public awareness about the safe use, transport and disposal of hazardous substances.
BOPRC in the past has provided Cleaner Production programmes that have included an element of waste reduction and recovery education and advice regarding the storage and disposal of hazardous substances. Up until 2016 a Haz-Mobile service had been provided to communities for the safe collection of domestic hazardous waste and agrichemicals. The Council has also supported targeted campaign e.g. silage wrap recollection and agrichemical drop off depots.

The BOPRC Community Engagement Team also supports the implementation of the WRES through the Enviroschool zero waste study unit and the Community Initiatives Fund, which includes funding for SBN who are presently running Circular Economy events. In the recent past, the Environment Enhancement Fund has not supported any waste reduction initiatives and nothing specifically aligned with the WRES.

City and district councils have statutory responsibility for waste collection and management, including waste minimisation. They are required to have Waste Management and Minimisation Plans (WMMPs) following the waste management hierarchy of:

- Avoid - prevention of waste generation is the most preferable, for example, designing out waste from products and processes
- Reduce - support products that will produce less waste, for example, those with less packaging.
- Reuse - for example, donate unwanted clothing or household goods to opportunity shops.
- Recycle – for example, aluminium cans, paper and glass can be collected and reprocessed.
- Recovery of resources - for example kitchen and garden waste can be composted.
- Residual disposal

Interview Notes:

- BOPRC urgently needs to ask ‘do we have a role in waste and resource efficiency? If so, what is the scope and influence? Start by undertaking a mapping exercise of who is doing what, with a governance focus.
- There was general agreement that the Council needs to support the sector due to the market failing to provide reliable and enduring systems.
- The BOPRC could lead a regional response, particularly providing support for the smaller TLA’s to adopt best practice.
- A role of the BOPRC needs to be advocating for national solutions and enable them to be implemented locally and provide the big picture thinking.
- BOPLASS is leading the conversation regarding the provision of systems (both regional and cross-regional with Waikato) to better manage waste operators, collect meaningful and robust data and develop and implement a Waste Infrastructure Strategy.
- Someone needs to resource a facilitator and co-ordinator to make all the talk become action.

With regard to the **provision and monitoring facilities and infrastructure** the following was noted that the Council could:

- Improve the management, consenting and monitoring of infrastructure and facilities and the Council needs to be more proactive in the co-ordinating and development of facilities and infrastructure.
- Consider the overall impact (regional/sub-regional) of consenting waste sites.
- Increase monitoring of clean fill sites, especially with the prospective waste levy about to be expanded to all waste disposal sites.
- Proactively work with waste collectors and site operators to sort and divert useful resources.
- Broker consistency across TLAs waste minimisation plans, bylaws and align facilities and infrastructure to support them.
- Develop infrastructure to fill the gaps e.g. hazardous waste facility.
- Waste infrastructure /facilities will only advance if Waikato is at the table due to economy of scale and the already existing relationship between both regions operators and facilities.

The following was noted regarding any potential **WRES Review**-

- Keep it simple, be solutions focused and flexible due to the changing environment, keep an eye on what is likely to change, future proof the actions.
- Update re current legislation – no need for the data as there are other reporting avenues.
- Over the next six years the TLA Waste Minimisation Plans will come up for review. How a TLA responds to regionally based initiatives needs to be considered in any review, ideally the regional strategy could guide and inform the renewal of these plans.
- Promote a regional response to the circular economy

7.2 Other opportunities in the regional context:

Regional opportunities identified in the WRES (2013):

- An opportunity to develop a more effective and coordinated regional and cross-regional approach to increase beneficial reuse, resource efficiency and recovery.
- Key stakeholders indicated their interest in working together and identified opportunities including:
  - aggregation of potential regional resources such as organic wastes
  - coordinated procurement of product and services
  - increasing linkages between generators and processors
  - shared research and innovation opportunities
  - support market development for resources such as construction and demolition wastes and organics
  - collaborative investment in programmes and infrastructure planning and development such as the development of a resource recovery network or park to increase economies of scale and that also provide economic, environmental, social and cultural benefits for all
  - prioritising and delivering initiatives identified in this Strategy
  - more consistent regulations and compliance monitoring

Interview Notes:

- The role of the external agency proposed by Eunomia to licence waste operators and report to the National Waste Data Framework could be undertaken by the Regional Councils as long as

they could deliver the requirements of the system (particularly, IT) like any other potential provider.

- It was also noted that there may be less resistance to share sensitive commercial information if the reporting was provided to an external party.
- Similarly BOPLASS and WAILASS, due to their role to provide efficiency to constituent councils and the skills and experience that exist within them may be logical umbrella organisations for the external agency to operate under.

National / international Opportunities:

- BOPRC could undertake regional reporting regarding UN Sustainable Development Goal #12 – "Responsible Consumption and Production" and the associated Global Reporting Initiative – 306
- Consideration regarding the BOPRC role in helping the government's Carbon Zero by 2050 initiative through resource efficiency programmes such as the Circular Economy framework.

7.3 Waste Resources Advisory Group recommendations:

The Members of the WRAG recommend to the BOPRC Regional Direction and Delivery Committee the following:

- **That the BOPRC firstly considers and defines its role, if any, in regard to waste and resource efficiency in the region.**

If it is found that the BOPRC has a role:

- **Review the current relevance of the WRES (2013) and develop policy that provides clear direction and takes into account new legislation and allows for constantly changing 'waste sector' environment.**
- **Allocate realistic resourcing to implement policy including designated staff time.**
- **Consider the future of the WRAG including: broadening of representation, functions and roles, outsourcing the coordination role or the establishment of an alternative assemblage entirely.**

The author would like to acknowledge the willing and quality participation of all the interviewees and the support received from BOPRC staff.

8 Appendices

8.1 Appendix 1: List of people consulted

Hendrik Metz - WRAG Chairperson (Fulton Hogan Ltd)

Glen Crowther (Sustainable Business Network)

Marty Hoffart (Waste Watchers)

Marianna Tyler (ex Waste Minimization Advisor - Waikato Regional Council)

Leah Wyatt - Education Projects Advisor (Waikato Regional Council)

Rebecca Maiden (Tauranga City Council)

Bob Brown & Regan Fraser (Rotorua Lakes Council) – declined to be interviewed due to both being new to their roles but indicated that they are interested in the outcome of the report.

Stephen Boyle (BOPLASS)

Cr Paula Thompson (BOPRC)

8.2 Appendix 2: WRAG Terms of Reference

Terms of Reference for the Waste Resources Advisory Group (WRAG) - Adopted 14 May 2014

The Waste Resources Advisory Group (WRAG) is established as part of Focus Area A of the Waste and Resource Efficiency Strategy. It is a key component of achieving the strategy vision of Working Together Towards a Resource Efficient Region.
The purpose of the group is to support the successful implementation of the Bay of Plenty Waste and Resource Efficiency Strategy, through the provision of advice on annual planning processes and ongoing strategy review to ensure its relevance.

1) **Members**
The WRAG is to be made up of members representing local and central government, business and industry leaders, District Health Boards, community and iwi groups who have direct relevant expertise in the waste and resource recovery sector. In the 2013/2014 financial year members of the WRAG include:
Chair: Hendrik Metz (Fulton Hogan Ltd); Glen Crowther (Envirohub); Neale Overend (Computer Recyclers); Marty Hoffart (Waste Watchers); Marianna Tyler (Waikato Regional Council); Annaka Davis (Toi Te Ora Public Health); Ilze Kruis (Western Bay of Plenty District Council); Tim Senington (Rotorua District Council); Reece Irving (BoPRC), Rebecca Maiden (TCC); David Puschart (Waste Management); Peter Harford (Petes Takeaways); Tom McDowall (Kawerau District Council); Michael Quintern (Mynoke); Jim Finlay (Opotiki District Council); Nigel Clarke (Whakatane District Council)

The WRAG may invite others with relevant expertise to attend meetings from time to time. Where members are unable to attend an appropriate representative may be sent in their place with prior notice to the Chair.

2) **Roles**

The primary roles of all members of the WRAG are to:

1. Provide feedback and advice on annual regional and district planning and review processes.
2. Monitor and review the effectiveness of the strategy.
3. Report back to their respective organisations with details of relevant projects and identify opportunities for waste and resource efficiency.
4. Provide advice on issues, or opportunities, presented to the group during the course of implementation of the strategy.
5. Identify, coordinate and seek funding for projects and activities.

Additional role of Waikato Regional Council on the WRAG is to:

6. Input around cross-regional issues and opportunities, identification of collaborative initiatives and alignment of policies and regulations, where relevant.

Additional role of Ministry for the Environment representation on the WRAG is to: 7. Provide national perspective and input on issues, topics and initiatives the MfE view as priority which may provide some direction for the strategy.

3) **Meeting coordination**

The WRAG will be serviced by a coordinator who is provided by the Bay of Plenty Regional Council. The coordinator's functions include:

1. Arranging WRAG meetings and recording minutes;
2. Compiling and distributing meeting documents;
3. General facilitation and other roles as determined and required by the group.

4) **Deliverables**

The WRAG will deliver an annual report to the relevant Bay of Plenty Regional Council committee (currently the Regional Direction and Delivery – R D & D committee). The annual report will provide a summary of activities and outcomes of initiatives undertaken in the previous 12-months and outline key initiatives for the next 12-months. It will indicate projected funding requirements for the WRAG to undertake work, and identify potential sources for that funding.

5) **Meeting Process**

The following guidelines apply to meetings of the WRAG:

1. Substitution of membership is allowable with the prior notice to the Chair.
2. In the absence of the Chair of the WRAG, the Chair will appoint an acting Chairperson who must be a member of the WRAG.
3. Members will notify the coordinator within a reasonable time frame if they are unable to attend a meeting.
4. Meeting notes will be written in summary form and will not attribute any comments to any persons (Chatham house rules).
5. Minutes of the meeting will be circulated to members within ten working days of the meeting.
6. Minutes of meetings will not be publicly available, subject to the provisions of the Local Government Official Information and Meetings Act 1987 (LGOIMA) and related requests.

6) **Reporting**
The annual report may also be presented to WRAG member's respective boards or Trustees and special interest groups including, but not limited to, the Waikato & Bay of Plenty Waste Liaison Group and the Regional Waste and Contaminated Land Forum

7) **Frequency and duration**
The WRAG will meet a minimum of three times per year. The 'year' is based on the local government financial year being 1 July to 30 June. Meetings are proposed to be held in July to access applications to the WRAG fund, November and April of each financial year to give sufficient time for the group to consider and comment on the review and planning process.

The group will also meet on an 'as needed basis' up to two more times a year to address any issues or topics that may arise. Members are free to remove themselves from the group with notice to the Chair.

Participation in good faith
Members of the WRAG are required to act in good faith and on a 'no surprises' basis. Participants should be focused on the achievement of strategy objectives. Any conflicts of interest should be declared to the group as soon as possible.

8) **Confidentiality**
Information prepared for the WRAG or by the WRAG will be of interest to member organisations and wider stakeholders. Members of the WRAG may seek expert opinions from outside the WRAG if required. If there is any Information discussed in the meetings that members view as confidential to the WRAG, those members need to state this clearly to the Chair and understand that confidentiality is subject to the provisions of Local Government Official Information and Meetings Act 1987 (LGOIMA) and related requests.

9) **Review**
This term of reference will be reviewed annually in alignment with the strategy annual review.

8.3 Appendix 3: Waikato Regional Council (WRC) - Designated Resource (Waste)

The WRC has a Waste and Resource Efficiency Strategy (2015-18) with the vision of "working together towards a zero waste region"; it is similar to the WRES held by BOPRC.
The goals of the strategy are to:

- protect our communities, land, water and air from harmful and hazardous wastes
- encourage resource efficiency and beneficial reuse that creates sustainable, economic growth

The strategy has the following focus areas:

- Improve waste data and information management
- Review regulatory environment governing waste
- Reduce the harmful impacts of waste
- Increase resource efficiency and beneficial reuse
- Stimulate research and innovation

Priorities are identified by governance regarding the way of working
2016 – 2018 - $110k pa tagged to the priorities in the strategy (+ FTE)

In 2016 WRC established a position of Waste Minimisation Facilitator with the purpose of implementing the regional Waste and Resource Efficiency Strategy. The position sat in the Community and Services Directorate and reported to the Team Leader – Environmental Education.
The position was disestablished in 2018 and its functions and responsibilities have been absorbed by the current Education Projects Advisor in the Community and Services department.

One of the functions of the Advisor is to convene the Waste Strategy Advisory Group (WSAG) twice a year. The WSAG membership comprises of industry, community and local and central government representatives with relevant expertise from the waste and resource recovery sector.
The primary roles of all members of the WSAG are to:

- Provide feedback and advice on annual planning and review process, and recommend changes to the strategy to Waikato Regional Council.
- Monitor and review the effectiveness of the strategy.
- Report back, at a political or senior management level, to respective organisations.
- Provide advice on issues, or opportunities, presented to the group during the course of implementation of the strategy.

The BOPRC is also identified as a member of the WSAG to: Input around cross-regional issues and opportunities, identification of collaborative initiatives and alignment of policies and regulations, where relevant.

The following are the observations of the former waste minimization advisor of their time in the role:

- Had to build as strong case to achieve a designated staff member this due to there being no legislation that directs RCs to manage solid waste.
- Capability and capacity improved over the time
- Biggest gain from taking a regional approach – shared new infrastructure (share risk and cost) and identifying regional economic opportunity for resource efficiency and recovery
- Planned strategic approach to identifying what new infrastructure is required and to help direct the best regional positioning for that infrastructure
- RMA and WMA need to better align
- Waste and resource efficiency is included in regional economic growth opportunities (social & economic)
    - Undertakes proactive planning for rural waste, disaster waste and hazardous waste collaboratively with TLAs and industry
    - Take a stakeholder regional approach with the 11 councils

- Functions undertaken by the Waste Minimization Advisor (2016-2018)
    - Convened Regional advisory group that created an annual work programme based on the annual priorities set by the Council
    - Collated and reported regional data
    - Found greatest benefits and gaps in the system
    - Informed resource consents (be their conscience)
    - Provided waste minimisation education
    - Information for decision making (data)
    - Attends Waikato and Bay of Plenty Waste Liaison Group & The Upper North Island Strategic Alliance (UNISA)
    - Undertook regional campaigns and social media promotions
    - Supported MFE & WMINZ funding applications from other parties
    - Kept waste minimisation and resource efficiency on the table and front of mind at a regional level
    - Played a connectors role

Receives Only – No Decisions

Report To: Regional Direction and Delivery Committee

Meeting Date: 19 February 2019

Report From: Alex Miller, Compliance Manager - Primary Industry & Enforcement

Overview of Wastewater in the Bay of Plenty Region in 2018

Executive Summary

This report is an update to the Regional Direction and Delivery Committee on municipal wastewater (treatment, conveyance, and discharge) in the Bay of Plenty Region. There are 16 municipal wastewater treatment plants (WWTPs) servicing 14 communities across the Bay of Plenty Region.

There are a significant number of challenges faced by the TAs in the operation of their WWTPs, which can result in failure to comply with their consent conditions. These challenges are experienced across the region, with a number of non-compliances identified throughout 2018, ranging from low-risk or technical non-compliance to moderate non-compliance.

In addition to monitoring compliance for WWTP consents, Regional Council is also working with TAs to develop a best practice guideline for response to unauthorised network overflows, which is expected to be completed in 2019.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Overview of Wastewater in the Bay of Plenty Region in 2018.

1 Introduction

The attached report provides an update to the Regional Direction and Delivery Committee on the current situation with regards to municipal wastewater (treatment, conveyance, and discharge) in the Bay of Plenty Region. A brief summary of this report is provided in the sections below.

There are 16 municipal wastewater treatment plants (WWTP's) servicing 14 communities across the Bay of Plenty Region. There are six territorial authorities (TA's) responsible for the operation and compliance of these WWTP's:

- Tauranga City Council

- Western Bay of Plenty Council
- Rotorua District Council
- Whakatāne District Council
- Kawerau District Council
- Ōpōtiki District Council

There is one WWTP operated by a community organisation (Kāingaroa Village inc).

2 Wastewater Treatment Plant Compliance

There are a significant number of challenges faced by the TAs in the operation of their WWTP's, which can result in failure to comply with their consent conditions. These challenges include:

- Increased inflow over the summer months, as the local populations dramatically increase,
- Infiltration into the pipe networks,
- Unforeseen mechanical and electrical failures,
- Aging infrastructure (both at WWTP's and networks),
- Expected permanent population increase; and
- A lack of funding for upgrades.

These issues are common across the region, with the majority of TAs having some level of non-compliance at their WWTPs throughout the 2018 calendar year. The majority of non-compliances were considered to be low-risk or technical non-compliance, with only two moderate non-compliances identified. Two TAs were fully compliant with their consent conditions for the 2018 calendar year: Rotorua District Council (Rotorua Lakes Council) and Tauranga City Council.

3 Network Overflows

Network overflows can present a risk to both the environment and the community. There are several factors that can lead to an unauthorised network overflow, including blockage as a result of wipes, congealed fat and roots.

Whilst emergency discharges from WWTP's may be provided for by resource consent, network overflows are neither permitted nor consented. A Regional Wastewater Management Group, comprised of representatives from all of the TA's, Toi te Ora and Bay of Plenty Regional Council, was set up in order to develop a best practice guide for the TA's to follow in the reporting and management of overflows. It is envisaged that a best practice guide will be agreed and operational by the end of 2019.

4 Community Reticulation

There is a growing understanding around the link between on-site effluent treatment and water quality issues in lakes, rivers and coastal environments, particularly in small communities with a large number of very old septic tank systems, and/or small lot sizes. In response to this, several communities are either working through proposals to connect to reticulation, or have been designated as maintenance zones where more stringent rules can be set around the disposal of private wastewater and maintenance of systems.

5 Central Government Position

Central Government recognises that Councils are facing system wide challenges in the management and capability of their wastewater systems, and the broader delivery of three waters infrastructure. It is Central Government's position that targeted reform of environmental regulation of wastewater services is likely necessary, and they have signalled that it will be progressed via a 2019 program to develop policy, to be introduced in 2020.

Council is working closely with Central Government, at a number of levels, to provide input into this programme of work.

6 Implications for Māori

Maori have identified discharges of treated and untreated wastewater to water to be of concern, particularly where that discharge is to freshwater. New consents such as the Rotoiti/Rotoma WWTP have included pre-treatment in response to cultural impact assessments developed by the relevant iwi, and will use land treatment and disposal methods.

Staff understand that the key aspects identified by iwi include:

- Active involvement in monitoring both before and after the consent is granted;
- Consultation in the proposed WWTP design and disposal method;
- Sharing of information;
- Up-skilling of young people in environmental management and the RMA
- Introduction of aspects of matauranga Māori in monitoring and response to issues.

TAs are encouraged to notify tangata whenua of network overflows, and this will be included in the Best Practice Guide for Network Overflows when this is developed.

7 Budget Implications

7.1 Current year budget

This work was undertaken as BAU within the existing 2017/2018 and 2018/2019 budgets for the Regulatory Compliance Activity

7.2 Future Budget Implications

This work is provided for in the 2018-2028 Long Term Plan, and contributes to the "freshwater for life" and "a healthy environment" outcomes.

Jessica Newlands
Senior Regulatory Compliance Officer

for Compliance Manager - Primary Industry & Enforcement

8 February 2019

APPENDIX 1

Overview of Wastewater in the Bay of Plenty Region

An Overview of Wastewater in the Bay of Plenty Region in 2018

BAY OF PLENTY REGIONAL COUNCIL TOI MOANA

An Overview of Wastewater in the Bay of Plenty Region in 2018

Date: January 2019

Author: Jessica Newlands (Senior Regulatory Compliance Officer – Three Waters)

Bay of Plenty Regional Council
5 Quay Street
PO Box 364
Whakatāne 3158
NEW ZEALAND

Executive Summary

This report is an update to the RD&D Committee on the current situation with regards to municipal wastewater (treatment, conveyance, and discharge) in the Bay of Plenty Region.

There are 16 municipal wastewater treatment plants (WWTP's) servicing 14 communities across the Bay of Plenty Region. There are six territorial authorities (TA's) responsible for the operation and compliance of these WWTP's:

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- Rotorua District Council
- Whakatāne District Council
- Kawerau District Council
- Ōpōtiki District Council

There is one WWTP operated by a community organisation (Kāingaroa Village inc).

There are a significant number of challenges faced by the TA's in the operation of their WWTP's, which can result in failure to comply with their consent conditions. These challenges are experienced across the region, with a number of non-compliances identified throughout 2018, ranging from low-risk or technical non-compliance to moderate non-compliance. These challenges include:

- Increased inflow over the summer months as the local populations dramatically increase,
- Infiltration into the pipe networks,
- Unforeseen mechanical and electrical failures,
- Aging infrastructure (both at WWTP's and networks),
- Expected permanent population increase, and,
- A lack of funding for upgrades.

There were two TA's that were fully compliant with their consent conditions for the 2018 calendar year – Rotorua District Council (Rotorua Lakes Council) and Tauranga City Council.

Network overflows can present a risk to both the environment and the community. There are several factors that can lead to an unauthorised network overflow, including blockage as a result of wipes, congealed fat and roots. Whilst emergency discharges from WWTP's may be provided for by resource consent, network overflows are neither permitted nor consented. A Regional Wastewater Management Group, comprised of representatives from all of the TAs, Toi te Ora and Bay of Plenty Regional Council, was set up in order to develop a best practice guide for the TA's to follow in the reporting and management of overflows. It is envisaged that a best practice guide will be agreed and operational by the end of 2019.

There is a growing understanding around the link between on-site effluent treatment and water quality issues in lakes, rivers and coastal environments, particularly in small communities with a large number of very old septic tank systems, and/or small lot sizes. In response to this, several communities are either working through proposals to connect to reticulation, or have been designated as maintenance zones where more stringent rules can be set around the disposal of private wastewater and maintenance of systems.

Central Government recognises that Councils are facing system wide challenges in the management and capability of their wastewater systems, and the broader delivery of three waters infrastructure. It is Central Government's position that targeted reform of environmental regulation of wastewater services is likely necessary, and have signalled that it will be progressed via a 2019 program to develop policy, to be introduced in 2020.

Council is working closely with Central Government, at a number of levels, to provide input into this programme of work.

Table of Contents

1 Introduction

This report is an update to the RD&D Committee on the current situation with regards to wastewater (treatment, conveyance, and discharge) in the Bay of Plenty Region.

2 Background

Wastewater is any unwanted water that has been affected by human use. Ministry for the Environment (mfE) defines four broad sources of wastewater in New Zealand (Ministry for the Environment, 2003). These are:

- Household systems (including flush toilets, dishwashers, showers, kitchen sinks etc)
- Factories and industry
- Commercial businesses/offices
- Farms and horticulture

Wastewater generated by the sources outlined above must be collected and treated prior to discharging in order to avoid issues in the receiving environment. Potential negative effects arising from the discharge of poorly treated or untreated wastewater can include:

- The spread of pathogens harmful to human health (for example E.coli, cryptosporidium, norovirus and giardia),
- Algal blooms as a result of an increase in nutrients (nitrates, phosphorus, sodium),
- Fish kills and aquatic biota die off,
- Reduction in recreational use, and,
- Offensive odour.

Domestic wastewater generated in urban areas in the Bay of Plenty Region is typically collected by a pipe network owned and operated by a Territorial Authority (TA). This wastewater is treated within a municipal wastewater treatment plant (WWTP) prior to discharging to either; land, surface water, or via an ocean outfall.

Urban wastewater networks may also receive water from industrial sites via trade waste provisions.

Domestic wastewater generated in areas where collection by a TA is not available is generally discharged to land via an Onsite Effluent System (OSET) on individual properties.

3 Municipal wastewater compliance

There are 16 operational municipal wastewater treatment plants (WWTP's) servicing 14 communities across the Bay of Plenty Region. The WWTP at Rotomā is not yet constructed.

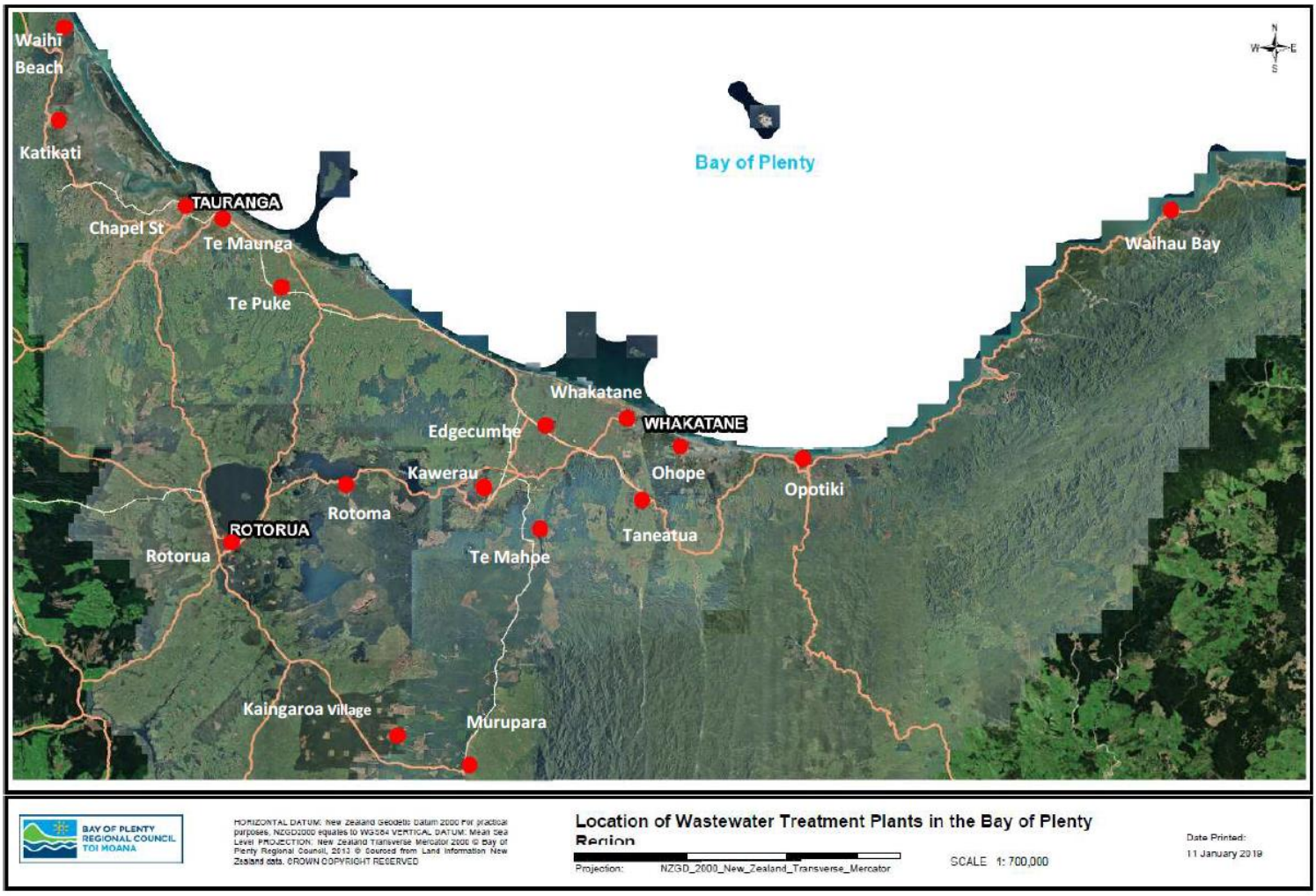


Figure 1: Location of Wastewater Treatment Plants in the Bay of Plenty Region

All of these WWTP's have resource consents associated with the discharge of contaminants. Compliance monitoring involves carrying out inspections to assess some or all active conditions within the resource consent, and reviewing water quality data sent in by the WWTP operators.

The frequency of on-site compliance monitoring (CMs) for each activity is set out in the Resource Management Act (RMA) Section 36 Charges Policy, which outlines the costs associated with maintaining a resource consent. This frequency takes into account the type of activity and its environmental risk profile. Other factors are also taken into account for particular consents, such as the consent holder's compliance history.

In addition to inspections, staff also undertake desktop performance monitoring (PMs), which is the audit of incoming returns from consent holders, such as test results, reports, records and monitoring data.

Both physical compliance inspections and performance monitoring results are assigned an overall compliance grade, which takes into account the risks associated with any non-compliances. These compliance grades are defined in Table 1.

Table 1: Explanation of Compliance Grades

Compliance Grade	Explanation
Complying	Complying with all assessed consent conditions.
Low Risk Non-Compliance	Compliance with most consent conditions. Any non-compliance is of a low risk to the environment.
Moderate Non-Compliance	Non-compliant with some consent conditions, where the environmental consequence of non-compliance is deemed to be minor to moderate risk, and/or has the potential to result in more serious environmental effects.
Significant Non-Compliance	Failure to comply with a number of consent conditions and/or the environmental consequences of non-compliance was deemed to be

3.1 Tauranga City Council (TCC)

3.1.1 Overview of treatment and discharge

There are two major WWTP's operated by TCC in Tauranga City; Chapel Street and Te Maunga. These WWTP's provide screening, primary and secondary treatment via an activated sludge process, and final cleaning via ultra violet light (UV) disinfection. Treated effluent from the Chapel Street WWTP is piped to the Te Maunga site after undergoing the UV disinfection.

Figure 2: Chapel Street WWTP

The combined flows are discharged to an eight hectare retention pond and a four hectare man-made wetland constructed in series. The outflow from the wetland is then pumped out to the Pacific Ocean via a three km long pipeline which extends 950 m off shore.

3.1.2 Resource Consents

There are nine consents are associated with the TCC operated WWTP's. For a summary of these consents please see Appendix A.

3.1.3 Compliance Rating

The TCC operated WWTP's were fully compliant with their consent conditions for the 2018 calendar year. This is based on a total of 35 inspections comprised of 15 performance monitoring returns and 20 site audits. See Figure 3.

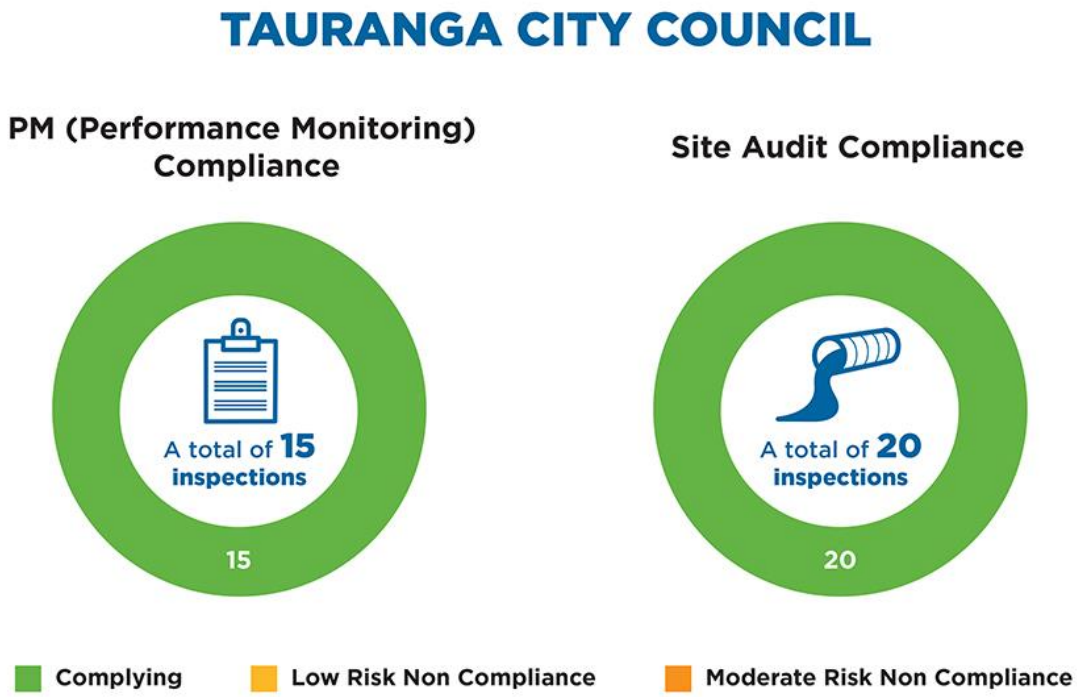


Figure 3: Compliance ratings for the inspections undertaken in 2018

3.1.4 Other Issues/Items to note

A UV disinfection plant was installed and commissioned in late 2015. There were several instances in the 2018 calendar year where the UV plant at Te Maunga shut down due to operational issues. The duration of the shut down and the identified cause are listed in Table 2 below. It must be noted that typically the discharge had been within consent condition exceedance levels prior to UV disinfection.

Table 2: UV Plant Shutdown Details

Duration	Identified cause
8th - 16th May 2018	Seven sleeves were broken/cracked.
17th – 18th October 2018	Strainer blocked, had to bypass the UV plant overnight.
5 pm 28th November 2018 – 12 pm 20th November 2018	A broken sleeve that triggered leakage faults in the plants electrical drivers
23rd December 2018 – present	Unknown

In addition to the UV plant shutdown, there was a power outage to the Te Maunga WWTP on the 11th of October 2018. The inflow was managed via using spare pond capacity and standby generators to prevent an emergency discharge.

The new Te Maunga WWTP thickening and sludge dewatering plant is currently being constructed. This plant is set to replace the sludge pond in accordance with the requirements of consents 62723 and 62878 which require the decommissioning of the sludge lagoon pond.

3.2 Western Bay of Plenty District Council (WBODC)

3.2.1 Overview of treatment and discharge

There are four WWTP's operated by the WBODC. These are located in Katikati, Waihī Beach, Maketū and Te Puke.

The Katikati WWTP on Prospect Drive comprises both primary (step screen) and secondary treatment (two aerated ponds, floating wetlands), a post wetland screen and UV disinfection. The treated wastewater is discharged to the ocean via an outfall 650 m offshore from Matakana Island. See Figure 4.

Wastewater from Waihī Beach, Athenree and Bowentown is piped to the Waihī Beach WWTP located on Capamagian Drive. The treatment is comprised of a single-lagoon sequential batch reactor (SBR), wetland and UV disinfection. The treated wastewater is discharged to land via irrigation.

Figure 4: Floating wetlands at Katikati WWTP

The Te Puke WWTP is located on Gordon Street, adjacent to the Waiari Stream. The treatment system is comprised of a step screen, sequentially activated sludge system, UV disinfection and wetland. The treated effluent is discharged to the Waiari Stream via seep from the wetland.

The Maketū treatment plant takes flows from Pukehina, Little Waihī and Maketū. The treatment system is comprised of a screen, two sequential batch reactor tanks, decant pond, emergency pond and filter. The treated effluent is discharged to land via subsurface drip irrigation.

3.2.2 Resource Consents

There are 8 consents held by WBODC for the operation of the WWTP's and the discharge of the treated product. Some of these have expired however they continue to operate under them while they apply for new consents in accordance with section 124 RMA.

- RM16-0206 was applied for in 2016 to replace the existing consents authorising the operation of the Katikati WWTP (24895 and 30136) which expired in November 2016. This consent was granted in August 2018.

- The Te Puke WWTP is currently going through a re-consenting process. RM16-0204 was publically notified on the 20th November 2018 and is intended to replace the three existing consents which expired in 2016 (24889, 24891 and 30135).

3.2.3 Compliance Rating

The following compliance rating relates to the performance of the WWTP's. The WBODC operated WWTP's were largely compliant with their consent conditions for the 2018 calendar year. There were three low risk non-compliant ratings for the Waihī Beach, Te Puke and Maketū WWTP's relating to late performance monitoring returns.

