Rotorua Te Arawa Lakes Strategy Group

NOTICE IS GIVEN

that the next meeting of the **Rotorua Te Arawa Lakes Strategy Group** will be held in **The Council Chamber, Rotorua Lakes Council, Civic Administration Building, 1061 Haupapa Street, Rotorua** on:

Friday, 2 November 2018 commencing at 9.30 am.

Fiona McTavish
Chief Executive
Bay of Plenty Regional Council Toi Moana

Bay of Plenty Regional Council,
Rotorua Lakes Council and
Te Arawa Lakes Trust.
Working as one to protect our lakes with funding assistance from the Ministry for the Environment.

ROTORUA TE ARAWA LAKES PROGRAMME

Rotorua Te Arawa Lakes Strategy Group
Terms of Reference

Interpretation

In these Terms of Reference:

"Organisations" means the Te Arawa Lakes Trust, the Rotorua District Council and the Bay of Plenty Regional Council.

"Rotorua Lakes" means Lakes Rotorua, Rotoiti, Rotoehu, Rotoma, Okataina, Tikitapu, Okareka, Tarawera, Rotomahana, Rerewhakaaitu, Okaro and Rotokakahi.

"Group" means the Rotorua Te Arawa Lakes Strategy Group, formed as a Joint Committee under Clause 30 of Schedule 7 of the Local Government Act 2002.

Purpose

The purpose of the Group is to contribute to the promotion of the sustainable management of the Rotorua Lakes and their catchments, for the use and enjoyment of present and future generations, while recognising and providing for the traditional relationship of Te Arawa with their ancestral lakes.

Membership

Six members:

- The Chairperson of the Te Arawa Lakes Trust and one other senior representative;
- The Mayor and one other elected representative of the Rotorua Lakes Council;
- The Chairperson and one other elected representative of the Bay of Plenty Regional Council.

Quorum

As per clause 3.1 of the RLSG Agreement (dated 8 October 2004), the ordinary quorum for a meeting of the Group will be one member from each of the Organisations.

Group Chairperson

The Group has agreed to rotate its Chairperson on an annual basis.

Term of the Committee

This is a permanent joint committee under the Te Arawa Lakes Settlement Act 2006. The *Te Arawa Lakes Deed of Settlement* (December 2004) included clauses establishing the Group (Cultural Redress: Lakes Management and Relationships, clauses 9.1 to 9.3). The Terms of Reference for the Group come from a signed agreement between the three parties (dated 8 October 2004) and included in Part 1 of the Relationship Schedule to the Deed of Settlement.

Specific Responsibilities and Delegated Functions

The Group will have the following functions:

- The provision of leadership to the Organisations and the community in relation to implementation of the Vision of the Strategy for the Lakes of the Rotorua district 2000.
- The identification significant existing and emerging issues affecting the Rotorua Lakes.
- The preparation, approving, monitoring, evaluation and review agreements, policies and strategies to achieve integrated outcomes for the Rotorua Lakes.
- The identification, monitoring and evaluation of necessary actions by the organisations and other relevant organisations.
- The receiving of reports on activities being undertaken by the organisations and other relevant organisations.
- Involvement during the preparation of statutory plans in relation to significant issues. Such plans include but are not limited to iwi and hapū management plans, district and regional plans, reserve management plans and annual plans.
- Involvement in applications for activities in relation to significant issues not addressed by existing policies of the co-management partners. Such activities include but are not limited to resource consents, designations, heritage orders, water conservation orders, restricting access to the lakes (during special events or in particular circumstances), and transferring and/or delegating of statutory authority.

Note:

The Rotorua Te Arawa Lakes Strategy Group reports directly to the Regional Council.

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:	Sir T Curtis (Chairman, Te Arawa Lakes Trust)
Deputy Chairperson:	Mayor S Chadwick (Rotorua Lakes Council)
Appointees:	**Bay of Plenty Regional Council:** Chairman D Leeder, Councillor K Winters, Councillor T Marr (Alternate) **Rotorua Lakes Council:** Councillor K Hunt, Deputy Mayor D Donaldson (Alternate) **Te Arawa Lakes Trust:** R Meha, W Emery
Attendees:	S Lewis (Director, Mana Honohono – Investments and Partnerships, Ministry for the Environment)
Committee Advisor:	S Kameta

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

Agenda

1 Karakia Whakapuare/Opening Karakia

2 Apologies

3 Public Forum

4 Acceptance of Late Items

5 General Business

6 Declarations of Conflicts of Interests

7 Previous Minutes

8 Reports

Previous Minutes

Minutes of the Rotorua Te Arawa Lakes Strategy Group Meeting held in Committee Room 1, Rotorua Lakes Council, Civic Administration Building, 1061 Haupapa Street, Rotorua on Friday, 15 June 2018 commencing at 10.30 a.m.

Present:

Deputy Chairman: Mayor S Chadwick (Rotorua Lakes Council)

Appointees: Councillor K Hunt (Rotorua Lakes Council), Chairman D Leeder (Bay of Plenty Regional Council), Councillor T Marr (Alternate, Bay of Plenty Regional Council), Councillor K Winters (Bay of Plenty Regional Council), R Meha (Te Arawa Lakes Trust)

In Attendance: Ministry for the Environment: S Lewis (Director, Mana Honohono – Investments and Partnerships), Te Arawa Lakes Trust: K Vercoe (Chief Executive), N Douglas (Manager - Environment), Bay of Plenty Regional Council – Toi Moana: Councillor Bruning, C Ingle (General Manager, Integrated Catchments), H Creagh (Rotorua Catchments Manager), A Grayling (Rotorua Catchments Principal Advisor), S Grayling (Biosecurity Team Leader), R Cross (Land Management Team Leader), L Mason (Integrated Catchments Programme Manager), Y Tatton (Governance Manager), T White (Incentives Negotiator), J Pani (Incentives Board Support, Rotorua Catchments); Rotorua Lakes Council: G Williams (Chief Executive) in part, JP Gaston ((Group Manager Strategy and Partnerships) in part, S Michael (Infrastructure Manager) in part, G Rangi (,C Sutton (Rotorua Lakes Rural Board), P Thomas (Chair Rotorua Lakes Community Board)

Apologies: Sir T Curtis (Chairman Te Arawa Lakes Trust)

In the absence of the Chairman, Mayor Chadwick assumed the chair.

1 Karakia

Councillor Marr opened the meeting with a karakia.

2 Apologies

Resolved

That the Rotorua Te Arawa Lakes Strategy Group under its delegated authority:

1 Accepts the apology from Sir Toby Curtis tendered at the meeting.

Chadwick/Hunt
CARRIED

3 Acceptance of Late Items

Members were advised Item 8.1 Te Arawa Lakes Trust Update Report and an additional item, Te Arawa Lakes Trust Report on Nature Conservancy, were distributed under separate cover.

The reason why the Late Item, Te Arawa Lakes Trust Report on Nature Conservancy was not on the agenda was that it had just come to hand. The reason why it could not be delayed was to provide an update to members while the matter was current and no decision was required.

Resolved

That pursuant to section 46A of the Local Government Official Information and Meetings Act 1987 the following item be considered at this meeting:

1) Late Item, Te Arawa Lakes Trust Report on Nature Conservancy

Winters/Hunt
CARRIED

Change to the Order of Business

It was proposed Te Arawa Lakes Trust Report on Nature Conservancy be dealt with after item 8.1 Rotorua Te Arawa Lakes Trust Update Report.

4 General Business

Nil

5 Confidential Business to be Transferred Into Open

Nil

6 Declaration of Conflicts of Interest

Nil

7 Previous Minutes

7.1 Rotorua Te Arawa Lakes Strategy Group Minutes - 09 March 2018

Resolved

That the Rotorua Te Arawa Lakes Strategy Group under its delegated authority:

1 Confirms the Rotorua Te Arawa Lakes Strategy Group Minutes - 09 March 2018 as a true and correct record.

Winters/Hunt
CARRIED

8 Reports

8.1 Te Arawa Lakes Trust Update Report

Ms N Douglas, Environment Manager, Te Arawa Lakes Trust (TALT) provided members with a status update and summarised the progress of key projects and activities outlined in the report.

Key Points:

- Reference to the correct spelling of Thomas Malcolm (Puna Consultants) in the report was noted
- A discussion document as part of the Te Arawa /Rotorua Lakes Iwi Management Plan was currently out for consultation
- Acknowledged the Regional Council's support to enable a Community Action Coordinator to be appointed to increase efforts in reducing catfish migration and numbers
- TALT and Scion's joint application to the Ministry of Research, Science and Innovation to develop a Climate Change Research Plan and Strategy had been successfully funded
- TALT and Ngati Tarawahi had been successful in securing funding to undertake research and monitoring of taonga species in Lake Okataina.

In Response to Questions:

- Members would be informed when the Community Action Coordinator was in place, expected late July/ mid-August
- It was anticipated the first report on the Climate Change Research Project would be presented to the Strategy Group in a year's time.

Resolved

That the Rotorua Te Arawa Lakes Strategy Group under its delegated authority:

1 Receives the report, Te Arawa Lakes Trust Update Report.

Hunt/Meha
CARRIED

8.2 Te Arawa Lakes Trust Report on Nature Conservancy Visit

Ms N Douglas, Environment Manager, Te Arawa Lakes Trust (TALT) provided members with a summary of a recent visit from the Nature Conservancy.

Key Points:

- Nature Conservancy was a global, nature capital investment organisation investing in large scale, green infrastructure projects focused on the restoration of complex and significant ecosystems
- Investment included supporting communities, relationships and capacity building to enable continuity and cultural overlay
- Lake Tarawera was considered a significant lake restoration project.

In Response to Questions:

- Ministry for the Environment (MfE) and Department of Conservation (DoC) had engaged with the Nature Conservancy over the past two years with a DoC staff member seconded to assist the Nature Conservancy work in New Zealand
- A joint workshop was to be held with the Nature Conservancy, MfE and DoC on Freshwater Improvement funding and investing in New Zealand.

Resolved

That the Rotorua Te Arawa Lakes Strategy Group under its delegated authority:

1 **Receives the report, Te Arawa Lakes Trust Report on Nature Conservancy Visit.**

Hunt/Meha
CARRIED

8.3 Rotorua Lakes Council Update Report

Mr G Williams, Rotorua Lakes Council (RLC) Chief Executive, Mr JP Gaston, Group Manager Strategy and Partnerships and Mr S Michael, Infrastructure Manager presented the report.

Key Points:

- The wastewater treatment plant construction was progressing well with an expected completion date of April 2019
- RLC had met with Minister Parker (MfE) regarding alternative approaches to Plan Change 10 and Incentives Funding
- Improving the Lake Rotorua frontage was a major project in the RLC Long Term Plan 2018-28.

In Response to Questions:

- A correction to the report - 4. bp 2 noted the two kilometres of sewer trunk main was to link Lake Rotoma not Lake Rotorua to the wastewater treatment plant as incorrectly stated in the report
- While there were outstanding issues with some hapu regarding the Rotorua Wastewater Treatment Plan resource consent renewal, extensive consultation had been undertaken and any outstanding matters would be considered through the renewal application process
- An estimated $15-19M was required to finance the Tarawera Sewerage Scheme and a working party was assessing the optimal funding mix
- RTALSG members had resolved at the September 2017 meeting to support in principle the reticulation of sewage from the Lake Rotoehu community to the Rotomā-Eastern Rotoiti sewage scheme, subject to appropriate funding.

Resolved

That the Rotorua Te Arawa Lakes Strategy Group under its delegated authority:

1 Receives the report, Rotorua Lakes Council Update Report.

Leeder/Hunt
CARRIED

8.4 Ministry for the Environment Update Report

Mr S Lewis, Director, Mana Honohono – Investments and Partnerships, MfE, provided an overview of the report.

Key Points:

- Waste minimisation transition towards a circular economy was progressing well
- A stakeholder taskforce had been established to address waste minimisation, particularly recycling
- MfE were developing a detailed work plan to improve the synergies between freshwater, land use intensification and contamination and climate change impact.

In Response to Questions:

- It was noted bp 4, urban development, should read 'affordable housing' not 'the Housing Commission' as incorrectly stated in the report
- The long term waste minimisation programme was moving towards a circular economy, eliminating the need to send any waste offshore
- Key initiatives included increasing the waste levy; expanding the levy to more landfill types; increasing resource efficiency initiatives; improving the waste data framework; prudent investing of funding from increased levy; increasing onshore waste processing and decreasing the toxic impact from waste packaging
- It was clarified that the impact of Climate Change on Rotorua Lakes was included in the Rotorua Lakes Council work streams.

Resolved

That the Rotorua Te Arawa Lakes Strategy Group under its delegated authority:

1 Receives the report, Ministry for the Environment Update Report.

Chadwick/Hunt
CARRIED

8.5 Rotorua Te Arawa Lakes Strategy Group Terms of Reference Review

Key points:

- Members discussed the need for the Strategy Group's Terms of Reference and membership to remain relevant to the changing needs of the partnership and issues of environmental concern.
- While the Strategy Group acknowledged the principles of the Terms of Reference membership, it had not adhered to the requirement of annual rotation of the Chair and felt it appropriate to amend the Terms of Reference and membership to meet current needs and priorities.
- Further inclusion of scope for the Strategy Group included: climate change impacts, lake related biosecurity matters, fisheries bylaw enforcement, Lake Tarawera as a Deed funded lake.

Resolved

That the Rotorua Te Arawa Lakes Strategy Group under its delegated authority:

1 Receives the report, Rotorua Te Arawa Lakes Strategy Group Terms of Reference Review.

Hunt/Leeder
CARRIED

2 Recognises the need to ensure the Rotorua Te Arawa Lakes Strategy Group membership is effective and supports Te Arawa Lakes Trust's request to amend the membership of the Rotorua Te Arawa Lakes Strategy Group to allow for the appointment of an Independent Chairperson without voting rights.

3 Recognises that the current membership restrictions of the three parties will require amending accordingly.

4 Requests that Sir Toby Curtis be approached to undertake the position of Independent Chairperson for a term of three years.

5 Acknowledges a vacancy arising from the appointment of Sir Toby Curtis as Independent Chairperson and requests that Te Arawa Lakes Trust appoint a further member to the Strategy Group.

6 Staff from the three partners to undertake a further review of the Terms of Reference to reflect the need to respond to changes in the governance structure and changing environmental priorities, and bring back to the Strategy Group for discussion.

Leeder/Chadwick
CARRIED

8.6 Brown Bullhead Catfish Incursion Project Update

PowerPoint Presentation Objective ID A2900921

Ms H Creagh, Rotorua Catchments Manager and Mr S Grayling, Biosecurity Team Leader updated the Strategy Group on action taken in response to the Catfish incursion in Lake Rotoiti.

In Response to Questions:

- Catch rates were still high in Te Weta Bay
- Biological control may not be effective
- Electronic DNA testing was specific to each species
- BOPRC biosecurity budget had significant increases over the coming years.

Resolved

That the Rotorua Te Arawa Lakes Strategy Group under its delegated authority:

1 Receives the report, Brown Bullhead Catfish Incursion Project Update.

Hunt/Winters
CARRIED

8.7 Programme Status Update, Three Year Plan and Annual Work Programme

PowerPoint Presentation Objective ID A2900919

Ms H Creagh, Rotorua Catchments Manager, Ms A Grayling, Rotorua Catchments Principal Advisor provided an update on progress and submitted the Three Year Plan and Annual Work Programme for approval, as provided for in the Deed of Funding with the Crown.

In Response to Questions:

- Members would receive an invitation to attend the Low Nitrogen Use Fund launch to be held in July 2018
- While the Ohau Chanel diversion corrosion control was not Deed funded it could be reconsidered after further discussions with MfE
- Trialling alternative materials regarding corrosion control would require technical engineering input
- Forestry conversion plans needed to identify setbacks from waterways in order to comply with Regional Council's land use requirements and harvesting and conversion needed to be in accordance with Resource Management Act requirements including Regional Plans.
- Te Tuapapa o ngā wai o Te Arawa was expected to be embedded across the two councils through staff training sessions.

In response to an invitation to update members on the Lake Rotorua Incentives Scheme, Councillor Bruning, Chair of the Lake Rotorua Incentives Committee advised the Incentives Scheme was tracking well against targets.

In response to an invitation to address members, Mr P Thomas, Chair of the Rotorua Lakes Community Board acknowledged Te Arawa Lakes Trust and the progress and management of the various projects undertaken. Catfish incursion had been highlighted as an issue of concern to the Community Board.

Staff Follow-up:

- Rotorua Lakes Council staff to report back to the Strategy Group on the Lake Rotorua sewage reticulation connection to ensure the project was completed and all properties connected
- Achievements against nutrient removal goals and targets to be included in future Programme Status Reports
- An update from the Chair of Lake and Freshwater Science be included in the RTALSG agenda as a standing item on a 6 monthly basis
- Staff report back on any long term affects of the recent floods on Lake Rotorua and in particular any occurrence of silting.

On behalf of Rotorua Lakes Council, Mayor Chadwick acknowledged the Regional Council's contribution to the Mayoral Manaakitanga Relief Fund established following the Rotorua April 2018 Flood event.

Resolved

That the Rotorua Te Arawa Lakes Strategy Group under its delegated authority:

1 Receives the report: Programme Status Update, Three Year Plan and Annual Work Programme.

2 Approves the Three Year Plan (2018/2019-2020/2021) and Annual Work Programme 2018-2019 for submission to the Minister for the Environment in accordance with the Deed of Funding for the Programme.

Winters/Hunt
CARRIED

9 Karakia

Councillor Marr closed the meeting with a karakia.

The meeting closed at 12:25 pm

Confirmed

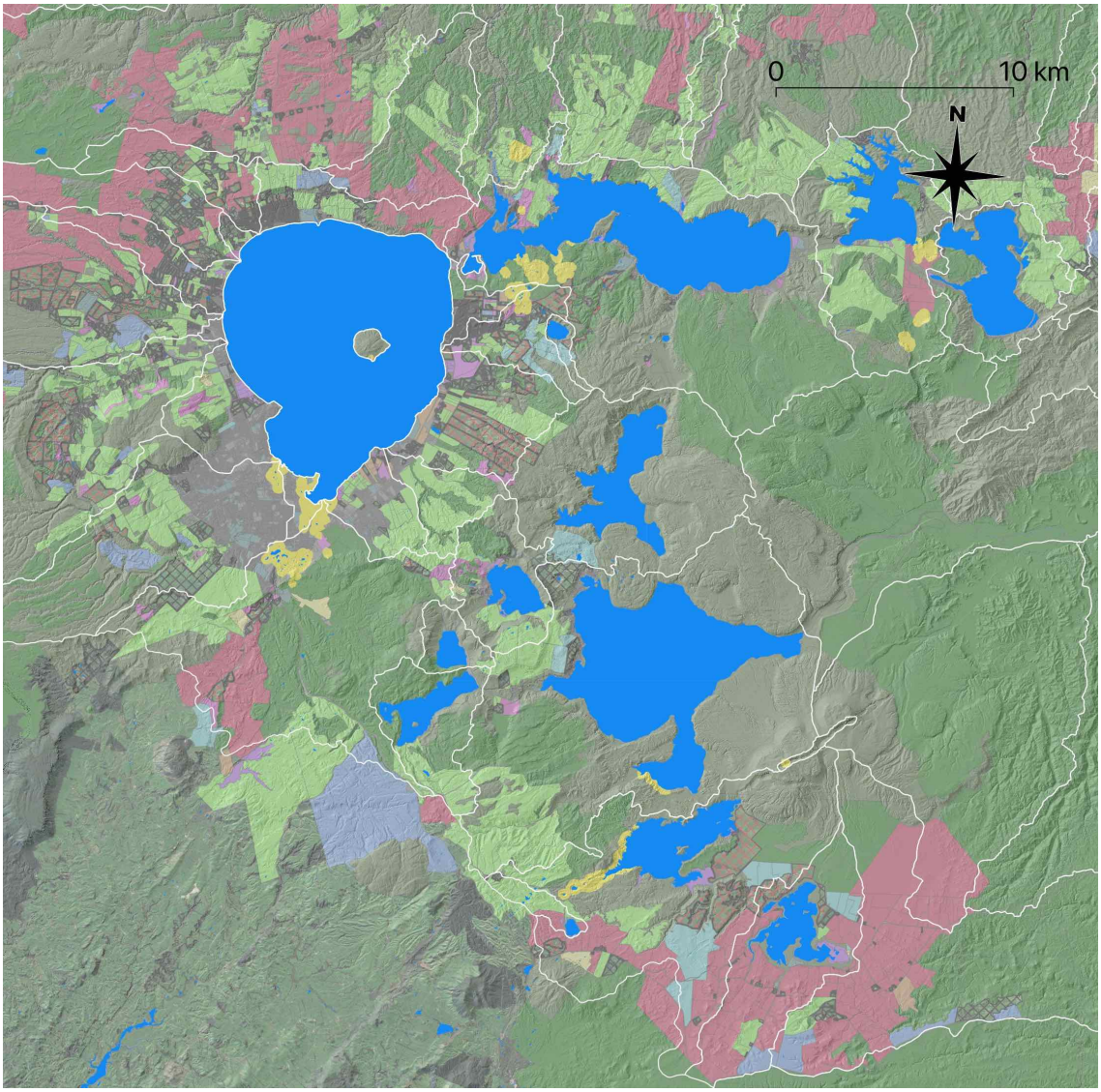
_____
Chairperson

_____
Date

Reports

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.

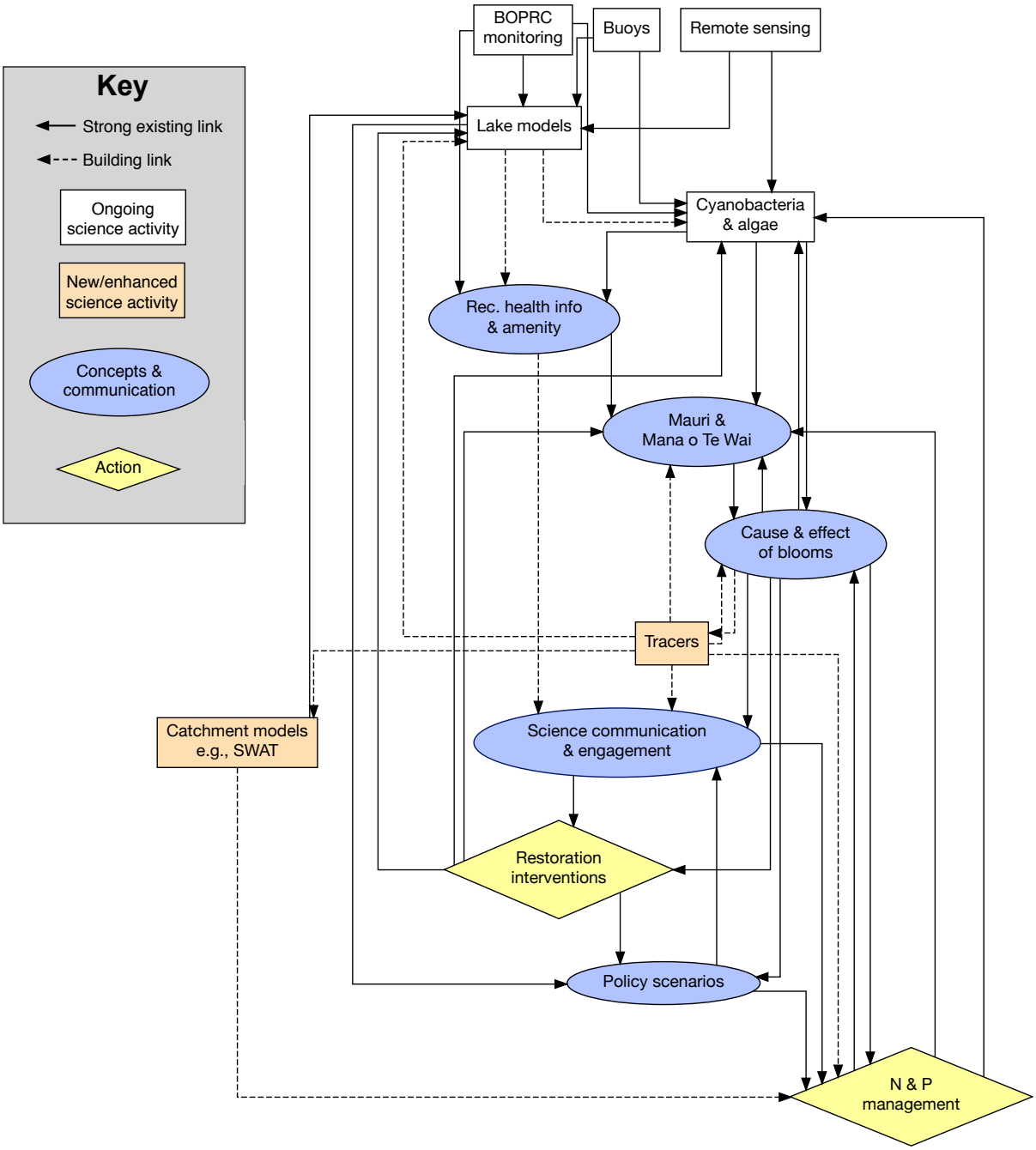


Diagram showing the evolution of linkages involving the Chair's programme.