This is based on a total of 47 inspections comprised of 32 performance monitoring returns and 15 site audits. See Figure 5.

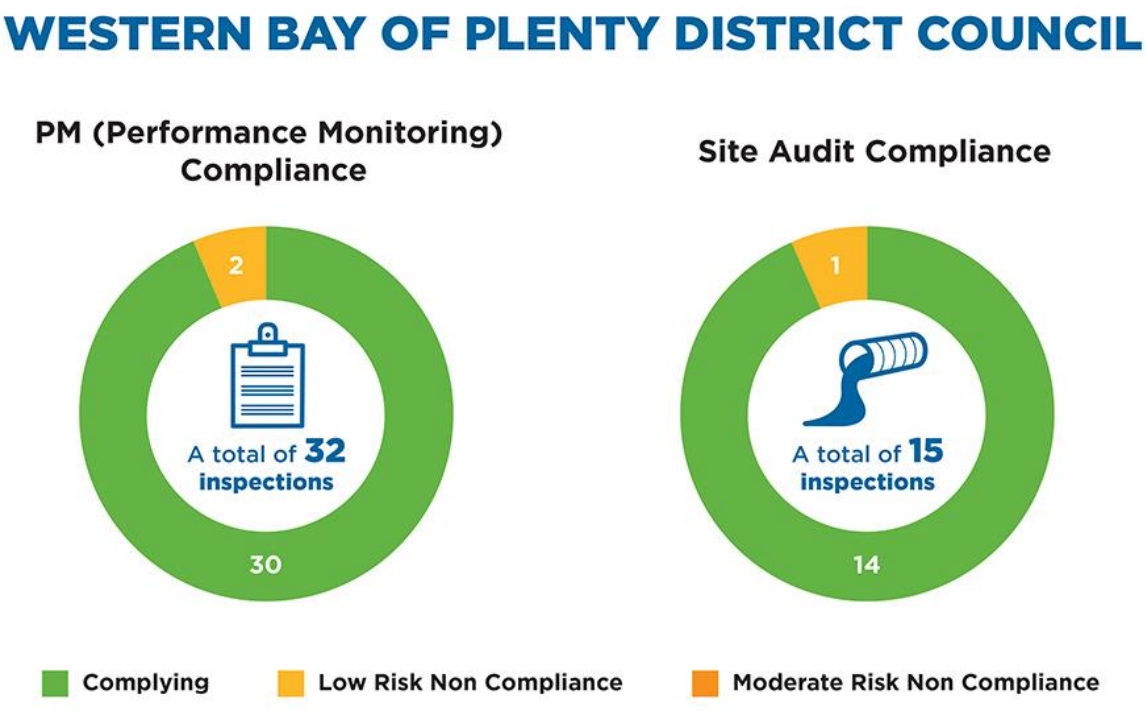


Figure 5: Compliance ratings for the inspections undertaken in 2018

3.2.4 Other issues/items to note

The new consent application (RM16-2014) for the Te Puke WWTP sets out a number of upgrades that will likely need to occur to bring the WWTP up to the required standard for population growth.

The volumes going through the Katikati WWTP triple during summer. This places pressure on the system, which is already significantly undersized. The ocean outfall pipe is in poor condition, and is

to be extensively monitoring and repaired as per the consent conditions. The consent conditions also require the ocean outfall diffuser to be replaced within 24 months of the consent becoming operative (which was August 2018)

The original Katikati WWTP was constructed in 1999 with some upgrades implemented in 2015. These upgrades included:

- Advanced microbial digestion desludging process equipment.
- Improvements to the primary treatment ponds (raining embankments, new weir etc).
- Raising of the wetland embankment.
- New flow control system.
-

In November 2015 floating wetland rafts were installed.

The Waihī Beach WWTP had additional aeration capacity installed in 2013 and the UV disinfection system upgraded in 2015.

3.3 Kawerau District Council (KDC)

3.3.1 Overview of treatment and discharge

The Kawerau WWTP treatment process is comprised of primary screening, clarifiers and centrifuges. The treated wastewater is discharged to land via Rapid Infiltration Basins (RIB's). The plant and RIB's are located on the property of the Kawerau District Council at Spencer Avenue, Kawerau.

Figure 6: The RIB at Kawerau, with some pooling discharge seen to the bottom of the photo

3.3.2 Resource Consents

Kawerau District Council holds three consents relating to the WWTP and disposal of sludge.

3.3.3 Compliance Rating

The KDC WWTP was rated as low risk non-compliant for the performance monitoring section. The water quality returns were not submitted to council for the 2018 calendar year. The site audits found the plant and RIB's to be fully compliant with the consent conditions.

This is based on a total of 12 inspections comprised of 9 performance monitoring returns and 2 site audits. See Figure 7.

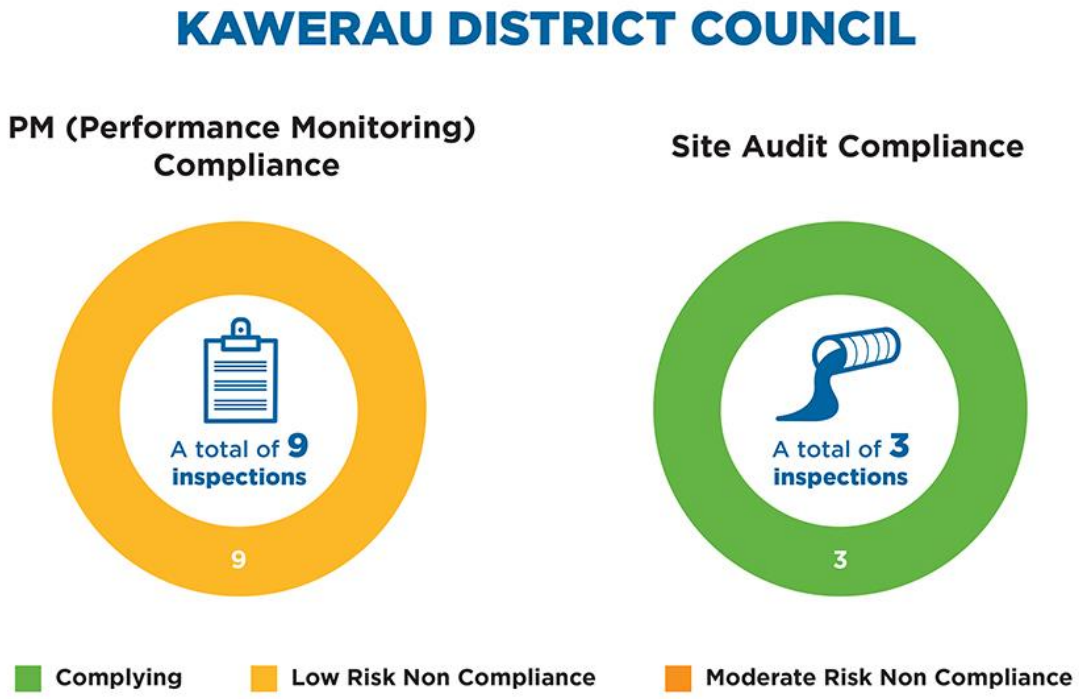


Figure 7: Compliance ratings for the inspections undertaken in 2018

3.3.4 Other Issues/Items to note

The Kawerau WWTP used to discharge to the Tarawera River. This was changed to rapid infiltration basins due to the Tarawera River Catchment Plan change.

3.4 Opotiki District Council (ODC)

There are two WWTP operated by ODC. One serves the urban area of Ōpōtiki and subdivision of Waotahi Drifts, the other serves a small subdivision at Waihau Bay.

3.4.1 Overview of treatment and discharge

The Ōpōtiki WWTP consists of pre-treatment (screen and Imhoff Tank), and an oxidation pond without aeration. The treated effluent is then discharged to land via irrigation on the sand dunes adjacent to the oxidation pond. The screened solids are sent to the vermicomposting operation in Kawerau.

The system located at Waihau Bay consists of a pre chamber, septic tank and a soakage field.

Figure 8: The pond at Opotiki WWTP

3.4.2 Resource Consents

ODC holds three consents related to the WWTPs. More detail on these is provided in Appendix A.

3.4.3 Compliance Rating

The ODC operated WWTP's are largely compliant with their consent conditions for the 2018 calendar year. There were three low risk non-compliant ratings given out Ōpōtiki WWTP relating to elevated copper and zinc levels in the groundwater monitoring returns. These were followed by sediment sampling as per the consent conditions, and no levels of concern were noted.

This is based on a total of 20 inspections comprised of 17 performance monitoring returns and 3 site audits. See Figure 9.

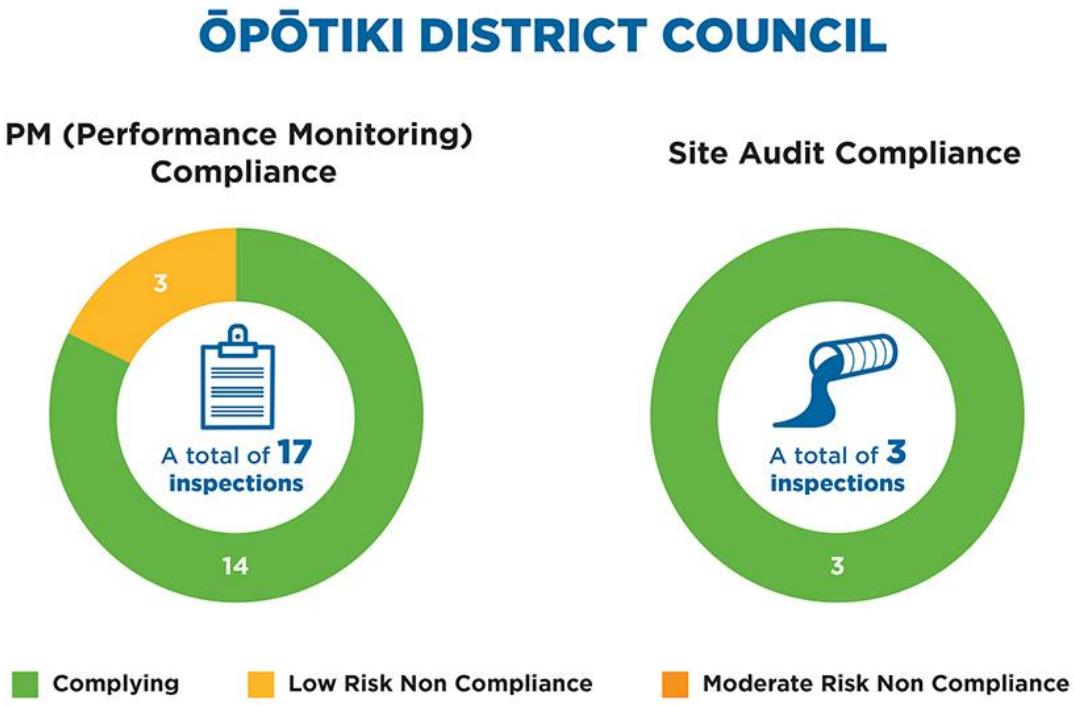


Figure 9: Compliance ratings for the inspections undertaken in 2018

3.4.4 Other Issues/Items to note

Ōpōtiki Township has aging wastewater infrastructure and as a result has high groundwater infiltration and stormwater inflow. ODC are conducting a staged replacement of this infrastructure, combined with relining where possible from 2016 to 2021 which should reduce wet weather flows into the WWTP.

Wastewater flows into the WWTP are expected to increase in the future due to:

- population growth,
- new reticulated areas, and
- industrial growth.

WWTP upgrades are therefore likely required in the future (this will be dependent on the reduction in infiltration achieved by the network replacement and relining). Pattle Delamore and Partners identified three upgrade options ranging from pond based upgrades, to installation of membrane filtration technology. Capital costs were estimated in the range of $1.2 M to $2.7 M depending on the selected option. A SBR treatment plant was also considered with an estimated capital cost of $6.1 M. (Pattle Delamore Partners Ltd, 2016)

At the time of writing this report, no upgrades have been undertaken at the Ōpōtiki WWTP.

3.5 Rotorua District Council (RDC)

3.5.1 Overview of treatment and discharge

The wastewater from the urban area of Rotorua is treated at a WWTP on Te Ngae Road. The WWTP comprises two secondary treatment processes in parallel (a 5 stage Bardenpho and membrane bioreactor), designed to treat both nitrogen and phosphorus using biological nutrient removal. The sludge is either composted onsite, or transported to landfill. The treated effluent is discharged to land via irrigation in the Whakarewarewa Forest.

Figure 10: The Rotorua WWTP (Source; RDC 2018)

The Rotoiti WWTP (located south of SH30) is nearing construction. RLC intend to move the communities of Rotoiti, Rotoehu and Rotomā into a reticulated network in order to improve lake quality. The new plant will comprise of a membrane bioreactor with disposal to rapid infiltration basins.

3.5.2 Resource Consents

RDC currently hold two consents, one for the Rotorua WWTP which is set to expire in 2021, and one for the proposed Lake Rotomā/Rotoiti WWTP.

RDC have applied for resource consent (RM18-0508) to authorise the ongoing operation of the existing WWTP and to authorise the discharge of treated wastewater to freshwater. The proposal includes an upgrade to the WWTP. The consent application has been directly referred to the Environment Court.

3.5.3 Compliance Rating

The Rotorua WWTP is fully compliant with its consent conditions for the 2018 calendar year. This is based on a total of 20 inspections comprised of 18 performance monitoring returns and 2 site audits. See Figure 11.

The WWTP consented under RM16-0384 is not yet operational.

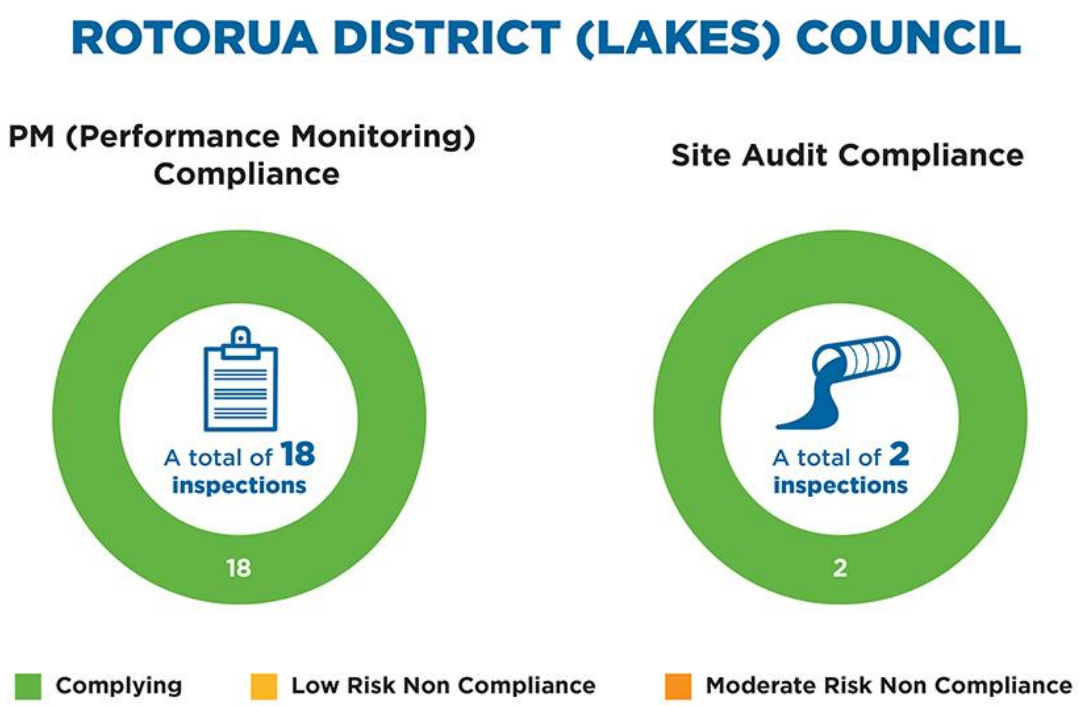


Figure 11:Compliance ratings for the inspections undertaken in 2018

3.5.4 Other Issues/Items to note

In order to optimise the WWTP upgrade for consent RM18-0508 and to ensure the proposed conditions can be met, RDC are currently undertaking an investigation of the sources of infiltration and inflow within the reticulation system. The aim is to reduce this additional flow so that the WWTP can successfully manage and treat the urban wastewater. There are issues with the network, leading to a high rate of infiltration. The main one being that some infrastructure including pump stations is below flood levels. Corrosion due to the geothermal nature of the area is also a significant problem.

3.6 Whakatane District Council (WDC)

3.6.1 Overview of treatment and discharge

Whakatāne District Council operates six WWTP's which treat the discharge from following the urban areas:

- Whakatāne,
- Ōhope,
- Edgecumbe,
- Tāneatua,
- Murupara, and,
- Te Mahoe.

WDC is currently exploring options for the reticulation and treatment of Matatā's wastewater.

The Ōhope WWTP is comprised of; primary screening (screw press), aeration pond, two maturation ponds, a floating wetland and UV disinfection. The treated effluent is discharged to the Pacific Ocean via an outfall pipe 550 m offshore.

The Whakatāne WWTP is a two-stage oxidation pond system with pre-screening (step screen) comprising four ponds covering approximately 23 hectares. The treated effluent is discharged to the Pacific Ocean via an outfall pipe 600 m offshore. See Figure 12.

The Te Mahoe Village treatment and disposal system consists of individual septic tanks for the private dwellings, reticulation, a centralised secondary treatment system (unlined intermittent sand filter) and discharge via sub-surface dripper irrigation to land.

Edgecumbe, Taneautua and Murupara WWTPs comprise of older oxidation pond systems and operate under pre-RMA consents. All of these WWTP discharge to freshwater as detailed further in Appendix A.

Figure 12: The ponds at the Whakatane WWTP

3.6.2 Resource Consents

WDC currently hold 11 resource consents related to the 6 WWTP's. See Appendix A for more detail on these. Several of these consents will come up for renewal in the next 10 years.

3.6.3 Compliance Rating

There was a range of compliance ratings given out to the WDC operated WWTP's in the 2018 calendar year. These relate to the issues described in detail in Section 3.6.4. Notably the Ōhope WWTP received a moderate non-compliance rating due to discharging on both the oncoming and outgoing tides, and consistently exceeding the consented discharge quantity. Other low risk non compliances relate to missing returns and contaminant concentrations in the discharge exceeding consent requirements for short periods of time. See Figure 13

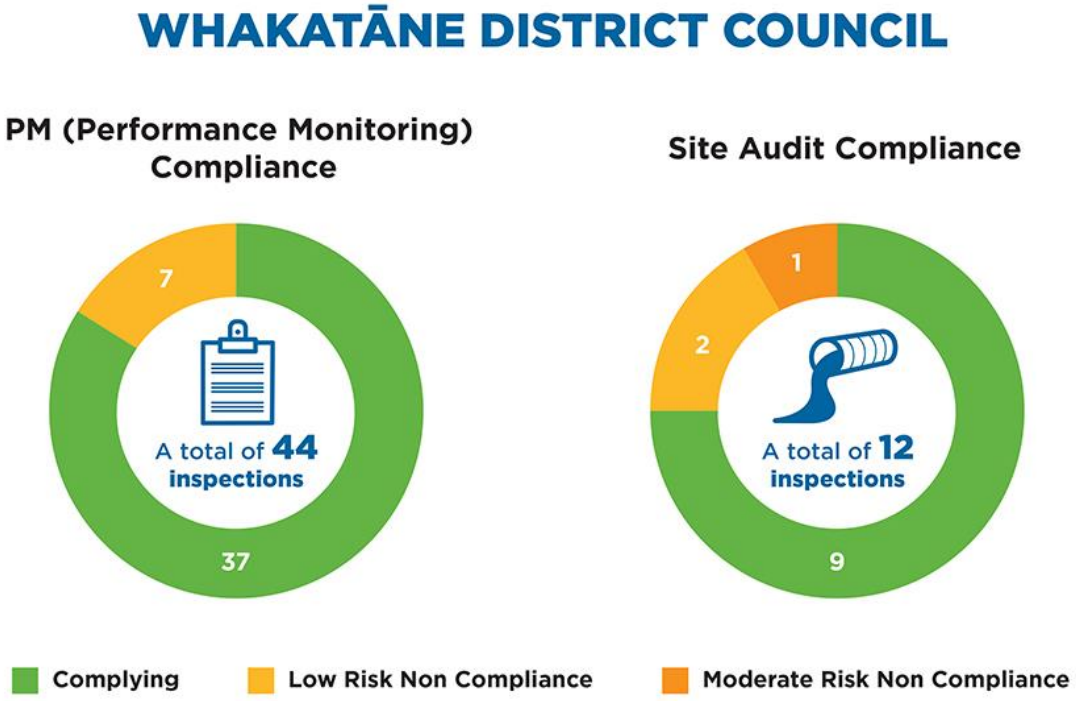


Figure 13: Compliance ratings for the inspections undertaken in 2018

3.6.4 Other Issues/Items to note

Edgecumbe

The Edgecumbe wastewater pipe network was significantly damaged by the 1987 earthquake and subsequent land subsidence. The cracks and faults within the network have been largely left unrepaired, leading to a high incidence of infiltration of groundwater into the system. Whakatāne District Council estimates that there is up to three times more water entering the system than expected for a town the size of Edgecumbe. The repair of the network has been included in the Long Term Council Community Plan.

The Operative Regional Plan for the Tarawera River Catchment covers the catchment of the Tarawera River including all its sub-catchments, and Upper Tarawera Lakes and their catchments, but excludes Lake Rerewhakaaitu and its catchment. The Plan was developed due to low water quality and abstraction concerns and was made operative on 2004. The plan was reviewed by BECA in 2015 as part of a 10 year review requirement. This review highlighted several areas where improvements can be made, significantly in terms of the review of non – compliant consents and the introduction of limits consistent with the National Policy Statement for Fresh Water.

The discharge from the Edgecumbe WWTP to the Tarawera River via Omeheu Canal has a history of continual non-compliance due to the ponds discharging volumes higher than consented limits. In addition Iwi are strongly opposed to the discharge of human waste into the Tarawera River. The discharge consent expires in 2026.

Ōhope

Ōhope WWTP has ongoing non-compliance with Resource Consent number 65984 conditions 2.1 and 6.3. These conditions relate to discharge quantity and discharging on the outgoing tide respectively. During periods of high demand, especially during summer the WWTP discharges on both the oncoming and outgoing tides, and consistently exceeds the consented discharge quantity. Summer peaks are provided for in the consent conditions, however during some periods these are also exceeded.

WDC are currently obtaining technical advice, and are working with BOPRC to obtain a variation to the consent in order to permit these discharges.

At the time of writing this report, Ōhope WWTP was near capacity in their ponds. Since the 27th of December at 1pm the operation team have been pumping continuously to keep up with flows and to try to reduce the pond levels down to design operational level. The UV plant is fully operational and samples have been taken to ensure the discharge is still of a high quality.

3.7 Kāingaroa Village Inc

3.7.1 Overview of treatment and discharge

Kāingaroa Village is located in the Kāingaroa Forest near Rotorua. The WWTP has been in place since the 1960's. The WWTP is comprised of a coarse screen, pit (where large material and grit is removed manually), a two chamber balancing pond and two oxidation ponds in series. The discharge is to land in the adjoining forestry block.

3.7.2 Resource Consents

The WWTP operation and associated discharge is covered by consent 66821 which expires on the 30th of September 2021.

3.7.3 Compliance Rating

Kāingaroa Village WWTP has not yet been assessed for the 2018 calendar year at the time of writing this report. This will be done as a priority in 2019. It must be noted that the returns for the 2017 and 2018 calendar years have not been submitted to BOPRC.

3.7.4 Other Issues/Items to note

The Kāingaroa oxidation ponds require de-sludging and do not provide required treatment levels. There is however no funding available to provide any upgrades or to de-sludge the ponds. Kāingaroa Village Inc requires substantial support going forward.

4 Network Overflows

There is currently no standard code of best practice outlining the procedure for a TA to take in the event of a network overflow. Despite of this, there are several steps that BOPRC expect TA's to undertake in order to protect the environment, and the public from an unauthorised overflow.

These expectations are as follows:

- Notify BOPRC, relevant Iwi and Toi te Ora immediately.
- Fence off the affected area.
- Clean up the affected area with the use of a sucker truck where necessary,
- Erect signs to warn the public of the overflow.
- Take samples if the overflow has entered water both during and after the event to determine the extent of possible contamination.
- Clear the pipe blockage and jet the pipes.
- If necessary, do a pamphlet drop in the surrounding area, especially if the blockage was due to wipes and fat to educate the public about these issues.

TCC has consistently good reporting on network overflows.

There have been issues with the reporting from other TA's, these include:

- Notification submitted significantly after the incident occurred (days and months),
- Notification was not rung through to the pollution hotline,
- High E Coli results up stream of the discharge were not followed up at the time,
- A lack of signage and fences around the affected area.

4.1 Regional Wastewater Management Group

The Regional Wastewater Management Group comprises representatives from Bay of Plenty Regional Council, Tauranga City Council, Western Bay of Plenty, Whakatāne, Rotorua, Kawerau and Ōpōtiki District Councils and Te Toi Ora Public Health

The purpose of the group is:

- To promote and document Bay of Plenty-wide best practice in responding to wastewater overflows.
- To establish and standardise regional best practice for the response and reporting of wastewater overflow events.
- To work towards best practice for mitigating overflow events.
- To create a non-statutory forum that fosters cooperation and a unified strategic approach to the long term management of wastewater overflows.

The group meet every second month and are developing a Regional Best Practice Guide for Managing Wastewater Overflows. The aim is to have the draft guide completed by the end of 2019 for subsequent sign-off by member organisations.

The Regional Best Practice Guide for Managing Wastewater Overflows will be developed by an external party. The group envisage that the RFP (Request For Proposal) for this work will be sent out to a selected group of consultants by the end of this month. The cost of this work will be covered by all TA's and BOPRC fairly.

4.2 Unauthorised Discharges Summary and WWTP Emergency Discharges

Discharges can occur from either the sewerage network (network overflows), or as emergency overflows from the WWTP itself due to inflows that exceed the capacity of the treatment plant. The main causes of network overflows are:

- Blockages from fat,
- Blockages from wipes,
- Blockages/damage from tree roots,
- Broken/damaged pipes, and
- Extreme wet weather events leading to infiltration exceeding the design capacity of the pipe.

Figure 14 provides a breakdown of the causal factors behind the 24 network overflows in Tauranga City last year. A blockage created by congealed fat was the most common cause of network overflows in Tauranga in 2018.

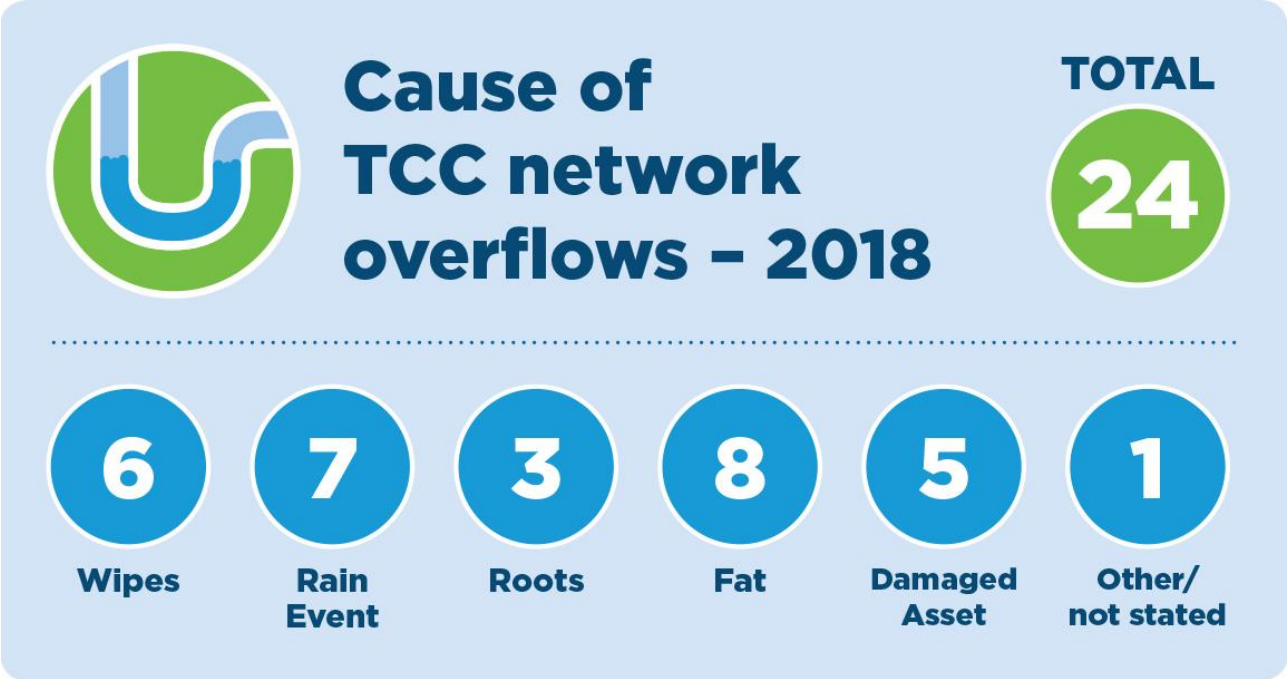


Figure 14: Cause of network overflows in the Tauranga City area

The following Table 3 shows the number of network overflows recorded by the TA's during the 2018 calendar year. Note that these overflows have been limited to where the discharge is to water, or to land where it may enter water. Please see Appendix B for a full breakdown. (Note that as there is no best practice guideline for the reporting of overflows, the information supplied by each TA varies). Only ODC reported no network overflows for the 2018 calendar year.

Table 3: Number of network overflows, and emergency WWTP discharges in 2018

Territorial Authority	Number of network overflows that may have entered water	Number of WWTP overflows/emergency discharges
TCC	24	1
WBODC	27	1
RDC	16	2
ODC	0	1
KDC	3	0
WDC	2	1
Kāingaroa Village Inc	Unknown	Unknown

As shown in Table 3 TA's reported only a small number of WWTP emergency discharges in the 2018 calendar year. Tāneatua, Murupara, Edgecumbe and Ōhope WWTP's all had to discharge flows over the consented limits due to inflows exceeding the capacity of the WWTP's however these are not considered emergency overflows (these are highlighted in grey in the full table in Appendix C). Please see Appendix C for more detail.

4.3 Network Overflow (Unauthorised Discharges) Case Study

WBOPDC own a parcel of land that adjoins the Te Puke WWTP, which they lease for grazing of livestock. On 27 April 2018, the lease was working with a fencing contractor on the site and rammed a strainer post into the ground in preparation of a fence that was to be installed. It later became apparent that the post had pierced a section of sewage pipe that leads to the WWTP, which resulted in a discharge of untreated wastewater into a nearby drain, which discharges into the Kaituna River.

WBOPDC notified BOPRC and arranged for sucker trucks to remove effluent from the drains. Due to parts not being available, WBOPDC's contractor undertook a series of temporary repairs along the section of pipe until a permanent fix could implemented. On 10 May 2018, the temporary repairs failed, resulting in a further discharge of untreated wastewater into the drain. WBOPDC again notified BOPRC, installed a bund in the drain, and removed effluent using a sucker truck.

BOPRC undertook a detailed investigation into this matter, and determined that WBOPDC, the contractor, and the leasee all had some level of responsibility for the incident but ultimately took the best practicable steps available to them at the time. As such, no enforcement was undertaken; however, a summary of the investigation and recommendations to prevent this happening again was provided to WBOPDC.

Figure 15: Water sampling of the discharge into the stream

Figure 16: Pipe repair undertaken

5 Position of Central Government

Cabinet Paper

On the 20th of November 2018 Central Government released the cabinet paper titled "Future state of the three waters system: regulation and service delivery." The cabinet paper outlines a process for decision making on the future state of the three waters. Notably emphasis is put on Council wastewater systems which are facing system-wide challenges. The paper states that:

"The best evidence available indicates that council wastewater systems are facing similar system-wide challenges as for drinking water, spanning funding challenges to core infrastructure, variable capability, weaknesses in regulation, and inadequate system stewardship. Wastewater plants are impacting on freshwater and coastal water quality, and sewage overflows are occurring at a frequency that is no longer acceptable for communities. Māori in particular have a strong aversion to the direct discharge of wastewater to water, often regardless of the degree of treatment prior to discharge."

The paper outlines several regulatory compliance issues which relate to wastewater. In summary, these are:

- An absence of a defined national framework for regulating the performance of wastewater services.
- A deficiency in public reporting on the environmental performance of WWTP's and the extent to which they comply with discharge consents.
- A large number of WWTP's legally operating on expired consents.
- A lack of formal enforcement action on the part of regional councils where consent conditions are breached.
- No quality assurance procedures for the safe production of biosolids from sewage sludge, and social and cultural resistance to the safe re-use of biosolids.

Central Government considers that targeted reform of environmental regulation of wastewater services is necessary given the perceived challenges affecting wastewater systems. To carry forward reform the Paper sets out the following time table and scope:

- In June 2019 the Ministers of Local Government, Health and Environment will report back to cabinet with detailed policy proposals for the three waters reform. Specific to wastewater, the policy proposals should include a targeted change to the environmental regulation to lift environmental performance within the existing framework of the Resource Management Act 1991. Measures should also be included which will afford greater transparency to the operation of wastewater systems.
- In late 2019 the Minister of Local Government will report back to Cabinet with detailed policy proposals for service delivery arrangements.
- In late 2019 the Minister of Local Government, Health and Environment will report back to Cabinet with detailed policy proposals for the economic regulation of three waters services.
- In late 2019 the Minister of Local Government, Health and Environment will report back to Cabinet with proposals to improve oversight and stewardship across the three waters system
- Legalisation is likely to be introduced in 2020.

There are preferred three high level service delivery arrangements which the cabinet paper outlines.

- Proceed with regulatory reform only, with voluntary, sector-led reforms to service delivery arrangements.
- Establish a three waters fund to support voluntary service delivery improvements.

- Create an aggregated system of dedicated, publicly owned drinking water and wastewater providers.

Cost estimates for upgrading Wastewater Treatment Plants

The National Policy Statement for Freshwater Management (NPSFM) requires Regional Councils to set objectives in order to improve water quality and quantity. This requirement, combined with Māori and the public's desire to reduce the discharge of sewage to freshwater and the coast, is likely to place pressure on Councils to upgrade WWTP's.

The Department of Internal Affairs commissioned a report from GHD and Boffa Miskel titled "Three Waters Review – Cost Estimates for upgrading Wastewater Treatment Plants to meet Objectives of the NPS Freshwater" (hereafter referred to as "the report") in order to gauge the potential cost of upgrading WWTP's so that the downstream catchments achieve the "B" water quality state under the NPSFM.

A pre assessment was undertaken to determine the level of upgrade necessary to achieve the required quality outcomes. The cost estimates presented in the report therefore are based on an upgrade of all relevant WWTP's to a Biological Nutrient Removal (BNR) - Activated Sludge Plant with Ultra Violet (UV) disinfection.

Note that the report does not address WWTP's that discharge to coastal receiving environments.

There are a total of four WWTP in the Bay of Plenty Region that discharge to freshwater (lake or river). The Rotorua WWTP will when the new consent is granted. The remainder discharge to either land or coastal receiving environments. The report incorrectly states that the BoP has six WWTP's that discharge to freshwater. The costs contained in the report for the BoP are therefore incorrect. The costs presented in the report have been included anyway for reference. **The report estimates the total regional (BoP) capital cost to be $55-$83M and operating cost to be $1.2 – 1.8M per annum.**

The BoP currently has one plant (Te Puke) that meets the recommendations of the report. The Rotorua WWTP will meet the requirements if the current consent application is approved. The majority of other plants do have UV treatment and advanced nutrient removal systems in place but do not go far enough to meet the criteria recommended by the report.

It must be noted here that WWTP's can achieve the desired water quality outcomes, albeit with a lower level (or alternative method) of treatment. A good example of this is Kawerau, which achieves a similar level of discharge water quality, whilst employing a far more simple method of treatment. Therefore the upgrades and costing set out in the report are not necessarily appropriate.

See Table 4 below for a summary of the WWTP's in the BoP region that discharge to freshwater.

Table 4: WWTP's in the BOP that discharge directly to freshwater (note these do not include discharge to land where it may enter water)

Plant Location	Discharge	Population Serviced	Population Category	WWTP standard met?
Te Puke (WBDC)	Freshwater (Waiari Stream)	8,144	Medium	Yes
Edgecumbe (WDC)	Freshwater (canal and Tarawera River)	1,638	Minor	No – consent expires 1 Oct 2026
Tāneatua (WDC)	Freshwater (Whakatāne River)	786	Minor	No – consent expires 1 Oct 2026
Murupara (WDC)	Freshwater (Rangitiaki River)	1,656	Minor	No – consent expires 1 Oct 2026

6 Proposed Reticulation Zones

There are several wastewater reticulation zones proposed throughout the Bay of Plenty. These zones are a combined effort by a number of agencies to improve water quality by transferring communities off existing OSET schemes to reticulation.

On-site effluent treatment systems include:

- Septic tanks
- Aerated wastewater treatment systems (AWTS)
- Greywater
- Waterless composting toilets
- Alternative toilet systems, including incinerating toilets and dehydrating toilets
- Pit latrines

Plan change 14 (OSET) to the Regional Natural Resources Plan proposes to require that the following high risk areas are reticulated:

- Mamakau Township,
- Lake Tarawera Settlement area,
- Lake Rotomā – Along State Highway 30 from Matahī Road to Oxford Road
- Lake Rotoiti – Hauparu Bay, Te Ruato Bay, Gisborne Point, Rotoi and Hinehopu
- Lake Rotoehu – Loop Road, School and campground, Ngamimiro Bay, Ōtautū Bay
- Matatā,
- Tara Road, Pāpāmoa,

6.1 East Rotoiti/Rotomā Sewerage Scheme

The proposed Rotoiti Wastewater Treatment Plan (WWTP) was granted consent on the 7th of May 2018 following an Environment Court Decision. The WWTP has capacity to treat the discharge from the communities of Rotoiti and Rotomā, as well as Rotoehu.

A pre-treatment system is required for each property to be connected to the WWTP. This was a requirement of the resource consent conditions and the land lease agreement. A STEP pre-treatment system for the Rotomā community was agreed on in April 2017. Rotomā No.1 Trust has approved the STEP installation on their land under a global approval. The pre-treatment system for the Rotoiti community is currently undergoing final design and will be sent out for tender shortly.

The Rotoma phase of the scheme is being done first to meet with the Ministry of Health Funding Subsidy (concern for drinking water) requirement to demonstrate material project progress in 2018/19 year.

All Iwi under Ngāti Pikiao Environmental Society agreed to the scheme and have signed a Heads of Agreement with Rotorua Lakes Council in late 2017. Ngāti Pikiao is the Iwi comprising the confederation of hapu that surround Lakes Rotoiti/Rotoehu, Rotomā and Okere (the Waterways.).

Approximately 24 million dollars (of the total estimate for the project of 35 million dollars) has now been committed to contracts. The project team intends to fit all remaining works within the residual balance of 11 million dollars. The remaining works include tendering for the Rotoiti pre-treatment system and finalising the design of the Rotoiti main trunk pipelines. Maintaining the above budget would mean that the net capital costs for each of the ratepayers in the scheme would be kept around the $14,100 estimated in the 2017/18 RDC Annual Plan.

6.2 Matatā Progress

The Regional Council is continuing to work with Whakatāne District Council to progress options for a reticulated sewerage system for the Matatā community. Funding assistance was allocated in the BOPRC Long Term Plan 2015-2025 for Year 2 (2016/17) towards the cost of the capital works however this did not get spent.

There was a community meeting in September 2018. The residents who were present made it very clear that they wanted reticulation to be provided as a matter of urgency. There were a number of suggestions from residents as to how this could be achieved. A joint working group including staff from BOPRC and WDC are looking to progress those suggestions.

6.3 Mamaku Township

There are a number of challenges with providing on-site wastewater disposal in Mamaku. This includes poorly drained peat soils, a rhyolite confining layer, small sites and old poorly maintained systems.

Mamaku is currently a Maintenance Zone under the OSET Plan. Draft Plan Change 14 intends to retain Mamaku as a maintenance zone. Draft Policy OSET 2 lists Mamuku as one of the "Communities where on-site effluent treatment systems present a high risk to the environment, and where sewage reticulation is the preferred option."

A community meeting was held on Sunday 4 November 2018 following a meeting and presentation with the Rotorua Rural Community Board on 15 October 2018.

Since the draft plan change was made available for comment the following 3 component process has been agreed with RLC for Mamaku:

- A work programme to identify a long-term solution for Mamaku (e.g. investigation, options, costs, etc).
- Include 'holding pattern' rules for Mamaku in Proposed Plan Change 14 (probably a 'pump-out' zone that is more cost-effective in the short term and recognises the limited incomes of many residents)
- Review of the rules once the long-term solution has been identified.

BOPRC and RLC will collaborate on a comprehensive report for Mamaku. This includes the potential effects of the nutrients discharged by wastewater systems on Lake Rotorua Nutrient Budgets.

6.4 Tara Road, Pāpāmoa

This is an area of poorly drained peat soils with low transmissivity and high water table. Many of the wastewater systems are unsuitable, poorly installed and not maintained. It is expected that by including this area as a Maintenance Zone the performance of systems can be improved and where problems are identified they can be repaired.

6.5 Lake Tarawera Settlement area

Lake Tarawera has a declining Trophic Level Index. One of the few options available to reduce nutrient inputs to the Lake is by reticulating this community. There is broad support for this proposal and there are some subsidies available.

7 Conclusion

The discharge of untreated or ineffectively treated wastewater, and the gases produced by wastewater can have negative effects on both the environment itself and the people that live in it.
All TA's in the Bay of Plenty Region face system-wide challenges in the operation and management of both their WWTP's and sewage networks. These challenges combined with a lack of funding, impact negatively on the ability of the WWTP's to meet their resource consents. Both BOPRC and Central Government recognise this as an issue. BOPRC are taking steps to;

- Improve the relationship between BOPRC and the TA's,
- To increase and set best practice for the reporting of overflows,
- To designate areas as maintenance zones,
- To provide support for reticulation zones, and,
- To ensure that compliance monitoring is comprehensive and up to date.

There are two districts that have fully compliant WWTP's, and there are improvements being made to overflow reporting. This indicates that compliance is achievable, and should be aimed for in the wider BOP to ensure that the environment and the people of our region are protected from the potential negative effects of municipal WWTP's.

8 Works Cited

GHD and Boffa Miskell. (2018). *Three Water Review - cost estimates for upgrading wastewater treatment plantss to meet objectives of the NPS Freshwater.*

Ministry for the Environment. (2003). *Sustainable Wastewater Management: A handbook for smaller communities.* Wellington.

Office of the Minister of Local Government. (2018). *Future state of the three waters system: regulation and service delivery.* Wellington.

Pattle Delamore Partners Ltd. (2016). *Opotiki Wastewater Treatment Plant Issues and Options Investigation.* Opotiki District Council.

9 Appendix A – Resources Consent Tables

Tauranga City Council			
WWTP	**Consent Number**	**Purpose**	**Consent Expiry**
Chapel Street	62722	To discharge odorous gases and other gases as by-products of biological breakdown and stripping of sewage such as sulphides, amines and organic fatty acids from the Chapel Street Wastewater Treatment Plant located at Chapel Street, Tauranga.	30 April 2040
	62882	For the purpose of discharge of secondary treated and disinfected wastewater overflow into the Coastal Marine Area (Tauranga Harbour) during extreme wet weather.	30 April 2040
	62883	To provide for the ongoing occupation of the Coastal Marine Area and use of the Chapel Street harbour overflow structure.	30 April 2040
	62886	For the purpose of discharging secondary treated and UV disinfected reclaimed water from the Chapel Street Wastewater Treatment Plant by spray irrigation to various sites in the Tauranga District.	30 April 2040
Te Maunga	62878	For the purpose of discharging secondary-treated and disinfected wastewater from the Chapel Street Wastewater Treatment Plant and secondary treated wastewater from the Te Maunga Wastewater Treatment Plant into the Coastal Marine Area. To provide for the ongoing occupation of the coastal marine area by the Ōmanu ocean outall structure and the potential retrofit (relining) of the structure.	30 April 2040
	62723	To discharge odorous gases and other gases as by-products of biological breakdown and stripping of sewage such as sulphides, amines and organic fatty acids from the Te Maunga Wastewater Treatment Plant located at Tip Lane, Mount Maunganui.	30 April 2040
	62881	For the purpose of discharging seepage of treated wastewater from oxidation ponds into Rangataua Bay.	30 April 2040
	62885	For the purpose of discharging secondary-treated and disinfected wastewater overflow in extreme wet weather conditions to the Tauranga Harbour via an unnamed tributary of the Mangatawa drain.	30 April 2040
	67894	To authorise and set conditions on earthworks for the creation of trenches on the Te Maunga Landfill, Tip Lane, Tauranga and the deposition of anaerobically digested and stabilised sludge into the trenches.	31 July 2024

Western Bay of Plenty District Council			
WWTP	Consent Number	Purpose/s	Consent Expiry
Katikati	RM16-0206	- The purpose of this resource consent is to authorise and set conditions on the occupation of space in the coastal marine area for the discharge pipeline, diffuser outlet and buoy. - The purpose of this resource consent is to authorise and set conditions on the erection/ placement of a new diffuser outlet and buoy in the coastal marine area (CMA) and the associated disturbance in the CMA. - The purpose of this resource consent is to authorise and set conditions on the disturbance, deposition and excavation in the coastal marine area in the coastal marine area associated with undertaking discharge infrastructure investigations or maintenance - The purpose of this resource consent is to authorise and set conditions on the discharge of contaminants to air from the Katikati Wastewater Treatment Plant (WWTP). - The purpose of this resource consent is to authorise and set conditions for the discharge of treated wastewater to the coastal marine area (CMA) from the Katikati Wastewater Treatment Plant (WWTP).	31 July 2018
Waihī Beach	66950	- For the purpose of discharging tertiary treated wastewater (TWW) to water or onto land in circumstances which may result in that TWW entering water on the consent holders property at Capamagian Drive, Waihī Beach.	31 May 2047
	30137	- To discharge odorous gases and other gases as by-products of biological breakdown and stripping of effluent such as sulphides, amines and organic fatty acids from the Waihī Beach Sewage Treatment Plant located on Capamagian Drive, Waihī Beach.	31 May 2016
	24940	- For the purpose of discharging seepage from aerated lagoons and wetlands, associated with the Waihī Beach Sewage Treatment Plant, to ground.	31 May 2016
	66279	- To authorise and set conditions on the discharge of Grade “Bb: Biosolids to land.	
Te Puke	24891	- For the purpose of discharging wastewater from a treatment system consisting of activated sludge, constructed wetlands and ultraviolet disinfection, via wetland seep to the Waiari Stream.	30 November 2016
	30135	- To discharge potentially odorous gases from the Te Puke Sewage Treatment Plant located on Gordon Street Te Puke.	30 November 2016
	RM16-0204	- The discharge of treated wastewater from the	Going

		Te Puke Wastewater Treatment Plant to riparian wetlands and diffuse discharge to the Waiari Stream. - The discharge of odorous gases to air arising from the Wastewater Treatment Plant. - Modification of the Riparian Wetland for Installation of the Diffuser Pipe - Temporary discharge of sediment containing Water to the Waiari Stream during installation of the diffuser pipe and rock chamber and during maintenance activities.	through public notification
Maketu	65977	- For the purpose of discharging treated wastewater (TWW)by way of sub-surface irrigation from a Wastewater Treatment Plant (WWTP) to be constructed on site. - To authorise and set conditions for the earthworks associated with the installation of a wastewater treatment plant on site.	11 August 2045
	66314	- To authorise and set conditions for the discharge of odorous gases to air from the Maketū wastewater treatment scheme , including associated sewage pump stations and disposal field.	19 August 2045
	66988	- To authorise and set conditions on the use of a mixture of dewatered primary wood waste (cellulose) as well as dewatered municipal bio-solids from the Maketū Wastewater Treatment Plant for a vermicomposting operation. The purpose is also to authorise and set limits for the discharge of contaminants to land and the discharge of odorous gases to air from the vermicomposting operation.	28 February 2022

Kawerau District Council			
WWTP	**Consent Number**	**Purpose**	**Consent Expiry**
Kawerau WWTP	65081	For the purpose of discharging municipal sewage from the Kawerau District Council Wastewater Treatment Plant to land, as well as discharging odours to air from the WWTP and a group of rapid infiltration basins. All sources of discharge are located on the property of the Kawerau Disrict Council, Spencer Avenue, Kawerau.	31 October 2032
	64687	For the purpose of carrying out vermiculture to process primary screenings and centrifuge solids from the sewage plant, at Spencer Avenue, Kawerau.	30 April 2017
	67265	To authorise and set conditions for the discharge of contaminants to land and the discharge of odorous gases to air from the vermicomposting of septage waste.	31 October 2032

Ōpōtiki District Council			
WWTP	**Consent Number**	**Purpose**	**Consent Expiry**
Ōpōtiki WWTP	63179	For the purpose of discharging secondary treated effluent via soakage trenches to land adjacent to the Waioeka Estuary, Ōpōtiki.	31 July 2025
	63594	For the purpose of discharging sewage milli-screenings from the Ōpōtiki Sewage Treatment Plant to land.	31 July 2025
Waihau Bay	63013	For the purpose of discharging treated sewage to ground soakage on the permit holder's property at Te Moana Subdivision, Otutehapari Road, Waihau Bay, Opotiki.	03 April 2030

Rotorua District (Lakes) Council			
WWTP	**Consent Number**	**Purpose**	**Consent Expiry**
Rotorua WWTP	60739	- For the purpose of discharging secondary treated effluent via irrigation sprinklers to land within the Whakarewarewa State Forest, and - For the purpose of placement, use and maintaining of a series of v-notch weirs, a concrete structure and a concrete flume in or on the bed of the Waipa Stream and associated tributaries for water monitoring, and - For the purpose of discharging odours and aerosols from secondary treated effluent via irrigation sprinklers to air within the Whakarewarewa State Forest	31 July 2021
	RM18-0508		Not yet granted – With Environment Court
Rotoiti/Rotoma	RM16-0384	The purpose of this resource consent is to authorise and set conditions for the discharge of: - contaminants to air from the Rotoiti Wastewater Treatment Plant (WWTP) and Land Disposal System (LDS). - contaminants to land from the Rotoiti Wastewater Treatment Plant (WWTP) to the Land Disposal System (LDS). - sediment contaminated stormwater to land associated with the earthworks for the construction of the Rotoiti Wastewater Treatment Plant (WWTP) and the Land Disposal System (LDS). To authorise and set conditions on earthworks associated with the construction of the Rotoiti Wastewater Treatment Plant (WWTP) and the Land Disposal System (LDS).	31 July 2052 (permanent discharges) 31 July 2027 (Earthworks and temporary discharge)

Whakatāne District Council			
WWTP	**Consent Number**	**Purpose**	**Consent Expiry**
Whakatāne	62659	To discharge odorous gases and other gases as by-products of biological breakdown and stripping of sewage such as sulphides, amines and organic fatty acids from the Whakatane Sewage Treatment Facility located at Kope Canal Road, Whakatane.	30 October 2026
	20368	For the purpose of discharging effluent from oxidation ponds serving the Whakatāne Urban Area.	1 October 2026
Ōhope	60569	To discharge aerosols, odorous gases and other gases as by-products of biological breakdown and stripping of sewage, such as sulphides, amines and organic fatty acids from the Ohope Wastewater Treatment Plant located at Wainui Road, Ohope.	31 July 2021
	65984	To authorise and set conditions for the discharge of treated effluent from the Ohope and Port Ōhope Township wastewater treatment plant comprising of aeration lagoon, oxidation ponds and maturation cells via an ocean outfall into the Pacific Ocean.	30 September 2035
Edgecumbe	20702	For the purpose of discharging effluent from oxidation ponds serving the Edgecumbe Community Council area and situated at Edgecumbe Soldiers Road.	1 October 2026
	62657	To discharge odorous gases and other gases as by-products of biological breakdown and stripping of sewage such as sulphides, amines and organic fatty acids from the Edgecumbe Sewage Treatment Facility located at Edgecumbe Soldiers Road, Edgecumbe.	30 September 2026.
Tāneatua	20049	To discharge waste water from oxidation ponds to be constructed at Tāneatua into the natural waters of the Whakatāne River.	1 October 2026
	62658	To discharge odorous gases and other gases as by-products of biological breakdown and stripping of sewage such as sulphides, amines and organic fatty acids from the Taneatua Sewage Treatment Facility located at Taneatua.	30 September 2026.
Murupara Township	20778	For the purpose of discharging effluent from oxidation ponds receiving wastes from Murupara Borough and domestic wastes from the Kaingaroa Logging Company at Murupara.	1 October 2026
	62656	To discharge odorous gases and other gases as by-products of biological breakdown and stripping of sewage such as sulphides, amines and organic fatty acids from the Murupara Sewage Treatment Facility located at Murupara	30 September 2026.
Te Mahoe	RM16- 0143	The purpose of this resource consent is to authorise and specify conditions associated with	30 June 2051

		the discharge of treated wastewater to land via shallow sub-surface dripper irrigation from the Te Mahoe Wastewater Treatment Plant.	

Kāingaroa Forest Village Inc.			
WWTP	**Consent Number**	**Purpose**	**Consent Expiry**
Kāingaroa Village	66821	For the purpose of authorising the discharge of wastewater to land and discharge of contaminants to air from the Kāingaroa Forest Village oxidation ponds.	30 September 2021

10 Appendix B – Network Overflow Summary

ROTORUA DISTRICT COUNCIL					
DATE	LOCATION	DETAILS	EFFECT	TASKS UNDERTAKEN	NOTES
26/07/18 17:41	NORRIE PL	SEWAGE- BLOCKAGE, SEWERMAIN	-	-	HIBLASTED TO CLEAR BLOCKAGE IN SEWER MAIN. U/S M/H OVERFLOWING PROFUSLY INTO STREAM. TOO DARK TO ATTEMPT SITE CLEAN UP - WILL DO IN MORNING
08/08/18 08:42	7 FROUDE ST	SEWAGE- BLOCKAGE, SEWERMAIN	-	-	CLEARED BLOCKAGE FROM SH009078 - CLEANED OVERFLOW AND DISINFECTED AREA
18/08/18 15:48	31 WAIKUTA RD	SEWAGE- BLOCKAGE, SEWERMAIN	-	-	BLOCKAGE CLEARED - MINIMAL W/WATER FLOWING INTO S/W NETWORK
03/09/18 11:54	NORRIE PL	SEWAGE- BLOCKAGE, SEWERMAIN	-	-	CLEARED BLOCKAGE & DISINFECTED AREA. BIG CLEAN UP ON THE STREAM BANK TOSSED TO OTHER CREW
15/09/18 22:18	62 PANDORA AVE	SEWAGE- BLOCKAGE, SEWERMAIN	-	-	CLEARED BLOCKAGE FROM SH004296, CLEANED UP OVERFLOW AT HOUSE BASEMENT AND GARAGE AND DISINFECTED. REMOVED PAPER/SOLIDS ETC FROM PROPERTY
30/08/18 14:34	S HWAY 30	SEWAGE- BLOCKAGE, SEWERMAIN	-	-	BROKEN LEACHATE RISING MAIN 100Ø REPAIR AND PUMPED AWAY LEACHATE OVERFLOW INTO HOLDING PONDS
25/09/18 08:21	5 MAISEY PL	SEWAGE-CCTV INSPECTION	-	-	CCTV S/W MAIN. COULD ONLY CAMERA ABOUT 1M - TOO MUCH SLUDGE / MUD. DOES NOT SEEM TO BE IN USE. USED AS AN OVERFLOW LINE TO DEWATER S/W MAIN YEARS AGO BY HICKEYS
27/07/18 08:30	NORRIE PL	SEWAGE-CLEAN UP OVERFLOW	-	-	USED 1.5 DIGGER TO REMOVE SPILLAGE, WASTEWATER OVERFLOW MATERIAL. HOSED AND DISINFECTED AREA AROUND MANHOLE. CHECK U/S M/H'S BACK TO THEBES - **NO OVERFLOW**

24/07/18 15:40	22 LUXOR PL	SEWAGE- OVERFLOW, SEWER MANHOLE	-	-	SH004214 OVERFLOWING. HIBLASTED TO CLEAR. RESUMED FLOW FROM SH003509. WASH DOWN AND DISINFECT AREA - POSSIBLE CCTV REQUIRED
26/08/18 14:34	WESTMINSTER DR	SEWAGE- OVERFLOW, SEWER MANHOLE	-	-	WASTEWATER SEEPING FROM SH006142, HIBLASTED TO CLEAR, RESUME FLOW FROM SH005290, WASH DOWN AND DISINFECT AREA
09/09/18 10:32	AMIES RD	SEWAGE- OVERFLOW, SEWER MANHOLE	-	-	CLEARED BLOCKAGE FROM SH004945 - CLEANED AND DISINFECTED AREA
08/01/18 12:41	MATAIKOTARE RD	SEWAGE- OVERFLOW, SEWER MANHOLE	-	-	HOSED OVERFLOW AREA & DISINFECTED. SUCKER TRUCK USED TO SUCK UP CONTAMINATOR FROM PONDING AREAS & ROADWAY
30/01/18 08:58	23 CHAPMAN PL	SEWAGE- OVERFLOW, SEWER MANHOLE	-	-	OVERFLOW AT #23 - ALL DOWN STREAM - M/H'S FULL - HIBLAST TO CLEAR BLOCKAGE AND RESUME FLOW FROM SH004468 - CALLED SUCKER TRUCK IN FOR CLEAN UP
30/01/18 10:12	14 PARAONE ST	SEWAGE- OVERFLOW, SEWER MANHOLE	-	-	CALLED IN AS WATER LEAK - SH002635 WAS OVERFLOWING- HIBLAST TO CLEAR AND RESUME FLOW FROM SH007411 - NO OBVIOUS CAUSE - WAIT TIL BACKFLOW SIBSIDES AND WASH DOWN AREA
29/05/18 09:01	DEPOT ST	SEWAGE- OVERFLOW, SEWER MANHOLE	-	-	A POWER CUT AT PUMP STATION. CLEANED AND DISINFECTED AREA AND FIRE STATION AND AROUND PUMP STATION. CALLED TO SEWER BLOCK AND RETURNED FOR FURTHER DISINFECTION
20/02/18 15:45	HEAPHY PL	SEWAGE- BLOCKAGE, SEWERMAIN	-	-	OVERFLOWING M/H'S - SUCKER TRUCK IN TO LOWER LEVELS SO WE COULD HIBLAST, CLEARED BLOCKAGE AND TO BE CLEANED TOMORROW

TAURANGA CITY COUNCIL					
DATE	LOCATION	DETAILS	EFFECT	TASKS UNDERTAKEN	NOTES
17/12/2018	MAYFAIR STREET	OVERFLOW CAUSED BY FAT/WIPES BLOCKAGE - IMPACTED THE WAIMAPU ESTUARY	OVERFLOW - DISCHARGED TO STORMWATER/EBOP ADVISED		Council staff and contractors have cleared the blockage, cleaned the surrounding area, and placed warning signage from Turret Road to Fraser Cove Reserves. Staff have visited the residents and businesses in the area to raise awareness of the impacts of wipes on the network.
10/12/2018	155 FIRST AVENUE	WASTEWATER MANHOLE HAS POPPED OFF AND IS OVERFLOWING AT 155 FIRST AVE	OVERFLOW - DISCHARGED TO STORMWATER/EBOP ADVISED	JETTED AND CCTV USED	jetter to unblock line and do cleanup, vacumed out sumps. sewer entered stormwater, sign to be placed around pond at end of 3rd ave.
22/11/2018	154 ELIZABETH STREET	RAW SEWAGE IS FLOWING INTO 154 ELIZABETH STREET	OVERFLOW - DISCHARGED TO STORMWATER/EBOP ADVISED	JETTED AND DISINFECTED AR	Jet main from MH 80234 to clear a block from main 9842. Discharge into basement of Still buiding and ground floor of new car park building. Use Petes Take a ways vacuum truck to clear mess, sweep /suck back to hose. Health Warning signs put out, Clean up
12/11/2018	103 WATLING STREET	RAW SEWERAGE FLOWING OUT OF GULLY TRAPS AT 103 WATLING STREET	OVERFLOW - DISCHARGED TO STORMWATER/EBOP ADVISED	WARNING SIGNS OUT	Bell Plumbing had already cleared blockage by rodding.The blockage was caused by wet wipes, but the sewer had gone over the right of way over the driveway and under the house, it had also entered in to two cess pits with the out let being in a stormwater
15/10/2018	7 SIMPSON ROAD	MANHOLE IS OVERFLOWING OVER THE FOOTPATH AND WILL BE GOING INTO THE STORM WATER. DOWNER WAS DOING SOME MAINTENANCE LAST WEEK POSSIBLY A BROKEN VALVE. IN THE GRASS OUTSIDE 7 SIMPSON ROAD.	BLOCKAGE - OVERFLOW TO LAND (CONTAINED)	JETTED & SUCTION TRUCK	Arrived on site had no job details because the TCC computer was down for maintenance found sewer manhole full and running down the road.Got mapi up on my computer and went to next manhole and it was clear so i rang inter group and asked for there jetter v

27/09/2018	150 DICKSON ROAD	WATER BUBBLING OUT OF MANHOLE OUTSIDE HIS HOUSE ON THE BERM AND DOWN GUTTER.	OVERFLOW - DISCHARGED TO STORMWATER/EBOP ADVISED BLOCKAGE - OVERFLOW TO LAND (CONTAINED)	JETTED AND DISINFECTED AR	Used Dr Drain to jet and clean up area after removing roots causing blockage. sewer was entering sump and was vacumed out. EBOP notified. Sign put out at outlet.
1/09/2018	HOLLISTER LANE/JOBLIN WAY	SMELL COMING FROM THE CREEK BEHIND HOLLISTER LANE AND STAMFORD PLACE	OVERFLOW - DISCHARGED TO STORMWATER/EBOP ADVISED	DUG UP TO REPAIR PIPE	overflow at manhole 79625 and flowing over bank and into open drain. traced sewer line and found that blockage was located at 34 joblin way. called in intergroup and Radleigh and was advised to put up signs around sw pond039 and pond017 but due to it bei
27/08/2018	44 HEWLETTS ROAD	SEWER MANHOLE IS POURING INTO THE STORMWATER AT THE CHEROKEE PLACE AND AERODROME ROAD INTERSECTION	OVERFLOW - DISCHARGE TO WATERWAY (EBOP NOTIFIED)	JETTED AND DISINFECTED AR	Jetted line across Hewletts Rd to clear blockage, vacum sump as sewer entered stormwater. Blockage related to other blockage on Aviation dr with the pet food factory.
22/06/2018	2/1 SIXTH AVENUE	SEWER MANHOLE OVERFLOWING.	OVERFLOW - DISCHARGE TO HARBOUR/SEA (EBOP NOTIFIED)	JETTED AND DISINFECTED AR	MH 7559 overflowing in road and entering harbor at outlet 57765. call in Intergroup jetter and vacuum trucks. Jet from D/S MH 75560 to clear fat block in main. Contact EBOP about discharge to S/W and spoke with Radleigh. Set up Vac truck at CP62489 and w
3/06/2018	45 OPAL DRIVE	RAW SEWAGE FLOWING INTO BACKYARD OF 17 SUMMERLAND CRES FROM PUMPSTATION. 2051HRS - PHONE DOWNER WW , ADVISED MIKE. MIKE ADVISED THAT HE IS ON SITE AND IS AWARE. 2054HRS - PHONE TENANT (MICH- 022 088 3802). MICH ADVISED HE HAD PHONE HIS LANDLORD (ROSS) AS FYI. MICH HAS SPOKEN WITH DOWNER REGARDING THIS.		CLEAN AND DISINFECT	WKDONE: sprayed and disinfected 7 properties after overflow from pumpstation. Also disinfected around pumpstation but we were only there to disinfect, the overflow was sorted and wasn't due to a blockage, was due to water infiltration from flooding (storm

24/05/2018	KINGSWOOD ROAD	CRACK IN THE CONCRETE BASE WASTEWATER RUNNING INTO ESTUARY	OVERFLOW - DISCHARGE TO WATERWAY (EBOP NOTIFIED)	JETTED AND DISINFECTED AR	manhole leaking, notified ebop and called mike collins from BOPRC to advise of the overflow and that we will leave it till the morning due being dark.; WKDONE: we meet onsight to find a second manhole overflowing so called in intergroups jetter to clear t
18/05/2018	81 TOM MUIR DRIVE	OVERFLOWING MANHOLE ON WATLING STREET IN TOM MUIR RESERVE COMING DOWN WATLING STREET INTO TOM MUIR DRIVE	BLOCKAGE - OVERFLOW TO LAND (CONTAINED)	JETTED AND DISINFECTED AR	Jetted line to clear blockage that was rags and fat. cleand up around manhole, scraped back solids into manhole and hosed down area, disso. spread lime over area. Erected signs.
30/04/2018	35 KINGSWOOD ROAD	MANHOLE OVERFLOWING STORMWATER RESERVE BEHIND 20 HERONVALE WAY	OVERFLOW - DISCHARGED TO STORMWATER/EBOP ADVISED	RODDED LINE	sewage bubbling up from submerged sewer main behind #20 Heron Rise. MH75139 had fat logs blocking the outlet into the MH. Used rods to clear fat and free main. Discharge from main stopped immediately at hole in pipe. Collect signs and install as requested
17/04/2018	30 NICOLE PLACE	A LEAK BY A MANHOLE FLOWING DOWN THE ROAD.	OVERFLOW - DISCHARGED TO STORMWATER/EBOP ADVISED	JETTED AND SIGNS	Sewer blocked by roots. Called Dr Drain and jetted to clear and removed roots, also put sign out at stormwater outlet as some went to drain. Got Intergroup vacume to suck out sumps and manhole. Sewer manhole sealed, safety grill installed.
29/03/2018	2 STABLEFORD DRIVE	SMELLY WATER COMING FROM THE MANHOLE LID AND POSSIBLE FROM THE PROPERTY AT 2 STABLEFORD DRIVE. IT WAS RUNNING DOWN THE GUTTER. CALLER ALSO NOTICED AN OVERFLOW AT THE CORNER OF BRAITHWAITE LANE.	OVERFLOW - DISCHARGED TO STORMWATER/EBOP ADVISED	JETTED & SUCTION TRUCK	Found overflowing manhole on the corner of Stableford and Pyes Pa Road. Called Intergroup but they are too busy so called Dr Drain. Will need Intergroup still to help. EBOP and Rafleigh notified, health warning signs out around the walking track and chey

18/03/2018	17 SEVENTH AVENUE	LARGE BLOCKAGE OUTSIDE THE PROPERTY. THE CALLER INDICATED THAT THERE IS OVERFLOWING GULLY TRAPS AT 17 AND 17A SEVENTH AVE (ALL 4 OF UNITS ARE HAVING ISSUES). GREY WATER GOING DOWN THE STORMWATER DRAINS AND OUT INTO THE HARBOUR. THE OVERFLOW LOOKS LIKE CONITNOUS LOOKS 30-40MM PIPES WORTH.	OVERFLOW - DISCHARGE TO WATERWAY (EBOP NOTIFIED)	JETTED & SUCTION TRUCK	cleared blockage with intergroup jetter from manhole 75558. line was blocked with fat. cleaned up overflow using intergroup sucker truck, washed down area and disinfected. because grey water had got into stormwater and made its way to harbour warning sign
8/03/2018	79 ESK STREET	WAYNE LEWIS FROM BOPRC CALLED, OVERFLOWING MANHOLE IN THE ESK STREET RESERVE AND AT THE WAIMAPU ESTUARY. WAYNE HAS IDENTIFIED AS THE MAIN OVERFLOW COMING FROM MANHOLE 76068 WITH A SMALLER OVERFLOW FROM MANHOLE 87451.	OVERFLOW - DISCHARGED TO STORMWATER/EBOP ADVISED	JETTED AND DISINFECTED AR	Sewer blockage at ssmm/h 87451 was unblocked by rodding 5 meters from m/h82054.Cleaned up at 76068 with disso around m/h quite a bit here and cleaned up minor leaking sewer round 87451 some soaked up in grass area.
3/02/2018	2/1 SIXTH AVENUE	BLOCKED SEWER LINE OUTSIDE THE PARK APARTMENTS (WHERE THE APARTMENTS EXIT ON TO SEVENTH AVE) SEWER LINE WAS UNBLOCKED VERY RECENTLY BUT IT IS OVERFLOWING AGAIN.	OVERFLOW - DISCHARGED TO STORMWATER/EBOP ADVISED	CLEAN AND DISINFECT	overflow from mh 87634 and 3 x gullytraps and 3 x basement floor waste gully traps. discharge to private sump exiting at private sw outlet in front of appartments into harbor. track block into southen pipeline construction area and bypass pump turned off
30/01/2018	1 CHADWICK ROAD	OVERFLOW IMPACTING THE WAIMAPU RIVER AND POTENTIALLY THE ESTUARY	OVERFLOW - DISCHARGE TO WATERWAY (EBOP NOTIFIED)		Council staff and contractors have undertaken emergency repairs to the manhole to stop the overflow. Warning Signage is in place at access points around the estuary. Further remedial works to the network will be undertaken over the next week.
25/01/2018	93 CASTLEWOLD DRIVE	OVERFLOWING MANHOLE	OVERFLOW - DISCHARGE TO WATERWAY (EBOP NOTIFIED)	DUG UP TO REPAIR PIPE	150mm pipe had pulled away from manhole. Intergroup jetted, vacume and CCTV. Notified EBOP, completed repairs erected signs.