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.

ERI Report References:

Cursons R and BJ Hicks. 2018. Development of a molecular tool to positively identify brown bullhead catfish from its environmental DNA in water. Environmental Research Institute Report No. 120. Client report prepared for Bay of Plenty Regional Council. Environmental Research Institute, Faculty of Science and Engineering, The University of Waikato, Hamilton.

Tempero, G.W. 2018. Ecotoxicological Review of Alum Applications to the Rotorua Lakes: Supplementary Report. **ERI Report No. 117**. Client report prepared for Bay of Plenty Regional Council. Environmental Research Institute, Faculty of Science and Engineering, The University of Waikato, Hamilton, New Zealand.

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Culliford, D. and Battershill, C. 2018. Whakatane dredge project plan: environmental considerations. **ERI Report No. 113**. Environmental Research Institute, Faculty of Science and Engineering, The University of Waikato, Hamilton, New Zealand.

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Ross, P.M., Culliford, D. P. 2018. The impact of capital dredging on the pipi (Paphies australis) of Te Paritaha (Centre Bank) in Tauranga Harbour. **ERI Report No. 109**. Client report prepared for the Port of Tauranga Limited. Environmental Research Institute, Faculty of Science and Engineering, The University of Waikato, Hamilton, New Zealand. 12pp.

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Ling, N. 2017. Alum dosing at Waitangi Soda Springs – bioavailability of aluminium in 2016. **ERI Report No. 103.** Client report prepared for Bay of Plenty Regional Council. Environmental Research Institute, Faculty of Science and Engineering, The University of Waikato, Hamilton, New Zealand. 8 pp.

Ling, N. 2017. Puarenga Stream alum dosing – effects on Lake Rotorua/Sulphur Bay biota 2016. **ERI Report No. 102**. Client Report prepared for the Bay of Plenty Regional Council. Environmental Research Institute, Faculty of Science and Engineering, The University of Waikato, Hamilton, New Zealand. 12 pp.

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.

Me W., Hamilton D.P., Abell J.M. 2017. Simulating discharge and pollutants from the Waipa Stream catchment under different irrigation scenarios using the SWAT model. **ERI Report No. 98**. Client report prepared for Rotorua Lakes Council. Environmental Research Institute, Faculty of Science and Engineering, The University of Waikato, Hamilton, New Zealand. Download as PDF

de Lange, W.P. and Moon, V.G. 2017. Shoreline changes for southeastern Matakana Island (Panepane Point) following capital dredging (2015-16). **ERI Report No. 95**. Client report prepared for Port of Tauranga. Environmental Research Institute, Faculty of Science and Engineering, The University of Waikato, Hamilton, New Zealand. 13 pp. Download as PDF

Dada A.C., Hicks B. J., Ling N., Hamilton D. P., Abell J.M. 2018. Assessment of effects of proposed treated wastewater discharge to the Te Arikiroa Thermal Channel and Sulphur Bay (Lake Rotorua). **ERI Report No. 91**. Client report prepared for Rotorua Lakes Council. Environmental Research Institute, Faculty of Science and Engineering, The University of Waikato, Hamilton, New Zealand. Download as PDF

Tempero, G.W. and Hamilton, D.P. 2016. Lake Rotorua and Lake Rotoehu: Total and Non-crystalline Aluminium Content in Bottom Sediments. **ERI Report No. 89**. Client report prepared for Bay of Plenty Regional Council. Environmental Research Institute, Faculty of Science and Engineering, The University of Waikato, Hamilton, New Zealand. 44 pp. Download as PDF

Hicks, B.J., Bell, D.G., Powrie, W. and Robinson, F. 2016. Boat electrofishing survey of fish abundance in the Ohau Channel, Rotorua, in 2015. **ERI Report No. 86.** Client report prepared for Bay of Plenty Regional Council. Environmental Research Institute, Faculty of Science and Engineering, The University of Waikato, Hamilton, New Zealand. Download as PDF

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Ling, N. 2016. Utuhina Stream monitoring 2015: Effects of continuous alum dosing on fish and aquatic invertebrates. **ERI Report No. 81.** Client report prepared for Environment Bay of Plenty. Environmental Research Institute, Faculty of Science and Engineering, University of Waikato, Hamilton, New Zealand.15 pp.

Tempero, G.W. 2015. Ecotoxicological Review of Alum Applications to the Rotorua Lakes. **ERI Report No. 52**. Client report prepared for Bay of Plenty Regional Council. Environmental Research Institute, Faculty of Science and Engineering, University of Waikato, Hamilton, New Zealand. 37 pp.

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.

Report To: Rotorua Te Arawa Lakes Strategy Group

Meeting Date: 02 November 2018

Report From: Chris Ingle, General Manager, Integrated Catchments

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Amendments to the Rotorua Te Arawa Lakes Strategy Group Agreement and Terms of Reference

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Executive Summary

Members requested a review of the Rotorua Te Arawa Lakes Strategy Group Agreement in order to amend the membership to make provision for a non-voting Independent Chairperson. It is anticipated that this will be agreed to by the partner Organisations prior to this meeting.

Recommendations

That the Rotorua Te Arawa Lakes Strategy Group:

1 Receives the report, Amendments to the Rotorua Te Arawa Lakes Strategy Group Agreement and Terms of Reference;

2. Endorses the following amendment to the Rotorua Te Arawa Strategy Group Agreement and reflected in the Terms of Reference:

2. Membership:

The membership of the Group shall comprise of six members:

2.1 <u>Two members</u> of the Te Arawa <u>Lakes Trust</u> Entity <u>appointed by that entity one of whom is a governance member</u> and one of whom is a senior executive; and

2.2 Two members of the Bay of Plenty Regional Council appointed by that Council one of whom is the Chairperson of that Council; and

2.3 Two members of the Rotorua Lakes Council appointed by that Council one of whom is the Mayor of that Council.

2.4 <u>Plus one non-voting Independent Chairperson appointed by the members for a three year term in alignment with the Local Government triennium.</u>

3. **Approves the additional minor amendments to the Rotorua Te Arawa Strategy Group's Terms of Reference.**

4. **Appoints Sir Toby Curtis as the Independent non-voting Chairperson of the Te Arawa Lakes Strategy Group for the period up to the first meeting following the 2019 local government elections to align the three year term to the Local Government triennium.**

5. **Acknowledges the appointment of Willie Emery as the Te Arawa Lakes Trust's governance member.**

6. **Instruct partner Organisation staff to include the following matters as agenda items where appropriate: climate change impacts, lake related biosecurity matters, fisheries bylaw enforcement, Lake Tarawera as a priority lake.**

1 Background

At its meeting on 15 June 2018, members recognised the need to ensure the Rotorua Te Arawa Lakes Trust Strategy Group's (RTALSG) membership remained effective.

While the Strategy Group members acknowledged the principles of the Agreement at the time it was signed between the three parties, it had not adhered to the requirement of annual rotation of the Chair and felt it appropriate to amend the Agreement's membership to meet current needs.

The Strategy Group therefore supported Te Arawa Lakes Trust's request to consider amending the membership to allow for the appointment of an Independent Chairperson without voting rights and therefore enabling both Te Arawa members to fully participate in the meetings.

Members also discussed the need for RTALSG's Terms of Reference to remain cognisant of changing environmental issues whose impacts should be considered and included in the Strategy Group's function. These included: climate change impacts, lake related biosecurity matters, fisheries bylaw enforcement, Lake Tarawera as a priority lake.

The recommended changes to the Agreement and Terms of Reference were reviewed and supported by the RTALSG Programme Steering Group.

2 Legislation

RTALSG was established under the Te Arawa Lakes Deed of Settlement. The RTALSG Agreement (2004) forms part of the Relationship Schedule (Schedule 1, Part 1) of the Te Arawa Lakes Deed of Settlement, under the umbrella of the Te Arawa Lakes Claims Settlement Act 2006. The Agreement informs the functions and membership of RTALSG.

On further investigation it is deemed the legislation is not a constraint to changing the Agreement and in fact accommodates amendments so far as they are done in a

manner provided for in the Agreement, which requires consensus of all three parties (not including the Crown).

The definition of Rotorua Lakes Strategy Group Agreement as stated in the Te Arawa Lakes Claims Settlement Act 2006 also accommodates further amendments to the Agreement.

3 Rotorua Te Arawa Lakes Strategy Group Agreement

Section 8.1 of the Agreement enables the Agreement to be amended with the consent of each of the partner organisations.

Under section 8.2 an agreement to amend the RTALSG Agreement will have no effect until recorded in writing and signed by each of the Organisations of the Group.

Section 4.2 and 4.4 of the Agreement identify the Strategy Group's functions as identifying significant existing and emerging issues affecting the Rotorua Lakes; and the identification, monitoring and evaluation of necessary actions by the Organisations and other relevant organisations. These sections enable the Strategy Group to include emerging environmental issues and the monitoring and evaluation of necessary actions without the need to specifically identify these in the Agreement.

4 Agreement Amendment Required

At the request of the Te Arawa Lakes Trust the RTALSG members supported the inclusion of a non-voting Independent Chairperson to preside at meetings. The role of the Independent Chairperson sits outside the voting membership of the Group and therefore is not deemed to be a member for the purposes of a quorum. The amended Agreement is shown as Appendix 1. The amendments have also been reflected in the revised Terms of Reference along with minor wording changes to provide clarity of meaning (Appendix 2).

The role and responsibilities of the Independent Chairperson are prescribed in Appendix 3.

The appointment of an Independent Chairperson and Sir Toby Curtis approached to undertake this role creates a vacancy in the Te Arawa membership with Te Arawa Lakes Trust confirming their appointment of Willie Emery (Appendix 4).

5 Next Steps

Amendments to the Agreement require the approval of the partner Organisations.

The request to amend the membership of RTALSG was presented and agreed to by Te Arawa Lakes Trust.

Rotorua Lakes Council will be considering the amendment at their meeting on 25 October 2018 and the Bay of Plenty Regional Council at their meeting on 1 November 2018. It is anticipated the amendment will be agreed to by both parties.

Once the Strategy Group partner Organisations agree to the proposed amendments to the Agreement, each will be required to sign the amended Agreement.

The amended Agreement will replace the Rotorua Lakes Strategy Group Agreement 2004 (renamed Rotorua Te Arawa Lakes Strategy Group in 2009) and becomes the defining Agreement and the current Terms of Reference for the meetings will be updated.

Yvonne Tatton
Governance Manager

for General Manager, Integrated Catchments

24 October 2018

APPENDIX 1

2018.10.10 Amended Rotorua Te Arawa Lakes Strategy Group Agreement November 2018

TE ARAWA LAKES TRUST

ROTORUA LAKES COUNCIL

BAY OF PLENTY REGIONAL COUNCIL

ROTORUA TE ARAWA LAKES STRATEGY GROUP AGREEMENT

Amended 2 November 2018 from the original Agreement dated 8 October 2004

Amendments are shown in italics

THIS AGREEMENT includes Amendments to the original 2004 Agreement and is made on the 2nd day of November 2018

PARTIES: TE ARAWA LAKES TRUST (previously ARAWA MAORI TRUST BOARD) on behalf of **TE ARAWA)**

AND: ROTORUA LAKES COUNCIL (previously known as ROTORUA DISTRICT COUNCIL)

AND: BAY OF PLENTY REGIONAL COUNCIL

BACKGROUND:

A. The Parties have established the Rotorua Lakes Strategy Joint Committee (*now known as the Rotorua Te Arawa Lakes Strategy Group)* on the basis set out in the Rotorua Lakes Strategy Co-management Options Report dated October 2001 ('' the Report'*)*.

B. As expressed in the Report the Parties wish to ensure that Te Arawa is a member of the joint committee as of right formalised through Te Arawa's Settlement Legislation, so that the joint committee is a permanent committee, which is not able to be discharged on or following a local authority triennial general election.

C. The Deed of Settlement between the Crown and the Arawa Maori Trust Board will record that the Settlement Legislation will provide that:

(i) the Bay of Plenty Regional Council and the Rotorua District Council will establish, with the Te Arawa Governance Entity, the Rotorua Lakes Strategy Group (''the Group'') no later than the Settlement Date;

(ii) the Group is deemed to be a joint committee within the meaning of clause 30(1)(b) of Schedule 7 of the Act, despite the Te Arawa Governance Entity's membership of that Group as of right;

(iii) despite anything to the contrary in Schedule 7 of the Act, the joint committee is to be permanent and the quorum at meetings of the Group is to be as herein provided.

OPERATIVE PART

Conditionally upon Settlement Legislation so enabling them, the parties agree as follows:

1 Interpretation

1.1 In this Agreement:

'Act'' means the Local Government Act 2002;

''Organisations'' means the Te Arawa Governance Entity *(now known as Te Arawa Lakes Trust),* the Rotorua *Lakes* Council and the Bay of Plenty Regional Council, sometimes referred to as "Partner Organisations";

"Rotorua *Te Arawa* Lakes" means Lakes Rotorua, Rotoiti, Rotoehu, Rotoma, Okataina, Tikitapu, Okareka, Tarawera, Rotomahana, Rerewhakaaitu, Okaro.[1]

1.2 Unless the context requires otherwise, terms or expressions defined in the Deed of Settlement between the Crown and Te Arawa and the Settlement Act have the same meaning in this Agreement.

2 Membership

The membership of the Group shall comprise:

2.1 *Two members of the Te Arawa Lakes Trust Entity appointed by that entity - one of whom is a governance member and one of whom is a senior executive;* and

2.2 Two members of the Bay of Plenty Regional Council appointed by that Council one of whom is the Chairperson of that Council; and

2.3 Two members of the Rotorua Lakes Council appointed by that Council one of whom is the Mayor of that Council.

Plus one Independent non-voting Chairperson appointed by the members for a three year term in alignment with the Local Government triennium and is to be reviewed and confirmed at the first meeting of the Group following the local government elections.

The Independent Chairperson is not deemed to be a member of the Rotorua Te Arawa Lakes Strategy Group for the purposes of a quorum.

The Independent Chairperson shall assume the role and responsibilities as defined in the Rotorua Te Arawa Lakes Strategy Group Independent Chairperson Guidelines.

3 Quorum

3.1 The ordinary quorum for a meeting of the Group will be one member from each of the Organisations.

3.2 The special quorum for a meeting of the Group will be four members of the Group.

3.3 In the event that the ordinary quorum is not satisfied at three consecutive meetings of the Group in circumstances , where in the case of each such meeting:

3.3.1 It was notified in accordance with the Standing Orders;

3.3.2 Order papers were sent to each member of the Group in accordance

[1] Notes the deletion of Lake Rotokakahi as from the original Agreement as Rotorua Te Arawa Lakes Strategy Group has no jurisdiction over this lake.

with the Standing Orders; and

3.3.3 The meeting had not been cancelled for any reason, then the

3.3.4 member in attendance may declare the third meeting inquorate according to the Standing Orders and the special quorum will then be substituted.

3.4 At any subsequent meeting, the ordinary quorum will be restored as soon as clause 3.1 is satisfied.

3.5 No matters that were not on the order paper for the meeting at which the special quorum was established under clause 3.3 can be considered by a special quorum meeting.

4 Functions

The Group will initially have the following functions:

4.1 The provision of leadership to the Organisations and the community in relation to implementation of the Vision *and Strategy for the Lakes of the Rotorua District*;

4.2 The identification of significant existing and emerging issues affecting the Rotorua Lakes;

4.3 The preparation, approval, monitoring, evaluation and review of agreements, policies and strategies to achieve integrated Outcomes for the Rotorua Lakes;

4.4 The identification, monitoring and evaluation of necessary actions by the Organisations and other relevant organisations;

4.5 The receiving of reports on activities being undertaken by the Organisations and other relevant organisations;

4.6 Involvement during the preparation of statutory plans in relation to significant issues. Such plans include but are not limited to iwi and hapu management plans, district and regional plans, reserve management plans, and annual plans;

4.7 Involvement in applications for activities in relation to significant issues not addressed by existing policies of the co-management partners. Such activities include but are not limited to resource consents, designations, heritage orders, water conservation orders, restricting access to the lakes (during special events or in particular circumstances), and transferring and/or delegating of statutory authority.

4.8 *Consider the effects of Climate Change in all work within the Rotorua Te Arawa*

Lakes Programme. 6

4.9 *Respond to declining water quality in all Rotorua Te Arawa Lakes by pursuing appropriate intervention and funding to respond. This may include lakes not currently funded by Deed funding e.g. Tarawera.*

5 Prior committee discharged

5.1 Contemporaneously with the establishment of the Group the Bay of Plenty Regional Council and the Rotorua District Council will discharge, pursuant to clause 30(5) of Schedule 7 of the Act, the joint committee known as the Rotorua Lakes Strategy Joint Committee.

6 Standing Orders

6.1 The New Zealand Standard Model Standing Orders for Meetings of Local Authorities and Community Boards (NZS9202:2003) will apply to the Group unless the members of the Group unanimously agree to vary those orders as they apply to the Group *("Standing Orders")*.

6.2 An agreement to vary the Standing Orders as they apply to the Group will have no effect until recorded in writing and signed by each of the members of the Group.

7 Te Arawa Governance Entity to execute Covenant

7.1 The Arawa Maori Trust Board will procure the execution by the Te Arawa Governance Entity of a deed of covenant in the form set out in Schedule 3 of the Deed of Settlement.

8 Amendments to this agreement

8.1 This agreement may be amended with the consent of each of the Organisations of the Group.

8.2 An agreement to amend this agreement will have no effect until recorded in writing and signed by each of the Organisations of the Group.

8.3 Amendments as italised in this Agreement are agreed to by and on behalf of the entity below.

IN WITNESS WHEREOF those present have been executed the day and year first hereinbefore written.

EXECUTED for and on behalf of **TE ARAWA LAKES TRUST**
by its authorised signatories:

Trust Chairman

Chief Executive

EXECUTED for and on behalf of **ROTORUA LAKES COUNCIL**
by its authorised signatories:

Mayor

Chief Executive

EXECUTED for and on behalf of BAY OF PLENTY REGIONAL COUNCIL
by its authorised signatories:

Chairman

Chief Executive

APPENDIX 2

2018.10.10 Rotorua Te Arawa Lakes Strategy Group Terms of Reference Draft Amendments

Rotorua Te Arawa Lakes Strategy Group
Terms of Reference

Interpretation

"Organisations" means the Te Arawa Lakes Trust, the Rotorua Lakes Council, and the Bay of Plenty Regional Council; sometimes referred to as "Partner Organisations".

"Rotorua /Te Arawa Lakes" means Lakes Rotorua, Rotoiti, Rotoehu, Rotomā, Ōkataina, Tikitapu, Ōkāreka, Tarawera, Rotomahana, Rerewhakaaitu, Ōkaro. ~~and Rotokakahi~~.

Comment [YT1]: Deleted as RTALSG has no jurisdiction over this lake.

"Group" means the Rotorua Te Arawa Lakes Strategy Group, formed as a Joint Committee under Clause 30 of Schedule 7 of the Local Government Act 2002; Sometimes referred to as the "Strategy Group".

Purpose

The purpose of the Group is to contribute to the promotion of the sustainable management of the Rotorua Te Arawa Lakes and their catchments, for the use and enjoyment of present and future generations, while recognising and providing for the traditional relationship of Te Arawa with their ancestral lakes.

Membership

The membership of the Group comprises of six members:

- Two members of the Te Arawa Lakes Trust Entity appointed by that entity - one of whom is a governance member and one of whom is a senior executive; and

Comment [YT2]: Previously the Chairman

- Two members of the Bay of Plenty Regional Council appointed by that Council - one of whom is the Chairperson of that Council; and
- Two members of the Rotorua Lakes Council appointed by that Council - one of whom is the Mayor of that Council.

Plus one non-voting Independent Chairperson appointed by the members for a three year term in alignment with the Local Government triennium and is to be reviewed and confirmed at the first meeting of the Group following the local government elections.

The Independent Chairperson is not deemed to be a member of the Rotorua Te Arawa Lakes Strategy Group for the purposes of a quorum.

The Independent Chairperson's shall assume the role and responsibilities as defined in the

Rotorua Te Arawa Lakes Strategy Group Independent Chairperson Guidelines.

The Deputy Chairperson shall be appointed from the membership at the first meeting of the Group following the local government elections.

Quorum

The quorum for a meeting of the Group will be one appointed member from each of the partner organisations

The special quorum for a meeting of the Group will be four members of the Group.

In the event that the ordinary quorum is not satisfied at three consecutive meetings of the Group in circumstances, where in the case of each such meeting:

- It was notified in accordance with the Standing Orders;
- Order papers were sent to each member of the Group in accordance with the Standing Orders; and
- The meeting had not been cancelled for any reason, then the members in attendance may declare the third meeting inquorate according to the Standing Orders and the special quorum will then be substituted.

At any subsequent meeting, the ordinary quorum will be restored

No matters that were not on the order paper for the meeting at which the special quorum was established can be considered by a special quorum meeting.

Term of the Committee

The Rotorua Te Arawa Lakes Strategy Group is a permanent joint committee established under the Te Arawa Lakes Settlement Act 2006 (Te Arawa Lakes Deed of Settlement - Cultural Redress: Lakes Management and Relationships, clauses 9.1 to 9.3 -December 2004) and is not disestablished as a consequence of a local government election.

The Group's Terms of Reference are derived from the Rotorua Lakes Strategy Agreement included in Part 1 of the Relationship Schedule to the Deed of Settlement, December 2004.

Specific Responsibilities and Delegated Functions

The Group has the following functions:

- Provide leadership to the Organisations and the community in relation to implementation of the Vision and Strategy for the Lakes of the Rotorua District originally adopted in 2000 and refreshed version adopted by the Strategy Group in 2013.
- Identify significant existing and emerging issues affecting the Rotorua Te Arawa Lakes and respond appropriately.
- Approve, monitor, evaluate, and review agreements, policies and strategies and all other proposals to achieve integrated outcomes for the Rotorua Te Arawa Lakes.

- Identify, monitor, and evaluate necessary actions by the partner organisations and other relevant organisations.
- Receive reports on activities being undertaken by the partner organisations and other relevant organisations.
- Participate in the preparation of statutory plans in relation to significant issues. Such plans include but are not limited to Iwi and hapū management plans, district and regional plans, reserve management plans and annual plans.
- Participate in applications for activities in relation to significant issues not addressed by existing policies of the partner organisations. Such activities include but are not limited to resource consents, designations, heritage orders, water conservation orders, restricting access to the lakes (during special events or in particular circumstances), and transferring and/or delegating of statutory authority.
- Consider the effects of Climate Change in all work within the Rotorua Te Arawa Lakes Programme.
- Respond to declining water quality in all Rotorua Te Arawa Lakes by pursuing appropriate intervention and funding to respond. This may include lakes not currently funded by Deed funding e.g. Tarawera.

Power to Recommend

To the partner organisations on any matters within the Strategy Group's delegated functions as it deems appropriate.

The Rotorua Te Arawa Lakes Strategy Group report directly to their own Organisations.

APPENDIX 3

Rotorua Te Arawa Lakes Strategy Group Independent Chairperson Guidelines

Guidelines for the Rotorua Te Arawa Lakes Strategy Group (RTALSG) Independent Chairperson

The Independent Chairperson is a non-voting member and is not deemed to be a member for the purposes of a quorum.

The Independent Chairperson will be responsible for the chairing of meetings in a competent, professional and efficient manner, adhering to tikanga which includes:

- Chair meetings in accordance with the RTALSG's Terms of Reference.
- Attend and Chair between 6-8 face to face meetings per year of around 2-3 hour duration held in Rotorua, RLC Chambers.
- Participate in the setting of the RTALSG agenda where required.
- Be well prepared for meetings.
- Ensure that adequate time is available for discussion of all agenda items, in particular strategic issues.
- Encourage open communication, meaningful participation and constructive dissent at meetings
- Declare and appropriately manage own conflict of Interests.

The Independent Chairperson will:

- Act in a manner which positively enhances the strategic vision, goals, aspirations and performance of RTALSG.
- Have a strong understanding of tikanga and demonstrate cultural competence relevant to Te Arawa.
- Support effective communication and relationships between the RTALSG Partners.
- Promote a culture of openness and debate.
- Adhere to strict confidentiality of all material and will not disclose any confidential information to any third party without express permission from the RTALSG Partners.

As the administering body the Bay of Plenty Regional Council (BOPRC) will:

- Provide a copy of the RTALSG Terms of Reference.
- Provide Secretariat support to the RTALSG and Chair – this includes working with the Chair in the preparation of the Agenda and in drafting the Minutes for approval etc.
- Ensure that the RTALSG Partners receive accurate, timely and clear information.
- Provide a briefing for the Chair ahead of meetings including a heads up on any contentious items.
- Provide an opportunity for a post meeting conversation to discuss any matters that arose during the meeting and to plan for future meetings.
- Pay the Independent Chair a Meeting Fee for every meeting attended in line with the BOPRC Elected Members and Appointed Members Expenses Policy
- Raise at the earliest opportunity any concern with the performance of the Independent Chair to enable early resolution.

The appointment of the Independent Chairperson is to be reviewed and appointed every three years in alignment with the Local Government triennium.

APPENDIX 4

2018.08.24 TALT Confirmation of Independent Chair and member appointment

24 August 2018

TE ARAWA LAKES TRUST

Chris Ingle
General Manager, Integrated Catchments
Bay of Plenty Regional Council
PO Box 364
Whakatane 3158

Tēnā koe Chris,

Acceptance of Independent Chair and Confirmation of Te Arawa Lakes Trust Representative to Rotorua Te Arawa Lakes Strategy Group

Thank you for your letter dated 23 August 2018 regarding Independent Chair and TALT representative vacancy.

We are pleased to confirm the following;

1. Dr Sir Toby Curtis accepts the positon of Independent Chair of the Rotorua Te Arawa Lakes Strategy Group.

2. Willie Emery is confirmed as the TALT appointed representative to the Rotorua Te Arawa Lakes Strategy Group.

On behalf of our organisation please convey our thanks to our strategy group partners and we look forward to our continued close working relationship.

Naku noa Na,

Karen Vercoe
Chief Executive Officer

cc: Taa Toby Curtis
Willie Emery

Report To: Rotorua Te Arawa Lakes Strategy Group

Meeting Date: 2 November 2018

Report From: Karen Vercoe – CEO Te Arawa Lakes Trust

Te Arawa Lakes Trust – Request for Funding for Programme Participation

Executive Summary

The Chief Executives of the three partner organisations of the Rotorua Te Arawa Lakes Programme (the Programme) have agreed that consideration needs to be given to how Te Arawa Lakes Trust are funded to enable them to more effectively participate as a Partner in the Programme.

This paper provides the information necessary for the Rotorua Te Arawa Lakes Strategy Group to commence a conversation regarding this matter, so it may make recommendations to the relevant governing bodies.

Te Arawa Lakes Trust have directly approached the Crown with a request for an equitable funding allocation t to enable them to effectively participate as a partner in the Programme and ensure that their Treaty of Waitangi Settlement with the Crown has durability and is implemented as was envisaged at the time of Settlement.

The Te Arawa Lakes Trust has a specific and clear role in the implementation of the Lakes Programme aligned with the outcomes sought by the Rotorua Te Arawa Lakes Strategy Group. While the Lakes Trust works through their discussions with the Crown, it is considered appropriate that the Rotorua Te Arawa Lakes Programme provide a level of funding to enable their participation. It is envisaged that the Te Arawa Lakes Trust allocation from the current Deed Funding of the Programme, is $350,000 per year for the next three years ($1,050,000 in total).

Recommendations

That the Rotorua Te Arawa Lakes Strategy Group:

1 Receives the report, Te Arawa Lakes Trust – Request for Funding for Programme Participation;

2 Agree that Te Arawa Lakes Trust receive funding to implement the outcomes as identified within the Lakes programme.

1 Background

When Te Arawa's Treaty of Waitangi Settlement with the Crown was finalised and the Rotorua Te Arawa Lakes Programme was established, a Funding Deed associated with the Programme was entered into between Bay of Plenty Regional Council, Rotorua Lakes Council and the Crown. Te Arawa Lakes Trust was not a signatory to the Funding Deed but is a Partner to the Programme of lakes restoration. Te Arawa are also land owners of the lake beds and this is recognised via a Statutory Acknowledgement on the lake beds.

Since the inception of the Lakes Programme, particularly in more recent years, the Regional Council has intermittently funded Te Arawa staff participation in the Programme. This has included funding of representatives to attend meetings such as Work stream Leads and Partnership Steering Group.

The Regional Council also, through a significant funding commitment, funded the development of Te Tūāpapa o ngā wai o Te Arawa (Te Tūāpapa), a Cultural Values Framework for Te Arawa, under contract to the Lakes Trust. The resulting framework now guides the participation of the work of Te Arawa Lakes Trust in the Programme.

The focus for the Trust now is to ensure that Te Tūāpapa is embedded across the Programme and their other areas of work.

The implementation of Te Tūāpapa since its adoption by the Strategy Group in 2016, the Regional Council has been through a series of projects that have also been funded by the Regional Council via contract to the Lakes Trust. It is considered that this is not the partnership approach envisaged upon the establishment of the Rotorua Te Arawa Lakes Strategy Group.

In order to better reflect the partnership anticipated in the Settlement, the Chief Executives of the three partner organisations of the Rotorua Te Arawa Lakes Programme have agreed that consideration needs to be given to how Te Arawa Lakes Trust are funded to enable them to more effectively participate as a Partner in the Programme.

The Te Arawa Lakes Trust have also directly approached the Crown with a request for funding support to enable them to effectively participate as a partner in the Programme and ensure that their Treaty of Waitangi Settlement with the Crown is implemented as was envisaged at the time of Settlement and has durability into the future.

The Trust request to the Rotorua Te Arawa Lakes Strategy Group, to enable full participation in the Programme is $350,000 per year for the next three years ($1,050,000).

The purpose of this paper is to seek further direction from Strategy Group in response to this request.

2 Rationale and Proposed Work Programme

The current Work Programme for the restoration of the Rotorua Te Arawa Lakes focusses on interventions for the Deed funded Lakes, The programme outlines implementation plans that deliver on the Trophic Level index for each of the Lakes; Rotorua, Rotoiti, Rotoehu and Okareka. The remaining work Programme is funded through Regional and Local Council. The Te Arawa Lakes Trust contribution is funded through the dividend from Te Arawa Management Ltd (TAML) and has been to the value of $130-$150k per year.

The Programme structure for the Deed funded Lakes was established to meet the requirements of the Deed of Funding, to apply a Programme Management methodology for Programme implementation and monitoring and for the approach to be quality assured every three years.

Quality Assurance was recently completed in accordance with the requirements of the Deed and Recommendation 2.5 of the quality assurance report recommends that cultural values are embedded through the Programme by developing a training package for people working in the Programme in relation to Te Tūāpapa. Te Arawa Lakes Trust would need to provide this training. There is currently no funding set aside for this.

This governance structure set up for the Programme includes Work stream Leads, Programme Steering Group and the Rotorua Te Arawa Lakes Strategy Group. To ensure the Programme runs effectively, decision making and projects are collaborative and account for the values of Te Arawa, participation of the Trust at all levels of the Programme is essential. The implication of the current resources constraints for TALT is that the participation of Te Arawa, across the programme, particularly at work stream leads, is intermittent.

The Lakes Trust have provided a proposed work programme attached in Appendix One to this report, which would be funded from the funds requested here as well as the ongoing contribution of the Te Arawa Lakes Trust at the current level.. All work streams are focussed on implementing Te Tūāpapa across the Lakes Programme and potentially into the community and broadly include the following:

1. Embedding Te Tūāpapa through Councils, Crown agencies and the wider community through staff training, story-telling and case studies.

2. Establishing a Hungatiaki Forum (Iwi Engagement Forum) to bring Te Arawa together to discuss and lead issues of lake restoration

3. Development of a Cultural Health Index pilot (the methodology currently being developed with funding from the Regional Council).

4. To support implementation of Mahire Whakahaere (Te Arawa Fisheries Management Plan) - research and habitat restoration focus.

5. Statutory Roles and Function – Te Arawa participating fully in planning, policy and consent processes to ensure that decisions on these reflect Te Arawa values.

While delivery of projects which implement Te Tūāpapa are currently being delivered by the Lakes Trust, under contract to the Regional Council, the Lakes Trust has aspirations to have their own autonomous funding stream to deliver on those

projects. The contracting arrangement is not reflective of the Partnership approach envisaged by the Te Arawa Lakes Settlement Act and the establishment of the Rotorua Te Arawa Lakes Strategy Group, hence their discussions with the Crown and their request outlined in this paper.

3 Funding Analysis

The request of Te Arawa Lakes Trust being considered here is for $350,000 for three years from the Deed of Funding ($1,050,000 in total). All Deed Funding is 50% funded by the Crown and 50% funded by the Councils .Therefore, Te Arawa Lakes Trust is requesting the following over three years:

- $525,000 of Crown Funding ($175,000 per year)
- $262,000 of Regional Council Funding ($87,000 per year)
- $262,000 of Rotorua Lakes Council Funding ($87,000 per year)

Current Allocation – Outcomes and Risks

Currently all funding under the Deed has been allocated to interventions which directly achieve or support a nutrient benefit to the relevant lake. For example, in Lake Rotorua this includes sewerage reticulation, the Incentives Scheme, the Low Nitrogen Land Use Fund and the Gorse Conversion Project. All of these projects are planned and implemented to achieve the 435 tonne steady stage load of nitrogen to Lake Rotorua by 2032, as required by the Regional Policy Statement and the commitments that have been made to the community in that respect.

Any annual underspends in funds allocated to these nutrient reduction projects, rather than being cost savings, have generally been over-budgeted for that year. For example for the Incentives Scheme, agreements will get signed up in one year but may be paid over several years as the conditions of the agreement are met, an annual budget is an estimate only.

In the long run, the total $40 million will be required to make a 100 tonne reduction in nitrogen entering Lake Rotorua via the Incentives Scheme. To provide $1,050,000 total funding to meet the request discussed in this paper from Incentives Scheme funds, at an average price of $400 per kg of nitrogen, approximately 2.6 tonne less nitrogen reduction to the lake would be achieved.

The same principal could be applied to the gorse scheme and to the 50 tonne engineering solutions. Other options to meet Te Arawa's funding request could be to reduce funding to the Low Nitrogen Land Use Fund (funding available in the round to be advertised shortly would reduce by approximately $1 million), remove business support for properties under 40 hectares to assist with meeting Plan Change 10 or limit investment in the 50 tonne engineering solutions.

The Integrated Framework which has been set up to achieve the 435 tonne steady state nitrogen load to Lake Rotorua (320 tonne reduction by 2032), includes a contribution from landowners and a contribution from the Programme. There is a concern that by diverting money from interventions such as those discussed above; the Programme would not be meeting its part of that commitment. However, there is a need to ensure that Te Arawa are fully able to participate and engage in the Programme to ensure that the Programme is a success and the vision for the lakes

of the Rotorua District is achieved. There are also opportunities for Te Arawa to participate in delivery of the 50 tonne engineering solutions, under contract to the Regional Council

Proposed allocation – Outcomes and Risks

Currently the Deed Funding is focussed on supporting interventions that will deliver to the Regional Policy Statement in respect of 4 of the Rotorua Te Arawa Lakes and Te Tūāpapa guides how Te Arawa will engage in the programme.

The remaining funding for the wider programme across the remaining Lakes comes from the Partner organisations BOPRC, RLC and TALT. The Deed funding is largely used to fund arrange of interventions as described in the section above.

In order to ensure that the Regional and District Council are giving full effect to the RPS, meet the conditions of the Deed funding and embed Te Tūāpapa it is considered that a more holistic view of implementation approach to the Lakes Programme must be taken.

The Regional Policy Statement WL 3B (c) provides the target of 435tn for Lake Rotorua, the same policy WL 3B (a) states that *Contaminants be managed to avoid compromising public health and each catchment's ecology, mauri, fishability, swimmability and aesthetics.* Policy WL 6B directs *Control contaminant discharges in the following catchments at risk*; and lists the remaining Te Arawa Lakes and Rotokākahi as well.

Further to these policies on Water Quality the RPS outlines policies with respect to integrated resource management and Iwi Resource Management which describe the expectations for sustainable resource management and the role of iwi in this sustainable management of resources and the ways in which hapū and iwi can give effect to their role as kaitiaki. (Refer RPS IR 3B, IR 4B, IW 2B, IW 3B. IW 5B, IW 6B, IW 7D). The methods outlined in the RPS are to be implemented by both Regional and District Council.

The Deed Funding does not have TALT as a party to it, however the achievement of the provisions across the 4 catchments cannot be achieved without TALT; no one else can define or measure mauri, the indicator species in the Lakes are taonga species under the Te Arawa Fisheries Regulations and our role as the representative for hapū and iwi in respect to the Te Arawa Lakes is a given. The achievement of the targets and the outcomes in the RPS for which the Deed funding is provided requires a level of investment in the Te Arawa Lakes Trust.

The Rotorua Te Arawa Lakes Strategy Group recognised Te Tūāpapa o ngā Wai o Te Arawa as the framework to be implemented to ensure the role of the Te Arawa across the programme is embedded. This can only be achieved in full through direct investment in the Te Arawa Lakes Trust as a programme partner and as an equal participant across the programme structure.

So while the RPS target of 435tn is a key outcome for the RTALSG to achieve, there are a range of outcomes sought by the Rotorua Te Arawa Lakes Programme and these are not currently being provided for. There are wider outcomes expected of the Partnership by the community and these also need resourcing to be achieved. The investment of $1,050,000 over 3 years is 0.25% of the total funding for the Programme.

4 Options

Options that the Group may like to consider include the following. Note these options can be selected as singular options or as a combination of options:

Option A

Support the request of Te Arawa Lakes Trust in full for three years. Deed Funding to be applied as outlined in section 3 of this report above, noting the effects as detailed. Support Te Arawa Lakes Trust requests to the Crown for a sustainable funding allocation in the long term.

Option B

Support Te Arawa Lakes Trusts request to the Crown for funding to support the implementation of their Treaty of Waitangi Settlement and provide direct Programme funding for agreed projects to TALT at this time.

Option C

Support Te Arawa Lakes Trusts request to the Crown for funding through joint engagement of the partners directly to government Ministers. The Strategy Group acknowledges that this option does not resource Te Arawa Lakes Trust engagement across all levels of the Strategy Group and could therefore impact the Trusts long term contribution to the programme.

OUTCOMES –TE MANA O TE WAI IS UPHELD AND ENHANCED

Water is healthy – Healthy lakes (WAIORA)
The authority (whakapapa, matauranga, values) of Te Arawa is readily recognised (WAIRUA)
Te Arawa is well equipped for the journey ahead (WAIATA)

INDICATORS – LOOK, FEEL, SOUND, TASTE, SMELL AND WAIRUA

Indicators can be described to suit our different customers

WHAT WILL WE MEASURE?	WHO IS IT FOR?	
	TE ARAWA HAPŪ, IWI & WHANAU	**PARTNERS** BOPRC, RCL & COMMUNITY
WAIORA The Footprints of the Koura can be seen on the bed of the Lake	• Mauri o meter • Kaitiaki Flows • Te Arawa Health Index • More places I can gather kai • More plentiful kai	• Water quality –TLI • Nutrient Levels • Algal Blooms (recreation indicator)
WAIRUA, WAIATA The wellbeing of the relationship between the water, Te Arawa, and the community	• Te Mana Whakahono rohe – delegations to iwi and hapū • Te Tūāpapa is a reference for iwi/hapū and community • Funded projects with hapuu for delivery and research • Increases in traditional use and cultural activities on the lakes • Greater investment in lakes infrastructure • Increase in number of whānau benefitting from the Lakes	

PERFORMANCE MEASURES – TRACKING OUR ACTIVITY TOWARDS THE OUTCOME

HOW MUCH?

SCMAK kits distributed
Dollars allocated for hapū projects
reduction in structures impacting cultural values
of monitoring sites for taonga ika
# of sites for swimming increased

HOW WELL?

data sets submitted
% of budget spent on projects
% structures impacting cultural values
# of sites where there is an increase in taonga species
# of actions that reflect Te Tūāpapa values

IS ANYBODY BETTER OFF?

Iwi/hapū/whanau participating in local projects

Changes to Plans and consents reflect Te Arawa input
More kai on the table

TE ARAWA LAKES TRUST

FUNCTION	STATUTORY RESPONSIBILITIES	LAKES STRATEGY ALIGNMENT (LAKES/COASTAL)	TE ARAWATANGA (ENGAGEMENT)
	YEAR 1-3		
EMBED TE TUAPAPA WITHIN THE LAKES PROGRAMME	**OBJECTIVE** • Council staff understand the intent and content of Te Tūāpapa • Te Tūāpapa is integral to the lakes structures and activities consent review process • Environment policies and TALT position is clear and consistent; aligned with Te Tūāpapa **PROJECTS** • Iwi Management Plans • Te Mana Whakahono • Maintain focus on Bylaws • Engage in significant key planning processes (RMA)	**OBJECTIVE** • Council staff understand the intent and content of Te Tūāpapa and what it means to their work • Te Tuapapa is embedded within the Rotorua Te Arawa Lakes Programme **PROJECTS** • Action Plan for Te Tūāpapa • Develop workshops for Council and other agency staff to understand Te Tūāpapa • Iwi engagement forum established	**OBJECTIVE** • Te Arawa Iwi and hapu understand the intent and content of Te Tūāpapa, what it means to them and how they can get involved **PROJECTS** • Develop case studies that exemplify Te Tūāpapa in action • Develop and implement Engagement Plan • Communications plan and story telling framework for Tūāpapa
	YEAR 1-3		
RESEARCH & MONITORING	**OBJECTIVE** • TALT can share the unique cultural landscape around the Te Arawa Lakes • Community and hapū/whanau understand the treasures that are around our lakes • Specific cultural values are collated and mapped **PROJECTS** • Cultural mapping and impact assessments Research programme to implement Mahire Whakahaere • Monitoring plan for Mahire Whakahaere	**OBJECTIVE** • Te Arawa researchers are sought after and involved • The questions Te Arawa are asking get answered **PROJECTS** • Stocktake of all research questions for Te Arawa and align with programme • Te Arawa Science roles established • Development of a Te Arawa Health Index	**OBJECTIVE** • Tools are developed to support cultural values assessments and decision-making **PROJECTS** • Hapū/ iwi research projects • Development of a Te Arawa Health Index
	YEAR 1-3		
CAPABILITY & CAPACITY BUILDING	**OBJECTIVE** • A clear and agreed programme and process is in place for the review of consents for lakes structures • Whanau and hapū are aware of their roles, responsibilities and powers in respect of the lakes **PROJECTS** • Te Manawhakahono • Update database of technical experts • Undertake compliance training with TALT Trustees, Komiti Whakahaere, Pouturiao and staff • Policy development for Structures and fees	**OBJECTIVE** • Te Arawa are delivering programmes of work associated with the Lakes programme **PROJECTS** • Programme development and delivery • Research and Science panel	**OBJECTIVE** • Te Arawa hapū and whanau are leading projects that deliver their Te Ttūāpapa Values **PROJECTS** • Kaitiaki forum

TE ARAWA LAKES TRUST

Report to: Te Arawa/Rotorua Lakes Strategy Group

Meeting Date: 2 November 2018

Report From: Nicola Douglas, Environment Manager
Te Arawa Lakes Trust

Scope
This report outlines the activities that have taken place in alignment with the strategic outcomes sought by the Te Arawa/Rotorua Lakes Strategy Group. This report also provides insight into the broader activities of the Te Arawa Lakes Trust as they relate to these outcomes.

Summary

The key focus of the first quarter of the 2018/19 year has been continuing to engage hapū and iwi with the Rotorua/Te Arawa Lakes programme in a number of projects. There team continues to engage in Lakes Structures and consents issues with the focus on ensuring Te Arawa values as outlined in Te Tūāpapa are maintained.

Te Arawa/Rotorua Lakes Programme

Te Tūāpapa is embedded into the Lakes Strategy programme

1. The Te Arawa Lakes Trust are pleased to report that as a result of the recent independent review of the Programme Management of the Rotorua Te Arawa Lakes programme it was identified that revisiting and re-confirming the principles of the Strategy would be helpful to guide decision making in the Programme.
   As well as confirming the existing principles the principles stated in Te Tūāpapa have added; 1. Value the role that TALT and Te Arawa have to play regarding the Te Arawa Lakes and 2. Value te Ao Maori. This is a strong symbol of the commitment of TALT and the Partners to embed Te Tūāpapa in the programme.

2. This will be supported by the delivery of a series of wānanga with Regional Council staff on Te Tūāpapa to ensure that there is understanding with the Partner organisations on how to apply Te Tūāpapa within the programme and work across the Lakes.

3. The Te Arawa Lakes Trust have appointed William Anaru (Ngati Whakaue/Ngati Pikiao/Tuwharetoa) to the role of Hunga Hika ahi – Hapori to support the community and volunteer effort to reduce catfish numbers in the Lake and increase awareness on this issue.
   William has been with us 4 weeks and has already run his first event, secured 75 volunteers, applied for the requisite permits to enable community to "catch' the catfish and is currently putting together a programme of activity for the volunteers to undertake for the coming summer.

Sewerage and reticulation

4. The Te Arawa Lakes Trust is undertaking the second phase of the Cultural Impact Assessment (CIA) for the Tarawera Sewerage Scheme. This is ongoing and led by Lee Warbrick and Wally Lee.

Te Arawa Lakes Trust - Statutory responsibilities

Te Arawa Freshwater Fisheries Regulations

5. The Te Arawa Lakes Trust and the Komiti Whakahaere are awaiting a response from the Minister with respect to our submissions received on the bylaws which were publicly notified. This is still with MPI.

Lakes structures and Consents

6. The Te Arawa Lakes Trust has completed 3 Cultural Mapping reports for the existing Lakes Structures. We are currently undertaking Cultural Mapping for Lakes Tarawera, Okareka, Rerewhakaitu and Rotoiti.

7. The Te Arawa Lakes Trust has made submissions to consents for Endathol for weed management. TALT are also engaged in discussions regarding the Phosphorus Locking consent and a range of structures consents around the Lakes.

8. The Te Arawa Lakes Trust is working with RLC and the Advisory Group on the Cultural Impact assessment of the Rotorua Lakefront Development.

Te Arawa Lakes Trust - Te Arawatanga

Te Arawa Climate Change Working Group

9. The Te Arawa Climate Change Working Group – Te Urunga o Kea - hosted Hon. James Shaw on 11 October to outline the key areas of focus for Te Arawa on the issue of Climate Change.

10. Lani Kereopa is the Community Researcher engaged on a Partnership project with TALT and SCION to understand the needs for Te Arawa and develop the Strategy.

Okataina baseline survey – Taonga species

11. The Te Arawa Lakes Trust and Ngati Tarawhai have been successful in securing $56,000 from the WaiOra Fund to undertake research and monitoring of taonga species in Lake Okataina. To date 2 wānanga and 3 monitoring days have been held to learn about traditional stocks and practices as well as undertake koura monitoring with Dr Ian Kusabs and Joe Butterworth.

12. The Te Arawa Lakes Trust received 328 registrations for a fishing licence for the 2018/19 fishing season. There were 115 FREE licences issued to koeke (65 years and over) 3 FREE licences to those under 18 and 133 Te Arawa beneficiaries will be subsidised for their Fishing Licence.

Te Arawa Lakes Trust - Engagement

Support to whanau and hapuu

13. Engagement with Tuhourangi on consents associated with Lake Okareka Lake levels, Approval of a Jetty and the Tarawera Landing and Boat Lifters at Lake Okareka.

14. Te Arawa Lakes Trust is a party to the Ohinemutu working group recently established.

15. Lakes 380 Project presentation to hapū and iwi in Rotorua, hosted by Ngati Kea/Tuara at Taharangi marae

Broader Engagement with Community

16. Event on Fishing Season Open Day on Lake Rotoiti

17. Attendance at and Presentation to the Lakes Community Board meetings.

18. Presentation at the LWQS Workshop on Catfish

File No: 01-63-097-5

ROTORUA LAKES COUNCIL

Chairperson and Members
ROTORUA TE ARAWA LAKES STRATEGY GROUP

UPDATE REPORT FROM ROTORUA LAKES COUNCIL

Report prepared by: Jean-Paul Gaston, Group Manager Strategy and Partnerships
Report approved by: Geoff Williams, Chief Executive

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1. PURPOSE

To provide a short update on Rotorua Lakes Council (RLC) activity that relates to lake water quality.

2. EXECUTIVE SUMMARY

RLC activity currently underway that impacts the Lakes Programme includes:

- *Wastewater treatment and stormwater projects*
- *Planning Policy*

This report provides a brief update against each of these areas.

3. RECOMMENDATIONS:

1. That the report 'Update Report from Rotorua Lakes Council' be received.

4. WASTEWATER TREATMENT AND STORMWATER PROJECTS

Rotomā / Rotoiti Sewerage Scheme

- The construction of the wastewater treatment plant and land disposal system is progressing, well within clearing and forming of the building platform and access roads almost complete. Supply contracts for long lead equipment, has been confirmed.
- The construction of the Rotomā reticulation started in April 2018. About 12 kilometres of sewer trunk main that will link Rotoma to the wastewater treatment plant has been laid to date.

Rotorua Wastewater Treatment Plant

- The resource consent renewal application for the Rotorua Wastewater Treatment Plant has been lodged with Bay of Plenty Regional Council.

- The Tarawera Sewerage Steering Group continues with their evaluation of the sewerage options available to the community. This includes the development of the cultural impact assessment for each option. The cultural impact assessment development is facilitated by the Te Arawa Lakes Trust with significant input from the relevant Iwi and Mana whenua.