24/01/2018	9 SUTHERLAND ROAD	SEWER DISCHARGE INTO THE HARBOUR. VERY SMELLEY BUT NO SOLIDS. THE PIPE RUNS OUT FROM THE JUDEA RESERVE. SEWER LINES STARTS IN THE DRIVEWAY AT 9 SUTHERLAND ROAD.	BLOCKAGE - OVERFLOW TO LAND (CONTAINED)	JETTED AND DISINFECTED AR	Service Restored: MH 78244 overflowing in rugby field and crossing walking track. Use Intergroup to jet main and remove large fat block. Infom EBOP and Radleigh. Wash and disso. Errect health warning signs as instructed.
15/01/2018	HAUKORE STREET	MANHOLE SPILLING SEWAGE INTO ESTUARY.	OVERFLOW - DISCHARGED TO STORMWATER/EBOP ADVISED	CLEAN AND DISINFECT	Blockage caused by roots at wwmh 77387. Use digger to cut track in overgrown area at the Haukore St entrance to sewer track, remove lid and remainder of root intrusion. Seal joints and disinfect overflow area. Bury contaminated material. Reinstatement
13/01/2018	1 ADAMS AVENUE	SEWAGE IS OVERFLOWING OUTSIDE THE BEACHSIDE HOLIDAY PARK OFFICE.	OVERFLOW - DISCHARGE TO HARBOUR/SEA (EBOP NOTIFIED)	JETTED & SUCTION TRUCK	discharge from mh77032, main 6125 overflowing. Notify BOPRC and Radleigh. Blocked with wipes and rag. Jetted, sucker truck required and disso area. Health warning signs erected entire length of Pilot Bay.
10/01/2018	TOM MUIR DRIVE/WATLING STREET	THERE IS SEWERAGE COMING UP THROUGH THE LID AND OVER THE WALKWAY AT THE BOTTOM OF WATLING ST ON TOM MUIR DRIVE ON THE RESERVE AREA BETWEEN THE TWO TREES. LID NUMBER IS 82746.	OVERFLOW - DISCHARGED TO STORMWATER/EBOP ADVISED	JETTED AND DISINFECTED AR	mh 82746 overflowing to grass and sw pond in the reserve. blocked mh 75636. use intergroup jetter to clear block approx 22m upstream. jetter pulled back a lot of rubble so have arranged the jetter and vacuum trucks for the morning. health warning signs in

WESTERN BAY OF PLENTY DISTRICT COUNCIL					
DATE	**LOCATION**	**DETAILS**	**EFFECT**	**TASKS UNDERTAKEN**	**NOTES**
6/01/2018	31 Moehau Street	Internal blockage/Gravity main	Private property/Waterway		-
10/01/2018	16 Milsom Place	Internal blockage/Gravity main - FAT	Stormwater	Jetting	-
16/01/2018	17A George Street	Internal blockage/Manhole/Gravity main - FAT	Stormwater	Jetting	-
1/02/2018	62 Kayelene Place	Internal blockage/Manhole - FAT	Contained/Stormwater	Jetting	-
3/02/2018	Wilson Road	Gravity main - DAMAGED ASSET	Stormwater		-

15/02/2018	Sater Place	Internal blockage/Manhole/Gravity main- FAT/OTHER	Stormwater	Jetting	-
21/03/2018	Kayelene Place	Manhole - OTHER	Stormwater	Jetting	-
2018-03-26 (follow up of 21-03-2018)	56a Kayelene Place	Gravity main - DAMAGED ASSET	Waterway	Other	-
10/04/2018	Matahiwi Rd	Rising main - DAMAGED ASSET	Stormwater	N/A	-
30/04/2018	18 Gordon Street	Gravity main - OTHER	Private property/Stormwater/Waterway	Other	-
1/05/2018	Wills Road	Manhole - OTHER	Stormwater	N/A	-
8/05/2018	17 Gordon Street	Gravity main - DAMAGED ASSET	Waterway	Other (Pumping)	-
10/05/2018	18 Gordon Street	Gravity main - DAMAGED ASSET	Waterway	Other (Pumping)	-
4/06/2018	19 Gordon Street	Manhole/Gravity Main - OTHER	Waterway	N/A	-
4/06/2018	40 King Street	Manhole/Gravity Main - OTHER	Private Property	N/A	-
3/06/2018	55-57-59 Brighton Road	Gravity main - OTHER	Private Property	N/A	-
4/06/2018	71-73 Athenree Road	Gravity main - OTHER	Private Property	N/A	-
16/07/2018	6 Gilfillan Drive	Manhole/Gravity Main - OTHER	Private Property	Self Cleared	-
10/08/2018	27 Marine Avenue & 56 Beach Rd	Internal blockage - OTHER	Stormwater	Jetting	-
12/08/2018	8 Scarborough Road	Internal blockage - OTHER	Contained	Jetting	-
23/07/2018	24B Little Waihi Road		Private Property		-
7/08/2018	24B Little Waihi Road	Internal blockage - FAT	Contained/Private property	Other (vaccum trailer)	-
20/10/2018	7a Bowentown Boulevard	Gravity main - FAT	Contained	Jetting	-
23/10/2018	49 Beach Rd & 1 Fairview Rd	Manhole - FAT	Contained	Jetting	-
11/11/2018	4 Hanlen Avenue	Rising main - OTHER	Contained	Other	-
13/11/2018	22 Muir Place	Internal blockage - FAT	Private property/Stormwater/Waterway	Jetting	-

29/11/2018	16 Milsom Place	Internal blockage/Manhole/Gravity Main - FAT	Stormwater	Jetting	

WHAKATANE DISTRICT COUNCIL					
DATE	**LOCATION**	**DETAILS**	**EFFECT**	**TASKS UNDERTAKEN**	**NOTES**
1/05/2018	Millers Stream at Ōhope Beach	Road construction in the area damage to sewer main near pump station 3	Discharge to stream		Samples of stream were taken – damage to pipes was minimal.
13/12/2019	105/125 Commerce Street, Whakatāne	Sewer min leak caused by fat	Contained	Sewerage was contained and sucker truck deployed	Our Trade Waste Officer is now involved in working with Countdown to ensure regular servicing of grease traps. Sewerage was contained and sucker truck deployed to remove from site.

KAWERAU DISTRICT COUNCIL					
DATE	**LOCATION**	**DETAILS**	**EFFECT**	**TASKS UNDERTAKEN**	**NOTES**
43238	Onslow Street	150mm Sewer KW Roots	-	unknown	Sewage O/F
43250	Walter Nash Ave	150mm Sewer KW Roots In M/H	-	unknown	Sewage O/F
43458	Balance Street	150mm Sewer KW Build Up	-	unknown	Sewage O/F

11 Appendix C – Wastewater Treatment Plant Emergency Overflow Summary

ROTORUA DISTRICT COUNCIL	
DATE	**DETAILS**
29/04/2018	On the 29th of April an extreme rainfall event occurred which resulted in a Civil Defence Emergency. This resulted in extremely high flows into the WWTP which exceeded the design capacity. BOPRC and Toi Te Ora were notified when the first overflows became evident. Untreated wastewater overflowed to the Lake as the stormflow pump station capacity was exceeded. Treated wastwater discharged to the Puarenga Stream as the volume through the WWTP exceeded the capacity of the final effluent pump station.
5/06/2019	Two instances of influent overflow for several minutes from the stormflow pump station at the inlet to the plant on 5 June. These were due to electrical problems affecting both the inlet screen and the primary pumps during heavy rainfall. It's likely that the overflow reached a drainage channel at the rear of the plant but RDC could not detect if any reached the lake. This incident was advised to BOPRC by phone at the time it occurred
ŌPOTIKI DISTRICT COUNCIL	
DATE	**DETAILS**
2018	One minor overflow at the Ōpōtiki plant caused by a blockage in the miliscreen. This was reported to BOPRC , even though it did not have the potential to enter a water body
WESTERN BAY OF PLENTY DISTRICT COUNCIL	
DATE	**DETAILS**
None	None
TAURANGA CITY COUNCIL	
DATE	**DETAILS**
2/06/2018	The Chapel Street Wastewater Treatment Plant spilt treated, disenfected effluent to the Tauranga Harbour from 7 pm to 9 pm. The estimated volume was approximately 216m3. There appeared to be no visible damage to the outfall structure. The reason was due to exceesive inflows (32,600 m3 compared to normal flows of around 20,000 m3).
WHAKATANE DISTRICT COUNCIL	
DATE	**DETAILS**
25/12/2018, 26/12/2018, 12/10/2018, 2/9/2018	Excessive outflow from Tāneatua WWTP due to high inflows during rainfall events.
Multiple dates	Excessive outflow from Murupara WWTP due to high inflows during rainfall events.
9/12/2018, 10/12/2018	Emergency discharge from Whakatāne WWTP ponds, outlet pipe broken, levels reduced to allow divers in to repair pipe.
January and February 2018	Ōhope WWTP - pumping 24 hours to reduce levels to de sludge and to install wetlands.
September 2018	Ōhope WWTP - Reduced pond levels to installed UV plant pipework
27/12/2018-6/01/2019	Ōhope WWTP discharged high flows and pumped 24 hours due to heavy rain event and holiday makers

Multiple dates	Edgecumbe discharged over consented flow limits due to heavy rainfall, high ingress of water into pipes, high groundwater level and wasewater accumulation

KAWERAU DISTRICT COUNCIL	
DATE	**DETAILS**
None	None

Receives Only – No Decisions

Report To: Regional Direction and Delivery Committee

Meeting Date: 19 February 2019

Report From: Chris Ingle, General Manager, Integrated Catchments

Plan Change 10 Science Review

Executive Summary

Plan Change 10 requires council to undertake 5 yearly science reviews. The first science review is now completed by the Water Quality Technical Advisory Group (TAG) for the Lakes Programme and has been peer reviewed by Professor Warwick Vincent.

The review is a comprehensive distillation of technical and science information. It has 13 science conclusions and 48 recommendations.

The key conclusion is that there is no evidence to change the direction of the current Plan Change 10 and that the key focus on reducing land use losses of both nitrogen and phosphorus remains. Staff plan to meet with the MoU partners to discuss the report findings in the near future.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Plan Change 10 Science Review.

1 Introduction

Plan Change 10 requires that a review of the science that underpins the rules is undertaken in 2017 and at 5 yearly intervals thereafter. The first Science review has now been completed and a summary of the review report will be available to Councillors at the meeting. A Memorandum of Understanding between the Council and stakeholders commits Council to this review and reporting the findings to these stakeholders.

The review process involved the following steps:

- setting a Terms of Reference (ToR) and consulting with stakeholders,
- consulting with Water Quality TAG on the ToR,

- identifying science modules and authors to undertake each module,
- review of each science module by the independent peer reviewer,
- workshop presentation with Water Quality TAG and independent peer reviewer,
- finalisation of each module and completion of the Lake Rotorua Science Review – Summary report.

2 Review Modules

The review was undertaken by dividing the requirements of the Terms of Reference into 11 modules. Through the process of review a 12th module was initiated. A summary report detailing the findings of each module will be available at the RDD meeting. The modules reported are:

- Planning history of the Lake Rotorua nutrient targets,
- Lake Rotorua: Trends in water quality (2001-2017),
- Trends and state of nutrients in Lake Rotorua Streams 2002 – 2016,
- Progress towards 2022 nitrogen targets,
- Long-term nutrient loads and water quality for Lake Rotorua 1965 to 2017,
- Review and re-run of the Lake Rotorua model,
- Summary of ROTAN results,
- Seasonal phytoplankton nutrient limitation in Lake Rotorua,
- Eco-toxicological review of alum applications to the Rotorua Lakes,
- Land-based phosphorus loss and mitigation strategies,
- Anthropogenic phosphorus load to Rotorua review and revision,
- Review of relevant New Zealand and international lake water quality remediation science.

Each module forms a stand-alone report and the conclusions and recommendations have been brought together in the Summary Report. The review has listed 48 recommendations for work and staff are now planning to work with the Water Quality TAG to prioritise and determine when and how these recommendations might best be actioned.

3 Conclusions and Recommendations

The Review has been undertaken by a number of scientists as authors of each of the modules and also as members of the Water Quality TAG. The work has then been peer reviewed by Professor Warwick Vincent of Laval University, Quebec, Canada. A letter from Professor Vincent is attached at Appendix 1 outlining his experience and his involvement in the review as the peer reviewer.

Professor Vincent has highlighted that: *"… Lake Rotorua is probably one of the most intensively researched lakes nationally, if not internationally. This has been confirmed by the summary report, which is an impressive distillation of a large amount of data, information, modelling and analysis. The report contains 13 key science conclusions, which I have reviewed and support."*

The review has been summarised into a single Summary Report with 12 supporting technical reports.

There are 13 key science conclusions, and 48 recommendations for future work (see Summary Report). Many of the recommendations are already being implemented within the lakes programme but further prioritisation will take place to determine when each of these work streams will need to be undertaken.

The review has not revealed any science information that would contradict the current science advice to Council regarding Plan Change 10. In particular:

- Alum dosing appears to have been a key action in halting water quality decline,
- Nitrogen loading to the lake is well in excess of the annual target of 435 tonne and significant reductions in both nitrogen and phosphorus are required to achieve water quality at or near the TLI target,
- The nitrogen target of 435 tonne continues to be supported by the review,
- Climate change will make it more difficult to attain the water quality goals for the lake, and
- The focus of remediation should still be on catchment control of nutrients, including promising new approaches that are being trialled by Rotorua farmers.

Staff are planning to make all reports available to our MoU partners (Rotorua Primary Producers Collective and the Lakes Water Quality Society), as well as meeting with them to discuss the Science review and its findings. A planning response to the Science Review will be provided to RDD to finalise the requirements of PPC10, which requires that: *"Regional Council will respond to the recommendations that result from Method LR M2 science reviews through a formal and public decision making process. This may include initiation of a plan change and review of resource consent conditions".*

Finally the findings of the Science Review will be presented to the public through our normal Rotorua lakes science evenings.

4 Budget Implications

4.1 Current year budget

The review process is provided for in existing LTP budgets.

4.2 Future Budget Implications

While the recommendations of this report have no effect on the future budget of the Rotorua Catchments Activity at this stage, and generally it is felt that the implementation of the recommendations is provided for in LTP budgets, budgets may need to be reconsidered if major new operational activity areas are recommended by

the Water Quality Technical Advisory Group, MOU partners or the Council, following consideration of these recommendations.

Andy Bruere
Lakes Operations Manager

for General Manager, Integrated Catchments

7 February 2019

APPENDIX 1

Warwick Vincent signed peer review letter

The Chief Executive
Bay of Plenty Regional Council
PO Box 364
Whakatāne
New Zealand

3 December 2018

Attention: Fiona McTavish

Dear Fiona,

Peer Review of the Lake Rotorua Science Review

Thank you for the opportunity to be the independent science peer reviewer for the Lake Rotorua (Plan Change 10) Science Review.

I am a Professor in the Department of Biology at Laval University in Quebec, Canada (since 1990), and have conducted ecological research on lakes and rivers in several parts of the world, including North and South America, Europe and Asia. I was initially attracted to the invitation from your science team as I had previously undertaken research projects on Lake Rotorua in the 1980s. As an ex-patriot of New Zealand, I am also very interested in the progress your council has made in developing policy to restore Lake Rotorua.

My review followed a set process that involved:

- Scientific peer review of each of the 11 technical reports, with comments and recommendations provided for the authors to consider;
- Attendance at a workshop in Rotorua to discuss the key science findings and the implications of these. This workshop was attended by the authors of the technical reports and Regional Council staff; and
- Peer review of the final summary report prepared by your staff to confirm that it is a fair and accurate record and synthesis of the findings of the science review.

My initial observation from this work is that Lake Rotorua is probably one of the most intensively researched lakes nationally, if not internationally. This has been confirmed by the summary report, which is an impressive distillation of a large amount of data, information, modelling and analysis. The report contains 13 key science conclusions, which I have reviewed and support. I expect these conclusions will be useful in communicating the outcomes of the science review to councillors, staff and the community. Finally, the individual authors have made recommendations for future work and I understand that these will be prioritized for action to support the 2022 Lake Rotorua Science Review.

I trust this review will be helpful in your future management of Lake Rotorua and I commend your Council for the scope and quality of work that has been undertaken to date.

Yours sincerely,

Warwick F. Vincent, PhD, FRSC, hon. FRSNZ
Professor of Biology & Canada Research Chair
Department of Biology, Laval University
Quebec City, Quebec, Canada

Report To: Regional Direction and Delivery Committee

Meeting Date: 19 February 2019

Report From: James Low, Water Policy Team Leader

Update on Appeals to Region-wide Water Quantity Proposed Plan Change 9

Executive Summary

At its 11 December 2018 meeting, staff advised the Committee 14 appeals had been received to Proposed Plan Change 9. A further 26 parties have now filed a total of 164 notices to become parties to those appeals.

Key issues raised by the appeals relate to Māori rights and interests, renewable electricity provisions, unauthorised dairy shed water takes, municipal water supplies and operational matters.

Council has received direction from the Environment Court and has contacted appellants in order to meet Environment Court reporting requirements and to begin resolution of appeals. Staff will undertake informal negotiations in the first instance, before more formal Court mediation and, if required, Environment Court hearing time.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Update on Appeals to Region-wide Water Quantity Proposed Plan Change 9.

2 Confirms an appeals sub-committee is not required, noting staff delegations are sufficient to resolve the Environment Court appeals on Proposed Plan Change 9.

3 Notes staff will inform the committee and seek committee direction in respect of any substantive matters arising.

1 Purpose of report

The purpose of this report is to update the Committee on the Environment Court appeals received against Council's decisions on Proposed Plan Change 9 - Region-wide Water Quantity to the Regional Natural Resources Plan (PPC9) and confirm the committee's 11 December 2018 view that an appeals sub-committee was not required.

The report also outlines proposed topics the Environment Court will use to group appeals for resolution.

2 Background

PPC9 is the first step in a two-step process to improve water quantity management in the region and begins implementation of the National Policy Statement: Freshwater Management 2014 (NPSFM). PPC9 was notified on 18 October 2016 with hearings held in March 2018. The Regional Direction and Delivery Committee adopted the recommendations of the Hearing Panel at its September 2018 meeting and Council's decisions were publicly notified on 9 October 2018.

3 Appeals

Fourteen appeals were received when the appeal period closed on 21 November 2018. Subsequently 26 parties filed notices under section 274 of the Resource Management Act 1991 to join the appeals. Attachment 1 lists the appellants, relief sought and s274 parties.

Staff have delegated authority to resolve the appeals. As mentioned and agreed at the 11 December 2018 RDD meeting, it is not proposed to appoint an appeals sub-committee, for reasons outlined in the options analysis below. However, staff will keep the Regional Direction and Delivery Committee regularly informed on appeals progress and any substantive matters will be brought back to the Committee for direction. Should individual councillors have a greater interest in the appeals more regular updates can be provided.

3.1 Options Analysis for appeals resolution

The following table considers the relative merits of an appeals sub-committee, relative to the default of there being no appeals sub-committee.

Factor	**Appeals sub-committee** **1= Worst, 5 = Best**	**No appeals sub-committee** **1= Worst, 5 = Best**
Potential impact of appeals PPC9 considers a relatively narrow range of matters (water allocation). Staff have the technical knowledge and understanding of the potential impact which is limited.	Score: 2	Score: 5
Potential for significant shift in policy No significant shifts are envisaged, but staff can bring any that arise to the next Committee meeting. Staff are	Score: 2	Score: 4

able to address minor changes to policy.		
Consideration of the public interest A sub-committee would enable discussion and could lead to outcomes that fairly represent the public interest. However, the hearings process has already provided that opportunity and matters now needing determination are largely technical. Staff are more focussed satisfying legal requirements but are also aware of the political context. It is more appropriate for appeals to be administered from a legal standpoint first and foremost.	Score: 2	Score: 4
Timely decision making Referring all decisions to an appeals subcommittee will cause delays and frustrate appellants which could impact on their willingness to engage in mediation. Mediation requires parties to be mandated to make decisions. It will not work as effectively if all matters must be referred to a sub-committee.	Score: 1	Score: 4
Cost effectiveness An appeals sub-committee would require administrative support and coordination including staff resource that would otherwise be targeted to appeals resolution. The sub-committee would need to include consultants who were part of the original hearing panel and could be more likely to require additional legal and/or independent planning advice due to its members diverse interests and knowledge. Professional staff have familiarity with many of the technical matters and therefore are less likely to require costly support to make a decision.	Score: 1	Score: 4
TOTAL	**8**	**21**

On the basis of a higher score being best, the 11 December 2018 RDD agreement to not have PPC9 appeals subcommittee is confirmed.

4 Implementation and implications for future Water Management Area Plan Changes

Although PPC9 is under appeal, many of its more administrative provisions require implementation. Work is underway to improve Council's acquisition and use of metering data, record permitted activities and progress water accounts. Consents continue to be administered under the operative and proposed planning provisions.

Implications from PPC9 on future Water Management Area plan changes are being evaluated with a view to minimising impacts. For example, staff are advising all appellants of future Water Management Area plan change timelines and stressing the importance of their understanding this latter work. To date, parties spoken with have all acknowledged the uniqueness of this multi plan-change challenge and have committed to negotiating on a reasonable/pragmatic basis.

5 Implications for Māori

Water allocation is a very important matter for Māori and this is reflected in the number of appeals received from tangata whenua groups. These appeals address national issues including Māori values and relationships, governance and decision making, cultural use and economic development in addition to more operational aspects of the plan change.

Staff are prioritising discussions with tangata whenua appellants (Ngāti Mākino Heritage Trust, Tauranga Moana and others, Te Rūnanga o Ngati Awa, Motiti Rohe Moana Trust) with whom on-going relationships are critical to full NPSFM implementation.

6 Next steps

PPC9 appeals have been assigned to the Court's standard case management track meaning we are encouraged to explore solutions outside formal court proceedings first. Staff have consulted with all parties and filed a memorandum with the court proposing a topic structure (Attachment 1) that will be used by the court to group appeals for administrative purposes.

Council has proposed the following timeframes:

- Initial meetings with appellants to be completed by the end of February 2019;
- Multi party discussion or workshops to be held during March and April (starting with group 1 from the attached topic structure);
- A further Court report to be filed by 10 May identifying;
    - Appeal points that have been resolved or agreed in principle, pending resolution of related matters;
    - Appeal points that have not been resolved and will be the subject of Court-assisted mediation; and
    - Any legal issues that have been identified by parties as requiring determination prior to mediation

Staff are currently holding informal meetings with appellants as a precursor to multi – party conferences and, where required, Court assisted mediation.

7 Budget Implications

7.1 Current year budget

Plan Change 9 is being undertaken within the current budget for the Regional Planning and Engagement activity for Year 1 of the Long Term Plan 2018-2028. Aside from staff time, there is no budget set aside for resolving Environment Court appeals.

7.2 Future Budget Implications

Future implementation work is provided for in Council's Long Term Plan 2018-2028. Legal fees are budgeted each year based on trends from prior years (allowing for inflation).

7.3 Summary of Financial Implications

The cost of this Environmental Court appeal does not have a specific budget and will be absorbed into the 2019/20 legal budget. Staff will review the budget and any subsequent necessary budget requests through the in-year monitoring process.

Glenys Kroon
Senior Policy Analyst (Water Policy)

for Water Policy Team Leader

8 February 2019

APPENDIX 1

Proposed Topic Structure for Environment Court

GROUP 1

Topic 1 Māori values and relationships

Appellant	Summary of Relief	s274 parties
Ngāti Mākino Heritage Trust **ENV-2018-AKL-000320**	1. The establishment of a cultural purposes framework. 2. Methods (including rules) to adopt cultural flow preferences, assess or enforce mauri, protection headwaters (support for water conservation orders) or cultural opportunities mapping. 3. Rules to enforce any Iwi test and guidance to applicants regarding iwi interests in water.	Carrus Corporation Limited Federated Farmers of NZ Inc Ford Land Projects Pty Ltd Horticulture NZ Mercury NZ Ltd Motiti Rohe Moana Trust Tauranga Moana & Others Quayside Properties Ltd Rotorua Lakes Council Tauranga City Council Te Tumu Kaituna 14 Trust Trustpower Limited Creswell NZ Ltd Sunchaser Investments Limited Partnership
Tauranga Moana & Others **ENV-2018-AKL-000331**	1. Include in the preface kōrero that reflects Te mana o te wai, Te Tiriti of Waitangi, Section 6(e), and Kaitiakitanga. Reflect these in new issues, objectives and policies. 2. Ensure Te mana o te wai is given practical expression at all levels of decision making. 3. Provision for requirements for cultural mitigation, offsetting and/or compensation to address impacts of consents and for application of mātauranga and tikanga. 4. Add and amend various issues, objectives, policies, methods and rules to include consideration of effects on ahikaa, iwi and hapū relationships with waterbodies, effects on Māori and protections afforded to them.	Ballance Agri-Nutrients Limited Ford Land Projects Pty Ltd Mercury NZ Ltd Quayside Properties Ltd Te Runanga o Ngāti Awa Ngāti Tūwharetoa Geothermal Assets Ltd Trustpower Limited Creswell NZ Limited Horticulture NZ Motiti Rohe Moana Trust Tauranga City Council Ngāti Makino Heritage Trust Sunchaser Investments Limited Carrus Corporation Limited Te Tumu Kaituna 14 Trust Federated Farmers of New Zealand
Te Rūnanga o Ngāti Awa **ENV-2018-AKL-000318**	1. Greater inclusion of tāngata whenua values in resource consent processes and reinstatement of deleted provisions in WQ P10 (to generally decline applications where limits are exceeded). 2. The inclusion of consideration of tāngata whenua values in deciding applications in WQ P11. 3. The inclusion of cultural values and relationships of tāngata whenua as kaitiaki in Schedule 7.	Federated Farmers of New Zealand Royal Forest and Bird Protection Society of New Zealand Incorporated, Mercury NZ Limited Quayside Properties Limited Rotorua Lakes Council Motiti Rohe Moana Trust Horticulture New Zealand Tauranga Moana & Others

		Tauranga City Council Trustpower Limited Sunchaser Investments Limited Partnership Creswell NZ Limited
Motiti Rohe Moana Trust **ENV-2018-AKL-000319**	1. Mitigation and offsetting to restore Māori and tāngata whenua values. 2. Monitoring to address tāngata whenua values. 3. Amend Issues WQI1, WQI0, WQ08 and WQ09 to specify the tāngata whenua values and interests in freshwater management, natural features and identify Treaty principles. 4. Appropriate water allocation limits giving effect to identified Maori values. 5. Amend provisions to refer to Maori values as relevant to reviews and resource consents. 6. Monitoring of water allocation and use at Motiti and establish a WMA for Motiti Island. Review existing allocations at Motiti to restore traditional puna and water sources.	Federated Farmers of New Zealand Mercury NZ Limited Ngāti Makino Heritage Trust Tauranga City Council Trustpower Limited Creswell NZ Limited Sunchaser Investments Limited Partnership

Topic 2 Governance and decision making

Appellant	Summary of Relief	s274 parties
Ngāti Mākino Heritage Trust **ENV-2018-AKL-000320**	1. Recognition of iwi as decision makers for allocation of water for particular waterbodies.	Carrus Corporation Limited Federated Farmers of New Zealand Ford Land Projects Pty Ltd Horticulture New Zealand Mercury NZ Limited Motiti Rohe Moana Trust Tauranga Moana & Others Quayside Properties Limited Rotorua Lakes Council Tauranga City Council Te Tumu Kaituna 14 Trust Trustpower Limited Creswell NZ Limited Sunchaser Investments Limited Partnership Tauranga City Council
Motiti Rohe Moana Trust **ENV-2018-AKL-000319**	1. Implementation of TOW principles including rangatiratanga in water allocation.	Federated Farmers of New Zealand Mercury NZ Limited Ngāti Makino Heritage Trust Tauranga City Council Trustpower Limited Creswell NZ Limited Sunchaser Investments Limited Partnership
Te Rūnanga o Ngāti Awa **ENV-2018-AKL-000318**	1. Tāngata whenua involvement in deciding applications in WQ P11. 2. Rules WQ R1, R2, R3 and R5 be amended to include consideration of tāngata whenua values and tāngata whenua relationships with freshwater. 3. The inclusion of tāngata whenua involvement in deciding applications in WQ P11.	Trustpower Limited Horticulture New Zealand Motiti Rohe Moana Trust Tauranga Moana & Others Federated Farmers of New Zealand

		Sunchaser Investments Limited Partnership Tauranga City Council Quayside Properties Limited Creswell NZ Limited
Tauranga Moana & Others **ENV-2018-AKL-000331**	1. Policy to support operationalizing the role of iwi and hapū in management, governance, regulation of water, including specific Māori cultural dimension in allocation methodology, decision making authority for ahikaa (authentic Treaty partnerships). 2. A wide range of new provisions to better provide for authentic Treaty partnerships and processes. (Will need consideration under individual topic areas). 3. To provide for the relationships that Māori have with waterways and the Treaty including tino rangitiratanga, rights of control and its equivalent ownership in relation to water quality and allocation, mātauranga Māori. 4. Include in the preface kōrero that reflects the role of iwi and hapū in allocation decision making. Reflect in new issues, objectives and policies.	Ballance Agri-Nutrients Limited Ford Land Projects Pty Ltd Mercury NZ Limited Federated Farmers of New Zealand Quayside Properties Limited Te Runanga o Ngāti Awa Ngāti Tūwharetoa Geothermal Assets Ltd Trustpower Limited Creswell New Zealand Limited Horticulture New Zealand Motiti Rohe Moana Trust Tauranga City Council Ngāti Makino Heritage Trust Sunchaser Investments Limited Partnership Carrus Corporation Limited Te Tumu Kaituna 14 Trust

Topic 3 Cultural Use and Economic Development

Appellant	Summary of Relief	s274 parties
Ngāti Mākino Heritage Trust **ENV-2018-AKL-000320**	1. Mechanism for setting aside a portion or percentage of allocable flow to iwi for cultural purposes / establishing cultural allocations.	Carrus Corporation Limited Federated Farmers of New Zealand Ford Land Project Pty Ltd Horticulture New Zealand Mercury NZ Limited Motiti Rohe Moana Trust Tauranga Moana & Others Quayside Properties Limited Rotorua Lakes Council Tauranga City Council Te Tumu Kaituna 14 Trust TrustPower Limited Creswell NZ Limited Sunchaser Investments Limited Partnership
Tauranga Moana & Others **ENV-2018-AKL-000331**	1. Provision for iwi and hapū allocation of water and ownership.	Ballance Agri-Nutrients Carrus Corporation Limited Creswell NZ Limited Ford Land Projects Pty Ltd Horticulture New Zealand

		Mercury NZ Limited Motiti Rohe Moana Trust Ngāti Makino Heritage Trust, Ngāti Tūwharetoa Geothermal Assets Ltd Quayside Properties Limited TrustPower Limited Tauranga City Council Federated Farmers of New Zealand Sunchaser Investments Limited Partnership Te Tumu Kaituna 14 Trust Te Runanga o Ngāti Awa

Topic 4 Tāngata Whenua General

Appellant	Summary of Relief	s274 parties
Te Rūnanga o Ngāti Awa **ENV-2018-AKL-000318**	1. A reduction in scope of the plan change to provisions for water metering and to identify future water management area works only. 2. That further work is completed to address both the procedural and substantive concerns with the Assessment of Water Availability and Estimates of Current Allocation Levels Report October 2016.	Trustpower Limited Horticulture New Zealand Motiti Rohe Moana Trust Tauranga Moana & Others Sunchaser Investments Limited Partnership Tauranga City Council Quayside Properties Limited Federated Farmers of New Zealand
Tauranga Moana & Others **ENV-2018-AKL-000331**	1. Recognition of the difference between terms 'iwi and hapū' and 'tāngata whenua.' 2. Consistency with higher order documents. 3. Elimination of provisions that provide unfair certainty to particular users (detail to be dealt with under group 3).	Ballance Agri-Nutrients Limited Ford Land Project Pty Ltd Federated Farmers of New Zealand Mercury NZ Limited Quayside Properties Limited Te Runanga o Ngāti Awa Ngāti Tūwharetoa Geothermal Assets Ltd Trustpower Limited Creswell NZ Limited Horticulture New Zealand Motiti Rohe Moana Trust Tauranga City Council Ngati Makino Heritage Trust Sunchaser Investments Limited Partnership Carrus Corporation Limited Te Tumu Kaituna 14 Trust

GROUP 2

Topic 5: National Policy Statement Freshwater Management, Planning Approach, and Water Management Areas (NPSFM, Planning Approach, and WMAs)

Introduction, WQ I8, WQ O2, WQ O3, WQ O4, WQ O5, WQ O7, WQ O8, WQ O9, WQ O11, WQ O12, WQ P2, WQ P3, proposed WQ P3A, WQ M1, WQ M4, WQ R10, WQ R11

Appellant	Summary of Relief	s274 parties
Trustpower Limited **ENV-2018-AKL-000316**	1. Amendments to give effect to and be consistent with the NPSFM, achieve consistency within the plan change, avoid duplication of provisions, achieve holistic and integrated approach and other general planning amendments. 2. Relevant provisions: Introduction, WQ I8, WQ O2, WQ O3, WQ O7, WQ O8, WQ O12, WQ P2, WQ P3. 3. That the plan should be amended to properly recognise water quality matters in accordance with the policy guidance from the NPSFM. 4. Relevant provisions: WQ O3, WQ O5, WQ O7, WQ P2, proposed WQ P3A, WQ M1.	Fish and Game Council (Eastern Region) Federated Farmers of New Zealand Fonterra Co-operative Group Limited Mercury NZ Limited Ngāti Tūwharetoa Geothermal Assets Ltd Creswell NZ Limited Te Runanga o Ngāti Awa Rotorua Lakes Council The Royal Forest and Bird Protection Society of New Zealand Incorporated Horticulture New Zealand Motiti Rohe Moana Trust Ngati Makino Heritage Trust Tauranga Moana & Others Tauranga City Council Motiti Rohe Moana Trust
Royal Forest and Bird Protection Society **ENV-2018-AKL-000323**	1. Replace the word ‘aspirations’ in WQ O9 with ‘wellbeing’, which is widely used in the NPSFM and RMA.	Federated Farmers of New Zealand Ngāti Makino Heritage Trust Te Runanga o Ngāti Awa Trustpower Limited Creswell NZ Limited Horticulture New Zealand Motiti Rohe Moana Trust
Tauranga City Council **ENV-2018-AKL-000308**	1. Advice notes to WQ R10 and WQ R11 to give notice to plan users regarding future WMA limits being incorporated by way of a plan change.	Ngati Makino Heritage Trust Tauranga Moana & Others Ford Land Projects Pty Ltd Te Tumu Kaituna 14 Trust Western Bay of Plenty Regional Council Carrus Corporation Limited Quayside Properties Limited Trustpower Limited Rotorua Lakes Council
Eastern Fish and Game **ENV-2018-**	1. For limits set within the NPSFM under WQ P2, remove the allowance for crop and rootstock survival water provided by WQ P31.	Federated Farmers of New Zealand Trustpower Limited Rotorua Lakes Council

AKL-000328		Horticulture New Zealand

GROUP 3

Topic 6 Unauthorised takes (dairy)