Rotorua Urban Area Comprehensive Stormwater Resource Consent

- The final draft of the application which reflects the comments of the initial review is completed. An initial consultation with relevant Iwi stakeholders regarding the application is currently underway. The final draft of the application is planned to be submitted on 30 November 2018.

5. PLANNING POLICY AND STRATEGY

Bay of Plenty Regional Council - Plan Change 10: *Lake Rotorua Nutrient Management* (PC10):

- Pre-hearing caucusing has been held on the topics of Science, Overseer, LUC, Economics and Planning. This phase concluded with a second round of Planning caucusing on 4 and 5 October.
- A hearing timetable has been set down as follows:
  - Simultaneous exchange of evidence by 3 December 2018
  - Rebuttal evidence (if any) by 4 February 2019
  - Folders of evidence to be provided to the Court by 11 February 2019
  - Stage 1 hearing dealing with the principles and policies will commence on 4 March 2019 for a possible two week duration
- The Natural Capital Group* provided draft Alternative Natural Capital Allocation (ANCA) provisions (polices, rules, methods etc) on 24 September. A final version will be circulated by 5 November.

* CNI IHL, the Māori Trustee (Te Tumu Paeroa), RLC, Te Pumautanga o Te Arawa Trust, Te Kōmiti Nui o Ngāti Whakaue, Te Maru o Ngāti Rangiwewehi Iwi Authority, Kaingaroa Timberlands, Hancock Forests, and PF Olsen.

Rotorua Spatial Plan:

- A final document has been prepared and adopted by Council. A programme of actions are being prepared through Council's RMA Policy Committee and will guide a number of projects and Plan Changes.

6. CONCLUSION

Rotorua Lakes Council continues to work across multiple areas towards improved lake water quality as a partner in the Rotorua Te Arawa Lakes Programme.

Report To: Rotorua Te Arawa Lakes Strategy Group

Meeting Date: 02 November 2018

Report From: Chris Ingle, General Manager, Integrated Catchments

Programme Status Report and 2017-2018 Annual Report

Executive Summary

The Rotorua Te Arawa Lakes Strategy Group last met in June 2018. Since then progress has been made within the Programme including: progressing the request for funding for Te Arawa Lakes Trust, improving the Terms of Reference for Strategy Group, undertaking an Independent Quality Assurance of the Programme in accordance with the Deed of Funding and implementing the recommendations, deciding to close the Tikitere Zeolite Plan project, finalising audits of Benchmarks in the Lake Ōkāreka Catchment, progressing Farm Management Plans for the Tarawera Catchment, progressing connection of properties in the Lake Rotorua catchment that have not yet connected to sewerage reticulation, progressing other solutions for the 50 tonne nitrogen reductions from engineering solutions for Lake Rotorua, and progressing options for sewerage reticulation at Lake Tarawera.

Excellent progress has also been made with the Low Nitrogen Land Use Fund during the period. The Land Use Innovation Series was run by the Te Arawa Primary Sector group, funded by the Programme and very well attended. Following on from that Series, sixteen Expressions of Interest have been received for the second round of the Low Nitrogen Land Use Fund, focussed on trialling alternative low nitrogen land uses in the Lake Rotorua catchment.

Work has also continued on business as usual projects including Rotomā and remaining Rotoiti wastewater reticulation, Lake Rotorua Incentives Scheme and the advice and support service.

Recommendations

That the Rotorua Te Arawa Lakes Strategy Group:

1 Receives the report, Programme Status Report and 2017-2018 Annual Report;

2 Approves the 2017-2018 Annual Report for submission to the Minister for the Environment, in accordance with the requirements of the Deed of Funding.

1 Independent Quality Assurance Completed

The Deed of Funding with the Crown requires that an Independent Quality Assurance of the Programme at three yearly intervals. This Quality Assurance has recently been completed and is available as Appendix Two to this report.

Implementation of all recommendations is either complete or underway. Of particular note in terms of the recommendations, is that the Programme Steering Group have adopted a set of Guiding Principles for decision making. These guiding principles are taken directly from the Vision and Strategy document for the Programme and Te Tuapapa o nga wai o Te Arawa. They are as follows:

1. Focussed on outcomes – a clear purpose.
2. Transparent and fully accountable – a clear process for delivery and identified lines of responsibility.
3. Grounded in best knowledge (including mātauranga and science) and open to a full range of solutions.
4. Kaitiaki of the lakes catchment – managing the lakes for future generations.
5. Seeking to provide certainty for the future – ensuring stakeholders and landowners are involved in planning for their future.
6. Partnership driven – engaging with agents of change by drawing on their skills, knowledge and energy. We will nurture existing relationships and build new ones.
7. Agile – flexible in our approach and delivery. Able to adapt to changing science, economics, technology and behaviours.
8. Value the role that Te Arawa Lakes Trust and Te Arawa have to play regarding the Te Arawa Lakes.
9. Value Te Ao Māori.

2 Lake Rotorua – 50 Tonne Engineering Solutions and Tikitere Zeolite Plant

Unfortunately the Tikitere Zeolite project doesn't stack up for staff to be comfortable bringing it back to you to ask for your approval to proceed with it. The up-front costs of construction are estimated to be significantly more than expected, in the vicinity of $9.5million with operating costs of $750,000 a year. This has led to the Programme Steering Group agreeing not to proceed further with the project at this stage. This decision is also supported by an indication that there is uncertainty with the consistency of the geothermal flow, which is a risk to the ongoing success of the project once operational.

Therefore, staff have for now put the construction project on hold and are looking at alternatives to achieving the 50 tonne reduction. Construction will not occur in 2020-2021 as originally planned.

Our preference moving forward is to see investment in projects which will be assets to the community, in addition to in-lake nitrogen removal, with a preference for wetland enhancement, development and protection (especially for near lake wetlands).

Removal of nitrogen fixing species and opportunities in stormwater mitigation are also alternatives. A project is underway considering and pursuing all options. Removal of alders along the Puarenga will commence shortly as a starting point. Options for wetland restoration and enhancement are also being pursued where staff have existing relationships and we know there is landowner interest.

3 Low Nitrogen Land Use Fund and Land Use Innovation Series

The Land Use Innovation Series was run over September by the Te Arawa Primary Sector with funding from the Rotorua Te Arawa Lakes Programme. It included a series of workshops and fieldtrips aimed at showcasing possible alternative low nitrogen land uses for the Lake Rotorua Catchment. There were a variety of speakers, including in sheep milking, tourist accommodation opportunities, Manuka, forestry generally and discussion on trends in consumer demand. The series was well attended and was aimed at encouraging those with ideas for trialling alternative low nitrogen land uses in the Lake Rotorua catchment to make Expressions of Interest to the second round of the Low Nitrogen Land Use Fund.

Subsequently we have received a total of 13 successful Expressions of Interest for the second round of the Low Nitrogen Land Use Fund, these parties have now been invited to make full applications to the fund. These include intermixing tree crops, mobile hen houses, high end trout fishing, volcanic milk production, premium sheep breeds for 'farm to plate consumption and an automated production grow house. A number of the applicants are local property and farm owners who are looking to better utilise their land.

4 Sewerage Reticulation - Unconnected Properties

As previously reported, there are still a number of properties in the Lake Rotorua catchment that are not connected to sewerage reticulation and should be. We are now leading a project in the Brunswick/Rotokawa area to get these properties connected, it is intended that the actual connections will be made by the Rotorua Lakes Council.

Staff from both Councils are working together to make sure that all those unconnected properties are contacted and are provided with options and assistance for connection. A barrier for most non-connection appears to be financial hardship and staff are currently looking into options to enable connection in these cases.

5 Response to Catfish Incursion

A co-ordinator for the Community Response to the Catfish Incursion has been recruited by Te Arawa Lakes Trust. William Anaru started with the Trust in August. William's position is funded by the Regional Council for a period of three years and will help co-ordinate and support community efforts in response to the catfish incursion on Rotoiti, and helping to prevent further spread. Anyone in the community who needs support can make contact with William at the Te Arawa Lakes Trust.

Netting of catfish has commenced again as the water starts to warm up. Recruitment of an aquatic pests Biosecurity Officer has commenced. A targeted media and advertising campaign (including signage) to increase awareness of the presence of catfish and how to prevent their spread is to roll out with lake users over summer.

An update presentation on the response will be provided by Shane Grayling at this meeting.

6 Plan Change 10: Science Review 2017

Members are aware that a Memorandum of Understanding between the Lake Rotorua Primary Producers Collective, Lakes Water Quality Society and the Regional Council in addition to the provisions of Plan Change 10 (Lake Rotorua Nutrient Management) require a review of the science underpinning the water quality response on Lake Rotorua every five years. The first of these reviews is almost complete.

The review includes 11 specific science modules which have been prepared to report on various aspects of the science work underpinning the Lake Rotorua programme. These reports have been peer reviewed by the Independent Reviewer Prof Warwick Vincent from Laval University in Quebec, Canada.

The comprehensive review process has involved the following steps:

1. Development of the Science Review Terms of Reference, based on Plan Change 10 requirements and the MoU between the Lake Rotorua Primary Producers Collective, Lakes Water Quality Society and the Regional Council,

2. Scope of work for each report module, these are scientific papers reporting on specific aspects of the review,

3. Each draft science module report has been presented for review by the Independent Reviewer,

4. Science Review workshop with Water Quality TAG, peer reviewer and other experts (July 2018),

5. The science reports are now being completed and summary report of complete review prepared.

Prof Vincent led a Water Quality Technical Advisory Group workshop in July 2018 and also presented to the Rotorua community on his research about climate change in the Artic Region. This review has been a major science project and it is expected that the work will be completed by December 2018 and presented to Strategy Group and Council in early 2019. The completed review will comprise 11 individual science reports and an overall summary report bringing together the review conclusions in a single presentation. The review will provide conclusions on the science foundation of the Lake Rotorua programme, the present state of water quality and recommendations for action and research.

7 Other Updates

- Te Tuapapa o ngā wai o Te Arawa training for staff working in the Rotorua Catchments Team of the Regional Council is about to commence. The purpose of this is to increase awareness of Te Tuapapa and how to live Te Arawa values in the work we do. The development of Te Tuapapa was funded by the Regional Council in 2016 and was developed by the Lakes Trust.

- An audit of Benchmark compliance (with Rule 11) in the Lake Ōkāreka catchment has been completed. Unfortunately one large property appears to be in significant non-compliance with their Benchmark. All other properties are in compliance. Support has been offered and accepted by the owner to bring the property back into compliance and this is a priority for staff. Further land use change in Ōkāreka is making good progress.

- Data is currently being collated for the Tarawera Farm Environment Plan project which is being led by the local farmer collective. Almost all farms have signed up for the voluntary project to develop and adopt Farm Environment Plans for their operations. A community meeting to present back the data collection is pending.

- The Lake Rotorua Incentives Committee has achieved a 20 tonne reduction in nitrogen entering Lake Rotorua (this includes one small agreement currently going through the approval process).

- Dates have now been set for the Environment Court hearing for Proposed Plan Change 10, starting 4 March in Rotorua.

- Nine resource consents have been granted under Plan Change 10, approximately 60-70 more consents are required for properties over 40 hectares now and staff are currently working on encouraging applications.

- The Tarawera Sewerage Steering Committee has recommended a preferred option for reticulation to the community and the project is now moving into an implementation phase.

- Staff have been working on renewing the Terms of Reference for Strategy Group as requested by the Group at its last meeting and also the request of Te Arawa Lakes Trust for a funding stream to undertake its work in the Programme.

- Public Notification of the consent application for the new Rotorua Wastewater Treatment Plant has occurred.

- The Lakes Ōkāreka outlet erosion protection works are planned for summer. High lake levels continue to be managed.

- A synoptic survey of the Waiteiti Stream is planned over summer to identify potential sources of e-coli and remedies for that.

8 2017-2018 Annual Report

As part of the Deed of Funding with the Crown, the Programme is required to prepare and submit to the Minister for the Environment an Annual Report. The report for the 2017-2018 financial years is included in Appendix 3 and includes progress on activities within the Programme over the financial year but also a summary of the water quality results for the each lake.

The water quality results this year are disappointing. Tarawera's TLI remains stable but is still well above its target TLI. Ōkāreka has also had a disappointing result which is linked to significant storm events in the area bringing high phosphorous loss from the catchment, also seen with high lake levels. A full presentation on the water quality results for the year will be provided at this meeting.

Strategy Group are familiar with the progress of the Programme over the past year as has been highlighted at its meetings, including the update provided above. Key achievements this year include progress with construction of the Rotomā-Rotoiti wastewater scheme, progress with Lake Rotorua Incentives agreements, the Low Nitrogen Land Use Fund and implementation of Plan Change 10.

Challenges are faced now with finding sufficient nitrogen from engineering solutions due to the non-viability of the Tikitere Zeolite Plant, the catfish incursion on Lake Rotoiti and the dealing with challenges in managing water quality on Lake Rotoehu and Lake Tarawera. Te Arawa Lakes Trust is currently taking the lead for next steps at Tarawera and the partners are keen to support this as required.

Helen Creagh
Rotorua Catchments Manager

for General Manager, Integrated Catchments

12 October 2018

APPENDIX 1

2018-11-02 Rotorua Te Arawa Lakes Strategy Group Dashboard

Rotorua Te Arawa Lakes Programme Steering Group

Programme Manager	Helen Creagh	**Sponsor**	Chris Ingle	**Status Report Date**	November 2018
Overall Status					

Category	RAG Status	Update
Financials	AMBER	A projected underspend in the Incentives Programme has the financials sitting at Amber.
Schedule	GREEN	
Resources	GREEN	
Scope	GREEN	
Overall Progress	GREEN	

Programme Risks

Overall Risk Register: 13 open risks	Risks 12 and above: 2 open risks
	Risks 8-11: 6 open risks
	Risks 1-7: 5 open risks

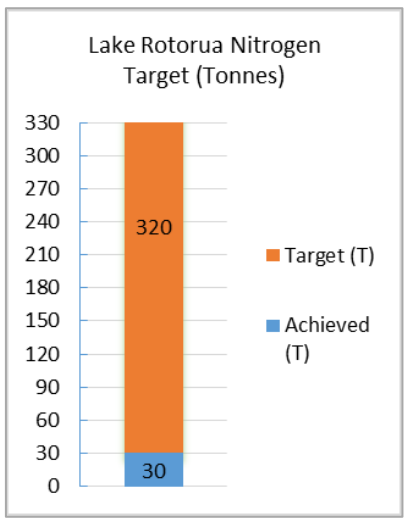
Projects Snapshot

TLI Target = 4.2
Current = 4.3
Stable

Lake Rotorua

- Progressing engineering solutions to achieve 50 t.
- Summer student will be undertaking a synoptic survey of the Waitetī Stream.
- Stocktake and gaps analysis is expected to be completed by end of 2018 for Rotorua WMA.
- Te Tuapapa staff training scheduled 31 October.
- 9 resource consents have been issued to date under PC10.
- Further 1.2t incentives deal is nearing completion. To date, 19.2t N has been secured.
- Public notification of the Rotorua WW Treatment Plant resource consent application.
- 93 percent of >40 ha property owners are engaged in Advice and Support.
- 17 EOI application received for the LNLUF. 13 have been invited to submit full applications by 2 Nov.

Overall status



TLI Target = 3.9
Current = 4.8
Declining

Lake Rotoiti

Overall status

- Continued construction of the WWTP and land disposal system and reticulation.

TLI Target = 3.5
Current = 3.9
Investigation

Lake Tarawera

Overall status

- Public meeting to be held on option for Tarawera Sewerage Scheme.
- Funding subsidy for reticulation from BOPRC and RLC have been confirmed through the LTP process.
- 137ha of Acacia control was completed this season.
- UoW modelling work is nearing completion.

TLI Target = 2.6
Current = 3.1
Declining

Lake Rotoehu

Overall status

- TAG workshop is scheduled 30 October to evaluate this lake.
- Alum dosing plant has been switched off.
- Sewerage reticulation is dependent on securing funding.

TLI Target = 3.0
Current = 3.5
Declining

Lake Okareka

Overall status

- One farm was found to be well in excess of their benchmark. Property owner is working with Perrin Ag.
- Landowners interested in undertaking significant land use change.

***Note: The stability of Lake Rotorua's TLI is due to artificial means.**

APPENDIX 2

2018 BOPRC Lakes Restoration Programme Independent Quality Review Report v1.0 Final Signed

ROTORUA TE ARAWA LAKES PROGRAMME

Independent Quality Assurance Review Report

Date: June 2018

Report Version: Final

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Overview

The Rotorua Te Arawa Lakes Programme involves a number of parties including the Ministry for the Environment (MfE), Bay of Plenty Regional Council (BoPRC), Rotorua Lakes Council (RLC) and The Te Arawa Lakes Trust.

The programme is a 24-year initiative to reduce the nutrient levels of the priority lakes. It is well into implementation of all the water quality solutions adopted for all of the four deed funded lakes: Rotoehu, Rotorua, Ōkāreka and Rotoiti.

Review objectives

The objective of this review is to provide the Ministry for the Environment (MfE), Bay of Plenty Regional Council (BoPRC), Rotorua Lakes Council (RLC) and The Te Arawa Lakes Trust assurance that the programme is well positioned to deliver expected outcomes within time and budget, and to the expected level of quality. It also provides assurance the governance and management of the programme is appropriate to support successful delivery.

Lastly, it includes a review of progress against recommendations from the previous IQA carried out in August 2014.

Key messages

The Rotorua Te Arawa Lakes Programme has a number of inflight projects contributing to the agreed outcomes in reducing nutrients and increasing water quality. Progress against the agreed annual work plan is reported six- monthly and annually.

There is appropriate governance and management in place for the programme. We recommend the programme develop a set of guiding principles to support the governance decision making, aligned to the Vision and Strategy foundational document. This will ensure the programme is 'doing the right things' over its life.

The development of a programme roadmap would provide a longer term view and show how the contribution of each project will achieve the agreed Trophic Level Indicators (TLI) targets. This roadmap should be reviewed on a monthly basis and used by the Partnership Steering Group (PSG) to ensure the right balance of initiatives. We would expect the roadmap to include both the delivery and supporting (e.g. communications, cultural values) workstream initiatives. This includes a supporting workstream initiative to embed the Te Arawa cultural values detailed in the Cultural Values Framework.

Project timeframes and costs are tracked individually and the development of a consolidated spreadsheet to track project milestones at a programme level will ensure underlying projects remain focused on agreed timeframes. Budget tracking is in place and monitored by the CFO forum. The programme is tracking under budget.

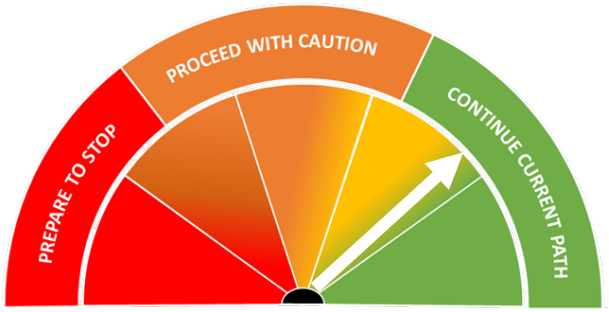
There are some good management practices across the programme and regular project manager/workstream leads meetings are occurring, supported by project status reporting. There are some opportunities to strengthen the status reporting to provide greater visibility of whether the underlying projects are on track to deliver. Status reports should also include updates from the supporting workstreams (e.g. communications and cultural values). We recommend the delivery workstreams increase their engagement with the supporting workstreams to determine the level of support needed. A dependencies register is needed for the programme to detail the known dependencies and how these will be managed.

Lastly we have made some recommendations to align the Communication and Stakeholder Plan with the Vision and Strategy document.

We are comfortable the previous recommendations have been addressed, with one exception – the development of a Quality Management Plan. This has been included as a new recommendation in this report.

Delivery assessment

This summary assessment is the independent opinion of the Review Team on the likelihood of the project meeting its objectives and benefits within time, budget and agreed quality levels.



RATING: Likely

SUMMARY: Successful delivery of the programme appears likely. There are some opportunities to further strengthen the governance to support decision making, and detail how the programme will achieve the agreed targets by 2032.

We have made recommendations to strengthen reporting and increase the visibility of delivery.

A full definition of the summary assessment ratings are provided in Appendix B – Assessment Ratings

FINDINGS AND RECOMMENDATIONS

REVIEW CONTEXT

The Rotorua Te Arawa Lakes Programme involves a number of parties including the Ministry for the Environment (MfE), Bay of Plenty Regional Council (BoPRC), Rotorua Lakes Council (RLC) and The Te Arawa Lakes Trust. The programme is a 24-year initiative to reduce the nutrient levels of the priority lakes.

The programme is well into implementation of all the water quality solutions adopted for all of the four deed funded lakes: Rotoehu, Rotorua, Ōkāreka and Rotoiti. By far the biggest undertaking of these is the solution for Lake Rotorua which includes the Integrated Framework + Engineering Solutions. It has a significant Crown and Council expenditure associated with it, but also significant implications for landowners in the catchment which need to be appropriately managed.

The programme is in quite a different position than when the last review was undertaken in 2014. During that review, planning for implementation of the Lake Rotorua solutions was underway but not in operational implementation. Significant work is now also underway in implementing the Tarawera Lakes Restoration Plan and establishing next steps for addressing declining water quality in that lake. That lake and its catchment lakes are not currently Deed funded so do not form part of this review.

Our review consisted of a desk-review of project documentation and interviews with key stakeholders in the period 7-15 June 2018. This report reflects our findings on the programme at that point in time.

IQANZ also conducted a Baseline Health Check Review in May 2012, and subsequently provided health checks in 2013 and 2014.

REVIEW OBJECTIVES

The key objectives of this Independent Quality Assurance Review will be to:

Progress to date

- Review progress to date against the programme's objectives and quality measures.
- Review progress against recommendations from the previous IQANZ independent quality assurance review.

Assurance over programme governance & management moving forward

- Provide an opinion to the Ministry for the Environment, Bay of Plenty Regional Council, Rotorua Lakes Council, and Te Arawa Lakes Trust as to how well the Programme is positioned to successfully deliver expected outcomes to time, costs, and quality expectations.
- Provide assurance that the overall programme governance and management environment in place for the programme is appropriate against public sector, BOPRC and prudent practice guidelines; ensuring that the controls are appropriate and of sufficient rigour to support successful delivery of the programme.
- Identify risks, issues and dependencies which may impact success, their impact and recommend appropriate mitigation or remedial actions.
- Identify programme strengths and improvement opportunities, and present pragmatic recommendations to improve delivery of the programme objectives.

CONCLUSION

The Rotorua Te Arawa Lakes Programme has been running since 2008. It has had a number of successes relating to the programme's objectives of reducing nutrients and increasing water quality. A Six-Monthly and Annual Report provides progress reporting against the agreed outcomes and targets detailed in the annual work programme and three year plan.

There is good programme governance in place at both strategic and operational layers, supported by appropriate terms of reference. A number of key projects are in flight for the deed-funded priority lakes, with work also underway for some of the non-funded lakes. These projects align to the outcomes and the achievement of the TLI targets, but do not align to the Vision and Strategy foundational document. We recommend the programme develops a set of guiding principles to facilitate decision making and ensure the programme is 'doing the right things' aligned to the vision and strategy. Some of the project targets are based on best guess estimates, and where uncertainty exists, targets should be reviewed and updated if required.

Although the short-medium projects are detailed in the Annual work Plan and Three Year Plan, there is no overarching view of the future work planned for the life of the programme until 2032. A programme roadmap would provide this view and show how the contribution of each project will achieve the agreed TLI targets. This roadmap should be reviewed on a quarterly basis and used by the Partnership Steering Group (PSG) to ensure the right balance of initiatives. The roadmap can be tweaked in the case of any project not on track to achieve its contribution to fill any gaps. We would expect the roadmap to include both the delivery and supporting (e.g. communications, cultural values) workstream initiatives. This includes a supporting workstream initiative to embed the Te Arawa cultural values detailed in the Cultural Values Framework.

Project timeframes and costs are tracked individually. We recommend the development of a consolidated spreadsheet to track project milestones at a programme level to ensure the projects remain focused on agreed timeframes. Budget tracking is in place and monitored by the CFO forum. The programme is tracking under budget.

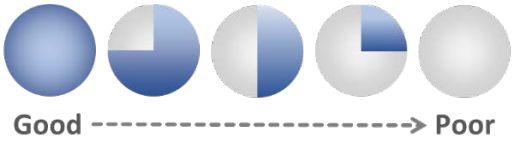
There are good management practices across the programme and regular project manager/workstream leads meetings are occurring, supported by project status reporting. There are some opportunities to strengthen the status reporting to provide greater visibility of whether the underlying projects are on track to achieve key milestones, budget and their contribution to targets. Status reports should also include updates from the supporting workstreams (e.g. communications and cultural values). We recommend the delivery workstreams increase engagement with the supporting workstreams to determine the level of support required. A dependencies register is needed for the programme to detail the known dependencies and how these will be managed.

Lastly we have made some recommendations to align the Communication and Stakeholder Plan with the Vision and Strategy document.

We are comfortable the previous recommendations have been addressed, with one exception – the development of a Quality Management Plan. This has been included as a new recommendation in this report.

SUMMARY OF FINDINGS

To quickly identify the strengths and weaknesses of the project, the following ratings have been given to each review scope component.



They take into account the surrounding context of the project and any work in progress.

Component	Rating	Description
Governance & Management		• Two layers of governance are in place: a strategy group and an operational Partnership Steering Group (PSG), supported by terms of references. • All four partners are well represented on both groups and meetings are generally well attended. • A set of guiding principles would provide alignment to the foundational Vision and Strategy and the Te Arawa Cultural Values Framework. This will support decision making as to whether the programme is 'doing the right things'. • The short and medium initiatives are detailed in the Annual Work Plan and Three Year Plan, but there is no overarching view of the longer term work for the life of the programme and how the collective of initiatives will achieve the targets. We recommend a roadmap is developed to provide this detail. • Programme and workstream reporting is in place and we suggest some areas reporting can be strengthened, covering more detailed tracking of the milestones and budgets and contribution to the TLI targets. The supporting workstreams should also be included in programme reporting and the leads should be expected to complete workstream reports.
Scope		• Scope is detailed in the project plans and reported (using a RAG status) in the status report. • Any changes to scope are managed through a change request. • Engagement with supporting workstreams could be strengthened. • A new initiative is required to embed cultural values through the programme.
Time/Schedule/Dependencies		• Projects detail their key milestones in the project plans and timeframes are tracked (using a RAG status) in the status reports. • Monthly meetings are held to discuss project progress. • Dependencies are not being tracked and a dependency register is needed to enable tracking.
Cost & Benefits		• Projects detail their budgets in the project plans and budgets are tracked (using a RAG status) in the status reports. • A CFO forum is in place and meets quarterly to review programme finances. • Some project targets (benefits) are best estimates based on planning information. Reviewing these again at the beginning of

Component	Rating	Description
		implementation would be beneficial to ensure they are appropriate where this uncertainty exists.
Resources		• Resources are detailed in the project plan and managed by individual projects per the Programme and Change Management Plan.
Risks & Issues		• A programme and project risk management plan is in place. • There is programme risk register and projects manage risks individually. • Risks are reviewed on a regular basis and are included in status reports. • Programme and project issues are documented and managed and included on status reports.
Stakeholder Engagement, Communications & Change Management.		• A Communications and Stakeholder Plan details the planned communications activity. • There is opportunity to align communications to the foundational Vision and Strategy document, especially for external communications. • Aligning the communications to key milestones of the key projects will provide more focus on communicating success.
Quality		• There is no Quality Management Plan for the programme despite this being raised as a recommendation in our previous review. We have included a new recommendation in this report to complete this.
Previous Recommendations		• Previous recommendations have been complete with the exception of the development of the Quality Management Plan.

A full definition of the summary assessment ratings are provided in Appendix B – Assessment Ratings

KEY RECOMMENDATIONS

Based on the detailed findings in this report, the following recommendations should be addressed as a matter of noted priority. The recommendations are broken into key themes/areas.

Governance & Management

#	Recommendation	Rationale	Priority	Owner	Due Date
2.1	Develop a set of guiding principles to facilitate decision making based on the foundational documents and goals.	The Vision and Strategy for the Lakes of the Rotorua district is a key foundational document developed in conjunction with the four partners and community involvement. It notes the guiding principles on the approach to the management of the lakes catchment and details 11 goals for delivering the strategy. Decision making for the priority projects shown in the annual and three years plans appears to be focussed on outcomes and the achievement of the TLI, which does not necessarily take into account all of the goals in the Vision and Strategy. A good example of this is goal 4 'The lakes catchment is managed through the Te Arawa values' and the alignment to the Te Arawa Cultural Framework. The programme of work itself is complex, involving four key partners. The partners already have busy work programmes and it is important the programme's focus remains on doing 'the right things' in the programme that align to the Vision and Strategy and avoid the potential for things to be included that so not align. The development of a set of guiding principles (using the principles in the Vision and Strategy document as a basis) will provide the focus to facilitate ongoing decision making to ensure the programme constant questions whether it is doing the right things, aligned to foundational documents, over the long implementation period.	High	Partnership Steering Group	13 Jul 2018
2.2	Develop a programme roadmap detailing current and planned work, and contribution to the targets. Review initiatives on a quarterly basis, including whether the targets are appropriate.	The Annual Work Plan details the projects to be undertaken over the next twelve months and the Three Year Plan details the medium-term initiatives. Both documents detail the priorities of the four priority lakes (Rotorua, Rotoehu, Rotoiti and Okareka) along with the planned activities. There is some high level activity detailed in the Annual Work Plan for the other eight (non-deed funded) lakes. The programme will run to 2032, however beyond Year 3 the work the programme will undertake is unclear.	High	Programme Manager	13 Jul 2018

#	Recommendation	Rationale	Priority	Owner	Due Date
		There would be benefit in the programme mapping out the indicative work programme to 2032 to detail the initiatives it will undertake, along with their timeframes, costs and contribution to the achievement of the outcomes/targets (TLIs). We recommend this is done in visual form broken down by the initiatives for each lake. Such a roadmap will provide a more holistic view of the overarching plan showing the activity currently underway and the planned future activity. Some initiatives have longer term goals beyond the three years and need the time to achieve their targets. This may not be clearly understood by all parties. Showing the contribution of each initiative will provide a long term view as to how the outcomes and targets (TLIs) will be achieved over the life of the programme. While the short-medium term projects will have certainty (per the approved Annual Work Plan and Three Year Plan), the longer term projects will have more fluidity. The roadmap should be reviewed quarterly and used by the PSG to ensure the right balance of initiatives to achieve the 2032 targets. If for any reason an initiative is not on track to achieve a target, then the roadmap will allow other initiatives to be tweaked or new initiatives to be added to fill any gaps required. If a project has underspent, the PSG must look at whether any planned initiatives could be brought forward and funded sooner. Similarly a regular review of targets should be undertaken on a quarterly basis to ensure initiatives are on track to contribute to the 2032 targets. The programme has a mixture of initiatives that have a range of certainty, with some being more certain to achieve agreed targets, and others being less certain. The less certain ones sometimes rely on high level estimates to determine targets. Over time it is possible some of these targets will need adjustment (gorse is a good example of this, where the target dropped from 30 to 12 tonnes). The roadmap should detail all initiatives across all workstreams, including the supporting work streams' key initiatives (e.g. Communications and Marketing) and any significant initiatives they may be working on or planning (such as the ones listed in the Communications and Stakeholder Plan). These of course will not have contributing targets associated with them, but still form part of the big picture.			

#	Recommendation	Rationale	Priority	Owner	Due Date
2.3	Strengthen status reporting: Include key milestones, budget and benefits in reporting to increase visibility and allow the governance groups to focus on exceptions. Add supporting workstream (e.g. communications and cultural value framework) updates. Develop reporting for the supporting workstreams.	Status reports are prepared by the workstream leads each month. This information is then consolidated into a programme status report presented to the PSG at the monthly meeting. The status reports contain a good level of information, however there is some opportunity to strengthen them. The project status reports provide RAG reporting for scope, budget and schedule, along with comments to support the ratings. Similar information is shown in the programme status report. The majority of workstreams complete project plans that detail the scope, key milestones, budget and benefits/outcomes and this forms the basis of their approval. We recommend some of this information be detailed in the project and programme status reports, including: – Key milestones: showing baseline dates, forecast dates, actual dates and % complete – Budget: showing baseline budget, forecast budget (life of project) and actual spend – Benefits/contribution: showing the contribution to the achievement of TLI targets. Inclusion of this information will provide greater visibility for the programme and the governance groups and will allow a focus on the exceptions. It will also provide early visibility as to changes to the overarching roadmap (e.g. if a project is not on track to provide its stated benefits/contribution, is an additional project needed to make up any shortfall). The programme status report focuses on reporting the delivery workstreams. We recommend an update is included for the supporting workstreams (e.g. communications and cultural values) to detail progress made or upcoming planned activity. Like the delivery workstreams, the supporting workstreams should provide monthly reporting of the key activities they undertake. This information should then be provided as workstream updates in the programme status report.	High	Programme Manager	13 Jul 2018

Scope

#	Recommendation	Rationale	Priority	Owner	Due Date
2.4	Increase delivery workstream engagement with supporting workstreams to determine what support is needed	The programme workstream can be broken down into two categories: – Delivery workstreams that deliver project outputs (vertical workstreams) – Supporting workstreams that support the projects (horizontal workstreams) The horizontal workstreams comprise Communications and Marketing, and Cultural Values Framework implementation. These workstreams provide support to the vertical workstreams. It is therefore important that there is engagement by the vertical workstreams to allow for any horizontal resources needed to provide delivery support. Whilst we have seen some evidence of this occurring it is not consistently applied. Applying this engagement across all vertical workstreams will allow for the appropriate resourcing and budgets to be included within the scope of each project. We recommend any new initiatives explore what support may be required during the planning phase. This would involve conversations with the supporting workstreams to determine what support and therefore resources may be required so they can be included in the budgets. Where initiatives are underway, the programme could consider this on a case by case basis as to what support may be required from the supporting workstreams. Supporting resources could then be included as required and any adjustments made to budgets.	Medium	Programme Manager	3 Aug 2018
2.5	Embed cultural values through adding a new initiative on the roadmap	A Te Arawa Cultural Values Framework was developed in 2014/15 which outlines four objectives to embed the Te Awara cultural values. The framework was developed for Te Arawa, Te Awara Lakes Trust (TOLT) and the Te Arawa Lakes Restoration Programme. One of the goals of the framework is to embed the Te Arawa cultural values across the Rotorua Te Arawa Lakes Programme. We have recommended (1.1) a set of guiding principles be developed to facilitate decision making based on the foundational documents and goals. In order to further embed the cultural values across the programme, a new initiative should be added to the roadmap to develop an appropriate training package across the programme. Discussion will be needed as to how this is funded.	High	Programme Manager	13 Jul 2018

Time/Schedule/Dependencies

#	Recommendation	Rationale	Priority	Owner	Due Date
2.6	Develop a dependencies register to track dependencies.	A large programme of this nature will have a number of dependencies, especially given the number of partners involved and their own busy work programmes. A good example of this is the catfish incursion in Lake Rotoiti which is noted in the Annual Work Plan. Although it has been agreed this does not form part of the programme, the programme must however manage this dependency and the impacts it may have on water quality projects. A dependency register is needed to detail this and any other dependencies for the programme and how these will be managed and communicated. The dependency register would be managed internally by the programme and relevant projects, with it being made visible from time to time to the PSG.	Medium	Programme Manager	3 Aug 2018

Cost & Benefits

#	Recommendation	Rationale	Priority	Owner	Due Date
2.7	Review targets (benefits) for projects that have uncertainty.	The programme is unique as many of the underlying projects are long term initiatives where the targets (benefits) are achieved during the project implementation phase, rather than after the project has completed. Individual projects detail their targets and KPI's in the project plan. Many of the initiatives have less certainty in terms of the benefits (targets) to be delivered. The gorse project is a good example where it was realised the initial target of 30 tonnes was not possible once implementation had begun, and it was agreed the target would be lowered to 12 tonnes. We recommend targets are reviewed in the case of those projects that fall into the higher uncertainty category, to confirm they are appropriate. This review should be carried out early in the implementation phase and the target adjusted (up or down) if required and agreed by the PSG. In the case of a target being adjusted downwards, we'd expect discussion as to how the shortfall will be addressed and this is detailed in ***recommendation 1.2*** above.	Medium	Programme Manager	3 Aug 2018

Stakeholder Engagement, Communications & Change Management.

#	Recommendation	Rationale	Priority	Owner	Due Date
2.8	Update the Communication and Stakeholder Plan to align to the Vision and Strategy. Include the planned communications for the key projects.	The programme has developed a Communication and Stakeholder Plan January – December 2018. The plan contains some good details, however is light in a few areas and could use some further expansion, as follows: • There is no alignment to the foundational Vision and Strategy document in the plan and in our opinion this should be consistent communication approach and reference to the alignment of the goals, especially in the case of external communications. The plan does note the key messages for the programme as a whole, but there needs to be better alignment back to the key foundational document that was used during public consultation. • The plan does not detail the planned communication aligned to the milestones of key projects, instead it notes there are projects that may need communication support. There would be some benefit in detailing the key communications for the key projects to ensure there is consistency in communications and who is responsible for this communication. Some of the targeted communications projects shown, such as the new website, should be detailed on the programme roadmap.	Medium	Communications Manager	3 Aug 2018

Quality.

#	Recommendation	Rationale	Priority	Owner	Due Date
2.9	Develop a Quality Management Plan for the Programme	We recommended in our previous review (Recommendation 1.8, Aug 2014) that a Quality Management Plan was needed to detail the quality criteria for deliverables, and how these will be assessed. Quality management is important for large complex programmes of this nature to ensure consistency in the quality of outputs and how these will be assessed, accepted and approved. It is unclear how this is being fulfilled currently. The plan has not yet been developed as it was not seen as a priority. We reiterate this recommendation as there would be benefit for the programme to develop the plan to	Medium	Programme Manager	3 Aug 2018

#	Recommendation	Rationale	Priority	Owner	Due Date
		detail how quality will be managed across the key projects along the agreement of the acceptance criteria for these.			

Previous Recommendations

The tables below detailed recommendations from our previous review (Aug 2014) and their status. All recommendations have been completed, with one exception.

#	Previous Recommendation	Completed / Action Required
1.1	Clarity of Financial Reporting	Complete. CFO Forum reviewing financial reporting quarterly, supported by quality financial reporting.
1.2	Mitigation of Resource Risks	Complete. Full time Programme Manager in place.
1.3	Reconfirm Governance Commitments	Complete. Governance commitment and attendance in place.
1.4	Strengthen Status Reporting	Complete. Some further recommendation made to strengthen reporting.
1.5	Further Develop Schedules	Complete. Individual projects managing schedules. Further recommendation made for the programme to track milestones as in place of project governance boards.
1.6	Resource Estimation	Complete. Resources detailed in the project plans for priority projects.
1.7	Expand Recording of issues	Complete. Programme and project issues registers in place and reviewed regularly.
1.8	Quality Management Plan & Configuration Management	Incomplete. Quality Management Plan yet to be developed.
1.9	Communications Resourcing	Complete.
1.10	Expand Risk Identification	Complete.
1.11	Risk Matrix Scores	Complete.
1.12	Broader Programme Benefits	Complete.

MANAGEMENT COMMENT

I agree with the findings and recommendations and I believe that we have sufficient resources within the programme to deliver on those recommendations within the next 6-12 months.

I think the assessment is fair and clarifies where our efforts need to be focussed over the coming months.

I would like to thank you for making these perceptive and helpful findings for us, so that we can take the programme forward to the next stage.

NEXT STEPS

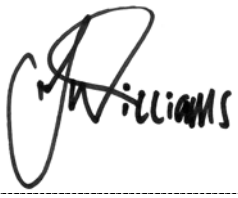
Please contact us if you would like to discuss the details of this report in person. We would be happy to answer any questions or provide further explanations around the findings and intent of the recommendations.

DOCUMENT SIGNOFF

27/06/2018

[date]

Chris Ingle
Project Sponsor
Bay of Plenty Regional Council



26/06/2018

[date]

David Williams
Lead Reviewer
IQA New Zealand Limited

APPENDIX A – TERMS OF REFERENCE

SCOPE

In Scope Components

The scope of this review included the following:

- Provide comment on the quality of the following programme management and governance practices employed by Bay of Plenty Regional Council including:
  - The processes to ensure appropriate governance and management of the programme.
  - The programme's monitoring and reporting environment.
  - The programme's approach to decision making and the major decisions made to date.
  - The programme governance and management controls.
  - The programme's objectives, critical success criteria and their definitions.
  - The processes used to develop a clear definition of the scope, inclusions and exclusions.
  - The programme approach to schedule management and estimation.
  - The programme's resourcing approach for both internal and external resources sourced under contract, the effectiveness of this approach and BOPRC's ability to manage those resources.
  - The programme's approach to financial management; including budgets, approvals and reporting.
  - The programme's benefit identification, definition, monitoring and tracking.
  - The programme's resourcing approach and its ability to manage those resources.
  - The programme's approach to communication and stakeholder engagement with internal and external stakeholders.
  - The programme's quality management and assurance processes and controls.
  - Identification of findings (strengths and improvement opportunities) together with pragmatic recommendations in relation to any improvement opportunities.
  - Make comment against the recommendations from the previous IQANZ independent quality assurance review detailing whether these have been implemented or on track to be implemented.
- Preparation of a high level summary report of findings and recommendations.

Scope Exclusions

- The scope of this review will exclude the following:
  - A detailed review of the 24 year work programme and 3 year work programme, other than consideration of the programme's achievement against these work programmes and planning to execute against them.
  - A detailed review of procurement processes and resulting contracts.

KEY STAKEHOLDER INTERVIEWS

We would like to thank the following stakeholders for their input to this review:

1. Programme Manager and Integrated Catchments Manager
   - Helen Creagh
   - Laverne Mason
2. Work stream Leads / Programme Managers
   - Niroy Sumeran (BOPRC)
   - Greg Manzano (Rotorua Lakes Council)
   - Rosemary Cross (BOPRC)
   - Elva Conroy (Te Arawa Lakes Trust)
3. Programme Management Accountant
   - Mary Burford
4. Ministry for the Environment Sponsor (Programme Steering Committee member)
   - Rob Schick
   - Annabelle Ellis
   - David Pearson (CFO)
5. Bay of Plenty Regional Council Sponsor (Programme Steering Committee member)
   - Chris Ingle
6. Te Arawa Lakes Trust Sponsor (Programme Steering Committee member)
   - Nicki Douglas
7. Rotorua District Council Sponsor (Programme Steering Committee member)
   - Stavros Michael

REVIEW TEAM

Team Member	Role	Substantive Role
David Williams	Lead Reviewer	Director

DOCUMENTATION REVIEWED

- 2016-10-05 Tikitere Nitrogen Reduction Project Brief Final
- 2016-12-16 - NDMS Business Requirements
- 2018 - 2019 Rotorua Te Arawa Lakes Programme Annual Work Plan draft
- 2018 Communications and Stateholder Plan Te Arawa Lakes Programme January - December 2018
- 2018-05-16 Programme Steering Group Agenda Pack
- 2018-05-16 PSG Programme Steering Group Minutes pdf
- 2018-05-30 Rotorua Te Arawa Lakes Programme Workstream Leads agenda pack
- 2018-05-30 Rotorua Te Arawa Lakes Programme Workstream Leads minutes
- 20150714 Agenda Partnership Steering Group (PSG) Meeting
- 20150714 Minutes Partnership Steering Group (PSG) Meeting PDF
- Audit Reccomendations Implementation Sheet
- BOPRC Lakes Programme Risk & Issue Register Current
- CR060 Lake Rotoehu Weed Harvesting Underspend
- CR061 Lake Rotorua Brunswick Sewerage Connections
- DRAFT 2018 - 2021 Three Year Plan Rotorua Te Arawa Lake Programme PDF
- Draft Annual Work Programme Financials 2018-19
- Final Tarawera Lakes Restoration Plan - December 2015 - PDF
- Lake_Okataina_action_plan
- Lakes Programme Documentation Checklist
- Lakes Programme Interview Schedule
- Partnership Steering Group (PSG) Terms of Reference FINAL
- Programme and Change Management Plan Rotorua Te Arawa Lakes Programme DRAFT May 2018 PDF
- Programme and Project Risk Management Plan FINAL (PDF version)
- Rotorua Te Arawa Lakes Programme Status Report Communications (April) Reporting
- Rotorua Te Arawa Lakes Programme Status Report Incentives (April) Reporting
- Rotorua Te Arawa Lakes Programme Status Report Lake Operations (April) Reporting
- Rotorua Te Arawa Lakes Programme Status Report Planning (April) Reporting
- Rotorua Te Arawa Lakes Programme Status Report Relationship and Fund Management (April) Reporting
- Rotorua Te Arawa Lakes Programme Status Report Rotorua Lakes Council (May) Reporting
- Rotorua Te Arawa Lakes Programme Workstream Leaders Terms of Reference March 2016 FINAL
- Rotorua Te Arawa Lakes Strategy Group Terms of Reference (RTALSG) FINAL
- rotorua-te-arawa-lakes-strategy-group-minutes-09-march-2018
- rotorua-te-arawa-lakes-strategy-group-public-meeting-agenda-09-march-2018
- Stakeholder Database
- Vision and Strategy for the Lakes of the Rotorua District PDF English

APPENDIX B – ASSESSMENT RATINGS

SUMMARY ASSESSMENT

Rating	Summary Assessment Description
Highly Likely	Successful delivery of the project/programme appears **highly likely** and there are no major outstanding risks or issues that at this stage appear to threaten delivery successfully.
Likely	Successful delivery of the project/programme appears **likely.** However attention will be needed to ensure risks do not materialise into major issues threatening delivery.
Feasible	Successful delivery of the project/programme appears **feasible** but risks or issues require management attention. The risks or issues appear resolvable at this stage of the project/ programme if addressed properly.
In Doubt	Successful delivery of the project/programme is **in doubt** with major risks or issues apparent in a number of key areas. Urgent action is needed to ensure these are addressed.
Highly Unlikely	Successful delivery of the project/programme appears to be **highly unlikely.** There are major risks or issues, which at this stage do not appear to be manageable or resolvable. The project/ programme may need re-baselining and/or overall viability re-assessed.

COMPONENT RATING

Rating	Description
	Process, practice and disciplines are appropriate and fit for purpose. No material improvement opportunities exist.
	Process, practice and disciplines are mostly appropriate and fit for purpose. Minor improvement opportunities exist.
	Process, practice and disciplines need development to support project success. Material improvement opportunities exist and should be addressed as a priority.
	Process, practice and disciplines are not appropriate or fit for purpose. Significant material improvement opportunities exist that require immediate attention.
	Insufficient process, practice and disciplines exist, creating an unacceptable level of risk to project success.

DOCUMENT CONTROL

DOCUMENT INFORMATION

Document Name	Rotorua Te Arawa Lakes Restoration IQA Report
Contact	David Williams Director
Status	Work in progress draft

DOCUMENT HISTORY

Author	Description of Change	Date	Version
David Williams	Initial document	15 June 2018	0.1
Nicki Carruth	Internal QA draft	20 June 2018	0.1
David Williams	Updated following factual accuracy	21 June 2018	0.2

DISTRIBUTION CONTROL

Person	Role	Date of Issue	Version
Helen Creagh	Programme Manager	20 June 2018	0.1
Chris Ingle	BOPRC Sponsor	21 June 2018	0.2
Helen Creagh	Programme Manager	21 June 2018	0.2
		Click here to enter a date.	

APPENDIX 3

2017- 2018 Rotorua Te Arawa Lakes Programme Annual Report

Annual Report

2017/2018

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ROTORUA TE ARAWA LAKES PROGRAMME

Bay of Plenty Regional Council, Rotorua Lakes Council and Te Arawa Lakes Trust.
Working as one to protect our lakes with funding assistance from the Ministry for the Environment.

Contents

Purpose

The purpose of this document is to report against the 2017/2018 Annual Work Plan of the Rotorua Te Arawa Lakes Programme. This report is in accordance with Clause 5.1 and 5.2 of the Deed of Funding.

This report provides an update on deed funded projects, including their financial status. It also provides an update on non-deed funded projects that fall under the Programme.

The overarching goal of the Deed of Funding is to reach community aspirations for water quality in four deed funded lakes: Rotorua, Rotoiti, Ōkāreka and Rotoehu. To show the status of reaching this goal, there is an update on how each priority lake is tracking in terms of water quality.

Overview

Lake Rotorua

RLC and BOPRC Annual Plan Budget 2017/2018 ($000)	Actual end of year Expenditure ($000)	Approved Crown Funding 2017/2018 ($000)	Crown Funding received to date ($000)	Crown Funding applied to date ($000)
9,804	4,154	4,902	2,498	2,077

The components of the Integrated Framework for Lake Rotorua continue to be very resource intensive. The Commissioners' decision on Proposed Plan Change 10 was received in August 2017 and appeals to the Environment Court closed at the end of September. Four appeals to the Commissioners' decision were received (from CNI Iwi Holdings, Federated Farmers, Te Tumu Paeroa and Ngāti Uenukukōpako). The Ngāti Uenukukōpako appeal is now withdrawn. A variety of parties joined these appeals under s274 of the Resource Management Act. The first Environment Court led mediation was undertaken in early February 2018 and staff have continued to participate in the appeal process as now directed by the Environment Court, including expert witness conferencing. Hearing dates are now set for the Environment Court hearing, with evidence in chief to be circulated by 3 December 2018 and the first hearing dates set for the weeks of 4 and 11 March 2019.