WQ O7, WQ O10, WQ P3, WQ P14, WQ R4, proposed WQ RX1

Appellant	Summary of Relief	s274 parties
Trustpower Limited **ENV-2018-AKL-000316**	1. Amendments to make existing unauthorised dairy farm takes above HEPs restricted discretionary activities requiring notification to HEPs operators (rather than non-notified controlled activities) and associated amendments to objectives and policies. 2. Relevant provisions: WQ O10, WQ P14, WQ R4, proposed WQ RX1.	Federated Farmers of New Zealand Fonterra Co-operative Group Limited Mercury NZ Limited Creswell NZ Limited OJI Fibre Solutions (NZ) Limited The Royal Forest and Bird Protection Society of New Zealand Incorporated Horticulture New Zealand Ngati Makino Heritage Trust Tauranga Moana & Others Tauranga City Council Te Runanga o Ngāti Awa
Royal Forest and Bird Protection Society **ENV-2018-AKL-000323**	1. Amendments to make existing unauthorised dairy farm takes above HEPs restricted discretionary activities requiring notification to HEPs operators (rather than non-notified activities) and associated amendments to objectives and policies. 2. Relevant provisions: WQ O10, WQ P14, WQ R4, proposed WQ RX1.	Federated Farmers of New Zealand Fonterra Co-operative Group Limited Trustpower Limited, Horticulture New Zealand Motiti Rohe Moana Trust Ngati Makino Heritage Trust Creswell NZ Limited
Te Rūnanga o Ngāti Awa **ENV-2018-AKL-000318**	1. The deletion of WQ P14 or for activities to be reclassified as RDA. 2. Deletion of the words “where relevant” (alongside consequential drafting) from WQ O7(a). 3. Activities subject to rule WQ R4 be restricted discretionary.	Federated Farmers of New Zealand Mercury NZ Limited Ngati Makino Heritage Trust The Royal Forest and Bird Protection Society of New Zealand Incorporated Horticulture New Zealand Motiti Rohe Moana Trust Tauranga City Council Creswell NZ Limited Trustpower Limited, Sunchaser Investments Limited Partnership Quayside Properties Limited
Horticulture New Zealand **ENV-2018-**	1. To amend WQ P3 to ensure that existing authorised users do not bear the consequences of over allocation caused by takes granted post October 2016.	Motiti Rohe Moana Trust Trustpower Limited Federated Farmers of New Zealand

AKL-000322		Creswell NZ Limited
Oji Fibre Solutions (NZ) Limited **ENV-2018-AKL-000317**	1. To amend WQ R4 to clarify that only surface water takes are subject to the Tarawera River Catchment Plan.	Federated Farmers of New Zealand Trustpower Limited The Royal Forest and Bird Protection Society of New Zealand Incorporated Creswell NZ Limited Motiti Rohe Moana Trust

Topic 7 Renewable Electricity

WQ O2, WQ O8(e), WQ O10,WQ P5, WQ P6, proposed WQ P8, WQ P11, WQ P14, WQ P19, proposed WQ P19X, proposed WQ P20, WQ P23, WQ R4, WQ RX1, WQ R10, WQ R11, proposed WQ R12

Appellant	Summary of Relief	s274 parties
Trustpower Limited **ENV-2018-AKL-000316**	The appellant is seeking: 1. Amendments relating to renewable electricity including to properly recognise, provide for and maintain the generation output of HEPs in the plan and give effect to and be consistent with planning documents including the NPSREG. 2. Relevant provisions: WQ O2, WQ O8, WQ P5, WQ P6, proposed WQ P8, WQ P11, WQ P19, proposed WQ P19X, proposed WQ P20, WQ P23, WQ R4, WQ R10, WQ R11, proposed WQ R12, and the unauthorised dairy take provisions WQ O10, WQ P14, WQ R4, proposed WQ RX1.	Eastland Generation Limited Fonterra Co-Operative Group Limited Te Runanga o Ngāti Awa Galatea-Murupara Irrigation Society CNI Iwi Land Management Limited Federated Farmers of New Zealand Royal Forest and Bird Protection Society of New Zealand Incorporated Horticulture New Zealand Motiti Rohe Moana Trust Tauranga Moana & Others Tauranga City Council
Mercury NZ Limited **ENV-2018-AKL-000313**	1. New policy to recognise the benefits of the take and use of water related to geothermal resources.	Eastland Generation Limited Te Runanga o Ngāti Awa CNI Iwi Land Management Limited Federated Farmers of New Zealand Royal Forest and Bird Protection Society of New Zealand Trustpower Limited Creswell NZ Limited Ngāti Tūwharetoa Geothermal Assets Ltf
CNI Iwi Land Management **ENV-2018-AKL-000333**	1. The deletion of WQ P19 because it inappropriately constrains the ability of CNI to develop and gives primacy to the NPSREG over the NPSFM and that matters relating to the Rangitāiki catchment should be dealt with in PPC12.	Federated Farmers of New Zealand Trustpower Limited
Te Runanga o Ngāti Awa **ENV-2018-AKL-000318**	1. To delete WQ O8(e) that recognises the benefits of energy generation from renewable resources. 2. Amend WQ P19 to ensure tāngata whenua values and potential use for Māori land is included within the policy.	CNI Iwi Land Management Limited Federated Farmers of New Zealand Ngāti Tūwharetoa Geothermal Assets Ltd Creswell NZ Limited

		Mercury NZ Limited Horticulture New Zealand Motiti Rohe Moana Trust Tauranga Moana & Others Tauranga City Council Trustpower Limited Sunchaser Investments Limited Partnership Quayside Investments Limited
Tauranga Moana & Others **ENV-2018-AKL-000331**	1. Amend WQ O2 with regard to Treaty rights and responsibilities. 2. Don't elevate NPSREG above NPSFM.	Trustpower Limited Motiti Rohe Moana Trust Horticulture New Zealand Tauranga City Council Ngāti Makino Heritage Trust Sunchaser Investments Limited Partnership Creswell NZ Limited Motiti Rohe Moana Trust Federated Farmers of New Zealand Quayside Properties Limited Te Tumu Kaituna 14 Trust Carrus Corporation Limited Ford Land Projects Pty Limited

GROUP 4

Topic 8 Limits, flows, levels and over allocation

WQ O4, WQ O7, WQ P2, WQ P3, WQ P4, WQ P5, WQ P6, proposed WQ P8, WQ P10, WQ P16, WQ P29, WQ R3, WQ R10, WQ R11, schedule 15, Assessment of Water Availability Report

Appellant	Summary of Relief	s274 parties
Horticulture New Zealand **ENV-2018-AKL-000322**	1. To replace the term 'limits' with 'interim thresholds' to provide clarity regarding NPSFM terminology. Limits are appropriate after a WMA process. 2. Amend WQ P3 to ensure that existing authorised users do not bear the consequences of over allocation caused by takes granted post October 2016. 3. Clarification is sought regarding allocation limits, net allocation, RAAR, frost protection, definitions and schedule 15.	Federated Farmers of New Zealand Royal Forest and Bird Protection Society of New Zealand Trustpower Limited Te Runanga o Ngāti Awa Rotorua Lakes Council Motiti Rohe Moana Trust Creswell NZ Limited
Trustpower Limited **ENV-2018-AKL-000316**	1. Amendments regarding allocation (including full, close to full and over allocation), interim limits (particularly secondary allocation), flow, and harvesting during high flows. 2. Relevant provisions: WQ P2, WQ P3, WQ P5, WQ P6, proposed WQ P8, WQ R3.	Mercury NZ Limited Te Runanga o Ngāti Awa Creswell NZ Limited Federated Farmers of New Zealand Fonterra Co-operative Group Limited Rotorua

		Lakes Council Royal Forest and Bird Protection Society of New Zealand Incorporated Horticulture New Zealand Motiti Rohe Moana Trust Tauranga Moana & Others Tauranga City Council
Royal Forest and Bird Protection Society **ENV-2018-AKL-000323**	1. Certainty regarding the term 'sustained decline' in relation to groundwater. 2. To revert to the notified term of 'to allow flow variation' rather than the decision term of 'to maintain flow variation' in WQ P4.	Federated Farmers of New Zealand Galatea-Murupara Irrigation Society Rotorua Lakes Council Trustpower Limited Horticulture New Zealand Motiti Rohe Moana Trust Ngati Makino Heritage Trust Creswell NZ Limited
Tauranga City Council **ENV-2018-AKL-000308**	The appellant is seeking: 1. To amend WQ P5 to allow the allocation limit to be substituted where a rigorous assessment process has occurred. 2. Amend WQ P16 to allow municipal water takes to be managed for low flow but not required to cease taking. (also listed under 4.3) 3. To add an advice note to WQ R10 and WQ R11 to state that any revision of limits to allocation would be via a plan change. WQ P1	Mercury NZ Limited Te Runanga o Ngāti Awa Federated Farmers of New Zealand Tauranga Moana & Others Western Bay of Plenty District Council Royal Forest and Bird Protection Society of New Zealand Incorporated Trustpower Limited Quayside Properties Limited Ford Land Projects Pty Ltd, Te Tumu Kaituna 14 Trust Carrus Corporation Limited Ngāti Makino Heritage Trust Creswell NZ Limited Rotorua Lakes Council
Ngāti Mākino Heritage Trust **ENV-2018-AKL-000320**	1. Revised limits for secondary allocation and interim minimum flows to 90% 7DMALF for rivers with a mean flow less than 5m3/s OR 80% of the 7DMALF for rivers with a mean flow greater than 5m3/s.	Sunchaser Investments Limited Partnership Tauranga City Council Creswell Nz Limited Trustpower Limited Quayside Properties Limited Te Tumu Kaituna 14 Trust Carrus Corporation Limited Ford Land Projects Pty Limited
Motiti Rohe Moana Trust **ENV-2018-AKL-000319**	1. Revised limits for secondary allocation and interim minimum flows to 90% 7DMALF for rivers with a mean flow less than 5m3/s OR 80% of the 7DMALF for rivers with a mean flow greater than 5m3/s.	Sunchaser Investments Limited Partnership Tauranga City Council Creswell Nz Limited Trustpower Limited Quayside Properties Limited

		Te Tumu Kaituna 14 Trust Carrus Corporation Limited Ford Land Projects Pty Limited
Tauranga Moana & Others **ENV-2018-AKL-000331**	1. Amend schedule 15 (Method for estimating surface water and groundwater allocation) to make consistent with integrated management and to apply to the whole of the water body and make interim until iwi/hapū limits understood. 2. Include recycling of wastewater and water conservation measures in WQ P29.	Horticulture New Zealand Motiti Rohe Moana Trust Tauranga City Council Ngati Makino Heritage Trust Trustpower Limited Federated Farmers of NZ Sunchaser Investments Ltd Partnership Quayside Properties Limited Te Tumu Kaituna 14 Trust Carrus Corporation Limited Ford Land Projects Pty Limited Creswell NZ Limited
Te Runanga o Ngāti Awa **ENV-2018-AKL-000318**	1. Withdraw the Assessment of Water Availability and Estimates of Current Allocation Levels Report and complete further work to address both procedural and substantive concerns with the report. 2. Reinstatement of the words “where relevant” in WQ O7.	Creswell NZ Limited Federated Farmers of NZ Horticulture NZ Motiti Rohe Moana Trust Tauranga City Council Trustpower Limited Sunchaser Investments Ltd Partnership Quayside Properties Limited
Motiti Rohe Moana Trust **ENV-2018-AKL-000319**	1. An avoidance or mitigation regime introduced to ensure adequate water of potable and swimming quality.	Federated Farmers of NZ Mercury NZ Limited Ngati Makino Heritage Trust Tauranga City Council Creswell Nz Limited Sunchaser Investments Ltd Partnership

Topic 9 Rules, resource consent matters and schedule 7

WQO3, WQ O4, WQ O11, WQ P6, WQ P7, WQ P10, WQ P11, WQ P12, WQ P16, WQ P17, WQ M4, WQ R1, WQ R2, WQ RX, schedule 7

Appellant	Summary of Relief	s274 parties
Trustpower Limited **ENV-2018-AKL-000316**	1. Amendments to WQ P10 including to provide guidance to resource consent applicants for demonstrating why the application should be granted, amendments to WQ P11 to generally exclude new applications above HEPs and amendments to WQ P11, WQ P16, to require specific resource consent conditions.	Royal Forest and Bird Protection Society of New Zealand Incorporated Horticulture NZ Motiti Rohe Moana Trust Tauranga City Council Fonterra Co-operative Limited

		Mercury NZ Limited Quayside Properties Limited Te Runanga o Ngati Awa Federated Farmers of NZ Galatea-Murupara Irrigation Society Rotorua Lakes Council Horticulture NZ Tauranga Moana & Others Creswell NZ Limited
Royal Forest and Bird Protection Society **ENV-2018-AKL-000323**	1. That the precautionary approach identified in WQ P7 not be restricted to water take permits where the limits are exceeded. 2. That WQ P 10 and WQ P12 be amended to include a requirement to avoid remedy or mitigate adverse effects with consequential change to WQ P17. 3. Additional clauses in WQ P16 (conditions on resource consents) to provide clear direction regarding rules. 4. Provide a setback from wetlands in the groundwater rules to preserve the natural character of wetlands. 5. Insert 'Subject to objectives WQ O3 and WQ O4' in WQ O11 and WQ M4, as a qualifier to water storage provisions.	Ballance Agri-Nutrients Limited Horticulture NZ Mercury NZ Limited Motiti Rohe Moana Trust Ngati Makino Heritage Trust Federated Farmers of NZ Tauranga City Council Rotorua Lakes Council Whakatane District Coucnil Trustpower Limited Te Runanga o Ngati Awa Creswell NZ Limited
Whakatāne District Council **ENV-2018-AKL-000315**	1. That greater policy direction be given in WQ P17 to provide for longer term consents, given the scale of investment in municipal water supplies.	Royal Forest and Bird Protection Society of New Zealand Incorporated Tauranga City Council Creswell NZ Limited Te Runanga o Ngati Awa Trustpower Limited Quayside Properties Limited Te Tumu Kaituna 14 Trust Carrus Corporation Limited Ford Land Projects Pty Limited Eastland Generation Limited
Te Rūnanga o Ngāti Awa **ENV-2018-AKL-000318**	1. Greater inclusion of tāngata whenua values in resource consent processes. 2. Consideration of tāngata whenua values and relationships in both the permitted and controlled activity rules. 3. Inclusion of cultural values and relationships of tāngata whenua in schedule 7, or its deletion.	Tauranga City Council Horticulture NZ Motiti Rohe Moana Trust Federated Farmers of NZ Creswell NZ Limited Royal Forest and Bird Protection Society of New Zealand Incorporated Sunchaser Investments Ltd Partnership Quayside Properties Limited Mercury NZ Limited
Horticulture	1. Include criteria in schedule 7 to determine efficient use for frost protection.	Motiti Rohe Moana Trust

New Zealand **ENV-2018-AKL-000322**		Trustpower Limited
Tauranga City Council **ENV-2018-AKL-000308**	1. Specifying a longer consents term for regionally significant infrastructure in WQ P17	Te Runanga o Ngati Awa Te Tumu Kaituna 14 Trust Federated Farmers of NZ Ford Land Projects Pty Limited Carrus Corporation Limited Ngati Makino Heritage Trust Rotorua Lakes Council Royal Forest and Bird Protection Society of New Zealand Incorporated Tauranga Moana & Others Western Bay of Plenty District Council Creswell NZ Limited Trustpower Limited Quayside Properties Limited
Tauranga Moana & Others **ENV-2018-AKL-000331**	1. Amend schedule 7 to recognise relationships of ahikaa, iwi and hapū 2. To include stocking rates or cows per ha in schedule 7. 3. Include cultural values and relationship of tāngata values in schedule 7 or delete. 4. Delete WQ P11(c)(ii) that relates to avoiding or mitigating saltwater intrusion. 5. That all rules are amended to recognise the relationship of ahikaa, iwi and hapū and require an iwi hapū assessment. 6. Delete or raise to RDA status rule WQ RX that provides a permitted activity for aquifer/ pump testing.	Carrus Corporation Limited Horticulture NZ Motiti Rohe Moana Trust Tauranga City Council Te Tumu Kaituna 14 Trust Federated Farmers of NZ Ngati Makino Heritage Trust Sunchaser Investments Limited Partnership Trustpower Limited Ford Land Projects Pty Ltd Quayside Properties Ltd Creswell NZ Limited

Topic 10 Municipal Water Supplies

WQ O5, WQ O8, WQ P16, WQ P21, WQ P31, WQ R6, definitions

Appellant	**Summary of Relief**	**s274 parties**
Tauranga City Council **ENV-2018-AKL-000308**	1. Consistency with the NPSUDC, the RPS, statutory obligations under the Health Act 1956, The Local Government Act 2002 and various parts of the RMA. 2. Revise WQ O5 (requires land use change to take into water availability) so that it is not 'water limitation led' to be consistent with TCC's obligations under NPSUDC. 3. Revise WQ 08 to give appropriate recognition to future urban growth. 4. Amend WQ P16 to allow municipal water takes to be managed for low flow but not required to cease taking. (also listed under 4.1)	Carrus Corporation Limited Federated Farmers of NZ Ford Land Projects Pty Ltd Royal Forest and Bird Protection Society of New Zealand Incorporated Creswell NZ Limited Te Tumu Kaituna 14 Trust

	5. That WQ P21 recognises and provides certainty and priority to the demands of the urban community and growth pressures. 6. A definition of regionally significant infrastructure.	Western Bay of Plenty District Council Mercury NZ Limited Te Runanga o Ngati Awa Tauranga Moana & Others Horticulture NZ Ngati Makino Heritage Trust Rotorua Lakes Council Trustpower Limited Eastland Generation Limited Quayside Properties Limited
Whakatāne District Council **ENV-2018-AKL-000315**	1. Greater certainty and priority to municipal water supplies. 2. Amendments to definitions for municipal supply to better recognise their agricultural based supply (Plains Water supply scheme). 3. To incorporate the definition for regionally significant infrastructure from the RPS.	Carrus Corporation Limited Creswell NZ Limited Eastland Generation Limited Federated Farmers Limited Ford Land Projects Pty Limited Royal Forest and Bird Protection Society of New Zealand Incorporated Horticulture NZ Mercury NZ Limited Motiti Rohe Moana Trust Quayside Properties Limited Tauranga City Council Te Tumu Kaituna 14 Trust Te Runanga o Ngati Awa Trustpower Limited Western Bay of Plenty District Council Rotorua Lakes Council
Horticulture New Zealand **ENV-2018-AKL-000322**	1. The ‘unbundling’ of municipal water is so that priority provisions don’t apply to those parts which are not used for domestic type supplies.	Carrus Corporation Limited Federated Farmers of NZ Ford Land Projects Pty Ltd Royal Forest and Bird Protection Society of New Zealand Incorporated Ballance Agri-Nutrients Limited Creswell NZ Limited Te Tumu Kaituna 14 Trust Mercury NZ Limited Tauranga City Council Trustpower Limited Quayside Properties Limited Rotorua Lakes Council Motiti Rohe Moana Trust Whakatana District Council

Topic 11 Rootstock Survival water

WQ O8, WQ P31(e)

Appellant	Summary of Relief	s274 parties
Horticulture New Zealand **ENV-2018-AKL-000322**	1. That the benefits of providing water for horticulture be specifically recognised in WQ O8. 2. Deletion of the requirement to relate rootstock survival water to that which is scientifically proven as necessary or a method that outlines the burden of proof.	Western Bay of Plenty District Council Creswell NZ Limited Motiti Rohe Moana Trust Trustpower Limited
Eastern Fish and Game **ENV-2018-AKL-000328**	1. Greater specificity and controls on crop and rootstock survival water. 2. Remove the term "during times of low flows and aquifer levels" from WQ P31 and replace with a term that is defined and consistent with the NPSFM.	Carrus Corporation Limited Federated Farmers of NZ Ford Land Projects Pty Ltd Quayside Properties Limited Te Tumu Kaituna 14 Trust Trustpower Limited Rotorua Lakes Council Horticulture NZ

Topic 12 Transfer of water permits

WQ P23, WQ R7, WQ R8, WQ R9

Appellant	Summary of Relief	s274 parties
Tauranga Moana & Others **ENV-2018-AKL-000331**	1. Transferred water must first be offered back to iwi/hapū 2. To require the transferee to provide an iwi/hapū assessment that proves there is no impact on the relationship of ahikaa, iwi or hapū. 3. To prevent the development of a tradeable regime by not allowing the partial or temporary transfer of permits.	Tauranga City Council Horticulture NZ Motiti Rohe Moana Trust Ngati Makino Heritage Trust Sunchaser Investments Limited Partnership Trustpower Limited Carrus Corporation Limited Ford Land Projects Pty Limited Te Tumu Kaituna 14 Trust Quayside Properties Limtied Federated Farmers of NZ Creswell NZ Limited
Quayside Properties Limited **ENV-2018-AKL-000340**	1. The reinstatement of the notified version of WQ P23, as an appropriate mechanism to avoid further over allocation and give effect to the NPSFM	Federated Farmers of NZ Galatea-Murupara Irrigation Society Mercury NZ Limited Motiti Rohe Moana Trust Trustpower Limited Western Bay of Plenty District Council

		Horticulture NZ Ngati Makino Heritage Trust
Te Rūnanga o Ngāti Awa **ENV-2018-AKL-000318**	1. Consideration of the impact of transfers on the current or future use of Māori owned land. 2. Provisions relating to the transfer of water permits without prior consideration of Māori land be deleted (for example WQ O11, WQ P2, WQ P13,WQ P23, WQ R7, WQ R8 and WQ R9).	Mercury NZ Limited Quayside Properties Limited Creswell NZ Limited Federated Farmers of NZ Horticulture NZ Motiti Rohe Moana Trust Tauranga Moana & Others Tauranga City Council Trustpower Limited Royal Forest and Bird Protection Society of New Zealand Incorporated Sunchaser Investments Limited Partnership
Trustpower Limited **ENV-2018-AKL-000316**	1. Amendments to WQ P23 so that surface water transfers will only be considered where they are not from downstream to upstream of an existing HEPs. 2. Relevant provision: WQ P23	Galatea-Murupara Irrigation Society Tauranga City Council

Report To: Regional Direction and Delivery Committee

Meeting Date: 19 February 2019

Report From: Stephen Lamb, Natural Resources Policy Manager

Proposed Plan Change 13 (Air Quality) - Hearing Panel Recommendations

Executive Summary

Plan Change 13 (the Plan Change) seeks to provide a framework for the sustainable management of air in the region – in particular to manage the discharge of contaminants.

The Plan Change was publicly notified on 27 February 2018. A total of 80 submissions were received, with 30 further submissions raising a total of 1,697 submission points.

Submitters were heard over five days in two locations: 15-17th October 2018 in Tauranga and 25-26th October in Rotorua. A total of 36 submitters presented their submissions to the Hearing Panel with two further submitters deciding not to attend but supplying further written material.

The recommendations have been received from the Hearing Panel with the key recommendations as follows:

- Industrial and trade premises – no longer excluded from AQ R1 but new discretionary activity rule AQ R22 included to manage handling of bulk solid materials (such as palm kernel extract).
- Open burning – ban on urban (backyard) burning extended to any burning carried out within 100 metres of a neighbouring dwelling house.
- Rotorua burners – changes recommended to provisions to allow for exceptional circumstances, ultra-low emission burners, secondary emission reduction devices, and one outdoor open fire on a business premises (until 2020).
- Agrichemical spraying – changes recommended to provisions to require best practice, training, along with minor amendments to notification and signage requirements to make them more practical. Additional controlled activity rule to allow for consent process for agrichemical spraying.
- Fumigation – after extensive discussion, recommend amendment to definition of "recapture", now requiring "effective recapture".
- Spraypainting/abrasive blasting – changes recommended to include all large scale spraypainting of solvent based paints, and allowance for items too large to dismantle

or transport to spray or blasting booths.

- Crematoria – all crematoria must apply for resource consent, with a controlled activity pathway provided to give certainty for existing crematoria, while allowing consent conditions to manage effects.

- New permitted activities for cement storage and handling, mobile or emergency diesel generators and pumps, and small scale activities (roasting coffee beans, in vessel composting and small free-range poultry farms).

The recommendations made by the Hearing Panel have been informed by a significant level of evidence, verbal discussion and questions held during the Hearing, Staff's section 42A report and the section 32 report. Given the extensive knowledge gained through the robust process run by the Panel it is considered that the recommendations are sound and reflect the high level of consideration the Panel has given to submissions. Staff recommend that the Committee accept the recommendations.

If the Committee accept the recommendations, the decisions will become Council decisions under clause 10 of Schedule 1 to the Resource Management Act 1991 (RMA). On and from the date the decisions are publicly notified (12 March 2019), Proposed Plan Change 13 is amended in accordance with the decisions.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Proposed Plan Change 13 (Air Quality) - Hearing Panel Recommendations.

2 Receives the report and recommendations of the Hearing Panel on Proposed Plan Change 13 (Air Quality) to the Bay of Plenty Regional Natural Resources Plan as set out in the attached document "Report and Recommendations of the Hearing Panel" and its appendices A to C.

3 Accepts the recommendations of the Hearing Panel on Proposed Plan Change 13 (Air Quality) to the Bay of Plenty Regional Natural Resources Plan as set out in the supporting document "Report and Recommendations of the Hearing Committee" and its appendices A to C as Council's decisions on submissions on Proposed Plan Change 13 (Air Quality) under clause 10(1) of Schedule 1 to the Resource Management Act 1991.

4 Approves public notification of its decisions on submissions on Proposed Plan Change 13 (Air Quality) to the Bay of Plenty Regional Natural Resources Plan in accordance with clauses 10 and 11 of Schedule 1 to the Resource Management Act 1991.

5 Notes that the requirements of 32AA(1)(d)(ii) of the Resource Management Act 1991 are fulfilled by Appendix C of the Hearing Panel report.

6 Notes that on and from the date the decisions are publicly notified, Proposed Plan Change 13 (Air Quality) to the Bay of Plenty Regional Natural Resources Plan is amended in accordance with the decisions.

1 Purpose

This report presents the recommendations made by the Hearing Panel on Proposed Plan Change 13 (Air Quality) to the Operative Regional Natural Resources Plan. The Hearing recommendations report is a supporting document to this agenda.

2 Background

The Bay of Plenty in general has good air quality however there are parts of the region where the air quality is not as good as it could be and this has effects on health and well-being. Proposed Plan Change 13 (Air Quality) to the Regional Natural Resources Plan (the Plan Change) seeks to provide a framework for the sustainable management of air in the region – in particular to manage the discharge of contaminants.

The process of developing this Plan Change was initiated by a full review of the Regional Air Plan carried out according to Section 79 of the Resource Management Act, 1991 (RMA). This review assessed whether the objectives had been met and reviewed the efficiency and effectiveness of the provisions. The outcome of the review was reported to the Regional Direction and Delivery Committee (the Committee) on 19 February 2015.

2.1 Community consultation

At this point, staff prepared a discussion document and draft set of provisions for what was then the new Regional Air Plan. These provisions were adopted by the Committee and the draft plan was released for public comment on 26 April 2016.

Following this, a draft plan change and discussion document was released to the community for feedback on 26 April 2016. During the extended feedback period, staff facilitated or attended a number of meetings and workshops to discuss the draft provisions with the community, including iwi and hapū.

Feedback from community consultation was incorporated into the draft plan.

2.2 Further decisions affecting the Plan Change

Following community consultation, this Committee approved revisions to the draft plan change as follows:

- In August 2016 the Committee approved the amalgamation of most regional plans, including the air plan, into the Regional Natural Resources Plan. The new Regional Air Plan became known as Plan Change 13.

- In August 2017, staff presented the Committee with options to manage air quality in the Mount Maunganui area. The Committee approved the option to use general provisions to manage discharges in this area at this time. This option was approved due to insufficient evidence base to support targeted rules for discharges in Mount Maunganui at this time.

- In October 2017 the Committee approved amendments to the draft rules intended to manage solid fuel burners in the Rotorua Airshed. These amendments extended the deadline to phase out old burners from 2019 to 2020 and introduced an “offset” rule to ensure the rules were consistent with

the Rotorua Lakes Council's Rotorua Air Quality Control Bylaw (reviewed in September 2017).

These amendments were made to the plan change prior to its notification.

2.3 Submissions

The Plan Change was publicly notified on 27 February 2018. A total of 80 submissions were received, raising a number of issues presented to this Committee on 27 June 2018:

a. No recognition of, or provision for, the operational requirements of established industry and the competing demands on the air quality resource.

b. Provisions require adverse effects to be avoided which may result in some activities to become prohibited.

c. Provisions refer to standards and guidelines outside the plan, with no allowance for their amendment or replacement. Some guidelines should not be used as they were not intended to be used as set standards.

d. Concern with the automatic exclusion of industrial or trade premises as permitted activities as this is not an effects based approach.

e. Support for the banning of urban open burning but concern with the definition of "urban property" which the rule relies on.

f. Concern with rules to manage solid fuel burners in Rotorua; lack of notice, lack of community consultation, and the health effects of cold homes, power bills, and cost of replacement burners.

g. Support for overall approach of agrichemical spray rules with requests to extend change window, changes to signage requirements, and requirement for training.

h. Widely divided submissions on the use of methyl bromide, other fumigants, and the requirement for recapture technology.

i. Concern with the definitions (or lack of) for the terms "noxious or dangerous", "offensive or objectionable".

j. Request for provisions to manage reverse sensitivity.

Submissions were summarised and released for further submissions on 1 July 2018. Thirty further submissions were received. Four further submissions focussed on one particular issue:

k. Concern about health effects of dust and particulates from bulk handling of fine materials (such as palm kernel extract) at De Havilland Way, Mount Manganui.

3 Hearing and Deliberations

On 9 August 2018 this Committee approved the establishment of a Hearing Panel. The members were selected to provide expertise and experience across air quality

science, local knowledge and appreciation of regional air issues, tikanga Māori, experience with resource management decision making.

The Hearing Panel consisted of the following:

- Councillor Andrew von Dadelszen (Chair)
- Councillor Matemoana McDonald
- Commissioner John Iseli

Staff recommendations in response to submission points (Section 42A report) were provided to the Hearing Panel and publicly released on 1 October.

Submitters were heard over five days in two locations: 15-17th October in Tauranga and 25-26th October in Rotorua. A total of 36 submitters presented their submissions to the Hearing Panel with two further submitters deciding not to attend but supplying further written material.

Deliberations were held in Tauranga over two days: 7-8th November 2018. The hearing closed on 8th November 2018.

4 Hearing Panel recommendations

In January 2018 the Hearing Panel completed their recommendations report (attached). Overall, the Hearing Panel's recommendations are generally supportive of staff recommendations made in the Section 42A report.

The recommendations made by the Hearing Panel were informed by evidence submitted during the Hearing (written and verbal), responses to questions of clarification from the Panel, submissions received, staff's Section 42A report, the Section 32 report, and site visits. An overview of the key recommendations is provided in the sections below.

These recommendations in this section are from the Hearing Panel and do not represent staff opinion.

4.1 Industrial and trade premises – AQ R1, AQ R2

The Plan Change included rule AQ R1 which generally permits *de minimus* activities. Industrial or trade premises were specifically excluded from this rule which generated a number of submissions for the Hearing Panel's consideration.

The Hearing Panel accepted that the condition excluding industrial or trade premises was too broad and inadvertently captured many *de minimus* activities. The Panel recommended that the activity of principal concern, the handling of bulk solid materials, was targeted by a specific rule as discussed below.

4.1.1 Handling of bulk solid materials – new rule AQ R22

Further submissions and evidence presented at the hearing highlighted the adverse effects experienced at Aerodrome Road in relation to a large bulk handling facility on De Havilland Way, Mount Maunganui, and with the unloading of bulk solid materials at the Port of Tauranga. The Panel carried out a site visit both to the operation at De Havilland Way and to the Port of Tauranga.

The Hearing Panel decided that large bulk handling facilities of this type have potential to generate significant dust emissions and should be subject to consent which would allow the effects of the dust discharge on sensitive areas to be properly assessed and mitigated through consent conditions. This is consistent with the approach used by other regional councils.

A new rule AQ R22 has been included in the Plan Change requiring consent for large bulk handling facilities. The scale limit has been set to ensure that consent is unlikely to be required for smaller scale facilities such as small rural fertiliser depots, particularly those that are well separated from sensitive receptors, where dust effects are typically minor.

4.2 Open burning – AQ P5, AQ R6, AQ R9

The proposed open burning rules target burning carried out in the outdoor open air and ban burning in urban areas.

In response to submissions, the Hearing Panel recommends changes to the open burning policy and rules to make it more effects based – removing the word "urban" and referring instead to open burning carried out within 100 metres of a neighbouring house.

The Panel also recommends including an allowance for written approvals to be obtained from the occupier of dwellings within 100m of the fire to provide an opportunity for burning to occur in some cases, such as rural areas, if agreement is obtained from nearby neighbours that could be adversely affected.

4.3 Rotorua burners – AQ P7, AQ R12, AQ R13, AQ R13A, AQ R13B, AQ R14

The suite of Rotorua burner provisions manage the discharge to air from solid fuel burners (burners) within the Rotorua Airshed.

The Hearing Panel recommends a number of changes to the policy and rules that manage burners in the Rotorua Airshed.

- Discharges are permitted only from certain existing indoor open fires to ensure new indoor open fires are not installed in the Rotorua Airshed.

- Ultra-low emission burners (ULEBs) have been added to the burner types permitted for use in Rotorua as replacement for existing burners (AQ R12(d)) or as new burners where an offset is provided (AQ R13). These modern ULEBs are designed to minimise PM_{10} emissions such that their effects are predicted to be less than emissions from modern wood burners.

- Existing outdoor solid fuel burners on business premises are permitted until 31 January 2020 (AQ R12(c)(iv)). The change recognises that such open fires are the source of significant PM_{10} emissions to the Rotorua Airshed, significantly exceeding emissions from modern wood burners. The change provides for one known existing outside fire to be a permitted activity until February 2020, providing time for alternatives to be investigated. After this time they will become discretionary (AQ R13A), requiring consent. This change will allow a full assessment of effects to be considered at that time

- The Panel recommends an additional discretionary activity rule AQ R13B to provide for future situations where secondary emission reduction devices may

be used to control particulate emissions from wood burners installed after 1 September 2005. Given the limited information available at this time, it is considered that the effectiveness of these devices should be assessed via the resource consent process.

4.4 Agrichemical spraying – AQ P8, AQ R15, AQ R25

The Hearing Panel recommends the following changes to the agrichemical spraying provisions:

- Include a new clause to AQ P8 to encourage best practice.
- Add condition (d) to general use of agrichemicals requiring training to encourage best practice to prevent spray drift. Having regard to the potential adverse effects associated with spray drift, the Panel considered that a specific training requirement should apply to all operators, except those using hand-held equipment.
- Signage and notification not required when spraying using hand-held application methods except where spraying is to occur on public amenity areas.
- Signage required at the entrance to private property where spraying is taking place. Signs must remain up until agrichemicals have settled, but must be taken down within 5 days. To ensure that signs are effective as a means of warning persons that spraying is occurring, it is important that signs do not remain in place for extended periods.
- After hearing submissions from the Department of Conservation and the forestry sector, the Hearing Panel decided to amend notification requirements to allow notification as early as 20 days prior to spraying on forestry or conservation areas. The panel accepts that the additional time period in these circumstances, where large blocks of land with multiple neighbours are often involved, allows for notification and potential subsequent discussion or meetings with affected parties.
- The Hearing Panel also recommend a new, controlled activity rule for agrichemical spraying that cannot meet the extensive conditions of AQ R15. This will allow the effects of agrichemical spraying discharges to be assessed to ensure appropriate controls are in place, while providing assurance to the sprayers that consent would be granted, subject to conditions.

4.5 Fumigation (including methyl bromide) – AQ R20

After hearing from submitters, including Genera and the Stakeholders in Methyl Bromide Reduction (STIMBR), the Hearing Panel decided to include the wording ‘effective’ before the word recapture and include a definition of effective recapture.

The definition of “effective recapture” requires that the concentration of fumigant (not absorbed by the target product) within a fumigation enclosure at the beginning of the fumigation period be reduced by 80% prior to ventilation of the fumigation enclosure.

This definition takes into account the advice of staff and the submission of STIMBR, who stated that 80% recapture of methyl bromide is consistently achievable using current technology. We accept the submission of Genera that 100% recapture of

methyl bromide is not practical at present and is not consistent with Environmental Protection Authority requirements.