The Commissioners decision on Plan Change 10 means that Plan Change as it stands has legal effect, the Regional Council are now implementing the plan change. Reworking of the Nutrient Management Plans to provide identification of Critical Source Areas for phosphorus and identifying mitigation measures is progressing. Advice and support staff continue to work closely with landowners to provide information on their obligations under the plan change. Three consents have been granted for properties over 40ha with further applications being processed. In total, 143 landowners have engaged with advice and support.

The Gorse Conversion Implementation Plan has been revised after ground truthing and aerial photography established gorse wasn't as big a problem as first thought in the Lake Rotorua Catchment. The Plan estimates a Nitrogen reduction of 12.8 tonnes at the root zone instead of the previous reduction of 30 tonnes. The programme will be look at alternative solutions to make up any shortfall. Work has continued on existing gorse agreements and also working with landowners to sign up new agreements. 203 ha of gorse in the catchment is now either covered by an agreement under the gorse scheme or has an agreement pending. Difficulties have arisen with getting some owners of Maori land to engage in the gorse scheme because of the 999 year encumbrance. In-particular, Te Tumu Paeroa will not support any of their landowners entering into the gorse scheme because of this requirement.

A paper was presented to the Strategy Group in March which set out the 2018 work plan and recommended completion of further research on the identified gaps, extension of information and education on all Low Nitrogen Land Use Fund tools and land uses. During the financial year being reported on here the Land Use Innovation Series was planned, along with an Expressions of Interest for trialling innovative low nitrogen land uses in the catchment. These have now been successfully run but in the new financial year, not reported on here.

The Incentives Scheme has secured deals of approximately 20 tonnes. There was a delay in the first half of the year due to the rework of the Nutrient Management Plans required to account for the Commissioners decision on Plan Change 10. Staff are continuing to engage with landowners and actively developing pipeline opportunities. The Incentives Committee have requested a report to their Committee meeting in November, staff are to advise on the properties with sufficient nitrogen available in the catchment and each individuals landowners interest in selling and likely timing on that. This will give the Committee the information required to inform the likelihood of achieving their target and the next steps in strategy for that. Staff resources to the Incentives Committee were increased during the year to assist in ensure that as much progress as possible was being made. The main barrier to the scheme remains capital value of land and borrowing against that, primarily for land in European title.

A joint letter from the Regional Council and Rotorua Lakes Council has gone to all unconnected properties (to sewerage reticulation) in the Rotokawa/Brunswick area asking them to connect and advising that if they don't Council will make the connection and recover costs from them. The letter has had a good response, most of the connections have not been made due to financial difficulty. Staff at both organisations will work out an appropriate approach for these properties.

A project team has been established to action preferred options for the 50 tonne engineering solutions, this work will largely focus on wetland retention, enhancement and perhaps construction. There will be a focus on ensuring that District and Regional Policy protects existing 'wet-land' which provides an important nutrient sink, particularly in the urban area. Urban stormwater management will also provide opportunities. The Tikitere project is looking to be cost-prohibitive given the benefits, recommendations to the Programme Steering Group and Rotorua Te Arawa Lakes Strategy Group are pending on this.

Lake Rotoehu

RLC and BOPRC Annual Plan Budget 2017/2018 ($000)	Actual end of year Expenditure ($000)	Approved Crown Funding 2017/2018 ($000)	Crown Funding received to date ($000)	Crown Funding applied to date ($000)
236	175	118	93	88

Planned actions on Lake Rotoehu include phosphorous locking (alum dosing) and weed harvesting.

Due to little weed growth this season the weed harvester wasn't operational. The Alum Dosing plant has been switched off as it is currently not considered effective. Research on phosphorus locking in Lake Rotoehu has indicated that lake weed growth may be limiting the effectiveness of alum dosing.

A workshop with the Water Quality Technical Advisory Group is planned in October to consider appropriate next steps for Rotoehu given the challenges faced with water quality and interventions on that lake.

Lake Okareka

RLC and BOPRC Annual Plan Budget 2017/2018 ($000)	Actual end of year Expenditure ($000)	Approved Crown Funding 2017/2018 ($000)	Crown Funding received to date ($000)	Crown Funding applied to date ($000)
50	35	0	25	18

The Rotorua Te Arawa Lakes Strategy Group approved a further land use change project in the Lake Ōkāreka Catchment at the end of 2016. This project had three streams to it: completing a full check of compliance with Rule 11, contributing to the Lakes A Zone District Plan review and securing further nutrient purchase from landowners in the catchment. Since then, the programme has offered funding for further land use change and nutrient purchase to all owners of sufficient land in the catchment. As a result we are in discussions with interested parties to secure further change with one large land use change project pending.

An audit of the catchment land use has been completed to assess compliance with the Rule 11 Benchmark. All bar one property audited are below their benchmark, support is being offered to this landowner to come back into compliance.

The funding set aside for the Lakes A Plan Zone District Plan review has not yet been progressed.

Lake Rotoiti

RLC and BOPRC Annual Plan Budget 2017/2018 ($000)	Actual end of year Expenditure ($000)	Approved Crown Funding 2017/2018 ($000)	Crown Funding received to date ($000)	Crown Funding applied to date ($000)
5,434	3,115	2,717	128	1,558

Ongoing projects on Lake Rotoiti include the final sewerage reticulation between Curtis Road and Hinehopu (part of the Lake Rotomā-Rotoiti Reticulation Project) and maintenance and monitoring works to deal with corrosion of the Ōhau Wall. Good progress has been made on the reticulation and the contract for the construction of the Wastewater Treatment Plant and Land Disposal Site has been let and will be completed in April 2019. Four fish passes have been installed in the Ōhau Wall and a structural management plan has been finalised to deal with corrosion, components to be installed during 2018/2019. Staff are working with iwi to undertake restoration works in the Ōhau Channel area.

Summary of TLI results

None of the twelve Rotorua Te Arawa Lakes met their Regional Natural Resources Plan (RNRP) TLI objective for the 2017/2018 year.

Annual trophic status has been impacted by climate, with record increases in lake level occurring and a shortened stratification season. This may help explain the overall increase in TLI for many lakes with the exception of Lake Rotokakahi (although the TLI is calculated without Secchi water clarity data). In some cases a shortened stratification season has resulted in two winter turnovers occurring in the same lake analysis year (July to June), which can increase all TLI parameters.

Blue-green algae (cyanobacteria) blooms resulted in health warnings being issued by Toi Te Ora for Lakes Rotoehu and Ōkaro. Lakes Rotoiti, Tarawera and Rotorua reached orange alert levels for some sites over the 2017/2018 summer.

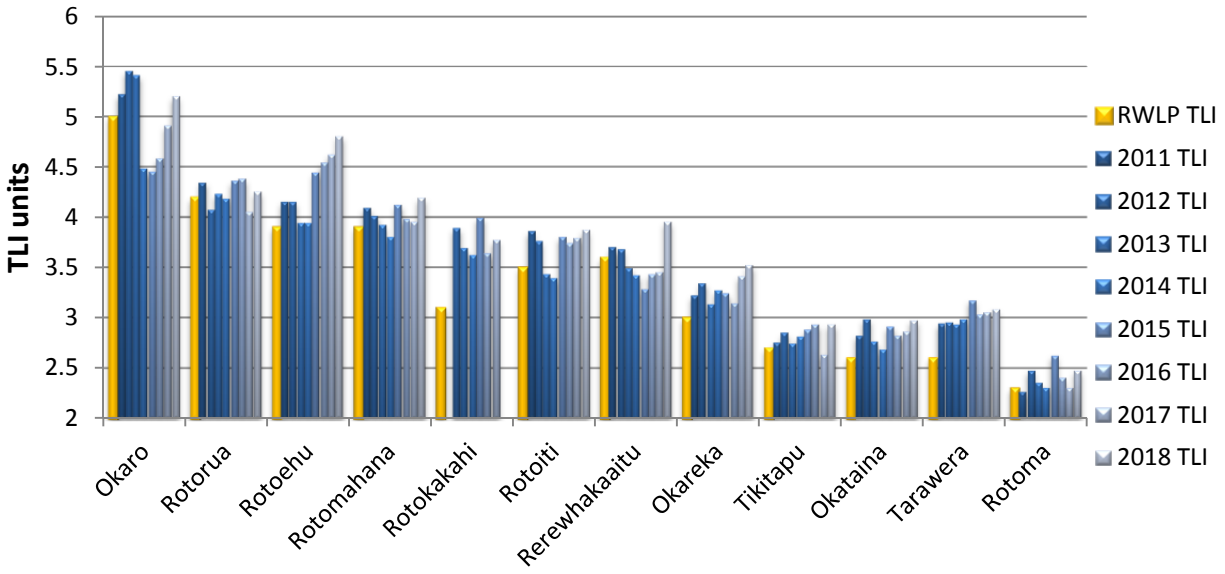


Figure 1: Regional Natural Resources Plan (RNRP) TLI Objectives and average annual TLI results, 2011 to 2018.

Note: Lake Rotokakahi TLI's are based on Te Wairoa Stream monitoring and a three-parameter TLI (no Secchi disk).

Key achievements

An overview of key achievements for 2017/2018 financial year are shown in the table below. The Deed funded activities are shown in bold.

For more detailed information about deed projects (including financials), please refer to the later sections of this report.

Lake operations

Lake Operations as shown in 2017/2018 Annual Work Plan	Lake operations achievements 2017/2018
Continue Lake Rotoehu Weed Harvesting.	**Due to lack of weed this season the weed harvester wasn't operational. Harvesting normally occurs in late summer early autumn period, so this will be revisited in April 2019.**
Investigate the feasibility of weed harvesting on Lake Rotorua for nitrogen reduction (as part of the 50 t engineering solutions).	**This project has been delayed due to staff priorities related to Plan Change 10. Staff are currently working to get this project back on track so appropriate actions can be implemented for the 2022 deadline.**
Continue phosphorous locking to maintain water quality (Lakes Rotoehu and Rotorua).	**Phosphorus locking continues to be undertaken. The resource consent renewal application has been accepted for the two plants on Lake Rotorua and is now working through the consent process.**
Continue to pursue resource consents, prepare site and review engineering and cost feasibility of Tikitere Zeolite Plant, in time for scheduled 2018/2019 construction.	**Detailed design and costs have been completed. Construction has been pushed out to 2019/2020 in the Regional Council's draft Long Term Plan. However, due to build cost and ongoing annual operational costs the project isn't likely viable. Recommendations to Programme Steering Group and Strategy Group are pending.**
Undertake mitigation works as agreed in the Ohau Wall consenting process.	**Four fish passes have been installed. Staff have commenced working with iwi to undertake restoration works in the Ōhau Channel area.**
Responsive weed management as required for amenity purposes across all lakes.	Continuing to work with partners, including Land Information New Zealand on this matter as required. Aquatic Plant Management Plans are being developed for the lakes.

Lake Operations as shown in 2017/2018 Annual Work Plan	Lake operations achievements 2017/2018
Initiate catchment and lake modelling work with the University of Waikato to identify potential phosphorus sources and water quality solutions at Lake Tarawera.	Lake Tarawera water quality modelling is underway and due to be completed by August 2018. This is a delay to the initial deadline due to other Plan Change 10 modelling taking priority.
Once catchment and lake modelling is available consider a review of action plans for Ōkaro and Ōkāreka to establish whether further intervention is necessary in these catchments, e.g. gorse removal, land use change.	Modelling for Lake Ōkāreka is due to be completed by August 2018. Modelling for Lake Ōkaro has been delayed due to resourcing issues. Pursuit of further land use change has progressed in Ōkāreka in the meantime as mentioned above.
The University of Waikato Chair of Science and the Water Quality Technical Advisory Group will continue to provide expert advice and scientific rigour for the Programme.	Technical Advisory Group (TAG) advice continues. TAG is close to releasing a paper on the impact of climate change to the Lakes Programme. Four meetings held during the reporting period, including two targeted workshops. Plan Change 10 Science Review is well underway and the final report is expected in October 2018.
Land Technical Advisory Group to provide technical support for land use and land management decisions.	Land TAG operating in a workshop mode. No workshops held during the reporting period.
Continue work to refine function of the Trout Barrier at Hamurana Springs by investigating options to alleviate algae issues above the barrier and prevent trout from passing above the barrier.	Communication with iwi is underway and staff are discussing options with consultants and contractors to find solutions to the issue.
Apply the structural management plan to manage the corrosion of the Ohau Wall.	Structural management plan has been developed and finalised with structural components to be installed in 2018/2019 financial year.
Manage the Ohau diversion wall as per new resource consent.	Monitoring is programmed and undertaken on a regular basis to check the integrity of the wall as well as undertake a range of environmental monitoring as required.
Continue to monitor forest harvest impact on groundwater and Lake Rotomā – a 4 year project.	Monitoring continues. The harvest operation has been completed. More detailed results will be available at the completion of the monitoring project in December 2019.

Lake Operations as shown in 2017/2018 Annual Work Plan	Lake operations achievements 2017/2018
Continue koura monitoring programme on all 12 lakes.	Koura monitoring is underway. Tikitapu and Rotomahana were monitored in the 2017/2018 period. All 12 lakes will be monitored on a five yearly rotation.
Install monitoring buoy in the Lake Tarawera and also either in the east of Lake Rotoiti or Lake Ōkāreka, subject to approvals.	Staff are awaiting detailed maintenance plan from the University of Waikato before installing additional buoys to ensure servicing and data collection is maintained.

Land management

Land Management as shown in 2017/2018 Annual Work Plan	Land Management achievements 2017/2018
Continue to implement the Lake Rotorua Gorse Programme, including signing up new agreements and implementing existing ones.	Staff are continuing to work with the owners of eligible gorse blocks to promote the Lake Rotorua Gorse Programme. There are two agreements currently under negotiation which, if successful, will result in the removal of 120 ha of gorse from the catchment. However, the requirement for a 999 year encumbrance to be registered on land titles is proving to be a disincentive for some Maori owned land and this is slowing progress. Alternative options for securing nitrogen gains from gorse conversion have been approved in the new Implementation Plan for the Project adopted through the year.
Continue the projects initiated for the first Low Nitrogen Land Use round and initiate a further funding round once the project outputs are assessed.	Round One projects are now complete. A paper was presented to Rotorua Te Arawa Lakes Programme Strategy Group in March which set out the 2018 work programme, this comprises of further research to plug gaps from round one, education and extension of the land use directory. During the financial year being reported on here the Land Use Innovation Series was planned, along with an Expressions of Interest for trialling innovative low nitrogen land uses in the catchment. These have now been successfully run but in the new financial year, not reported on here.
Continue to implement the Lake Rotorua Incentives Scheme, including signing up new agreements and implementing existing ones.	The Incentives Scheme has secured deals of around 20 t, with a recent large deal of 8.5 t secured and a further 1.2 t nearing completion. Several other deals are in the pipeline. Finalising incentives deals and securing Nitrogen in perpetuity is a lengthy process which is added to by the various external variables. Currently, some landowners are reassessing their situations and opportunities given Proposed Plan Change 10 and the recent government forestry initiatives. Monitoring plans aligned to Nutrient Management Plans have been finalised and are being implemented for the completed incentives deals. During this period, to add to the opportunities for success of the Incentives Scheme; business rules were reviewed, a realignment of Incentives team membership was carried out and a new Communications and Marketing Plan was launched to better integrate activities into the wider Rotorua Catchment Programme.

Land Management as shown in 2017/2018 Annual Work Plan	Land Management achievements 2017/2018
Continue to implement the Advice and Support service for landowners affected by Plan Change 10.	To date, 143 landowners have engaged with Advice and Support. There are 94 properties over 40 ha in area in the Lake Rotorua Catchment which require a resource consent this year and, of these, 87 are engaged with Advice and Support. Previously finalised Nutrient Management Plans (NMPs) are currently being re-worked to incorporate a greater emphasis on on-farm phosphorous mitigations as a result of the Commissioners' decisions on Plan Change 10. When completed, landowners will be able to use their NMP to support their application for resource consent and three have already.
Progress the Lake Ōkāreka Land Use Project to reduce nutrient loss in the catchment.	All properties bar one have been audited for compliance with Rule 11 and all are below their benchmarks. The property in non-compliance has been offered support. All large property owners have been approached and offered funding to convert pasture to trees as a result staff are negotiating a further 50ha of mānuka planting which will replace gorse and pasture. This represents 50% of the current land use change target.
Continue Acacia control on land in between Lake Tarawera and Lake Rotomahana to reduce N leaching as required.	14.7 ha of Acacia control was carried out for 17 weeks around Lake Rotomahana's Isthmus Track. This project remains a successful and practical project run in conjunction with the local people and providing local employment. Funding has also been provided this year by Te Ariki Trust.
Support the farming community to develop farm management plans that concentrate on Good Management Practices in the Lakes Rerewhakaaitu, Rotokakahi, Rotomahana and Tarawera catchments and provide support for the implementation of these plans. Quantify the nutrient reductions achieved by the farming community in these catchments.	This action in the Tarawera Lakes Restoration Plan and is a voluntary project with the local farming community, led by the Project Rerewhakaaitu group. The project relies on industry partnerships with Fonterra field staff rolling out the new 'Tiaki' farm plan for dairy farmers and Beef and Lamb NZ supporting its 'Land and Environment Plan' (LEP) for drystock farmers. Council contracted AgFirst and Perrin Ag to help deliver the LEPs. Good progress has been made with farm plans and Overseer nutrient budgets completed for 31 dairy farmers 18 drystock farmers. Only three farmers declined to take part. Fonterra has provided a summary report of nutrient loss rates and work is underway for a similar summary report by Beef and Lamb. A final project report and presentation to farmers is expected in October 2018.

Policy, planning, communications and information technology

Policy, planning, communications and information technology as shown in 2017/2018 Annual Work Plan	Policy, planning, communications and information technology achievements 2017/2018
Continue Schedule 1 RMA (1991) process for Lake Rotorua Nutrient Management rules being made operative.	Mediation has resulted in the appeal lodged by Ngāti Uenukukōpako being resolved and their associated s274 notices being withdrawn. The first Environment Court led mediation was undertaken in early February 2018 and staff have continued to participate in the appeal process as now directed by the Environment Court, including expert witness conferencing. Hearing dates are now set for the Environment Court hearing, with evidence in chief to be circulated by 3 December 2018 and the first hearing dates set for the weeks of 4 and 11 March 2019.
Identify timeframes for rules to be developed for the 'Non-Rule 11' lakes.	A regional water quality plan change is being scoped, taking into account the need for a 'hold the line' approach. This is also dependent on the direction of the new government, this being a key interest of theirs. The implementation programme has been amended to bring the Rotorua Water Management Area (WMA) forward. The stocktake for the Rotorua WMA has now started with this informing community discussions held from July 2019.
Continue working with lake owners to develop an action plan for Lake Rotokakahi.	Due to information gaps an action plan isn't able to be completed at this stage. Progress has been made on filling the information gaps that will lead to more accurate modelling. Staff will make contact with the lake owners to discuss a future action plan as appropriate.
Develop an action plan for Lake Rotomahana if needed.	No action plan for Lake Rotomahana has been required as the TLI has not triggered the Natural Resources Plan target.

Policy, planning, communications and information technology as shown in 2017/2018 Annual Work Plan	Policy, planning, communications and information technology achievements 2017/2018
Continue with the implementation of the Te Tuapapa or ngā wai o Te Arawa - Te Arawa Values Framework that was adopted by the Programme Strategy Group in October 2015.	The focus has been on re-engaging with, and encouraging, hapū and iwi to be involved with and in some cases, take ownership of freshwater and land-based projects. Te Arawa Lakes Trust have been taking a bottom-up approach to embedding Te Tuapapa within their work and the Programme. Projects such as the cultural mapping project for lakes structures, the development of the Cultural Indicators Project for the Tarawera Lakes Catchment and the employment of a Community Engagement Coordinator are all projects undertaken by Te Arawa Lakes Trust (with funding from the Regional Council) as part of the implementation of Te Tuapapa. Staff training for Regional Council staff working the Programme, on Te Tuapapa is planned for October. This will be a pilot which can be rolled out more broadly once refined. Te Arawa Lakes Trust have made a three year funding request to the Programme to enable further work in this workstream, which is currently under consideration.
Implement the Communications Plan approved by the programme, with a focus on Integrated Framework, the RMA process in relation to the Lake Rotorua Nutrient Management package and raising the profile of the Programme.	Communications support has been provided for Plan Change 10, incentives scheme, Chair in Lake and Freshwater Science, messaging on maritime signage and the installation of a pipeline and pump to manage the water levels of Lake Ōkāreka. Programme Facebook page continues to grow in popularity with 1,981 likes and 193 following the Instagram page. E-Newsletters delivered quarterly and a presence at the Rotorua Home Show in July. A communications plan is in place and being implemented, this includes a refresh of the Programme's website and an advertising campaign covering Programme activities over summer.
Establish the Nutrient Discharge Management System for nutrient management across all lake catchments.	Phase One of the Nutrient Discharge Management System is now live and the development of Phase Two is underway, with a scheduled completion date of 21 December 2018. Phase Three is scheduled for completion by 30 June 2019. This system automates a significant part of nutrient allocation and management associated with the Rotorua Te Arawa Lakes.

Sewerage

Sewerage as shown in 2017/2018 Annual Work Plan	Sewerage achievements 2017/18
Complete the remaining sewerage connections at Brunswick/Rotokawa, Lake Rotorua.	Bay of Plenty Regional Council and Rotorua Lakes Council agreed on a strategy to implement the connections. A joint notice from RLC and BOPRC was sent to un-reticulated properties outlining their responsibilities and staff are working through the responses to these.
Commence with detailed design of the Wastewater Treatment Plant and the Rotoiti Sewerage Scheme.	Detailed design of the Rotomā/Rotoiti Wastewater Treatment Plant and Land Disposal System and the Rotomā reticulation system has been completed.
Start with the construction of Rotomā/Rotoiti Wastewater Treatment Plant, the Land Disposal System and Rotomā reticulation.	Construction of the Rotomā/Rotoiti Wastewater Treatment Plant and Land Disposal System and Rotomā reticulation is well underway. 2 km of the main pipeline has been installed along the Rotomā waterfront.
Start the detailed design of Rotoiti reticulation.	Trial for the Biolytix system is complete.
Lodge resource consent application for Rotorua Wastewater Treatment Plant, alternative disposal system.	The resource consent application was submitted to Bay of Plenty Regional Council 20 August 2018.
Continue community engagement at Rotoehu in relation to sewerage, with the aim of agreeing on preferred options.	The Rotoehu Project Steering Group continue to evaluate sewerage options for the community.

Rotorua Te Arawa Lakes annual water quality results

Introduction

The Regional Natural Resources Plan (RNRP) includes policies designed to manage the water quality of the 12 the Rotorua Te Arawa lakes. Each of these lakes has an objective Trophic Level Index (TLI) based on past water quality (RL O1 (Objective 11) of the RNRP). The TLI is a numerical index that represents the water quality aspirations of the regional community.

Monitoring programmes have been developed to identify changes in lake water quality and ecology. These include physio-chemical water quality monitoring to generate the TLI, algal monitoring with a focus on cyanobacteria, and macrophyte monitoring using the LakeSPI index.

The objective of this report is to update the annual TLIs for each of the lakes and compare values against the objectives set in the RNRP. The TLI is made up of four measures; Total Phosphorus, Total Nitrogen, Chlorophyll-a and Secchi depth (water clarity).

The table below summarises the TLI data for the Rotorua Lakes for the period July 2017 to June 2018.

Lake *Regional Water & Land Plan Objective* *TLI units*	3-yearly average TLI to 2018 *TLI units*	2013/14 Annual TLI *TLI units*	2014/15 Annual TLI *TLI units*	2015/16 Annual TLI *TLI units*	2016/17 Annual TLI *TLI units*	**2017/18 Annual TLI**	Lake Type *based on Trophic Status*	LakeSPI Condition 2016/2017[1]
Ōkaro **5.0**	4.9	4.5	4.6	4.6	4.9	5.2	Eutrophic	Moderate
Rotorua **4.2**	4.2	4.2	4.4	4.4	4.1	4.3	Eutrophic	Moderate
Rotoehu **3.9**	4.7	4.0	4.5	4.6	4.6	4.8	Eutrophic	Poor
Rotomahana **3.9**	4.1	3.8	4.0	4.0	4.0	4.2	Mesotrophic	High
Rotoiti **3.5**	3.6	3.4	3.7	3.8	3.8	3.9	Mesotrophic	Poor
Rerewhakaaitu **3.6**	3.8	3.4	3.3	3.4	3.5	4.0	Mesotrophic	Moderate
Okareka **3.0**	3.4	3.3	3.3	3.2	3.4	3.5	Mesotrophic	Moderate

Lake *Regional Water & Land Plan Objective* *TLI units*	3-yearly average TLI to 2018 *TLI units*	2013/14 Annual TLI *TLI units*	2014/15 Annual TLI *TLI units*	2015/16 Annual TLI *TLI units*	2016/17 Annual TLI *TLI units*	**2017/18 Annual TLI**	Lake Type *based on Trophic Status*	LakeSPI Condition 2016/2017[1]
Tikitapu **2.7**	2.8	2.8	2.9	2.9	2.6	2.9	Oligotrophic	Moderate
Ōkataina **2.6**	2.9	2.7	2.8	2.8	2.9	3.0	Oligotrophic	Moderate
Tarawera **2.6**	3.1	3.0	3.1	3.0	3.1	3.1	Oligotrophic	Moderate
Rotoma **2.3**	2.4	2.3	2.5	2.4	2.3	2.5	Oligotrophic	High
*Rotokakahi** ***3.1***	*3.7*	*3.6*	*4.0*	*3.7*	*3.8*	***3.7***	Mesotrophic	Moderate

Figure 2: Three yearly average TLI values, annual TLI, trophic status category and LakeSPI condition for the Rotorua Lakes

*Italicised figures are based on Te Wairoa Stream monitoring and a three-parameter TLI (no Secchi disk).

Monitoring of the of the 12 Rotorua lakes shows that:

- Lake Ōkaro exceeded its target TLI for first time in five years, most probably due to climatic influences.
- The TLI for Lake Rotorua moved to just above its RNRP objective, however cyanobacteria activity remained at a low level.
- Lake Rotoehu water quality continues to decline after almost reaching its TLI target in 2014. Severe cyanobacteria blooms were experienced for a prolonged period. Like Rotorua, Lake Rotoehu is vulnerable to climatic conditions and longer stratification events which were experienced throughout the summer.
- Lake Rotoiti TLI continued to increase since exceeding its target TLI in 2014. However, other indicators such as cyanobacteria biovolumes and oxygen depletion rate continue to show the lake has remained resilient to further degradation since the installation of the Ohau Channel diversion wall.
- In Lake Ōkāreka, increased phosphorus levels as a result of multiple rain events and rising lake levels are the biggest contributors to a further increase in the TLI. Despite this the oxygen depletion rate in the hypolimnion has improved.
- After a large improvement last year, the TLI in Lake Tikitapu increased back to 2015/2016 levels. Increased rainfall and a short stratification season influence this result.
- Lakes Ōkataina, Rerewhakaaitu, and Rotomahana all displayed an increase in annual average TLI. While these lakes have had stable TLI results over the previous decade, this year's increase is climate influenced.
- Lake Tarawera's TLI has been stable over the last four years, but has increased relative to TLI results prior to 2014. This is due to an increase in phosphorus levels.
- After a rapid decline until 2010, Lake Rotokakahi has shown improvement but continues to exceed its TLI target.

Lake Rotorua

The annual TLI moved from being just under the objective TLI (4.2 TLI units) to above the objective, at 4.3 TLI units. The three-year average TLI was 4.2. Total nitrogen and total phosphorus concentrations were up slightly on the previous year, as was chlorophyll-a concentration.

Several stratification events occurred from mid-December to early autumn. The most significant seems to have been over late January, lasting around a week.

Cyanobacteria levels remained relatively low, similar to the previous summer. Also, like the previous summer, orange alert levels occurred in late January early February, but red alert levels did not. Consequently, no cyanobacteria health warnings were issued for the lake.

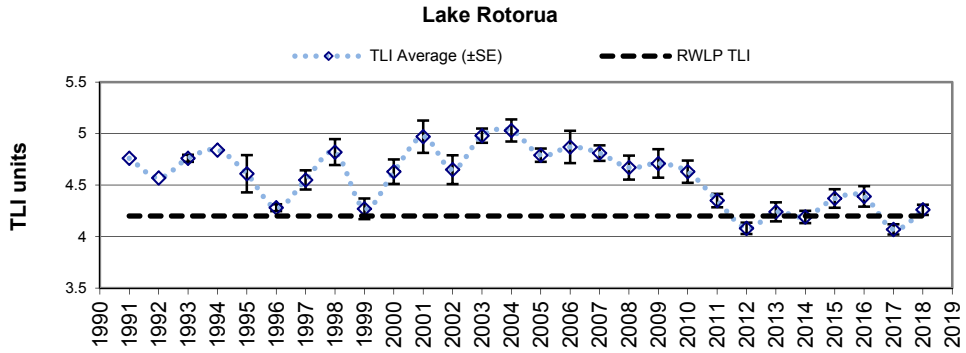


Figure 3: *Lake Rotorua annual average and three year average TLI results, compared to the RNRP Objective TLI.*

Lake Rotoehu

A significant increase in total nitrogen and chlorophyll-a concentrations has caused Lake Rotoehu's annual average TLI to increase for the fourth year running. The TLI moved from 4.6 to 4.8. Both ammoniacal-nitrogen and dissolved reactive phosphorus also showed significant increases, peaking over the summer stratification event.

Strong stratification resulting in anoxia (low dissolved oxygen), occurred from early December through to early January, and then again from mid-January to mid-February. Both dissolved nitrogen and phosphorus appears to have been released from sediments at these times, resulting in increased chlorophyll-a concentrations

Cyanobacteria concentrations were at orange alert levels for much of the summer and into autumn, reaching red action levels from mid-January. Health warnings continued from the previous season and were only lifted in June 2018.

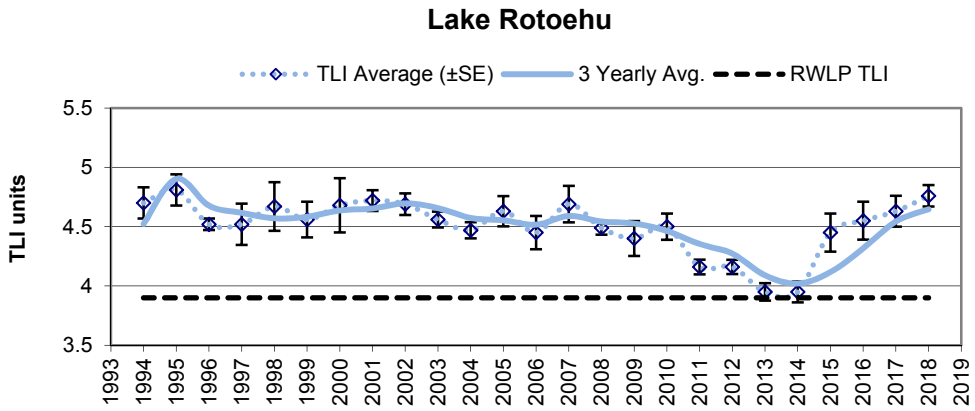


Figure 4: Lake Rotoehu annual average and three year average TLI results, compared to the RNRP Objective TLI.

Lake Rotoiti

Lake Rotoiti's annual average TLI continues to increase since reaching its lowest recorded TLI in 2012/2013, remaining above its objective TLI of 3.5. The annual average TLI sits at 3.9 TLI units with a three-year average TLI of 3.8. This year's increase can be attributed mostly to an increase in chlorophyll concentrations and a decrease in water clarity. TP showed some improvement, while TN increased marginally.

Dissolved reactive phosphorus showed a slight decrease in the epilimnion, but dissolved nitrogen species showed a slight increase. Hypolimnetic oxygen demand has remained stable over the past six years.

Cyanobacteria biovolumes were relatively low, with the exception of Okawa Bay. Here, orange alert levels were reached in mid-January for one week and again in March for the entire month.

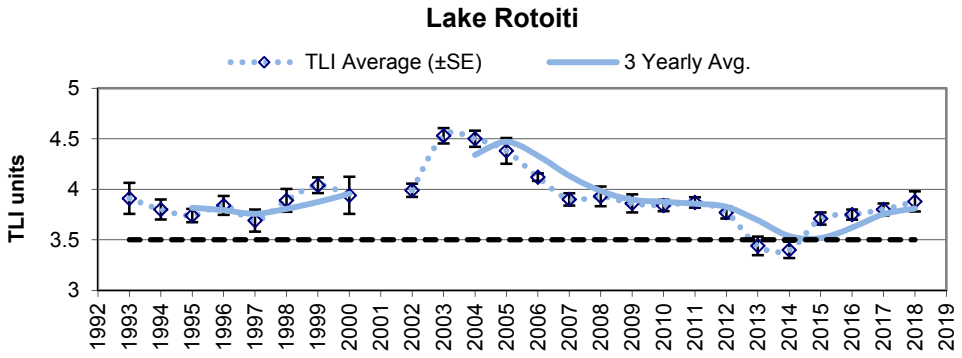


Figure 5: Lake Rotoiti annual average and three year average TLI results, compared to the RNRP Objective TLI.

Lake Ōkāreka

Lake Ōkāreka's annual average TLI increased from 3.2 last year to 3.5 for 2017/2018. The three year annual average was 3.4 TLI units. The increase in the last two years has been primarily due to increases in chlorophyll-a and TP. TN decreased on average compared to last year.

Hypolimnetic oxygen levels did improve on the last two years, with a slower rate of oxygen consumption over the stratification period. Ammoniacal-nitrogen concentrations did increase in the hypoliminion over the stratification period, although dissolved reactive phosphorus and nitrate-nitrite-nitrogen did not. A dramatic increase in lake level over the year will have had some influence on nutrient concentrations, particularly an increase in particulate phosphorus.

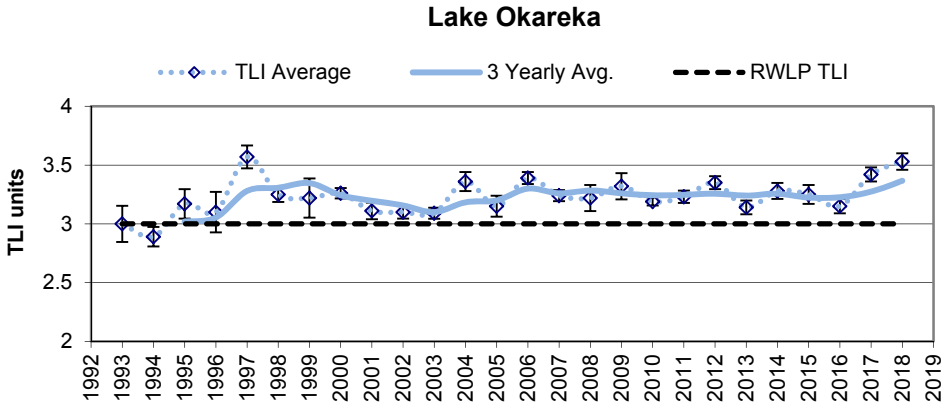


Figure 6: Lake Okareka annual average and three year average TLI results, compared to the RNRP Objective TLI.

Lake Tarawera

The annual average TLI in Lake Tarawera remained the same as 2016/2017 at 3.1. The TLI remains almost 0.5 above the RNRP objective of 2.6, with the three year average at 3.1.

Like many of the other lakes, the chlorophyll-a annual average concentration increased compared to the previous nine years, with a corresponding decrease in water clarity. Both total and dissolved phosphorus concentrations decreased moderately compared to last year's annual average. Annual average nitrogen concentrations were similar to last year, with nitrate-nitrite-nitrogen showing an increase in both the epilimnion and hypolimnion. The annual average Secchi depth (water clarity) has increased compared to the previous five years.

Cyanobacteria biovolumes for the most part did not reach alert levels, with the exception of one sample taken near the Tarawera outlet (Te Tapahoro) which did reach the orange alert level in early February. No health warnings were posted over the 2017/2018 season.

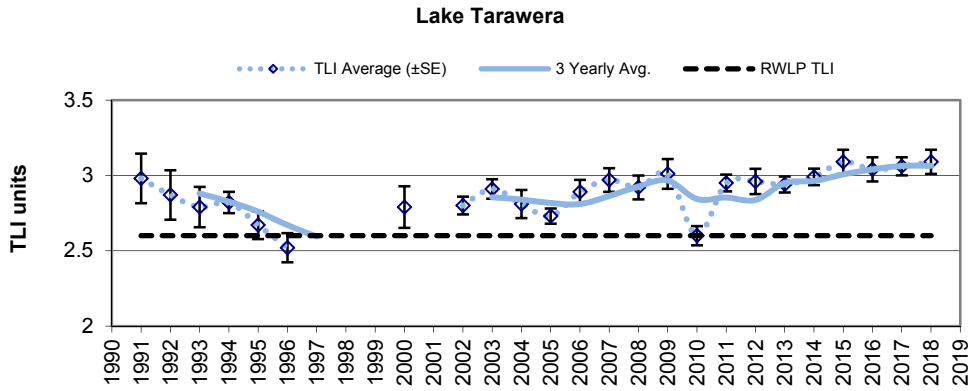


Figure 7: Lake Tarawera annual average and three year average TLI results, compared to the RNRP Objective TLI

Lake Okaro

Lake Ōkaro's annual average TLI for 2017/2018 increased above the RNRP objective of 5.0 TLI units, sitting at 5.2 TLI units. The three-year average TLI is at 4.9. The TLI has been progressively increasing since a noticeable improvement in 2013/2014. While all TLI parameters increased, the main increase was in the chlorophyll-a concentration, but with a notable increase also in total phosphorus. A marked increase in total and dissolved reactive phosphorus in the hypolimnion (bottom waters) is observed.

Water clarity was the lowest in five years, being on average half a metre less than last year.

Cyanobacteria were present at red action levels when summer monitoring began in November 2017, continuing into early January. Cyanobacteria biovolumes dropped off until mid-March then increased to near amber alert levels, tapering off again in late autumn.

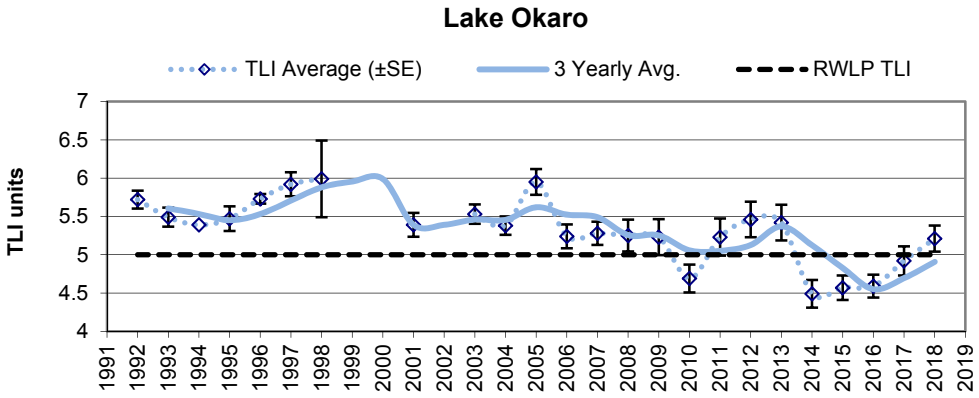


Figure 8: Lake Okaro annual average and three year average TLI results, compared to the RNRP Objective TLI.

Lake Rotomahana

Lake Rotomahana's annual average TLI increased to over 4.0 (eutrophic classification) reaching 4.2 for the first time since monitoring began. This places the TLI above the RNRP objective of 3.9.

All TLI parameters, with the exception of TP, increased markedly. Secchi depth decreased at a time of increased chlorophyll-a concentrations. Dissolved reactive phosphorus (DRP) concentrations showed a slight decrease and ammoniacal-nitrogen was low. Nitrate-nitrite-nitrogen concentrations reached the highest annual average observed for this lake since observations begun, remaining elevated after winter turnover. This has impacted total nitrogen with the highest total nitrogen in eight years observed.

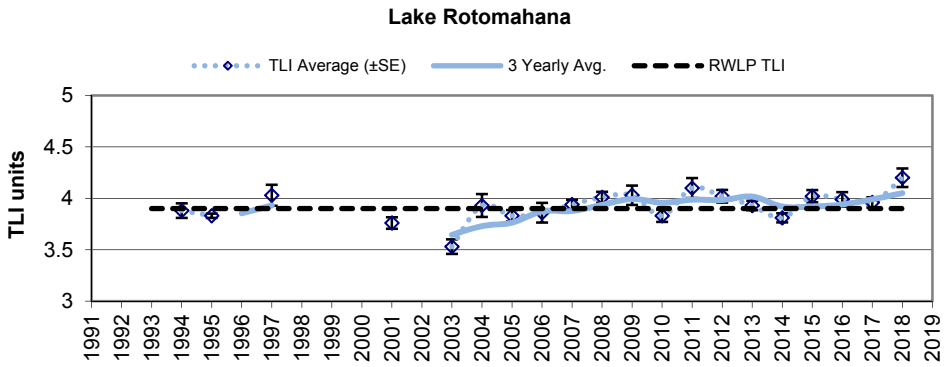


Figure 9: Lake Rotomahana annual average and three year average TLI results, compared to the RNRP Objective TLI.

Lake Rerewhakaaitu

Lake Rerewhakaaitu's annual average TLI rose above the RNRP objective of 3.6 for the first time in six years. The annual average TLI for Rerewhakaaitu was 4.0 for 2017/2018 with the three year average at 3.6 TLI units.

Chlorophyll-a concentrations were the highest experienced in 17 years, with elevated nitrogen and a decrease in water clarity contributing to the elevated TLI result. Nitrate-nitrite-nitrogen levels were the highest recorded explaining the sudden increase in TN. TP also reached the highest recorded levels, although DRP concentrations remained stable, possibly due to uptake from increased algae. Water clarity did decrease by over two metres on average, probably due to the higher phytoplankton concentrations experienced over the summer, and possibly increased runoff from rain events. Lake level was the highest recorded since 1991, with a 0.5 metre increase recorded in late April 2018 in under 48 hours.

Several sustained stratification events can be observed at 15-minute intervals in data collected by the monitoring buoy. The first event occurred in late December extending to mid-January, and then again in late January and may have extended to early March, although there was several weeks over this period where the buoy was not operating. During this time anoxia has occurred and there was an observed increase in ammoniacal-nitrogen presumably as a result of sediment release during reducing conditions.

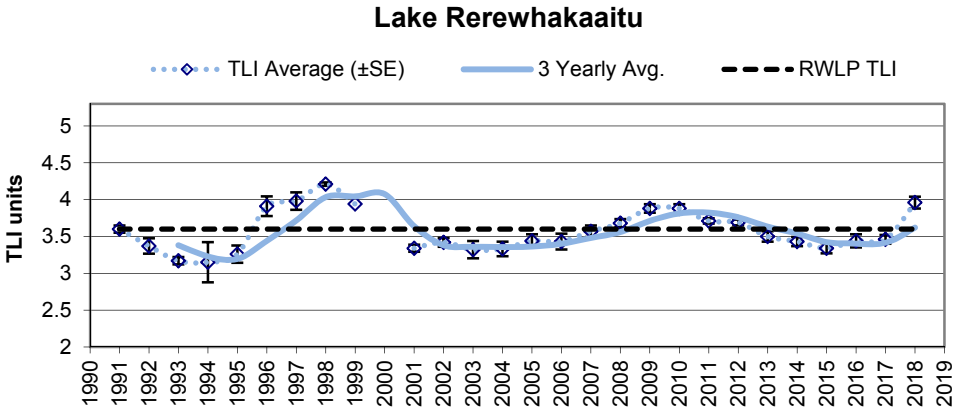


Figure 10: Lake Rerewhakaaitu annual average and three year average TLI results, compared to the RNRP Objective TLI.

Lake Tikitapu

Lake Tipitapu's annual average TLI increased to 2.9 from 2.6 in 2016/2017. The three-year average TLI moved to 2.8.

Chlorophyll-a average annual concentrations increased to the highest recorded, primarily thanks to a late winter turnover in 2017 and an early one in 2018. Phosphorus also increased to levels similar to those experienced in 2011/2012, which was also a time of increased lake level. Total nitrogen displayed a decrease in the annual average, but there was decrease in water clarity (Secchi depth).

Ammoniacal-nitrogen concentrations increased in the hypoliminion over the stratification period, although dissolved reactive phosphorus and nitrate-nitrite-nitrogen did not. The dissolved oxygen depletion rate in the hypolimnion declined after an elevated depletion rate was observed in the previous year.

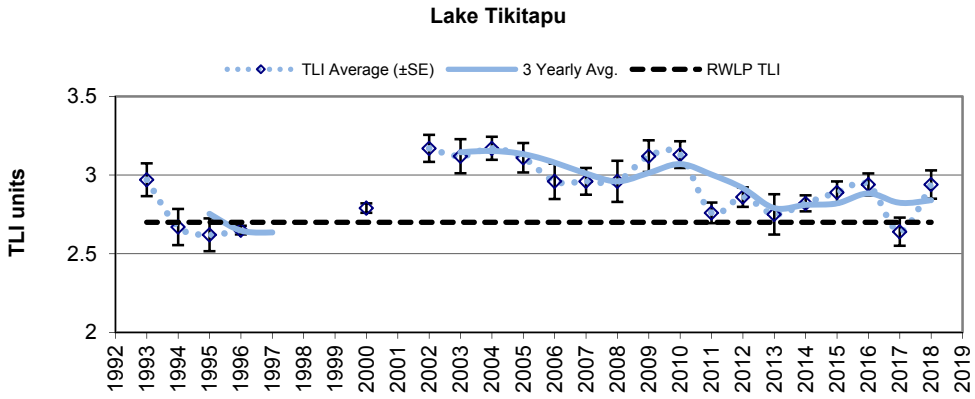


Figure 11: Lake Tikitapu annual average and three year average TLI results, compared to the RNRP Objective TLI.

Lake Okataina

Lake Ōkataina's annual average TLI increased from the previous five years sitting at 3.0 compared with 2.9 last year. The three-yearly average TLI was 2.9.

Average annual chlorophyll-a concentrations were one of the highest recorded, in part due to a winter peak in 2017 after winter turnover. This corresponds to one of the lowest annual average water clarity measures made in 15 years of monitoring. Both nutrients that make up the TLI decrease slightly compared to the previous two years.

Annual average phosphorus concentrations remain elevated in the lake, and nitrogen remains stable. The oxygen depletion rate increased on previous years, but there was no increase in dissolved nutrients occurring in the hypolimnion compared to the previous year.

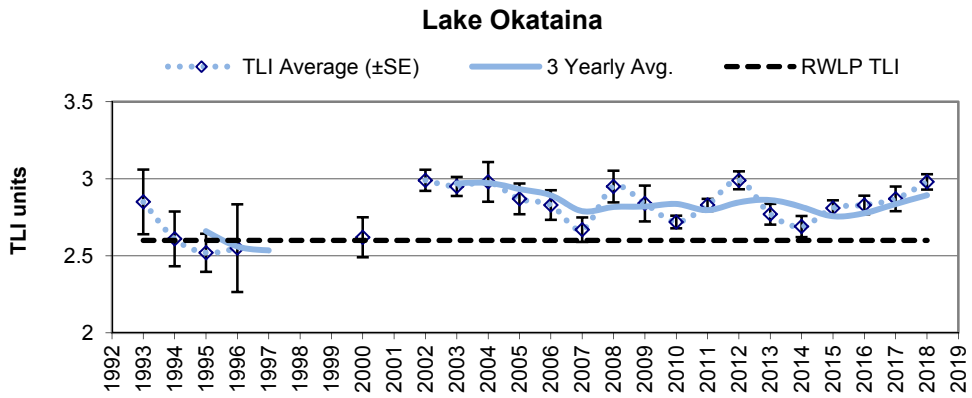


Figure 12: Lake Okataina annual average and three year average TLI results, compared to the RNRP Objective TLI.

Lake Rotomā

Lake Rotomā's annual average TLI increased compared to last year to be 0.2 TLI units above its RNRP objective of 2.3, sitting at 2.5. The three-year average TLI was to 2.4.

The increase in TLI was driven by increases in phosphorus and chlorophyll-a levels, and an almost 2 metre decrease in annual average water clarity. Total nitrogen remained stable, although ammoniacal-nitrogen in the hypolimnion was the lowest annual average recorded. This may due to the notably shorter stratification season, which also saw the dissolved oxygen depletion rate improve (decrease) compared to last year's result.

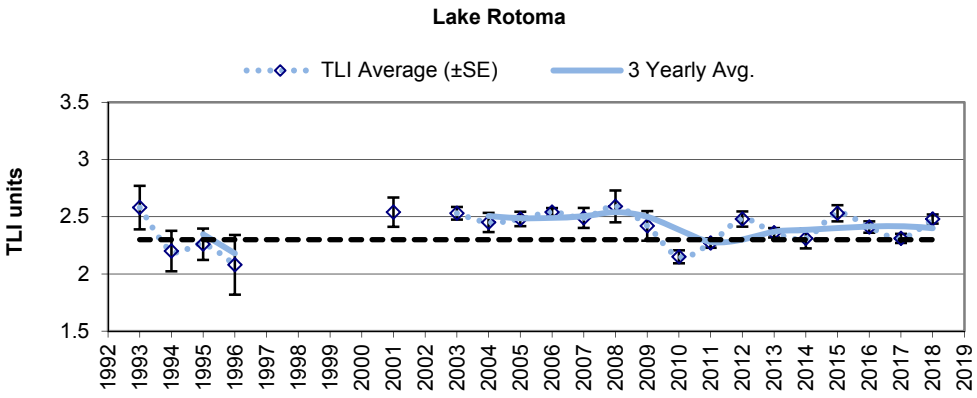


Figure 13: Lake Rotoma annual average and three year average TLI results, compared to the RNRP Objective TLI.