The Panel considers that the rule structure will provide clear guidance to resource consent applicants and decision makers that a minimum of 80% methyl bromide is sought for all sources, including fumigation of log stacks, containers, machinery and ship holds.

4.6 Spraypainting/abrasive blasting – AQ R16, AQ R17

The Hearing Panel considered submissions regarding the spraypainting and abrasive blasting of items too large to dismantle or transport to sealed booths. The rule has been amended to allow for spray painting and abrasive blasting of these items using best practice instead of a booth.

The spraypainting rule also widens the scope of the rule to include all larger scale painting using solvent based paints. This is more effects based as it targets all activities that may cause adverse effects.

The Hearing Panel also recommended the inclusion of drying areas in response to submitter concerns around odour from these areas.

4.7 Crematoria – AQ R21(g), AQ R27

After hearing from submitters regarding crematoria discharges, the Hearing Panel recommend to amending clause AQ R21(g) to specify that only new crematoria (established after 27 February 2018) be classified as discretionary activities.

Ongoing permitted activity status for crematoria is not considered to be appropriate as it does not allow for a site-specific assessment of effects, including where there is potential for the number of cremations to increase in future. Taking into account the concerns expressed by existing crematoria operators regarding possible consent requirements, the Panel recommends that existing crematoria be classified as controlled activities, included as AQ R27. This will allow the effects of existing cremator discharges to be assessed to ensure appropriate controls are in place, while providing assurance to the operators that consent would be granted to these existing permitted facilities, subject to conditions.

4.8 New permitted activity rules

4.8.1 Cement storage and handling – AQ R26

After considering submissions, notably from GBC Winstone, the Hearing Panel recommends a separate rule specifically addressing cement storage and handling is appropriate. The Panel visited the GBC Winstone site and observed the dust emission controls in place, and accepts that cement storage and handling can be adequately controlled via conditions of a permitted activity rule. A new, permitted activity rule AQ R26 has been included.

4.8.2 Mobile or emergency diesel generators and pumps – AQ R23

After hearing submissions from Mercury Energy and Port of Tauranga, the Hearing Panel recommend including ’mobile generators’ and ‘pumps’, in addition to emergency generators under rule AQ R23. All these sources are powered by diesel internal combustion engines with similar contaminant emissions.

Mercury Energy requested a specific clause (b) that applies to diesel-fired combustion sources at geothermal drilling and generation sites. The Panel accepts that the effects of contaminants discharged are expected to be minor under the strict conditions of the rule and recommend that clause AQ R23(b) be added to provide for geothermal drilling and electricity generation sites.

4.8.3 **Miscellaneous permitted discharges – AQ R3**

As a result of a submission, the Hearing Panel recommends adding small-scale fully enclosed in-vessel composting to the list of permitted activities. In these circumstances, odour is contained and treated and is expected to cause no more than minor effects at neighbouring properties. The Panel also recommend to specifically provide for small free-range poultry farms, and roasting of coffee beans as permitted activities.

The Panel considered the submission of Fonterra that requested inclusion of irrigation of dairy factory wastewater to land as a permitted activity. The Panel was provided with a copy of a consent held by Fonterra for irrigation onto farms and received details regarding the various matters, such as setback distances from sensitive receptors, that could be applied as conditions of a permitted activity rule. Numerous conditions would be required for a rule of this type and it is difficult to develop an effective rule that addresses all likely situations without a comprehensive assessment of effects. The Panel recommends that the definition of "liquid waste" in the Proposed Plan be retained as originally proposed, requiring consent for dairy wastewater irrigation.

4.9 **Other matters of concern to submitters**

4.9.1 **"Avoid" may lead to activities being prohibited**

There was considerable concern from submitters that use of the word "avoid" in objectives and policies would lead to many activities becoming prohibited. This concern was based on the Supreme Court decision in *King Salmon* where a private plan change was held not to give effect to the directive policies of the New Zealand Coastal Policy Statement.

Just prior to the Hearing, the Court of Appeal released its decision in *Davidson*, which specifically considered the extent to which the reasoning in *King Salmon* should be applied to resource consent applications.

The Hearing Panel considered the *King Salmon* and *Davidson* decisions and considered each use of the word "avoid" in the Plan Change. The Panel considered whether the use of the word "avoid" was designed to achieve a clear environmental outcome through being expressed in specific and directive terms and recommended changes where appropriate.

4.9.2 **No recognition of established activities**

A number of submitters were concerned that there was too much emphasis on achieving acceptable air quality with no provision for operational requirements of the region's industry, infrastructure and rural activities.

The Hearing Panel did not recommend the addition of an objective or policy to enable existing activities, however changes are recommended to AQ P1 and AQ P4 that make it clear that discharges of contaminants to air are provided for by the plan, and a number of matters related to existing industry should be considered.

4.9.3 Definitions of noxious or dangerous, offensive or objectionable

Submissions were divided regarding the definition of the term “noxious or dangerous” and the lack of a definition for the term “offensive or objectionable”. As these terms are used in the “bottom line” condition for most rules, an understanding of what they mean is important to effective use of the plan change.

The Hearing Panel does not recommend including definitions of these terms, as their interpretation needs to take account of case law precedents as they develop. However, the Panel recommends including explanatory text to give some certainty as to how the Council will interpret and implement these terms.

4.9.4 Reverse sensitivity

A substantial number of submitters requested a policy framework to manage reverse sensitivity. The Hearing Panel considered these submissions in acknowledgement that established activities located within their appropriate zones are at risk when new sensitive areas are established nearby. However, the Regional Council has no mandate to manage the underlying issue of land-use zoning in a regional air plan. Therefore the Panel recommends that no provisions to manage reverse sensitivity are included in the Plan Change.

4.10 Other recommendations

The Hearing Panel recommends a number of other changes which include:

a. Acronyms have been removed and terms included in full eg. National Environmental Standards for Air Quality not NESAQ.

b. Reference to the Ambient Air Quality Guidelines have been removed from most objectives and policies as they are not standards that should be met in all cases.

c. General wording and formatting to provide clarity for use and interpretation of the Plan Change.

4.11 Legal advice

Extensive legal advice has been obtained throughout the plan development process and through preparation of the section 32 and section 42A report. The recommendations of the Hearing Panel are consistent with legal advice already obtained, therefore no further legal advice has been requested.

5 Options for the Committee

The Committee may decide to change the recommendations made by the Hearing Panel, or to decline the recommendations.

If the Committee proposes to make changes to the recommendations made by the Hearing Panel, the change will need to be referred back to the Panel to consider in relation to the submissions and evidence presented during the course of the hearing. Submissions received in regard to the relevant topic will also need to be heard again.

If the Committee decide to decline the recommendations made by the Hearing Panel another round of hearings will need to be completed.

Each of these options presents a substantial risk to Council including financial cost, additional staff and community resources, and reputational risk – for little to no benefit.

The recommendations made by the Hearing Panel have been informed by a significant level of evidence, verbal discussion and questions held during the Hearing, Staff's section 42A report and section 32 report. This includes the assessment of many options as part of the process. In addition to this the Hearing Panel has extensive scientific, cultural and planning experience which has also had a role in the preparation of these recommendations.

Given the extensive knowledge gained through the robust process run by the Panel it is considered that the recommendations are sound and reflect the high level of consideration the Panel has given to submissions.

Staff recommend that the Committee accept the recommendations of the Hearing Panel.

6 Section 32AA Analysis

Under Section 32AA further evaluation is required for any changes made since the Plan Change was notified in February 2018. The further evaluation must be undertaken at a level of detail that corresponds to the scale and significance of the changes.

The Section 32AA analysis has been carried out and the report is included as Appendix C in the supporting document.

7 Implications for Māori

Changes to policy and rules managing air quality may have implications for Māori. This has been taken into consideration through an extended consultation period on the draft plan, extensive analysis of iwi and hapū management plans, and appointment of a Māori commissioner to the Hearing Panel.

Any implications for Māori have been considered and addressed through the hearing and deliberations process, and reflected in the recommendations from the Hearing Committee.

8 Significance and Engagement Policy

The recommendations have been assessed against the criteria and thresholds in Council's Significance and Engagement Policy and are not considered to be significant in this context.

9 Next Steps

If the Committee accept the recommendations, the Council Decisions version 8.0 of Proposed Plan Change 13 will be publicly notified on 12 March 2019.

The Committee's decisions will become Council decisions under clause 10 of Schedule 1 to the Resource Management Act 1991 (RMA). On and from the date the decisions are publicly notified, Proposed Plan Change 13 is amended in accordance with the decisions.

According to this timeframe, submitters may appeal to the Environment Court by 26 April 2019. Staff will update the Committee on appeals at the first available opportunity after this date.

10 Budget Implications

10.1 Current year budget

The work has been undertaken within the current budget for Regional Planning and Engagement activity in Year 1 of the Long Term Plan 2018-2028.

10.2 Future Budget Implications

The RMA process for the Plan Change is substantially complete. However, the cost of appeals to the Environment Court cannot be anticipated with any accuracy and will lead to additional costs that are unknown and not explicitly budgeted for.

The implications can only be assessed once appeals have been received. Staff will present to this Committee at this time.

Karen Parcell
Senior Policy Analyst (Natural Resources Policy)

for Natural Resources Policy Manager

7 February 2019

SUPPORTING DOCUMENT - Plan Change 13 (Air Quality) Report and Recommendations of the Hearing Committee

Receives Only – No Decisions

Report To: Regional Direction and Delivery Committee

Meeting Date: 19 February 2019

Report From: Sarah Omundsen, General Manager, Regulatory Services

Mount Maunganui Industrial Area Update

Executive Summary

This update outlines actions underway to manage contaminant discharges in the Mount Maunganui Industrial Area. There are a large number of sites in the Mount Maunganui Industrial Area that emit contaminants as part of their processes. The report covers the period from mid-November 2018 to 7 February 2019.

Regional Council continues to work with port, business and industry managers to ensure compliance with consent conditions and criteria of permitted activities in regional plans. A total of nine new air quality monitoring stations have been commissioned and have been providing air quality data for the past two months. Unfortunately, the monitoring stations have detected six exceedances of the PM_{10} and four exceedances of the SO_2 National Environmental Standards for Air Quality limits during this time.

As a result of the exceedances, we held a workshop with the Ministry for the Environment to discuss next steps. An overview of the visit is included in this report.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Mount Maunganui Industrial Area Update.

1 Background and purpose of this report.

This update report covers actions taken by the Regional Council in response to exceedances of the PM_{10} and SO_2 limits in the National Environmental Standards (NES) for Air Quality that have been recorded in the Mount Maunganui Industrial Area since November 2018. It also provides an update to the committee on methyl bromide issues, and gives an overview of a recent visit to Tauranga by the Ministry for the Environment (MfE). A recent discharge from a Port of Tauranga log-yard is highlighted which, despite the discolouration to water, did not breach consent conditions.

The bulk of the report covers the period from the last RDD meeting held on 11 December 2018 until 7 February 2019.

2 Implications for Maori

Ngāi Te Rangi iwi and affiliated hapū, particularly those with connections to Whareroa Marae, are major stakeholders in the Mount Maunganui Industrial Area and activities undertaken there. Residents around Taiaho Place, people attending events in the area, and children at the marae Kohanga Reo are affected by contaminant discharges to air. The Council have operated an air quality monitoring station at Whareroa Marae for almost three years, set up regular meetings with iwi representatives and engaged with marae residents on issues and concerns. Air quality at the marae is sampled for a wide range of contaminant parameters that may affect human health and wellbeing. This report covers three breaches of the National Environmental Standards for PM_{10} that have been detected at the marae air monitoring station since November 2018.

3 Particulate matter less than 10 microns (PM_{10}) and Sulphur Dioxide (SO_2) – breaches of the National Environmental Standards for Air Quality

3.1 PM_{10}

In the December 2018 report to this committee a single exceedance of the National Environmental Standards for Air Quality (NES) PM_{10} limit of 50 $\mu g/m^3$ 24 hour average was reported. The NES allows one exceedance per year in an air shed with all subsequent breaches needing to be publically notified.

Monitoring equipment installed at Whareroa Marae subsequently detected two further breaches of the NES on 11 December and 17 December 2018 which were confirmed and reported to Ministry for the Environment, Ngāi Te Rangi, and other local iwi and by public notification in the Bay of Plenty Times.

Regulatory Compliance officers began an investigation into probable sources of the elevated levels of PM_{10}. This included canvassing the major industrial sites up-wind of the monitoring station to determine the activities being undertaken during the periods of the breaches. Physical dust samples collected by the monitoring equipment were sent for electron microscope analysis to determine the spectrum of particulate matter present. At the time this report was submitted, the investigations were ongoing, with dust analysis to be completed, and no confirmed source is yet to be identified.

Between 12:00am 5 January and 12:00am 6 January 2019 a breach of the PM_{10} limit was detected and confirmed at the air monitoring station located on De Havilland Way off Aerodrome Road. The monitoring stations are located to monitor ambient air quality and to determine whether the activities occurring in the vicinity of the large dry bulk stock food storage sheds at 101 Aerodrome Road comply with the NES. An investigation into this breach revealed that RMD Transport were unloading bulk tapioca stock food into the eastern most storage shed on behalf of Dahuti International at the time the exceedances were recorded. Whilst the investigation is ongoing, RMD Transport has been abated to cease causing breaches of the NES.

Subsequently, two further breaches of the NES have been confirmed. One occurring at De Havilland Way on 1 February and another at the Kiwi Rail Yards South (off Totara Street) on 5 February. Investigations into probable sources of these breaches have commenced. Iwi, stakeholder and public notification has been undertaken.

Table 1 below summarises the PM_{10} exceedances and actions underway.

3.2 SO_2

On 22 and 28 January, three exceedances of the NES SO_2 1 hour limit were detected at the Rata Street monitoring site. This site location is behind the old Mount Maunganui fire station, opposite the Regional Council Mount Maunganui office. A total of nine exceedance of 350µg/m3 per year are allowed under the NES.

On 24, the "never to be exceeded" standard of 570µg/m3 was breached at the same monitoring location. This resulted in the Regional Council notifying the Ministry for the Environment and undertaking iwi and public notification of the breach.

The monitoring station lies directly west of the cruise ship berths at the Port of Tauranga. Each time an exceedance or breach of the NES was detected, a cruise ship was in berth and the wind was blowing from a westerly direction. It is suspected, subject to further investigation that cruise ship emissions are contributing to the SO_2 exceedances recorded.

Table 1 below summarises the SO_2 exceedances and actions underway.

Table 1: NES exceedances detected in the Mount Maunganui Industrial Area, November 2018 – February 2019

Date	Monitor location	Contaminant	Concentration	Investigation Status	Limit
09/11/2018	Whareroa Marae	PM_{10}	61 µg/m^3	Monitoring tape has been electron photographed. Sample composition being analysed.	50 µg/m^3 (24 hour) 1 exceedance/year
11/12/2018	Whareroa Marae	PM_{10}	55 µg/m^3	Monitoring tape has been electron photographed. Sample composition being analysed.	
17/12/2018	Whareroa Marae	PM_{10}	63 µg/m^3	Monitoring tape has been electron photographed. Sample composition being analysed.	
5/01/2019	De Havilland Way	PM_{10}	63 µg/m^3	Abatement notice issued to RMD Transport to cease breach of NES.	50 µg/m^3 (24 hour) 1 exceedance/year
1/02/2019	De Havilland Way	PM_{10}	59 µg/m^3	Monitoring tape to be collected for electron photography at Otago University followed by scientific analysis.	

5/02/2019	Kiwi Rail Yard South	PM_{10}	70 $\mu g/m^3$	Monitoring tape to be collected for electron photography at Otago University followed by scientific analysis.	50 $\mu g/m^3$ (24 hour) 1 exceedance/year
22/01/2019	Rata Street	SO_2	363 $\mu g/m^3$	Working with PoT to determine shipping and any other sources in proximity to the monitoring site.	350 $\mu g/m^3$ (1 hour) 9 exceedances/year 570 $\mu g/m^3$(1 hour) No exceedances/year
24/01/2019	Rata Street	SO_2	574 $\mu g/m^3$	Working with PoT to determine shipping and any other sources in proximity to the monitoring site.	
28/01/2019	Rata Street	SO_2 (unverified at time of reporting)	357.1 $\mu g/m^3$ 351.5 $\mu g/m^3$	Working with PoT to determine shipping and any other sources in proximity to the monitoring site.	

4 Potential Gazettal of the "Mount Maunganui Airshed"

An airshed is essentially an air quality management area. Areas are defined as the whole region of a regional council, as well as any part of the region that has been specifically gazetted as separate airshed.

The regulations of the NES apply to any airshed, whether gazetted or not. As the Mount Maunganui area is in breach of the ambient air quality standards for both PM_{10} and SO_2, this could affect the rest of the region.

Staff are looking at the option of gazetting the Mount Maunganui area as an airshed. This would isolate this one area from the rest of the region. A gazetted airshed is also an excellent planning tool, particularly if Council intends to introduce regulations in the future.

Staff will prepare a report for the April 2019 meeting of this Committee, with a full background and analysis for consideration and discussion.

5 Shipping emissions and MARPOL

The International Convention for the Prevention of Pollution from Ships (MARPOL) is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes and currently includes six technical Annexes.

Annex VI, the Prevention of Air Pollution from Ships, entered into force 19 May 2005. It sets limits on sulphur oxide and nitrogen oxide emissions from ship exhausts. New Zealand did not accede to Annex VI.

The Ministry of Transport has called for submissions on whether New Zealand should accede to Annex VI. Submissions closed on 11 February 2019 and the Regional Council submitted strong support for New Zealand's accession to Annex VI.

Based on the data available, shipping emissions are a significant contributor of airborne contaminants. Modelling indicates that shipping emissions alone may cause an exceedance of the ambient standard of the NES for SO_2.

Regional council's mandated role under section 30(d)(iv) of the Resource Management Act is to control the discharge of contaminants into air in the Coastal Marine Area (CMA). This, under normal circumstances would lead to policies and rules in a regional coastal plan to manage shipping emissions. However, due to Regulation 16 of the Resource Management (Marine Pollution) Regulations 1998, regional councils are unable to include rules in any regional coastal plan to manage these discharges.

This creates a tension between our mandated role and our ability to set regulations. Breaches of the ambient standard for SO_2 are treated seriously under the NES with regional councils required to decline consents for these activities. Without the ability to include rules targeting shipping emissions, a substantial source of SO_2 is effectively unable to be managed by the Regional Council, while all other sources must comply with the rules to the extent that they may need to significantly reduce emissions.

6 Methyl bromide

6.1 Requests for change to the recapture dates

As identified in previous reports, Genera have sought changes to the recapture schedule required by consent 62719 as provided for under condition 5C.1. The consent requires recapture of: 100% of container fumigations since 30 July 2018, 60% of log and timber fumigations since 31 October 2018, and 100% of log and timber fumigations from 30 April 2019.

The Council is expecting a request to defer the date to achieve 100% recapture of all log and timber fumigations shortly. While Genera has continued to meet the required recovery percentage (60%) for the months of October, November, and December 2018, they have made it clear that making the step up from 60% to 100% is a very significant increase, which may not be practicable at present. A particular challenge is the recapture of ship hold fumigations, which has not yet been achieved. Genera have undertaken trials of ship hold recapture and are continuing to invest in the development of technology to achieve recapture but it is not to the point of reliability necessary for full commercial use.

Genera continue to meet the requirement for 100% recapture for container fumigations in accordance with the consent recapture schedule.

Work continues on alternative fumigants, such as ethanedinitrile (EDN), which may be a potential substitute for methyl bromide in the future. The Environmental Protection Authority are currently working through the approval process for EDN.

6.2 Abatement Notices

Six Abatement Notices (ANs) were issued to Genera in the latter part of 2018 in response to a number of separate instances of non-compliance.

6.3 Worker illness

Four of these ANs were a direct result of the in-depth investigation that Council undertook into reports of worker illness in relation to Methyl Bromide exposure. These were appealed to the Environment Court and “stays” were sought while the appeals were resolved. A stay, where accepted by the court, means that the ANs don’t come into force until appeals are resolved.

The four ANs, in general terms, were for:

1. Not providing a 100 m buffer from all boundaries for fumigation events;
2. Not developing a Fumigation Plan to the satisfaction of the Council;
3. Not undertaking downwind monitoring in the correct locations; and
4. Not advising Council about complaints within 24 hours.

The Tauranga Moana Fumigation Action Group and the Port of Tauranga both sought to become Section 274 parties in relation to the appeals. It is rare for s274 parties to join enforcement proceedings such as ANs. The Environment Court considered the applications and decided that the Port as landowner was a legitimate s274 party but that the Fumigation Action Group were not. Therefore the Port was included in the resolution of the appeals.

Council officers and legal advisors worked closely with representatives of Genera and the Port to resolve the appeals to the ANs. The critical issue was the development of a Fumigation Management Plan, which, once approved by the Council officers would provide a clearly defined rule book for management, monitoring and reporting of fumigation and recapture events. An ‘in-principle’ agreement has now been reached, and the first three ANs above have now been withdrawn.

6.4 Boundary level exceedance

The other two ANs related to an exceedance during boundary monitoring for methyl bromide during a ship fumigation event. On 1 August 2018 Genera’s monitoring on the eastern boundary of the site during a fumigation event recorded an exceedance of the 1 hour average. The recorded value was 4.3 ppm and the consented maximum (which also coincides with the EPA specification) is 1.0 ppm.

The ANs issued were to:

- Cease discharging methyl bromide in excess of the TEL (tolerable exposure limit) at the boundary; and
- Ensure that when venting methyl bromide during hours of darkness, active monitoring of methyl bromide levels is undertaken

These two AN’s were not appealed.

Council officers have stepped up boundary monitoring in the wake of this event. In addition to more frequent use of a handheld meter we have also invested in renting specialised gas collection canisters from a laboratory. When we get the right combination of wind direction and ship venting we will be obtaining more specific data to determine if consent conditions are being complied with.

6.5 Consent variations and new consents

6.5.1 Consent variation

Council has received an application for a variation to the existing consent in response to ANs issued last year relating to fumigation of cargo that was not covered by the consent, specifically materials (grain) that contained a potential biosecurity threat. The application seeks two changes: a change to the way that "break bulk" cargo is fumigated and expansion of the types of cargo that can be fumigated in ship holds to include other bulk materials, such as grain.

"Break bulk" cargo consists of items like second hand machinery which are considered to contain a potential biosecurity risk and require fumigation on the wharf with methyl bromide. Genera are proposing that 100% of the fumigations of "break bulk" cargo will be subject to recapture.

In-vessel (ship hold) fumigation is currently only permitted via the consent for logs and timber, while fumigation of other bulk cargo is rare. The only previous occasion we are aware of resulted from the Ministry for Primary Industries requiring fumigation of a grain ship due to the presence of insect pests. While MPI issued a notice requiring fumigation, it did not give authorisation to operate outside of the conditions of the RMA consent held by Genera. To do so would require a ministerial directive.

At the time of writing the Council had contracted out the processing of the consent to an independent consultant and will be using an independent commissioner as decision maker in accordance with our policy. The application is currently under a Section 92 request for further information.

6.6 New resource consent

Council expects to receive an application within the next few months for a replacement for consent 62719, which currently exists for methyl bromide discharges at the Port of Tauranga. The current consent is due to expire in April 2020. It is expected that the application will cover several fumigant types, as regardless of the fumigant used; our Air Plan requires that consent be held for commercial use.

6.7 Connecting with the community

The Sustainable Business Network is organising a further meeting for 28 February with national politicians, the Fumigation Action Group, WorkSafe, EPA, TCC and ourselves. This will involve discussions around methyl bromide monitoring and recapture.

7 Ministry for the Environment visit

On 24 January, a senior analyst from MfE visited Tauranga specifically to understand the air discharge issues associated with the Mount Maunganui Industrial Area. The visit was at the request of Regional Council, but also in response to previous NES SO_2 exceedances and the current PM_{10} exceedances.

The first session during the visit was at Regional Council offices with Tauranga City Council, Toi Te Ora, Western Bay of Plenty District Council, Port of Tauranga, Ballance, Timberlands, and a number of Regional Council staff.

The purpose was to share our current policy, science, monitoring and compliance activities with MfE and other interested agencies and industry representatives. MfE also gave a helpful presentation on the NES and the Crown's expectations.

In the afternoon, the group was hosted at the Port of Tauranga with a tour and presentations by the Port and Kaingaroa Timberlands. The Port focussed on their continued attempts to reduce dust emissions from activities occurring on their land and outlined they were looking at technology for unloading bulk cargo from ships.

Kāingaroa Timberlands who lease a little over six hectares of Port land for their log yard operations spoke of their keenness to become the first consented air discharge log yard operator at the Port of Tauranga. They are also investing heavily in de-barking technology and expect that some 70% of the logs they export will be debarked. This will not only reduce dust production through bark fall onto the hardstand, but will reduce debris discharge to stormwater and cut down on methyl bromide fumigation use, as debarked logs usually do not require additional fumigation.

Finally, a small party of staff accompanied MfE to an informal meeting with the Whareroa Marae community. The purpose was for MfE to appreciate the location of the community in relation to surrounding industry, and hear first-hand how air quality is affecting tangata whenua and residents.

Around 15 locals connected with the marae attended and were very forthright in expressing their feelings. The community feels largely let down by Regional Council and other government agencies as they are still experiencing the chronic health effects of living in close proximity to large industrial discharge sites. Their stories were very moving, and aside from the frustration and anger there was a lot of sadness. We heard about kaumatua getting sick, tamariki at the kohanga reo getting sick, houses and structures corroding. A positive outcome was tangata whenua expressed their pleasure that MfE had come as they had not had any representative from Central Government visit them in many years.

The hui culminated with an agreement that council staff would continue to try to find solutions to the issues faced by residents of Taiaho Place, and we would organise a larger meeting to bring together agencies and experts to answer their questions and hear their concerns.

8 New rules to manage air discharges

The Hearing Panel for Plan Change 13 (Air Quality) to the Regional Natural Resources Plan (the Plan Change) has completed the public hearing process and completed deliberations. The Hearing Panel has recommended a number of amendments to the Plan Change relevant to the Mount Maunganui area. In brief, these are:

1. Fumigation – the Hearing Panel recommends the requirement of "effective recapture" with a definition of this term requiring 80% reduction in any fumigant not absorbed by the target product, prior to ventilation of the fumigation enclosure.

2. Handling of bulk solid materials – a new rule is recommended making large-scale handling of bulk solid materials (such as palm kernel extract) a discretionary activity. This would include the unloading of these materials both from ships' holds at the Port of Tauranga, and transferred to and from storage sites in the area (including De Havilland Way).

3. The Hearing Panel also recommends the inclusion of permitted activity rules for cement handling and storage, flaring of natural gas, and mobile or emergency generators.

The recommendations of the Hearing Panel are discussed further in the report in this agenda titled Proposed Plan Change 13 (Air Quality) – Hearing Recommendations.

9 Stormwater matters

Port of Tauranga log yard discharge, 20 December 2018

A call to the Regional Council Pollution Hotline alerted Regulatory Compliance staff to a dark coloured discharge into Tauranga Harbour from the open drain running parallel to the northern boundary of Tauranga Airport.

Figure 1: Discharge from the Airport Drain as photographed by BoPRC drone on 20 December 2018

Council staff immediately began an investigation and traced the discharge up Airport Drain to the Port of Tauranga log yard on Hewletts Road. The discharge was from the stormwater treatment pond on the log yard which is authorised under regional council resource consent 61418. The Port typically applies aluminium sulphate to settle out suspended solids prior to discharging from the pond.

Figure 2: Port of Tauranga Hewlett's Road Log yard Stormwater settlement pond.

Figure 3: Point of discharge from the stormwater settlement pond into the Airport Drain.

Analysis of samples collected from the discharge point as well as downstream where mixing had occurred confirmed the discharge complied with the consented limits for suspended solids, turbidity and pH. The existing discharge consent held by the Port expires on 31 March 2022.

In response to this incident the Port of Tauranga are undertaking measures to improve the quality of the stormwater discharging from this settlement pond.

9.1 Port of Tauranga stormwater discharge consent update

The Regional Council has reached an agreement with the Port of Tauranga regarding the processing of their stormwater discharge consent application. The current position is:

- Regional Council will temporary suspend the 45 day processing timeframe until Monday 25th February 2019.
- The Port will report back to Regional Council and the processing consultants about the outcome of negotiations with Ngāti Ranginui and Ngāi Te Rangi on this date. The consultants will then be able to continue processing the consent based on the most relevant information.
- Following 25th February 2019, a decision will be made as to whether a hearing is necessary. If not, a decision will be made in respect of the application within 20 working days. If a hearing is necessary, it will be held within 45 working days.

The tentative hearing date is scheduled for 17th/18th April.

10 Pollution hotline

During this two month reporting period, including the Christmas holiday break, Regulatory Compliance staff responded to the following in the Mount Industrial Area:

- 165 complaints.
- 89% related to air quality (148/165)
- 1 coastal
- 16 discharges to water and/or land
- 14 dust, 127 odour, 3 smoke, 3 industrial discharges, 1 other air related issue

Odour continues to cause the greatest number of call-outs from the public and neighbouring businesses. One pet food manufacturer caused 99 complaints to the pollution hotline during the period. A matter regarding this manufacturer is before the Courts in action being pursued by the Regional Council.

11 Summary

The additional air quality monitoring equipment installed around the Mount Maunganui Industrial area is giving Regional Council data on airborne contaminants that has not been accessible before. Whilst it was suspected levels of PM_{10}, SO_2 and other contaminants would be detected at higher concentrations; to have detected so many breaches of air quality legislation has come as a surprise. Business and industry and particularly the Port and activities undertaken on Port land have a large influence on air quality in the area. Council staff will continue to take measures to ensure consent

conditions are being adhered to, and businesses operating as a permitted activity are compliant with regional rules.

Reece Irving
Senior Regulatory Project Officer

for General Manager, Regulatory Services

8 February 2019

Report To: Regional Direction and Delivery Committee

Meeting Date: 19 February 2019

Report From: Chris Ingle, General Manager, Integrated Catchments

Inter-Regional Marine Pest Pathway Management Plan Discussion Document and Engagement Plan

Executive Summary

In August 2018 the Committee endorsed the development of a joint discussion document on inter-regional marine pest pathway management, for four upper north island regions.

This paper seeks the Committee's approval to release a discussion document and engage with our communities to seek feedback on the management of marine pests in the upper North Island. This project is a partnership between upper North Island regional councils, Biosecurity New Zealand and the Department of Conservation. The discussion document includes the option to develop consistent rules across the four regions to address marine pests and was endorsed by the Upper North Island Strategic Alliance (UNISA) in late 2017.

Consultation will run at the same time across the four participating regions using consistent engagement and communications processes (mid-March – mid May). Feedback received will inform future decisions on marine pest management options in the four regions - and potentially, the development of an inter-regional marine pest pathway management plan under the Biosecurity Act across the four regions.

The discussion document is not a statutory process but would fulfil many of the consultation requirements if a regulatory mechanism under the Biosecurity Act 1993 (such as an inter-regional marine pest pathway plan) was to be progressed.

It is recommended that council authorise the release of the draft discussion document and commencement of the engagement process (in conjunction with the project partners). The draft discussion document is attached to this report. The feedback received will be brought back to council for consideration.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Inter-Regional Marine Pest Pathway Management Plan Discussion Document and Engagement Plan.

2 Approves 'Better ways to stop marine pests?', a discussion document on inter-regional marine pests pathway management, to be released for consultation.

3 Delegates Top of North Marine Biosecurity Partnership Chair the authority to approve any minor changes, including grammatical and formatting, to the Discussion Document prior to its release for consultation.

1 Purpose

This paper seeks the Committee's approval to release 'Better ways to stop marine pests?' a discussion document on inter-regional marine pests pathway management, for consultation.

2 Background

In August 2018, the Committee endorsed development of a joint discussion document on inter-regional marine pest pathway management. The discussion document has been drafted by the Top of the North Marine Biosecurity Partnership, which comprises of northern North Island Councils (Northland, Auckland, Waikato, Bay of Plenty, Gisborne and Hawkes Bay) along with Department of Conservation (DOC) and Biosecurity New Zealand (BNZ).

The threat of marine pest incursions is particularly high in the coastal waters of northern New Zealand. This has been evident with the recent spread of pest species such as Mediterranean Fanworm. Our coastal waters are particularly susceptible to incursions of marine pests given the range of habitats available, relatively benign climate and the number of visiting vessels that are a vector for spread (the movement of 'fouled' vessels is the biggest pathway for the spread of marine pests). Bay of Plenty also has significant cultural, natural heritage and economic values that are potentially impacted by marine pests. These issues are also faced by our neighbouring regions such as Northland, Auckland and Waikato, which account for the majority of New Zealand's domestic vessel movements.

Controlling marine pests once established is extremely difficult. Preventing their arrival is far more cost-effective. Preventing the spread of marine pests is likely to be far more effective if a coordinated multi-region approach is adopted. There are also likely to be efficiency gains in implementation. The concept of consistent rules (targeting hull-fouling) across the four regions has been identified as an opportunity to address the issue.

Pathway plans, which regulate activities that spread pests rather than the pest itself, are a mechanism available to regional councils under the Biosecurity Act. They are a more effective means of addressing risk than traditional pest management plans, which rely on pest presence or controlling the sale, distribution or release of pest species. The Biosecurity Act also provides for two or more councils to jointly prepare management plans that applies across regions (an joint / inter-regional pest or pathway management plan), but requires that each council approve the procedural steps set out in the Act and each council has discretion over how costs are allocated in their respective regions.

A project to undertake initial scoping and consultation on an inter-regional approach for marine pests was endorsed by UNISA in late 2017. The project has been progressed through the top of the north partnership.

The project would be aligned as far as possible with the national processes to ensure it has applicability and utility across New Zealand – so similar approaches can be adopted in other regions and/or incorporated into national pathway planning by central government in the future. The discussion document will increase community understanding of the risks associated with marine pests and the options available. Feedback received will assist the councils to understand community views and inform future decisions on marine pest management.

The discussion document is the first step towards potentially developing inter-regional pathway management plan to help manage the spread of marine pests within the northern North Island regions.

3 'Better ways to stop marine pests?'

3.1 Discussion Document

The top of the north partnership have developed the draft discussion document setting out options to manage the spread of marine pests. The draft discussion document focuses on the threats and pressures the northern North Island is currently facing from marine pests and asks whether Councils' should be taking collective regulatory approach. The document highlights that hull biofouling poses the biggest risk of spread of pests between regions and suggests three regulatory options for our communities to consider.

The options include:

- Develop consistent rules requiring clean vessel across the four biggest boating regions – Northland, Auckland, Waikato, and Bay of Plenty.
- Go further – make rules for other pathways like ballast water, aquaculture, bilge water and marine equipment. OR
- Rely on a national approach **-** wait for BNZ to develop a national 'pathway' approach for marine pests (with each region retaining the option to develop their own rules for managing marine pests).

3.2 Engagement Plan

An engagement plan is currently being developed to support the discussion document. Assuming all councils approve the discussion document, consultation will be coordinated across the participating regions. Consultation approaches will be consistent as is practical while allowing for regional nuances. It is anticipated that consultation will begin on 1 March 2019 with the submission period running from 18 March to 24 May 2019. Feedback received would be reported to UNISA and participating councils in mid-2019.

The feedback will inform future decisions on marine pest management and potentially lead to the development of an inter-regional marine pest pathway management plan under the Biosecurity Act. The discussion document is planned to be 'hosted' on Bionet (a national website for biosecurity information) with a link to each council website. Each participating council would target engagement to suit stakeholders, tangata whenua and interested parties in their regions, utilising the same key messages and supporting material. A coordinated approach would be used for 'inter-regional' stakeholders to avoid duplication.

4 Implications for Māori

While Iwi and hapu have a strong interest in marine pest management, the release of the discussion document does not have any substantive regulatory or financial implications on Māori specifically. If progressed, the discussion document would provide an opportunity for the community to express their views, including the views of Maori. Local Bay of Plenty iwi would be included in the consultation process, to seek their views.

5 Budget Implications

5.1 Current year budget

There are no budget implications for the current year. Staff time to support the discussion document development and consultation has been allowed for in the Long Term Plan and annual plan Biosecurity Activity budget.

5.2 Future Budget Implications

The collation and analysis of feedback once it is received is likely to require staff time and the support of a consultant, which has been allowed for in the current Long Term Plan.

Should Council decide to support the development of an inter-regional marine pest pathway management plan following this discussion document process, staff will provide a breakdown of any financial implications for Council at that stage.

Greg Corbett
Biosecurity Manager

for General Manager, Integrated Catchments

8 February 2019

APPENDIX 1

Better ways to stop marine pests - IRMPP Discussion Document

CLEAN BELOW?
GOOD TO GO

Better ways to stop marine pests?

Ētahi tikanga pai atu mō te ārai orotā ō te moana?

We want to hear from you!

Mauria mai o whakaaro!

To protect the coastlines we all love, the four northern-most regions are considering shared rules on marine pests.

For several years, Northland, Auckland, Bay of Plenty and Waikato regions – together with boaties from all over – have been working together to stop the spread of marine pests.

We think that creating better, consistent rules across the regions is hugely important part of how we respond to the growing threat of marine pests.

But before going any further, we want to hear from you. So read on, find out more, and have your say!

Have your say at www.(URLTBC).co.nz.
Feedback closes 24 May 2019.

Front cover image: *Richard Hughes*

What's the problem?
He aha te raruraru?

New Zealand's wealth of coastline and rich, diverse marine life is very much part of who we are. The sea is in our hearts.

As the movement of boats increases, so too does the risk of marine pests spreading and threatening our incredible coastal playground, kai moana, underwater life, tourism and aquaculture industries and more.

For vessels coming from overseas, there are national rules in place to minimise the risk of new pest species arriving.

But for vessels moving around within our coastal waters – mostly our own vessels – rules to prevent pests spreading to new places vary from region to region.

A consistent approach across the regions would be simpler, more effective and make it easier to understand the rules.

Our four northern-most regional councils (Northland, Auckland, Waikato and Bay of Plenty Toi Moana) are also home to the biggest boating populations in the country. We're exploring whether inter-regional hull-fouling rules could be a better way forward – and we need to hear what you think.

What are the options?
He aha etahi ara?

Rules just for hull fouling? Include other pathways too?
Or wait for national rules?
Which option do you think is best – and why?

A 'pathway' means the way pests are transported from one place to another.

OPTION 1

Lead the way with consistent rules for clean hulls.

Develop consistent rules on managing hull-fouling across the four biggest boating regions – Northland, Auckland, Waikato, and Bay of Plenty.

Pros

- Reduced risk of marine pest spread.
- Reduced cost in the long run – it's cheaper to keep pests out than deal with them when they move to a new place.
- Good systems in place to deal with new pest arrivals.
- Easier for public and marine industries to understand.
- Could provide the model for an eventual national 'pathway' plan.

Cons

- Could be eventually superceded by national 'pathway' plan.
- Cost of hull surveillance programme in regions that don't already have one.
- Cost to boat owners to keep hulls clean.
- Still inconsistent with rest of New Zealand.

OPTION 2

Go even further – make rules for other pathways too.

Along with rules for hull-fouling, develop rules for other pathways like ballast water, aquaculture, bilge water and marine equipment.

Pros

- Addresses all the main risk pathways for marine invaders.

Cons

- Increased costs of implementation.
- Increased costs to commercial shipping, aquaculture and will require extensive changes to practices.
- Likely to take many years before new rules can be implemented.

OPTION 3

Wait for national rules.

Wait for MPI to develop a national 'pathway' approach for marine pests. Continue our combined efforts on public education, but each region keeps its own rules for managing marine pests.

Pros

- Rules will apply to all regions.
- Provides clarity for everyone having the same rules everywhere.

Cons

- Delays – expected to be several years before national rules could be developed.
- Risk of marine pests spreading remains same in the near future.
- One size fits all approach may not work for some councils/regions.

What could the rules look like?

Me pēhea te hanga o ngā ritenga?

If clean hull rules were to be developed, there are a few different options. Which do you think is best? Are there any other good options?

OPTION 1

Clean hull required at all times.

All vessel hulls required to have no more than a slime layer and/or barnacles at all times.

Pros

- Easy to understand.
- Exceptions could be applied to vessels which don't move.
- Doesn't require a vessel identification system.

Cons

- Rule will require compliance and monitoring by agencies.
- Cannot eliminate risk of marine pest transfer.

OPTION 2

Clean hull required only when moving.

No more than a slime layer and/or barnacles permitted when moving from one harbour/place to another. This rule is already in place for Northland.

Pros

- Easier to achieve than Option 1.

Cons

- Harder to enforce.
- Requires a vessel identification system.
- Requires mapping to identify the boundaries of the movement zones.
- Harder for the public to understand.

OPTION 3

Clean hull required only when moving to specially identified places.

No more than a slime layer and/or barnacles permitted when moving to specially identified high value places.

Pros

- Surveillance programmes can target 'high value places'.

Cons

- Only protects those special places identified, other areas will still be at risk.
- High value places will need to be identified and categorised based on economic, environment and cultural values.

Tell us what you think – head to www.(UPLTPC).co.nz

Why focus on boat hulls?
He aha ai tatou e arotahi ana ki ngā tākere waka?

Marine pests, particularly in their juvenile stages, can hide in amongst other hull-fouling, making them hard to detect. Fouled boat hulls can also act as a magnet for some marine pests by providing additional surface for them to settle on.

Unfortunately, it also makes it easy to accidentally transfer marine pests from one place to another on your boat hull if it hasn't been effectively cleaned.

New legislation now allows councils to manage 'pathways' if they choose to – that is, the way pests are transported from one place to another.

In the marine environment, the 'pathway' really means boats, as movement of hull-fouled boats is the single biggest risk for marine pest transfer.

It's not just about stopping the spread of pests that are already here and keeping them out of places like our world-class marine reserve at the Poor Knights in Northland.

It's also about putting good systems in place in case new, worse marine pest species slip through the cracks and reach our shores.

Together with vessel owners and the wider marine industry, we now have an opportunity to better safeguard our precious coastline, now and for future generations.

What about other pathways?
Pēhea ētahi atu tikanga?

Unfortunately, some marine pest species have invaded parts of our coastal marine area in recent years, arriving as hitchhikers on boat hulls or in the ballast water of international sea-going vessels. Nowadays, vessels coming from overseas must meet national rules to minimise the risk of new pest species arriving. However, we need to deal with some of the problem marine pests that have already become established to stop them from spreading further

Research tells us that fouling on boat hulls is by far the biggest risk for transferring marine pests, though there are other ways these pests hitch-hike around.

Aquaculture-related movement of marine pests will be covered by a proposed national standard. This standard will require aquaculture farms to manage their biosecurity risks, and can be found on the Ministry for the Environment's website.

For ballast water, incoming international vessel risk is managed by the Ministry for Primary Industries. However, there are currently no regulations to manage the transfer of ballast water from one region to another.

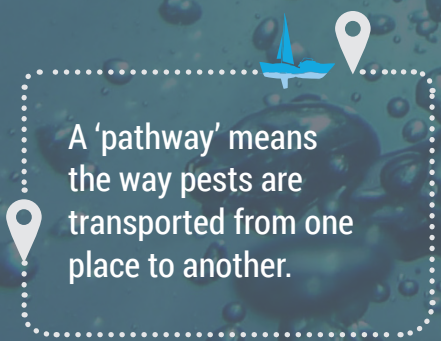
There is also a risk of marine pests being moved within fishing gear (including crab pots and dredges), residual water in cooling systems, bilge water and the movement of structures in the coastal marine area.

However, these risks are minimal compared to biofouling on vessel hulls – managing this will cover off the majority of the risks we face.

What's the current situation?
He aha te āhua ināianei?

The four northern-most regional councils, with support from MPI, have been collaborating closely in recent years to build awareness of marine pests and help boaties understand the actions they can take to reduce the spread.

However, the rules and management approaches for marine pests vary from region to region.



Northland Regional Council

Recently introduced 'pathway' rules requiring a clean hull when entering the region or moving from place to place – the first region in New Zealand to do so.

Northland's rules are implemented through a surveillance programme which inspects more than 2000 hulls a year. The pathways plan approach is a proactive way to managing the impacts of marine pests rather than a reactive measure of managing pests once they are established.

Auckland Council

Has risk-based rules in the Unitary Plan to manage the spread of harmful and invasive organisms via fouled hulls.

Waikato Regional Council

Currently has no pathway plan rules but is active in managing the impacts and risks of marine pest species.

Bay of Plenty Regional Council

Has pathway-style rules in the Proposed Regional Pest Management Plan. Currently has Small-Scale Management Programmes for Sabella and Stylea.

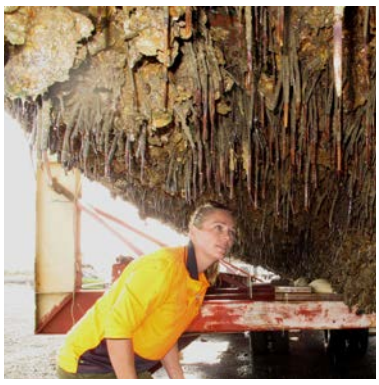
You can find out about more about these councils' marine pest rules at www.marinepests.nz

The Ministry for Primary Industries (MPI) has indicated interest in developing a national pathways programme, in line with its Biosecurity 2025 vision, but considers it important to understand the different regional needs and approaches first.

Where to from here?
Mai konei ki hea?

This document is intended for informal consultation to help the four regional councils understand people's views on how to prevent the spread of marine pests.

We'll collate all feedback received and use this to help inform the shape of pathways management within the four regions.



Have your say
Tuku kōrero mai

Which option for marine pest rules do you think is best? If clean hull rules were developed, what do you think those rules should look like?

We're keen to hear what you think!

You can jump online and have your say at: [link TBC]

If you'd prefer to email or post your feedback, send it to [email address] or [postal address].

Thanks for being part of the conversation and doing your bit to care for our precious marine environment.

Photo credit: *Poor Knights,* Seacology NZ

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Northland Regional Council
Te Kaunihera ā rohe o Te Taitokerau

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Waikato Regional Council
Te Kaunihera ā Rohe o Waikato

Bay of Plenty Regional Council
Toi Moana

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Ko Tātou This Is Us
Biosecurity 2025

Report To: Regional Direction and Delivery Committee

Meeting Date: 19 February 2019

Report From: Chris Ingle, General Manager, Integrated Catchments

Proposed Trial for Contract Wallaby Control

Executive Summary

At its October 2018 meeting, the RDD Committee requested that staff investigate trialling contract wallaby control, within the 'core' wallaby range.

An procurement process is recommended whereby potential control operators submit wallaby control proposals for specified areas. These proposals would then be evaluated against predetermined criteria, with contracts being negotiated with the preferred supplier/s.

This approach would aim to encourage innovation and maximise effectiveness. All contracted work would be monitored to measure the effectiveness of each method used, so that the most successful approaches can be applied in future wallaby control work, if required.

An initial trial would cost approximately $50,000 and could be funded through the Integrated Catchments Activity, without impacting other work outputs.

Recommendations

That the Regional Direction and Delivery Committee:

1 **Receives the report, Proposed Trial for Contract Wallaby Control.**

2 **Notes that an initial trial for contract wallaby control can be funded through the Integrated Catchments Activity.**

3 **Approves an initial trial for controlling wallabies.**

4 **Directs staff to report back on the trial with recommendations for any future application of the approach.**

1 Purpose

This paper seeks the Committee's approval to carry out an initial 'trial' wallaby control programme using pest control contractors.

2 Background

This Committee received a paper on bounties for wallaby control at its October 2018 meeting. The paper highlighted the risks and issues of using bounties. It also highlighted the importance of maintaining focus on containing wallabies to their current range (approx. 200,000 hectares) to mitigate the exponential increase in impact costs that would occur if wallabies continue to expand their range. Council's current and proposed Regional Pest Management Plan both focus on achieving this goal and staff are currently working with MPI, DOC, LINZ and other regional councils to secure Crown funding to assist with containment objectives.

The RDD Committee acknowledged the importance of achieving containment but also requested a proposal for suppressing wallabies within their 'core' range, by contracting out control operations.

3 Wallaby control contracting

3.1 Contracting options

Contracting out pest control work is widely used by agencies responsible for managing pests, including our Council. Two different approaches are typically used:

1. "Performance contracts" where a control target (outcome based) is set in the contract and the suppliers use methods of their choice to achieve that target. Only once the desired target is achieved is the contractor paid.
2. "Input contracts" where the agency prescribes the methods to be used and then audits the contractor to ensure the work is delivered in accordance with the prescription. If the contractor delivers the work in accordance with the contract they are paid - regardless of the result (or outcome) of the control operation.

Performance contracts rely on the availability of a robust monitoring technique to assess the reduction, or kill, of the target pest population. This approach puts the risk of operational failure on the contractor as they must achieve the outcome target the agency is seeking or they don't get paid. These types of contracts are appropriate when there are proven control techniques to achieve the desired result (e.g. residual trap catch measures used for possum control by OSPRI).

Input contracts allow the agency to prescribe the control methods to be used, but they then carry the risk of operational failure. In certain circumstances they can be a cheaper way of getting control work done as the contractor has a lot more certainty of getting paid. This contract approach is appropriate when trialling new approaches, or where there is good certainty that the methodology used will achieve the desired results and the cost-benefit associated with the work are well understood.

A variation on the input contracts option would be to ask local contractors to submit proposals for wallaby control in specified areas (Requests for Proposal). This would encourage innovative thinking from the contractor market and possibly generate new

ideas that have not been considered before (Intellectual property rights associated with the new idea would require careful management should a contractor's idea prove successful). All proposals submitted could then be evaluated and contract(s) negotiated with the suppliers offering the most desirable option. These contracts would then be treated as an 'input contract' with the contractor being required to implement the programme of works prescribed in the contract. The results from the operation could be monitored to assess the degree of impact the method has on the wallaby population and determine whether the approach has value for wider application.

3.2 Option analysis

The table below considers the advantages and disadvantages of the three options described above.

Option	Advantages	Disadvantages
1. Performance contracts	Payments are based on results (i.e. reduction in population to a target level)	Currently there is no monitoring method that has been scientifically proven for wallabies. This means Council is in a weak position should the contractor dispute the results of monitoring.
2. Input contracts	Potentially cheaper. Would allow Council to refine methods that currently appear to give promising results. Operational monitoring used to determine merits of the prescribed control method. No intellectual property issues.	Requires more staff time for auditing. May not result in significant wallaby reductions.
3. RFP for Innovation	Enables new ideas and alternative thinking to be trialled. Would allow an opportunity for Council input on final operational design. Work completed cheaper. Operational monitoring used to determine merits of the prescribed control method.	Require more staff time for auditing. May not result in significant wallaby reductions. Intellectual property issues associated with innovated methods that have not been tried before.

Staff recommend that that third option 'Request for Proposal' approach is taken. This would allow for innovative new ideas that have not been thought of before to be considered and trialled if they are felt to be realistic. Council could still have input into the final operation design through the negotiation phase of contract development. Any risks associated with intellectual property rights would be managed by negotiating with the contractor prior to executing the contract. Contract and operational monitoring will allow learnings to be incorporated into future control work.

3.3 Proposed trial

For a trial to provide any meaningful results staff consider an area of at least 500 hectares should be controlled. Ideally the trial should support wallaby containment objectives or contribute to Council's biodiversity goals, meaning the trial would be targeted to an area where wallabies are dispersing from, or a site where biodiversity protection is being carried out. Staff will commence consultation with landowners once approval for a trial has been granted.

The costs associated with this work are likely to be comparable with possum ground control operations which are approximately $100 per hectare meaning the cost of treating 500 ha is estimated to be $50,000.

3.4 Risks

Investing in wallaby control within their core range prior to achieving containment carries two key risks:

1. When controlling any pest in only a part of its core range reinvasion will occur as soon as control pressure is stopped, so any benefits the control programme has achieved will be lost over time, unless Council decides to invest in suppression control within the core wallaby range following this trial, on an ongoing basis.
2. Investing in suppression control work may over time become more politically popular than the containment programme in the current RPMP. Priority should be given to achieving the objectives of the Regional Pest Management Plan. The consequences of failed containment are significant increase in impacts, costs and potentially losing the opportunity to eradicate these pests in the future.

4 Implications for Māori

Providing investment in this work does not detrimentally impact on Council containment objectives there are no significant implications for Māori associated with the proposed contract wallaby control trial. If the trial is successful and Council decides to roll out a sustained long-term programme there may be some concern about the use of some control methods. This will need to be negotiated with Mana Whenua groups. Any Ahu Whenua Trusts within control areas will likely benefit from any control work through decreased grazing pressure on pastures and improved biodiversity (assuming other browsers such as deer are not present). Individuals may also see opportunities in tendering for the control work.

5 Council's Accountability Framework

5.1 Community Outcomes

This proposal directly contributes to the Healthy Environment community outcome in the council's Long Term Plan 2018-2028.

5.2 Long Term Plan Alignment

This work is not currently planned in the Long Term Plan 2018-2028. While the Biosecurity Activity funding is currently fully allocated, this initial trial can be funded through the Integrated Catchments Activity in the 18/19 and 19/20 year without affecting the achievement of the LTP KPIs.

Current Budget Implications

This work is outside the current budget for the Biosecurity Activity of the Long Term Plan 2018-2028 but the trial can be funded through the Integrated Catchment Activity.

Future Budget Implications

Future work on contract wallaby control within the 'core' wallaby range is outside Council's Long Term Plan 2018-2028. Should the initial trial prove successful and Council wish to 'roll-out' a contract wallaby control programme then this can be considered during future budget rounds.

Greg Corbett
Biosecurity Manager

for General Manager, Integrated Catchments

8 February 2019

Receives Only – No Decisions

Report To: Regional Direction and Delivery Committee

Meeting Date: 19 February 2019

Report From: David Phizacklea, Regional Integrated Planning Manager

Resource Management Act Plan Changes: Work Programme

Executive Summary

A review of Council's regional plans and plan change work programme under the Resource Management Act 1991 has been undertaken and an updated schedule provided with this report. The review considered the ability to achieve the set timeframes utilising current long term and annual plan resource constraints. Staff have made a number of amendments to the schedule to reflect current resource availability.

There are a number of factors that influence the ability of council to meet fixed timeframes for a Schedule 1 process with a number of these being out of Council's control.

For this reason the attached schedule should be considered a 'live strawman schedule' that is regularly updated to reflect the changing policy environment, national direction and provide the level of flexibility required.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Resource Management Act Plan Changes: Work Programme.

2 Notes that the attached schedule 'Regional Plan Changes Schedule' is a living schedule and will be regularly updated to reflect the progress of a plan change or Council decisions as a result of changes in policy direction, national direction or resource availability.

1 Plan Change Work Programme

The current schedule of regional plans and plan changes has been reviewed with the intent to achieve the set timeframes for delivery within current resourcing under the Long Term Plan 2018-2028. As part of this process staff have taken on board previous lessons learnt and reflected these within the time frames allocated to each plan change process.

There are a number of factors that influence Council's ability to meet fixed timeframes for a Schedule 1 process under the Resource Management Act with a number of these being out of Council's control. These include:

1. **Response to Government freshwater direction**

   The recent announcements made by central government in the freshwater space will require staff to monitor and provide feedback on behalf of council to the draft processes, thus reducing resourcing allocated to the NPS-FM implementation.

2. **Changes to Freshwater National Policy**

   Depending on what is contained within the resulting National Environment Standard for Freshwater Management (NES-FM) and revised National Policy Statement for Freshwater Management (NPS-FM) will impact the scale of work included for each Water Management Area (WMA) process, and may require a reallocation of resourcing to implement any government directions. However until future information is made available the level of impact this has is unknown.

3. **Other National Policy Direction**

   National policy statements are expected to be finalised and/or progressed for indigenous biodiversity, versatile soils and natural hazards over the next 12-18 months.

4. **National Planning Standards**

   The requirement to implement national planning standards may impact the timeframes of other projects to enable this to be achieved within the timeframes set by government. Until the final standards are released in April 2019 the level of impact this may have is unknown.

5. **Environment Court processes**

   Once a plan change reaches the appeals stage the Environment Court effectively runs the process. As seen with Plan Change 10 Council has no ability to influence the process to ensure this aligns with internal set timeframes. This impacts the availability of resources to other plan changes and their timeframes.

6. **Availability and accuracy of science information**

   Policy decisions can only be made once sufficient information is made available to provide an acceptable level of certainty and risk with this influencing the Schedule 1 process and outcomes. An example includes the level of science required to confirm the nutrient loads received by a water body, and the load required to achieve a community target. There is the ability to notify a plan change with a lower level of science completed to understand the complex environment processes, and in turn the final nutrient loads. This will release resources and allow other plan changes to commence, however the approach has an increased level of risk, and made result in a longer Schedule 1 process. Ultimately this is a Council decision, however the current approach has been to ensure sufficient science is available to allow a reasonable assessment and decision to be made.

7. **Level of engagement required with the community**

   The majority of regional plan changes relates to complex topics which requires more time for the community to understand to enable them to fully engage with the process. Other factors include over consulting the community, there is a need to stage planning processes to ensure the community continue to participate, and do not get ‘planning fatigue’. This influence the timeframes for each planning process and availability of resources.

8. **Treaty of Waitangi settlement negotiations and legislation**

   To date three Treaty Claims Settlements have either been enacted or are in progress that require changes to the Regional Policy Statement. The first is for the Rangitāiki River catchment, this has been completed and is now operative, the second is for the , Kaituna River catchment which has recently commenced, and the third is for Tauranga Moana and will commence once the when the treaty settlement claim has been enacted. Regional Council has no involvement in negotiating these claims but is required to administer and change its RPS and regional plans to recognise and provide for the respective vision, desired outcomes and objectives of these river documents.

Currently the intent is to align Schedule 1 processes and where able merge these into one engagement or notification process to avoid over consultation, reduce cost and gain efficiency. However this approach may not overcome all of the above factors.

2 Plan Change Schedule Amendments

Staff have made a number of amendments to the plan change schedule to reflect current resource availability. These amendments have also been informed by discussions held with other section of Council involved in plan change processes and include:

- Extending the timeframes for the geothermal notification to November 2019

- Altering the timeframes for NPS-FM implementation as shown in Figure 1 (note this has been previously approved at the 11 December 2018 RDD meeting)

- Extending the appeals period for plan changes

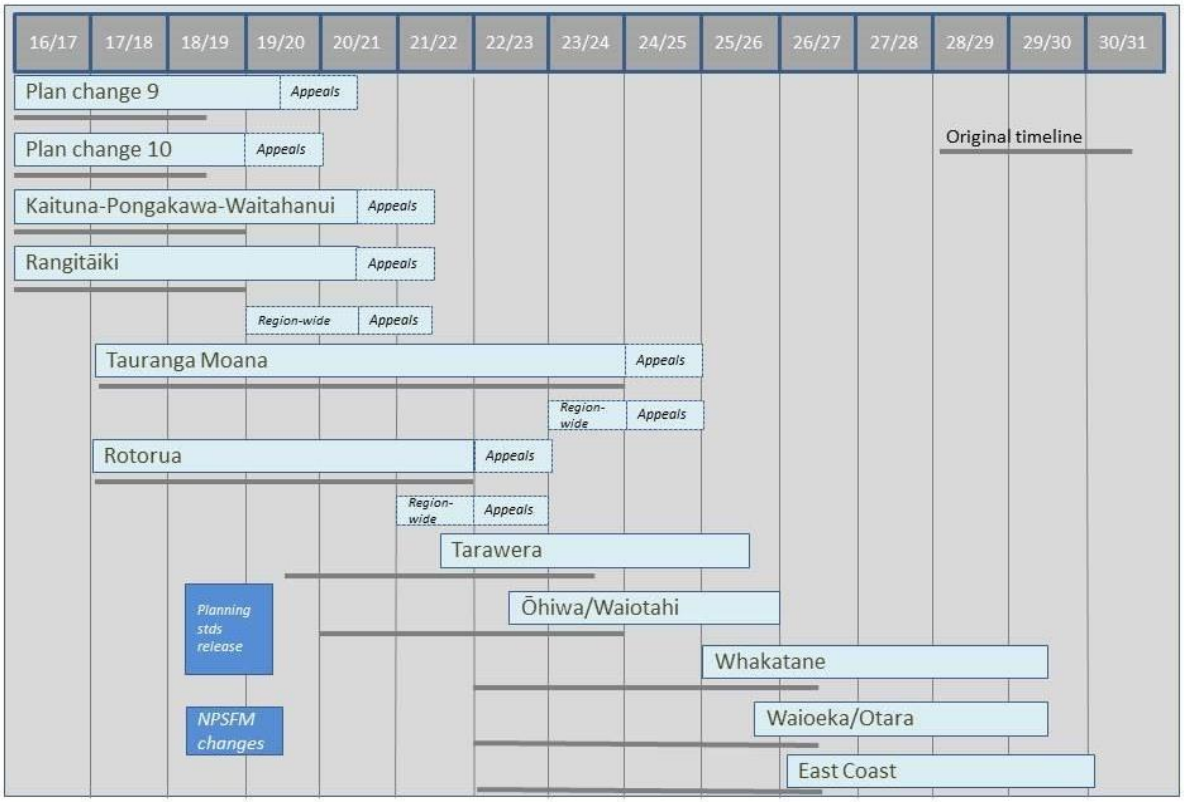
- Deleting RPS Changes 3 (Rangitāiki River) and 4 (Tauriko West Urban Limits) as these are now operative.

- Inserting RPS Change 5 (Kaituna River) with timeframes aligned to the Kaituna and Rangitāiki WMA change to the Natural Resources Regional Plan.

- Inserting RPS urban limits amendments to enable a more flexible approach to respond to residential growth demand, align with the outcomes of the Future Development Strategy including amendments to the urban limits in Katikati and Te Puke and to provide policy direction on low impact stormwater design and requiring planning for a 1 in 100 year event timeframe for flooding.

The agenda item ‘National Policy Statement for Freshwater Management Implementation Programme’ presented to and approved by the Regional Direction & Delivery Committee on 11 December 2018 outlines Council’s approach for the implementation of the NPS-FM and sets out the revised timeframes for each Water Management Area (refer Figure 1). These timeframes have been included within the revised plan change schedule provided in Appendix 1.

Figure 1: Approved National Policy Statement for Freshwater Management implementation programme



For the above reasons the plan change schedule in Appendix 1 should be considered a 'live strawman schedule' that is regularly updated to reflect the changing policy environment, national direction and provide the level of flexibility required.

3 Implications for Māori

It is recognised that Māori involvement in planning and delivery of policy is integral to their role as kaitiaki and necessary to achieve requirements the Resource Management Act 1991 and national policy statements.

The Act requires Council to consult with tangata whenua in the preparation of plans and plan changes. Te Mana Whakahono also places requirements on Council.

The alterations of the plan change timeframes will provide for more efficient consultation reflecting resource and time restraints of stakeholders, allowing for more informed feedback to policy development to be made.

4 Council's Accountability Framework

4.1 Community Outcomes

This project/proposal directly contributes to the Healthy Environment, Freshwater for life, a Vibrant Community and Safe and Resilient Communities Community Outcomes in the council's Long Term Plan 2018-2028. The plan change schedule relates to all policy departments which contribute to each of the community outcomes in various ways.

4.2 Long Term Plan Alignment

This work is planned under Regional Planning and Engagement group of activities in the Long Term Plan 2018-2028.

Current Budget Implications

This work is being undertaken within the current budget for the Regional Planning Activity in Year 1 of the Long Term Plan 2018-2028.

Future Budget Implications

Future work on Regional Planning is provided for in Council's Long Term Plan 2018-2028.

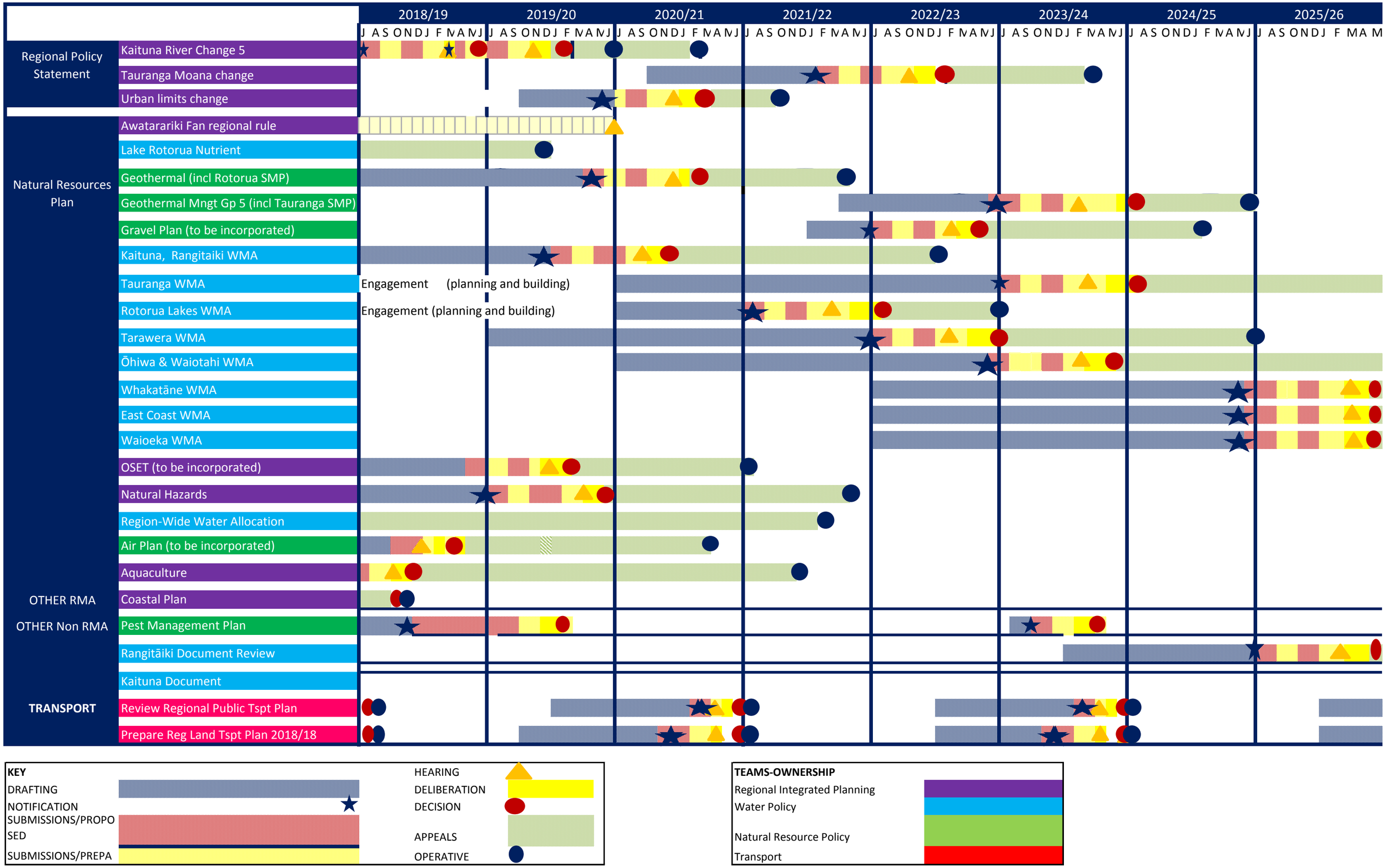
Rebecca Burton
Freshwater Team Leader

for Regional Integrated Planning Manager

8 February 2019

APPENDIX 1

Strategy Group Plan Change Coordination Timelines


2018/19
2019/20
2020/21
2021/22
2022/23
2023/24
2024/25
2025/26
J AS ONDJ F MAMJ
Regional Policy Statement
Kaituna River Change 5
Tauranga Moana change
Urban limits change
Natural Resources Plan
Awatarariki Fan regional rule
Lake Rotorua Nutrient
Geothermal (incl Rotorua SMP)
Geothermal Mngt Gp 5 (incl Tauranga SMP)
Gravel Plan (to be incorporated)
Kaituna, Rangitaiki WMA
Tauranga WMA
Engagement (planning and building)
Rotorua Lakes WMA
Engagement (planning and building)
Tarawera WMA
Ōhiwa & Waiotahi WMA
Whakatāne WMA
East Coast WMA
Waioeka WMA
OSET (to be incorporated)
Natural Hazards
Region-Wide Water Allocation
Air Plan (to be incorporated)
Aquaculture
OTHER RMA
Coastal Plan
OTHER Non RMA
Pest Management Plan
Rangitāiki Document Review
Kaituna Document
TRANSPORT
Review Regional Public Tspt Plan
Prepare Reg Land Tspt Plan 2018/18
KEY
DRAFTING
NOTIFICATION
SUBMISSIONS/PROPOSED
SUBMISSIONS/PREPA
HEARING
DELIBERATION
DECISION
APPEALS
OPERATIVE
TEAMS-OWNERSHIP
Regional Integrated Planning
Water Policy
Natural Resource Policy
Transport

Receives Only – No Decisions

Report To: Regional Direction and Delivery Committee

Meeting Date: 19 February 2019

Report From: James Low, Water Policy Team Leader

Freshwater Futures Update

Executive Summary

This report provides an update on policy work being undertaken to implement the National Policy Statement for Freshwater Management, relevant national policy direction and other Freshwater Future programme initiatives.

Key updates since the last Committee meeting include:

- In the December report staff confirmed that fourteen appeals were received to Proposed Plan Change 9. These appellants have now been joined by twenty five parties who lodged notices under section 274 of the Resource Management Act 1991. In total the s274 parties filed 164 notices, with many notices relating to multiple appeal points. Consequently, there are large numbers of parties in each topic area.
- Key technical work is being delivered for Plan Change 12 (Rangitāiki and Kaituna-Pongakawa-Waitahanui Water Management Areas) with policy options and discussion documents being prepared over the next few months;
- Correspondence has been received from the DIA regarding the next steps for the three waters project. This involves engagement with Regional Councils to complete a national stocktake on the regulation of WWTP's, address gaps in the knowledge of the three waters and national cost estimates for the upgrade of WWTP's discharging to the cost and to meeting targets for wastewater overflows.
- Implementation of the Essential Freshwater blueprint has commenced with a number of meetings being held by the taskforce. These have focussed on the level of analysis required to inform a section 32 analysis to support any regulatory proposals.
- The focus of the At Risk Catchments has been revised as a result of the feedback provided at the workshop held the 14 and 15 November. This has enabled the scope of the project to be better clarified. Discussions are being held between MfE and Council staff to discuss the At Risk Catchments identified for each region.
- A report on freshwater-related opportunities and constraints to economic growth in the Bay of Plenty has recently been completed. It found that if all current and future irrigation and frost protection consents are consistent with reasonable use, there should be enough fresh water in most catchments to provide for foreseeable growth.

Recommendations

That the Regional Direction and Delivery Committee:

1 Receives the report, Freshwater Futures Update.

2 Notes Appendix One which, as requested, provides an update on the various Rotorua lakeside community meetings over the 2018-2019 summer.

1 Purpose

This report provides an update on work underway to improve management of freshwater resources in the Bay of Plenty region. It also provides an update on freshwater policy matters at a national level.

2 National Updates

At a national level there are key activities underway that may impact Council's freshwater work programme for the Bay of Plenty.

2.1 Three Waters Review: Update

Government released a Cabinet paper on 22 November 2018 on the 'Future state of the three waters systems: regulation and service delivery.'

The paper proposed a staged approach over the next 18 months to identify and resolve the issues related to the three waters system and introduce legislation in 2020. An overview of each stage was provided to RDD in the December 2018 Freshwater Futures update.

Since this time correspondence from the DIA has confirmed that:

- Discussions have been held on how regional councils and government can work together to address gaps in knowledge about the three waters, particularly the environmental regulation of wastewater. Further research will be commissioned to target gaps identified.

- Options being considered for the regulation of wastewater include:

  - A minimum standards framework for wastewater discharges.
  - Broader options to require greater consistency for resource consents for wastewater treatment plants and networks;
  - Targets for wastewater overflows, with clear reporting of progress against them;
  - Changes to curb the current practice where wastewater treatment plants are allowed to operate for long periods of time on expired consents under section 124 of the Resource Management Act.

- Three research projects are intended to be commissioned focusing on wastewater systems:

- A national level stocktake on the regulation of WWTP (an overview of resource consents, compliance, enforcement and monitoring arrangements in place). A survey and data request will be sent out to Regional Councils to inform this project.
- A national cost estimate for the upgrade of WWTP discharging to the coast.
- A national cost estimate for meeting targets for wastewater overflows.

GHD Limited and Boffa Miskell Limited have been commissioned to complete these three reports in the first half of 2019. Two reference groups are being established to provide input from a regional council and territorial authority perspective on how the information for the above reports is collected, collated and presented in the final report. This will ensure all the relevant issues are captured and that the information is accurate.

2.2 Central Government's direction on Essential Fresh water

The Government's blueprint for fresh water, *Essential Freshwater: Healthy Water, Fairly Allocated,* was released Monday 8 October 2018 outlining the key actions government will be taking in the freshwater space over the next two years.

Implementation of the Essential Freshwater blueprint has commenced with a number of meetings held by each of the taskforce established to provide input to the potential regulatory and non-regulatory approaches required to achieve the outcome of halting further decline of water quality. Discussions have also been held on what level of analysis is required to inform a section 32 for any regulatory proposals. No updates on the outcomes of these meetings have yet been received by staff.

It is understood that the taskforce are working towards the following timeframes:

- Draft NPS Amendments and policy developed for Ministers decision – April 2019
- Draft policy taken to Cabinet – June 2019
- Consultation of regulatory proposals – July/August 2019
- Proposal to develop a NES taken to Cabinet for approval– December 2019
- Final decisions and approval by Cabinet – March 2020

These timeframes have not been formally confirmed by MfE and may be subject to change.

2.3 At Risk Catchments

Council staff attended the Ministry for the Environment 'At Risk Catchments' workshop in Wellington the 14 and 15 November 2018. The workshop was attended by regional and unitary councils, some iwi groups, non-governmental organisations and central government. The workshop identified the need to clarify the scope and intent of the ARC project, this has been taken on board and recently MfE have advised that two workstreams have been established to achieve this.

An overview of these two workstreams is provided below:

Workstream 1:

A focus on national level information to enable targeting of regulation, investment and potentially other interventions. This would include continued work on

developing criteria for risk assessment that will then be applied across all catchments nationally.

Workstream 2:

A focus on exemplars, a small group of catchments that will be identified through further discussion with partners and stakeholders. MfE intends to work collaboratively with agency partners (DoC and MPI), Regional Councils, iwi/hapū and communities in these catchments to identify appropriate measures to help improve the health of waterways from the bottom-up, and to identify gaps that could be filled by regulatory or non-regulatory interventions. This small group of catchments will be representative of a range of pressures and issues.

The workshop held in November identified 28 catchments across New Zealand for inclusion in Tranche 1. MfE have recently approached each Regional Council requesting further information on the catchments identified within the respective region. This process will further refine and reduce the 28 catchments to identify a small group of exemplars for Workstream 2.

The information requested has been complied by Council staff and provided to MfE. A teleconference has also been completed between Council and MfE Staff to discuss each catchment and provide additional information as required.

3 Plans and Plan Changes

Council is actively working on several freshwater plan changes to the operative Regional Natural Resources Plan. Updates are provided below.

3.1 Region-wide Water Quantity - Proposed Plan Change 9

In the December report staff confirmed that fourteen appeals were received to Proposed Plan Change 9. These appellants have now been joined by twenty five parties who lodged notices under section 274 of the Resource Management Act 1991. In total the s274 parties filed 164 notices, with many notices relating to multiple appeal points. Consequently, there are large numbers of parties in each topic area.

As directed by the Environment Court, staff have grouped the appeal topics and consulted with all parties. A memo proposing the topic structure has been provided to the Environment Court. At this stage, no preliminary legal issues have been identified and staff have begun meeting with parties. Following these initial meetings it is expected that Court assisted mediation will begin. Council is required to file a comprehensive post mediation memorandum with the Court by 12 April 2019. Staff will keep Councillors updated on progress.

The previous report also highlighted the development of a web based groundwater accounting tool. This tool is now live on Council's website and assists users to understand the allocation status of the region's groundwater. Work is progressing on a similar tool for freshwater.

At its 11 December 2018 meeting the committee agreed that an appeals sub-committee was not required and that staff, under their delegations, would negotiate appeals via the Court assisted mediation process. Staff will keep the committee fully informed of appeals progress via these freshwater futures updates but are happy to provide more regular updates to councillors who would like that.

3.2 Kaituna/Pongakawa/Waitahanui and Rangitāiki Water Management Areas - Plan Change 12

The purpose of this work is to deliver freshwater objectives based on freshwater values and to set appropriate water quality and quantity limits and methods to support those objectives by way of a change to the Regional Natural Resources Plan (RNRP).

Two key technical reports have recently been delivered. One estimates maximum contaminant load limits required to support values and objectives for Waihī and Maketū estuaries. The other reports the results of water quality, ecology and fish passage monitoring in the lowland drainage network of the Rangitāiki and Kaituna Plains. These have significant implications for Plan Change 12 and future management of land and fresh water, particularly in the catchments of Waihī and Maketū estuaries.

Some key technical work is still in progress, and is needed to inform our understanding of issues and options. Staff aim to see this completed by the end of December 2018, although this is subject to delivery by external consultants. This work includes:

- finalising review of the SOURCE surface water catchment modelling report, including industry organisation and expert peer review;
- assessment and reporting on nutrient status of hydro-electric power dam Lake Matahina;
- receiving and assessing groundwater modelling reports for Kaituna-Pongakawa-Waitahanui Water Management Area (WMA).
- developing and modelling mitigation scenarios for surface water quality;
- finalising the methodology for identifying and assessing minimum flow and allocation limit options for surface water.

Staff are also now starting to develop policy options papers and discussion documents to discuss with Regional Council elected members, co-governance forums, iwi, community groups and stakeholders in 2019. This requires consideration of all technical, policy and engagement information. The first is likely to be for groundwater management in the Rangitāiki WMA, and others will follow as the technical information is finalised. For the Kaituna-Pongakawa-Waitahanui WMA, investigation into appropriate water quality targets and methods is likely to be more complex than for Rangitāiki.

4 Co-Governance Forum Updates

In addition to the statutory changes noted above there is also co-governance work underway with Te Maru o Kaituna River Authority (TMoK) and the Rangitāiki River Forum. Both forums have continued to receive regular updates on the Freshwater Futures programme undertaken by Council. Council will continue to seek their advice/feedback as to whether/how our work aligns with the objectives of their river documents.

4.1 Te Maru o Kaituna River Authority update

TMoK held a water workshop at its December 2018 meeting which updated members & Ngāti Pikiao of the technical work being undertaken in the freshwater and coastal water space for the Kaituna catchment and Maketū Estuary.

Progressing Proposed Change 5 to the Bay of Plenty Regional Policy Statement in tandem with the freshwater plan change to the Bay of Plenty Regional Natural Resources Plan for the Kaituna-Pongakawa-Waitahanui and Rangitāiki Water Management Areas (Plan Change 12) was endorsed by RDD at its October meeting which will ensure alignment of these two Resource Management Act processes.. Draft Proposed Change 5 is being progressed and is expected to be ready for RDD committee to consider and approve its release for consultation at its April meeting. TMoK will be involved in the Change as a key partner

TMoK is progressing development of a Kaituna River Action Plan which is expected to be completed by July 2019. It will comprise priority projects to contribute to meeting the objectives of the river document.

4.2 Rangitāiki River Forum update

The Forum received an independent research in its last meeting on the 7 December 2018. on *"recognising and provide for kaitiakitanga"*. It is one of the objectives in *Te Ara Whānui o Rangitaiki - Pathways of the Rangitāiki: River Document*. In summary, the research found that kaitiakitanga is hapū-based and driven from Māori worldview, mātauranga Māori traditions and lore. Iwi want to exercise kaitiaki particularly in monitoring changes, protecting wāhi tapu sites, enforce resource management practices such as rāhui. It is important to convey people's relationship with the river.

In relation to the NPSFM implementation, a set of Freshwater workshops with the Forum is planned for 2019, as requested by the Forum. Following a Te Mana o Te Wai presentation by Tina Porou last year, the workshop is expected to cover the estimated sources of contaminants, and possible approaches in incorporating mātauranga Māori in the context of Regional Plan.

5 Regional Growth Study – Freshwater-related Opportunities and Barriers to Sustainable Economic Growth

Background

A report on freshwater-related constraints to sustainable economic growth in the Bay of Plenty was recently completed; it is available as a supporting document. The project stemmed from the Regional Growth Study, which identified fresh water as an enabler to economic growth. The project was part-funded by the Ministry for Primary Industries' (MPI's) Irrigation Acceleration Fund and the analysis was undertaken by Aqualinc Research.

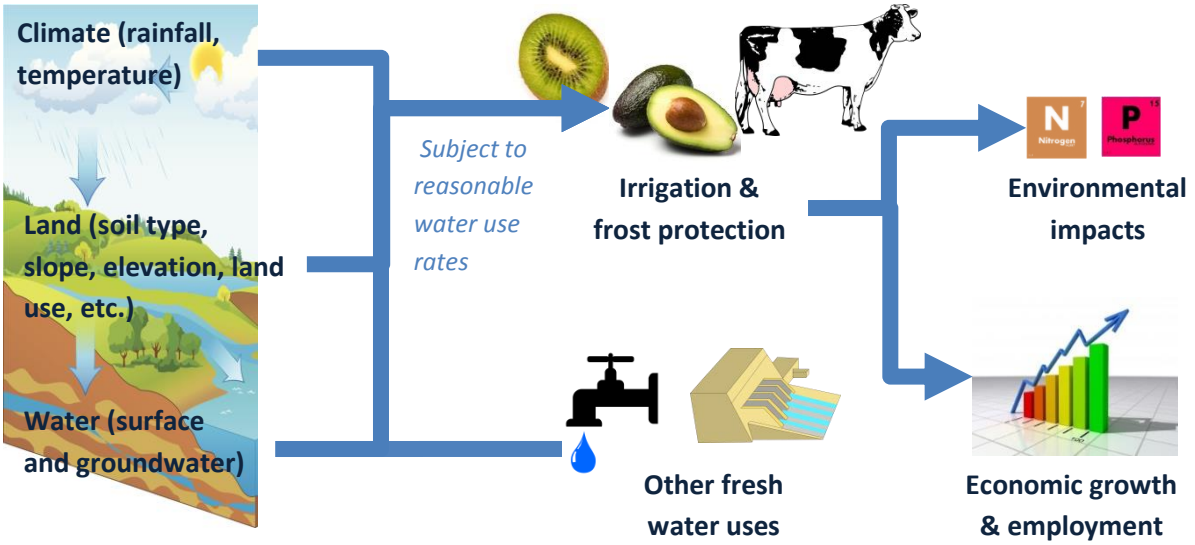
The aim of the project was to generate information that would support freshwater-driven sustainable economic growth in the region. It assessed the potential for irrigation expansion across the region, by answering the following questions:

- Is fresh water (quantity) a constraint to economic growth?
- What is the economic growth opportunity available from fresh water, including through more efficient allocation and use?
- Subject to the constraints identified above, is there a need for water storage or irrigation infrastructure in the region? If so, for what purpose?

- What other opportunities and barriers to freshwater-related economic growth are there?

The project's approach is broadly summarised in Figure 1 below. In a general sense, irrigation expansion is constrained mainly by the availability of suitable land and water (surface and ground water). For this project, water availability was determined by default allocation limits set by Proposed Plan Change 9, and existing allocations for uses other than irrigation and frost protection. Irrigation and frost protection allocations were reviewed based on reasonable use rates. Projections of future water demand for irrigation and frost protection were based on anticipated land use change patterns (i.e. mainly horticulture development). The study is therefore subject to the same limitations and uncertainties as those applicable to this underlying information. The focus of the report is freshwater quantity, although the project also identified other barriers and opportunities for economic growth. Although not directly related to current RMA planning processes, the report provides relevant and useful information for those processes too.

Figure 1 - Approach to assess freshwater-related constraints to irrigation expansion



Six workshops with tangata whenua and stakeholder representatives were held around the region to receive feedback on Aqualinc's initial analysis and to discuss other opportunities and barriers to economic growth.

Key findings

The key findings of the study are that the projected growth in irrigation (mainly for horticulture) can generally be provided for in most of the areas assessed with available fresh water (either surface water, groundwater or both), if all consented irrigation and frost protection is subject to reasonable use. Irrigation in the Bay of Plenty is generally 'dry year insurance' rather than critical for production, unlike in other eastern parts of the country. Nonetheless, there currently are a large number of water take consents, particularly older consents, which enable users to take more water than what is reasonable for the intended use. These consents may be 'locking up' water that could be available for other users. It would appear that in the Bay of Plenty, constraints other

than freshwater availability at a catchment or WMA scale may generally be more significant.[1]

In terms of irrigation and water storage infrastructure, the report concludes that there does not appear to be a need for large scale storage or infrastructure. However, there may be a need for small or community scale infrastructure such as shared bores or piped distribution to provide for areas without riparian access. Flexible allocation practices such as water user groups and rostering are also noted. The report also identified other opportunities for economic growth including new water-dependent industries and development of Māori-owned land.

The report also presents some general estimates of the economic and employment impact of irrigation expansion, which are significant. In the absence of water quality limits for most of the region, it presents estimates of changes in nitrogen and phosphorus losses as a result of the projected land use change, as possible indicators of environmental impact. These estimations should be considered indicative only.

Figures 2 to 5 below summarise the results of the analysis. For each WMA or catchment, the first column on the left shows the current level of allocation and estimated unconsented/permitted takes relative to allocation limits (cumulative). The second column shows the reduction in allocation that could be achieved if all irrigation and frost protection consents were subject to reasonable use rates. The third column shows the increase in allocation necessary to provide for foreseeable growth in horticulture irrigation and frost protection, also subject to reasonable use rates.

[1] For example, availability of wiling and skilled labour, infrastructure, access to capital, conflict between users, constraints on the use of Māori-owned land, lack of knowledge and information – such as economic viability of irrigation, land suitability for new land uses - , access to water at a local scale, access to markets, landowners' choice, etc.

Figure 2 - Current vs. potential surface water allocation, Western Bay of Plenty

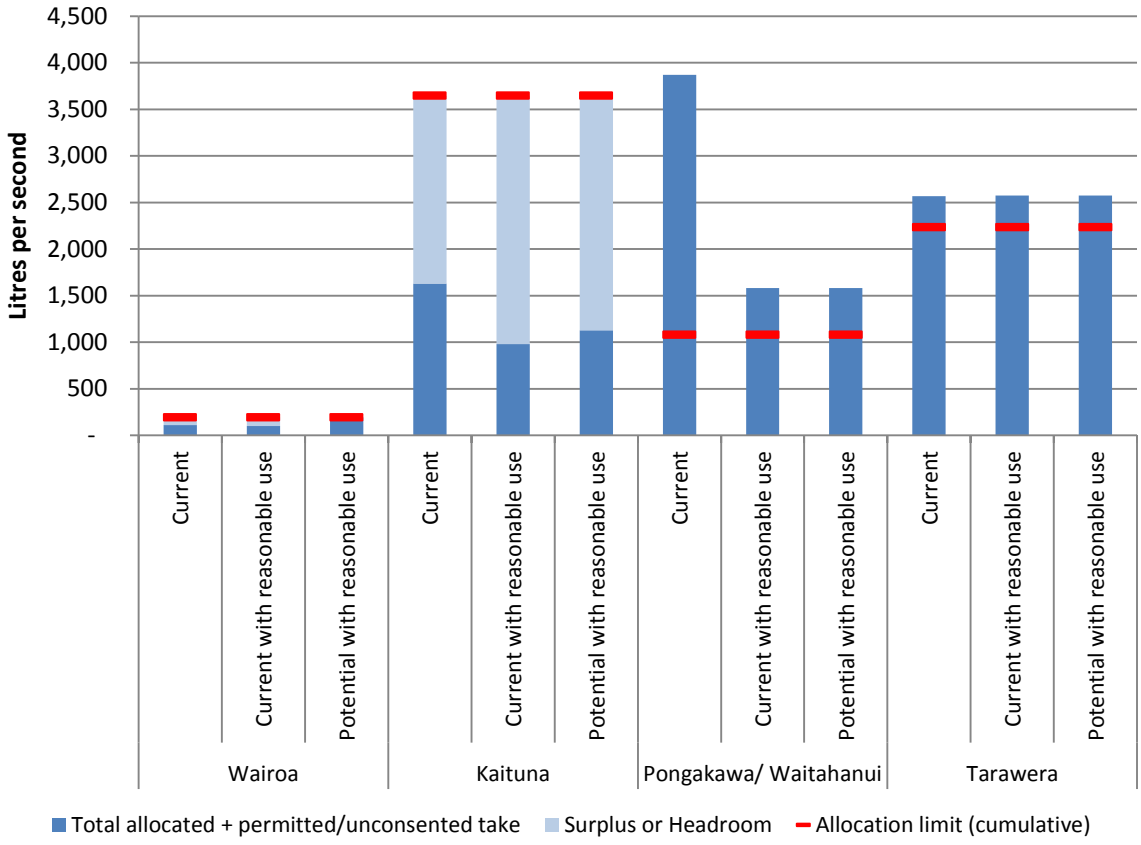


Figure 3 - Current vs. potential surface water allocation, Eastern Bay of Plenty

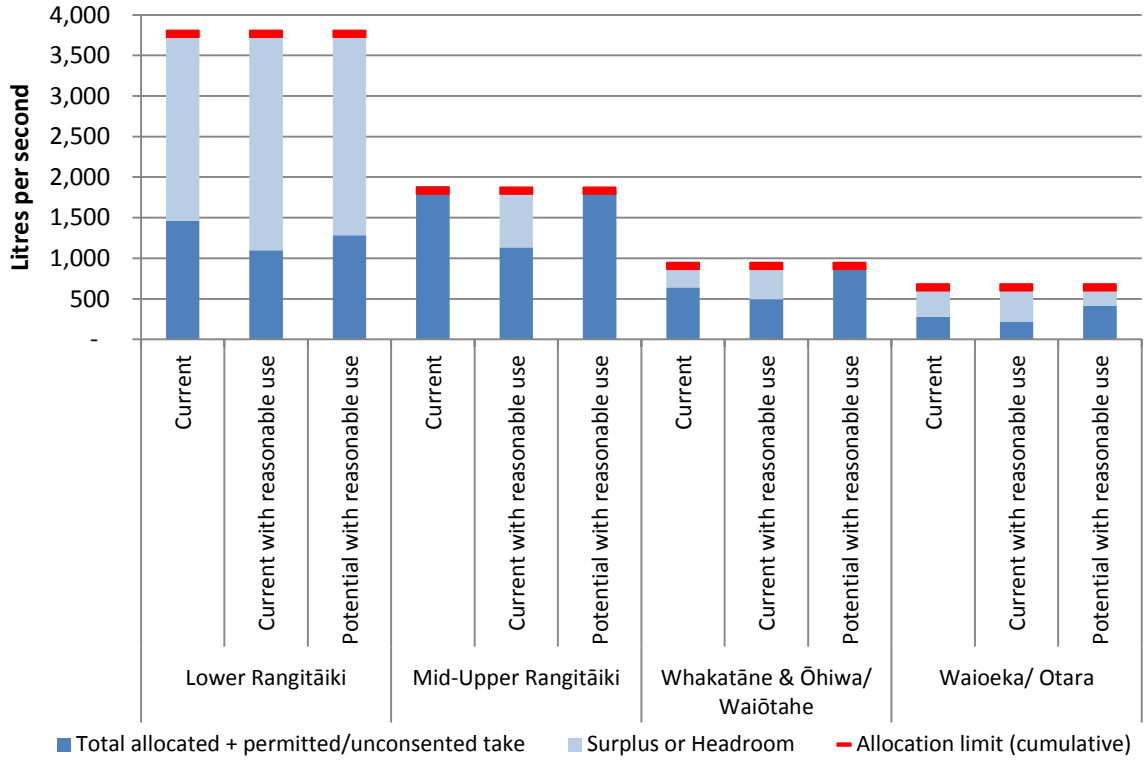


Figure 4 - Current vs. potential groundwater allocation, Western Bay of Plenty

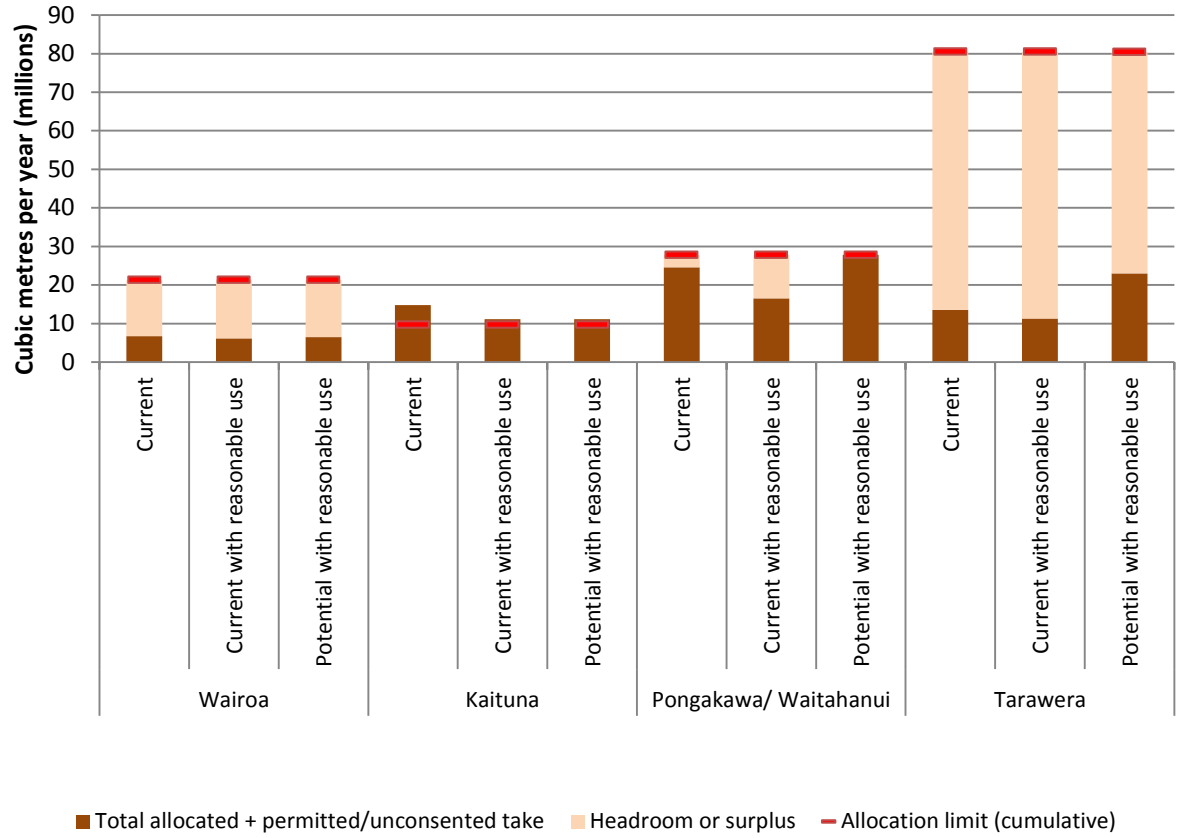
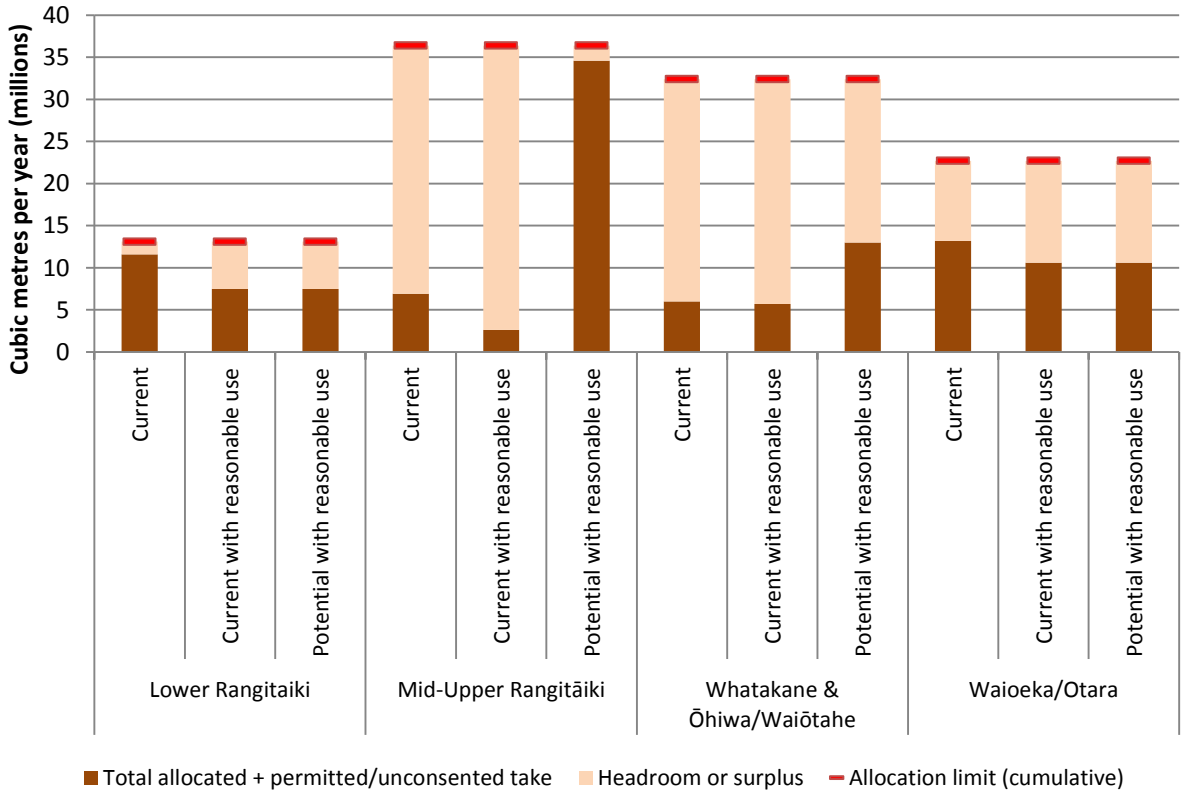


Figure 5 - Current vs. potential groundwater allocation, Eastern Bay of Plenty



Implications and next steps

The report provides useful information on the potential for irrigation expansion, and associated regional economic growth, under current planning rules. It also highlights key barriers and opportunities that may prevent or enable such growth. This information will also be useful for current RMA planning processes to set freshwater limits under the NPS-FM.

A copy and summary of the report will be distributed to tangata whenua and stakeholder representatives that participated in the workshops, Freshwater Futures community group members, the Regional Water Advisory Panel and Territorial Local Authorities Freshwater Forum. It will also be available on the BOPRC website and will be summarised in the next edition of the Freshwater Flash e-newsletter.

6 Advice

We continue to seek advice on Council's Freshwater Futures programme, through the Regional Water Advisory Panel and Territorial Local Authority Freshwater Collaboration Group. The next meetings of these two groups will be in March 2019.

6.1 Territorial Local Authority Freshwater Collaboration Group

The last Territorial Authority Freshwater Collaboration Group meeting was held on 17 October 2018 (draft minutes attached in Appendix 4).

Topics discussed include the national Essential Freshwater programme and Three Waters review, storm water and wastewater network discharge consent progress and compliance, Plan Change 9 and 12 updates. This continues to be a useful forum for sharing information and seeking opportunities for alignment.

7 Implications for Māori

It is recognised that Māori involvement in planning and delivery of improved water management is integral to their role as kaitiaki and necessary to achieve requirements of the National Policy Statement for Freshwater Management.

For the Rangitāiki and Kaituna-Pongakawa-Waitahanui WMAs, opportunities for Māori involvement in engagement on freshwater discussions will continue to be provided.

8 Council's Accountability Framework

8.1 Community Outcomes

Council's Freshwater Futures work directly contributes to the 'Freshwater for Life' community outcome in Long Term Plan 2018-2028.

8.2 Long Term Plan Alignment

This work is planned under various activities within the Long Term Plan 2018-2028, including the Integrated Catchment Management, Regional Planning and Engagement, Regional Development, Technical Services and Corporate Services groups of activities.

8.3 Current Budget Implications

Council's Freshwater Futures work is being undertaken within the current budget for the activities in Year 1 of the Long Term Plan 2018-2028.

8.4 **Future Budget Implications**

Future work is provided for in Council's Long Term Plan 2018-2028.

Any additional work for Bay of Plenty Regional Council resulting from national direction will need to be considered as to future budget implications.

Rebecca Burton
Freshwater Team Leader

for Water Policy Team Leader

8 February 2019

APPENDIX 1

2018-2019 - Lakeside Community Meeting Summary

MEMORANDUM

BAY OF PLENTY REGIONAL COUNCIL TOI MOANA

To: Regional Direction and Delivery Committee

From: Helen Creagh **Date:** 5 February 2019

Rotorua Catchments Manager

File Ref:

Subject: **Summary of Rotorua Lakeside Meetings - 2019**

Introduction

The Chair of the Regional Direction and Delivery Committee has a requested a brief round-up of the matters raised at the various community meetings around the Rotorua Te Arawa Lakes over the summer period.

Catfish and other biosecurity issues were a focus of discussion as well as lakeside sewerage reticulation, maritime matters and renewal of resource consents for lake structures, e.g. jetties, boatramps etc.

Rotoiti Ratepayer Association AGM – 2 January 2019

Our Chairman spoke briefly at this meeting and a presentation relating to our catfish response was given by Biosecurity Officer, Lucas McDonald. William Anaru who is employed by Te Arawa Lakes Trust as the Community Engagement Co-ordinator for our catfish response (a position funded by the Regional Council) was also in attendance.

The catfish response remains a significant area of concern for the people of Rotoiti. They were interested in whether there are enough contractors doing netting and whether eradication was still the aim of the response. Answers were provided regarding our aim for progressive containment of catfish.

Chairman Leeder received a number of concerns regarding processing of renewal consent applications for lake structures. Particularly regarding the time it was taking to process the applications, costs and the process around understanding and dealing with cultural effects. Chairman Leeder committed to a detailed update to be provided by staff by the end of January. This update has since been circulated widely to all of our distribution networks for structures across all lakes, providing clarification and commitments on various matters, including those raised at the meeting.

Tarawera Ratepayer Association AGM – 13 January 2019

The Chairman, Councillors and staff were in attendance at this meeting. Lakeside reticulation was a focus of discussion and there is still very widespread support in the community regarding getting on with this. However, concerns remain around the estimated cost per household unit and the ability of some to pay, also inequity between subsidies given for other lakes.

Commitment was made by the Tarawera Sewerage Steering Committee Chair, Glenn Snelgrove, that more money would be sought to subsidise the scheme and it is likely our Council will receive a request for further financial assistance in due course.

Similar concerns were raised with Chairman Leeder in relation to lake structures, as were raised at the Rotoiti meeting. The Chairman made the same commitment for staff to circulate an update by the end of January, which has completed as detailed above.

Rotomā – Rotoiti Sewerage Scheme Meeting – 19 January 2019

This is a Rotorua Lakes Council project. There are concerns in the community about increasing costs and the ability to deliver the system for the whole community as originally intended. Staff and Councillors were in attendance. We are keeping a watching brief on the next steps with this project, to ensure the system finally delivered meets the intention of what the Regional Council funding was provided for.

Rotomā and Rotoehu Ratepayer AGM - 20 January 2019

Poor water quality generally on Lake Rotoehu was raised (including with staff prior to the meeting). The local community organised a meeting to talk about the water quality issues on the lake which was attended by staff who outlined the research and actions on the lake in relation to water quality. This staff response was well received and staff will continue to contribute to the ongoing group.

There were a number of issues raised about boat safety and navigation and poor boating behaviour. To resolve some of these issues the community suggested Regional Council link regularly with a key group of ratepayers to discuss the solutions/actions. An issue of concern was raised regarding the presence of lake weed on a Regional Council jet ski about to enter Lake Rotomā. It was alleged that if the resident had not intervened then the weed would have been unloaded with the jet ski. Both matters have been referred to the Maritime team.

Lakes Water Quality Society AGM – 31 January 2019

The Chairman, Councillors and staff were in attendance. Primary concerns remain around catfish and aquatic weed control. Biosecurity Team Leader, Shane Grayling provided an update on the catfish incursion response and our recently granted resource consent relating to the use of endothall and diquat on the lakes, responding to questions in relation to both.

Chairman Leeder spoke briefly about the issues facing the lakes. The Chairman of the Lakes Water Quality Society - Don Atkinson, noted the significant challenges still facing the Regional Council with the management and restoration of the Rotorua Te Arawa Lakes, despite the good work already done.

Other than the biosecurity matters already mentioned, the challenges noted by Mr Atkinson included the necessity to continue with alum dosing on Lake Rotorua (the consents for this have expired and are currently going through a renewal process), challenges with the Lake Rotorua Incentives Scheme, and the need for more action in the Tarawera Catchments subsequent to the Tarawera Lakes Restoration Plan which is currently under implementation. Te Arawa Lakes Trust have committed to leading the further action in the Tarawera Catchments and Nicki Douglas the Environment Manager for the Lakes Trust responded briefly to this.

Lake Ōkāreka Community Association – 3 February 2019

Councillor Thurston and Rotorua Catchments Principal Advisor Anna Grayling were in attendance. The Ōkāreka community are well informed and engaged with Regional Council projects. Andy Woolhouse (Regional Council Consultant) gave an update on processing of a resource consent application relating to managing water levels in Lake Ōkāreka via the Waitangi Stream. However, the community were already well informed on this. Regional Council are making significant progress with a further land use change project in the catchment which is likely to mark the end of action in this catchment. The Chairman of the association was generally complimentary of Regional Council.

SUPPORTING DOCUMENT - Freshwater Constraints to Economic Development