Lake Rotokakahi

The 2017/2018 TLI measured at Lake Rotokakahi (at the outflow) remains steady at 3.7, slightly reduced from last year's result of 3.8. The TLI still remains well above its RNRP objective of 3.1. The three year average TLI for 2017/2018 (as measured by TP, TN and chlorophyll-a) was 3.7.

Phosphorus concentrations remain stable (dissolved and total), with total nitrogen decreasing. The decrease in the TLI is mainly due to a decrease in chlorophyll-*a* concentrations over the year.

No cyanobacteria blooms were observed over the summer months.

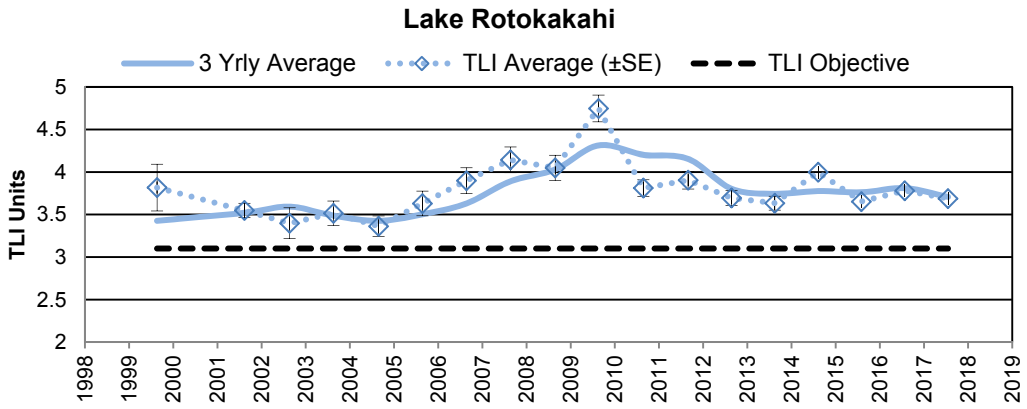


Figure 14: Lake Rotokakahi annual average and three year average TLI results, compared to the RNRP Objective TLI.

Annual Plan of Interventions – Deed Funded Lakes

Lake Rotorua

To meet community expectations for water quality in Lake Rotorua, nitrogen inputs must not exceed 435 tonne annually. This limit is set in the Bay of Plenty Regional Policy Statement.

The annual Trophic Level Index (TLI) for Lake Rotorua has moved from being just under the objective TLI of 4.2 to above the objective at 4.3 TLI units.

To achieve the objective TLI of 4.2 for Lake Rotorua, the programme is undertaking both short-term and long term interventions. Phosphorus locking (alum dosing) is a short-term intervention to help lower the lake TLI while long term interventions take effect. The lake will decline again if alum dosing is not carried out annually and this is not considered a long term solution to lake water quality. The solution to sustainable improvements is long term reduction of nutrients entering the lake, i.e. the Integrated Framework and Engineering Solutions, detailed as follows.

Planned and completed activities – Lake Rotorua

Project	Deed funded	Total target	12 month target	Annual reduction achieved	Update	Budget $000	Project status
Gorse	Yes	30 t (Reduction of nitrogen entering the lake)	4.0 t N	0.41 t N	Staff are continuing to work with the owners of eligible gorse blocks to promote the Lake Rotorua Gorse Programme. There are two agreements currently under negotiation which, if successful, will result in the removal of 120 ha of gorse from the catchment. However, the requirement for a 999 year encumbrance to be registered on land titles is proving to be a disincentive for some Maori owned land and this is slowing progress. A new implementation policy for this project was adopted during the year which identified that less gorse is present in the catchment than originally estimated. Consideration is being given to alternative options for securing nitrogen as part of the engineering solutions project.	**Budget** $547 **Spend** $118	
Rotorua Wastewater Treatment Plant – alternative disposal site	No	N/A	N/A	N/A	The resource consent application was submitted to Bay of Plenty Regional Council 20 August 2018.	**Budget** $0 **Spend** $0	N/A
Brunswick /Rotokawa sewage Connections	Yes	0.67 t N 0.553 t P	0.67 t N 0.553 t P	0 t N 0. t P	All unconnected properties have been written to and staff are working through the responses to that letter with relevant landowners.	**Budget** $320 **Spend** $30	

Project	Deed funded	Total target	12 month target	Annual reduction achieved	Update	Budget $000	Project status
Completed Lake Rotorua reticulation	Yes	9.74 t N 0.3 t P	9.74 t N 0.3 t P	9.74 t N 0.80 t P	Previously completed, reductions achieved annually.	**Budget** $0 **Spend** $0	N/A
Incentives	Yes	100 t N (Reduction of nitrogen entering the lake)	18.0 t N	11.36 t N	The Incentives Scheme has secured deals of around 20 tonnes of Nitrogen. Existing agreements continue to be implemented as per agreement conditions. Total reductions achieved to date through Incentives 18.89 t N to be put into effect over the next 4 years as activation dates fall due within the individual agreements.	**Budget Payments** $6,000 **Spend Payments** $1,477 **Budget Administration** $500 **Spend Administration** $444	
Tikitere Zeolite Plant	Yes	20-25 t N 0.0 T P	N/A	N/A	Detailed design and costs have been completed. Construction has been pushed out to 2019/2020 in the Regional Council's draft Long Term Plan. However, due to build cost and ongoing annual operational costs the project isn't likely viable.	**Budget** $684 **Spend** $833	

Project	Deed funded	Total target	12 month target	Annual reduction achieved	Update	Budget $000	Project status
Further engineering solutions	Yes	25-30 t N 0.0 t P	N/A	N/A	This project stalled in the first half of the financial year due to staff priorities in Plan Change 10 and related activities. Staff are currently working to get this project back on track so appropriate actions can be implemented for the 2022 deadline. The main opportunities for this are wetlands.	**Budget** $0	
Landowner support under PC10: Advice and Support Service	Yes	N/A	N/A	N/A	To date, 143 landowners have engaged with Advice and Support. There are 94 properties over 40 ha in area in the Lake Rotorua Catchment which require a resource consent this year and, of these, 87 are engaged with Advice and Support. Previously finalised Nutrient Management Plans (NMPs) are currently being re-worked to incorporate a greater emphasis on on-farm phosphorous mitigations as a result of the Commissioners' decisions on Plan Change 10. When completed, landowners will be able to use their NMP to support their application for resource consent.	**Advice and Support Budget** $501 **Spend** $337	
Landowner support under PC10 Low Nitrogen Land Use Fund	Yes	N/A	N/A	N/A	The first round of funding has been completed. Strategy Group have approved the second round plus an education campaign and these are being implemented.	**Budget** $501 **Spend** $194	
Phosphorous locking (Utuhina and Puarenga)	Yes	As required	As required	9.13 t P	Ongoing dosing maintained the lake total phosphorus within the range required.	**Budget** $750 **Spend** $720	

Project	Deed funded	Total target	12 month target	Annual reduction achieved	Update	Budget $000	Project status
Lake Rotorua Regional Water and Land Plan – Proposed Plan Change 10	No	140 t N (Reduction of nitrogen entering the lake)	NA	NA	Commissioner's decision released in August 2017. Appeals to that decision received and Environment Court hearing scheduled as detailed above. Plan Change has legal effect and is now being implemented with first consents granted.	**Budget** $0	
Nutrient Agreements (not Incentives Scheme)	No	N/A	3.9 t N 0.07 t N	1.23 t N 0.08 t P	Historical agreements in effect, nutrient reductions realised annually. Changes to versions of Overseer, density analysis 2001-2004 and applying in lake ratio means less nitrogen gains than originally reported.	**Budget** $0	N/A
			Total t N **Total t P**	**22.74 t N** **10.01 t P**	**Total budget 2017/2018** **Total expenditure 2017/2018**	**$9,804** **$4,154**	

Lake Rotoehu

To meet community expectations for water quality in Lake Rotoehu, a reduction of 8.9 tonne of nitrogen and 0.708 tonne of phosphorus is required on an annual basis.

The annual TLI for Lake Rotoehu has increased from 4.6 in 2016/2017 to 4.8 in 2017/2018. A significant increase in total nitrogen and chlorophyll-a concentrations has caused this increase.

Short term interventions of alum dosing have been put on hold due to inefficiencies. A Technical Advisory Group workshop is planned for late 2018 to establish next steps for Lake Rotoehu alum dosing. Another short term intervention, weed harvesting, progresses when required but due to little weed growth no weed harvesting was undertaken in the reporting period. A potential long term intervention for Lake Rotoehu is a sewerage scheme. Rotoehu Steering Group are in the process of evaluating options for the Rotoehu community.

Planned and completed activities – Lake Rotoehu

Project	Deed funded	Total target	12 month target	Annual reduction achieved	Update	Budget $000	Project status
Land use and land management change	Yes	6.6 t N 0.46 t P	8.45 t N 0.8 t P	8.45 t N 0.8 t P	Change completed previously, benefits realised annually. Figures reported are at the root zone.	**Budget** $0 **Spend** $0	N/A
Weed harvesting	Yes	3.5 t N 0.0 t P	3.5 t N 0.0 t P	0 t N 0 t P	Weed Harvester wasn't operational this season due to an algal bloom which inhibited weed growth.	**Budget** $100 **Spend** $39	

Project	Deed funded	Total target	12 month target	Annual reduction achieved	Update	Budget $000	Project status
Phosphorus locking	Yes	As required	As required	0 t N 2.00 t P	Research on p-locking in Lake Rotoehu has indicated that lake weed growth may be limiting the effectiveness of p-locking. Staff are investigating options to improve locking efficiency. A special WQTAG workshop is planned to address this matter. Alum dosing has been suspended until the workshop is completed. Resource consent application will need to be made during 2018/2019 to cover expiry of old consent.	**Budget** $136 **Spend** $134	
			Total t N **Total t P**	**8.45 t N** **2.8 t P**	**Total budget 2017/2018** **Total expenditure 2017/2018**	**$236** **$175**	

Lake Rotoiti

To meet community expectations for water quality, Lake Rotoiti needs a reduction of 130 tonne of nitrogen and 19 tonne of phosphorus.

Lake Rotoiti's annual average TLI continues to increase and now sits at a TLI of 3.9. Phosphorus levels have shown some improvement, while Nitrogen increased marginally.

The Ohau Diversion Wall has been in place since 2008 to help improve water quality by diverting Lake Rotorua nutrients from Lake Rotoiti while long term nutrient reductions into Lake Rotorua are achieved. A structural management plan for the Wall was has been finalised, with structural components being installed during 2018/19. Construction of the Wastewater Treatment Plant and Land Disposal system for the Gisborne Point/Hinehopu area is well underway and commissioning is expected later in 2018/19. This will complete sewerage reticulation for Rotoiti.

Planned and completed activities – Lake Rotoiti

Project	Deed funded	Total target	12 month target	Annual reduction achieved	Update	Budget $000	Project status
Sewerage reticulation Curtis Road to Hinehopu	Yes	4.9 t N 1.1 t P	0 t N 0 t P	0 t N 0 t P	Construction of the Rotomā/Rotoiti Wastewater Treatment Plant and Land Disposal System is well underway. Biolytix system trial is complete.	**Budget** $4,920 **Spend** $3,093	
Ohau diversion wall	Yes	150 t N 15 t P	150.0 t N 15.0 t P	150 t N 15 t P	Structural management plan has been finalised with structural components to be installed in 2018/2019 financial year. Four fish passes have been installed. Staff are working with iwi to undertake restoration works in the Ōhau Channel area.	**Budget** $514 **Spend** $22	

Project	Deed funded	Total target	12 month target	Annual reduction achieved	Update	Budget $000	Project status
Completed Rotoiti reticulation: Okere, Otaramarae, Whangamarino, Mourea, Okawa Bay	Yes	9.3 t N 0..78 t P	5.82 t N 0.48 t P	5.82 t N 0.48 t P	Completed reticulation for 62% of households – reduction ongoing annually. Construction of remaining reticulation underway as identified above.	**Budget** $0	
			Total t N **Total t P**	**155.82 t N** **15.48 t P**	**Total budget 2017/2018** **Total expenditure 2017/2018**	**$5,434** **$3,115**	

Lake Ōkāreka

To meet community expectations for water quality annual nutrient reductions of 2.5 t nitrogen and 0.08 t of phosphorus are required.

While all the previously planned actions for Lake Ōkāreka are complete, the lake hasn't reached its target TLI of 3.0 and has seen an increase over the last two years.

A project was undertaken to audit the current nutrient discharges from properties in the catchment and ensure they are complying with their nutrient Benchmark. The audit has identified that all but one property is complying with its Benchmark. Support has been offered to that property. Incentives for further land use change in the catchment have been offered to all owners of sufficient land and staff are negotiating with interested parties. Professor Hamilton from University of Waikato presented modelling progress results to the community in March. Monitoring is still ongoing.

Completed activities – Lake Ōkāreka

Project	Deed funded	Total target	Annual target	Annual reduction achieved	Update	Budget $000	Project status
Sewerage scheme	Yes	2.83 t N 0..23 t P	2.83 t N 0.3 t P	2.83 t N 0.23 t P	Reticulation complete, nutrient reductions recognised annually.	**Budget** $0	N/A
Previous land use change	Yes	1.18 t N 0.22 t P	1.18 T N 0.22 T P	1.18 t N 0.22 t P	Land use change complete, nutrient reductions recognised annually. Negotiations are underway to increase nutrient reduction to Lake Ōkāreka through further land use change. These figures are reported at the root zone.	**Budget** $0	N/A
Lake Ōkāreka land use change	Yes	NA	NA	NA	Following an audit all but one property has been found to be compliant with its Benchmark. All large property owners have been approached and offered funding to convert pasture to trees, as a result staff are negotiating a further 50 ha of mānuka planting which will replace gorse and pasture. This represents 50% of the current land use change target.	**Budget** $50	
			Total t N **Total t P**	**4.01 t N** **0.45 t P**	**Total budget 2017/2018** **Total expenditure 2017/2018**	**$50** **$35**	

Te Tuapapa o ngā Wai o Te Arawa/Te Arawa Cultural Values Framework

Te Tuapapa o nga wai o Te Arawa (Te Tuapapa) is a high level cultural values framework that describes the relationship between Te Arawa and the Te Arawa Lakes. It provides a framework to ensure that Te Arawa values are reflected in the management and restoration of the lakes.

The focus during 2017/2018 has been on re-engaging with, and encouraging, hapū and iwi to be involved with, and in some cases, take ownership of projects. We have been taking a bottom-up approach to embedding Te Tūāpapa within the work that we do. The Regional Council has also funded a number of projects to support the implementation of Te Tuapapa.

Stronger working relationships with hapū and iwi in relation to:	• Statutory responsibilities - lake structure consent renewals, wastewater projects, Plan Changes 9 and 10 to the Regional Water and Land Plan, Te Arawa Freshwater Fisheries Regulations (released January 2018). • Progressing a cultural mapping project, associated with lake structure consent renewals (Lakes Rotorua, Rotoma and Rotoehu). • Environmental enhancement projects: ▪ Support to Ohinemutu Pā (Te Kōmiro o Utuhina) residents to progress clean-up of Lakefront and Utuhina Stream. ▪ Engagement with Mokoia Island Trust Board and erosion control project for Hinemoa's pool – Waikimihia. ▪ Connecting Rotorua Lakes Council and Otaramarae Trustees regarding lakes access to Rotoiti. ▪ Support to Ngati Ngararanui regarding restoration of the Waiteti Stream.
Bringing hapū and iwi together:	• Establishment of a Te Arawa Kaitiaki/Hunga Tiaki Forum as a way of bringing the Trust, iwi and hapū together to share, learn and build capacity. Two wānanga were held 2017 with a further two planned for 2018. • Establishment of a Te Arawa Climate Change (Technical) Working Group. It is intended that a Te Arawa Freshwater (Technical) Working Group will be established in 2018. • Developing the methodology and programme for a cultural health assessment of all lakes within the Tarawera System. An action in the Tarawera Lakes Restoration Plan.

Communicating our values and technical information in a useful, visual and meaningful way:	• Development of information sheets for each lake – uploaded to the Trust's website. • Increased use of Facebook as our primary method of sharing information. • Development of an Iwi Management Plan for the Trust. Discussion document completed and released. • Employment of Te Hunga Hika ahi – Hapori (Community Action Coordinator) for the Catfish reduction programme. Funded by the Bay of Plenty Regional Council's Biosecurity Activity.
Identifying opportunities to apply a collective impact model to our work:	• Working with hapū to identify river and wetland restoration projects for Lake Rotorua. • Sowing the seed to apply a collective impact model for Tarawera 8 Lakes System. Interest from Maori landowners with regards to pest control, biodiversity enhancement, water quality improvement.
Supporting research projects:	• PhD student Tracey Takuira is researching the impacts of land use and nutrients on wetlands and how this effects kuta – a traditional weaving material found in wetlands. • Scion scientist Marie Joo Guen is undertaking research around contaminant filtering in the lakes. • A joint project with Ngati Tarawhai regarding a fisheries-related project within Lake Okataina has been funded by WaiOra. • Scion and the Te Arawa Lakes Trust have secured funding for a research project to support development of a Te Arawa Climate Change Strategy for the Te Arawa Climate Change Working Group • Support to Waikato University for a research project that seeks to understand how to prevent catfish eating koura.

Annual Plan of Interventions - Non-Deed Funded

Work has continued on the non-deed lakes to protect and enhance their water quality. Action plans for these non-deed funded lakes are all in various stages of formation and implementation. The implementation of the National Policy Statement for Freshwater Management (NPS-FM) process has commenced with a stocktake of the information collected previously for these lakes. This will inform upcoming policy development for these lakes.

Lake Tarawera

Lake Tarawera	Lake Tarawera achievements 2017/2018
Action 1 – Wastewater management	The Tarawera Sewage Steering Committee has secured funding from the Government's Freshwater Improvement Fund. However, further funding will need to be secured to enable the scheme to go ahead and the Committee is currently pursuing this. The planning process of the Scheme has continued in anticipation of further funds becoming available. The preferred option is currently to connect the reticulation at Tarawera to the Ōkāreka scheme, taking it back to the Rotorua Wastewater Treatment Plant. To ensure that the benefits of the large investment in this Scheme are maintained, a 'hold the line' style rule will be required in the Tarawera Catchment and is being investigated as part of region wide work on the NPS-FM.
Action 2 and 4 – Farm Environment Plans for inner and outer catchment farms: Lakes Ōkaro, Rerewhakaaitu, Rotokakahi and Rotomahana	A partnership project including the local farming collective - Project Rerewakaiitu, Fonterra and Beef and Lamb New Zealand is currently making excellent progress in establishing Farm Environment Plans for larger farms in the inner and outer catchment of Lake Tarawera. Farmer uptake is voluntary but despite this, only three farmers have declined to take part, 31 dairy farms and 18 drystock farms now having plans. A final project report and presentation to famers for direction on next steps is pending.
Action 3 – Control of nitrogen fixing plants	14.7 ha of Acacia control was carried out for 17 weeks around Lake Rotomahana's Isthmus Track. This project remains a successful and practical project run in conjunction with the local people and providing local employment. Funding has also been provided this year by Te Ariki Trust.
Action 5 – Limit on land use change	A regional water quality plan change is being scoped, taking into account the need for a 'hold the line' approach across many of the water bodies in the region, including Lake Tarawera. This is also dependent on the direction of the new Government, this being a key interest of theirs.

Lake Tarawera	Lake Tarawera achievements 2017/2018
Action 6 – Groundwater modelling	This work is underway by the University of Waikato and is expected to be completed later in 2018.
Action 7 – Cultural health assessment	This project is being led by Te Arawa Lakes Trust. Currently developing the methodology and programme for a cultural health assessment of all lakes within the Tarawera System.

Lake Ōkaro

Lake Okaro	Lake Okaro achievements 2017/2018
Action Plan	Water quality in Lake Okaro has fluctuated over the last 10 years. All actions in the action plan have been completed. The lake reached its target TLI in 2010, 2014, 2015, 2016 and 2017. The target of 5.0 is still classified as a eutrophic lake and as such, algal blooms are likely to be a regular annual feature.
Lake modelling – University of Waikato	The University are assisting with modelling land use scenarios and the effect on lake water quality. This project has been delayed due to other priorities.

Lake Rotomā

Lake Rotomā	Lake Rotomā achievements 2017/2018
Sewerage reticulation	Construction of the wastewater treatment plant and reticulation is well underway. The resource consent application for the Land Treatment System has been submitted to Bay of Plenty Regional Council.
Forest harvesting effects investigations	The harvest operation has been completed. More detailed results will be available at the completion of the monitoring project in December 2019.

Lake Rotokakahi

Lake Rotokakahi	Lake Rotokakahi achievements 2017/2018
Action Plan	This lake is privately owned, more information has been collected to help inform an action plan for the lake. Staff will progress with the owners whether an action plan is necessary.

Lake Tikitapu

Lake Tikitapu	Lake Tikitapu 2017/2018
Sewerage reticulation	Sewerage reticulation has been completed for Lake Tikitapu in 2010. No further work has been required for the Lake this financial year.

Financials

This section provides financial information as per the Deed of Funding with the Ministry for the Environment. The information contained here aligns with the content of the Annual Plan 2017/2018 for both Rotorua Lakes Council and Bay of Plenty Regional Council.

Rotorua Te Arawa Lakes Programme - Report B

Draft - Financial Progress Statement - Annual Report 2017/18 (July to June 2018)

Interventions	(A) Council Annual Plan Budget	(B) Actual year to date expenditure	(B - A) Variance to date over/(under) spend	Provision for signed agreement not yet released	(B / A) Actual progress to date	Intervention Financial progress indicator	Financial status to date	Intervention project progress indicator	(D) Council funding excluding Crown grants (50% of B)	(E) Approved Crown funding 2017/18	(F) Crown funding received to date	(G) = (B - D) 50% Crown funding applied to date	(H) Reserve interest accrued	(I) Other funding sources	(J) 2017/18 Agreements Provision	
	Funding deed clause 5.4.1								5.4.2 (a) Note 1	5.4.2 (b) / 5.2.2 (d)			5.4.2 (c)	5.4.2 (d) Note 2		
Lake Rotoehu	$000	$000	$000	$000	%				$000	$000	$000	$000	$000	$000	$000	
Weed Harvesting	100	39	(61)	0	39%		At risk		20	50	25	20	0	0	0	Change Request CR060 underspend of $90,000 approved by PSG 3 April 2018. Since that time contract for harvester renegotiated to pay retainer to operator, also maintenance costs and vessel manual update costs.
Land Management Change	0	0	0	0					0	0	0	0	0	0	0	
Phosphorus Locking Soda Springs	136	134	(2)	0	98%		On track		67	68	68	67	0	0	0	
Aeration	0	1	1	0					1	0	0	1	0	0	0	
Sediment	0	1	1	0					1	0	0	1	0	0	0	
Wetlands	0	0	0	0					0	0	0	0	0	0	0	
Total Lake Rotoehu	**236**	**175**	**(61)**	**0**					**88**	**118**	**93**	**88**	**0**	**0**	**0**	
Lake Ōkāreka																
Sewerage Reticulation	0	0	0	0					0	0	0	0	0	0	0	
Land Management Change	50	35	(15)	0	71%		Moderate risk		18	0	25	18	0	0	0	Change Request 58 approved to include budget as approved in 206 Strategy Group Report. Expenditure on Benchmark auditing only, agreements still pending.
Outlet Structure	0	0	0	0					0	0	0	0	0	0	0	
Total Lake Ōkāreka	**50**	**35**	**(15)**	**0**					**18**	**0**	**25**	**18**	**0**	**0**	**0**	
Lake Rotorua																
Advice and Support	501	337	(165)	0	67%		At risk		168	251	251	168	0	0	0	Advice and Support on track with all willing landowners over 40 ha now enrolled. Change request?
Phosphorus Locking	750	720	(30)	0	96%		On track		360	375	375	360	0	0	0	
Tikitere Diversions	684	833	149	0	122%		Moderate risk		417	342	342	417	0	0	0	Overspent at year end due to design, costing and preparation works being ahead of schedule. Change request?
Gorse	547	118	(430)	0	21%		At risk		59	274	137	59	0	0	0	Less gorse available for conversion than originally estimated. Change request?
Wetlands	0	0	0	0					0	0	0	0	0	0	0	
Land Incentive Payments	6,000	1,477	(4,523)	2,698	70%		Moderate risk		739	3,000	1,018	739	0	0	0	Less agreements signed/paid than budgeted. Change request?
Land Incentive Board Administration	500	444	(56)	0	89%		On track		222	250	251	222	0	0	0	Change request?
Low Nutrient Land Use Fund	501	194	(307)	0	39%		At risk		97	251	126	97	0	0	0	Underspent due to key staff member on maternity leave during period. Significant work/expenditure occurring now. Change request?
Sewerage Reticulation	320	30	(290)	0	9%		At risk		15	160	0	15	0	0	0	
Total Lake Rotorua	**9,804**	**4,154**	**(5,650)**	**2,698**					**2,077**	**4,902**	**2,499**	**2,077**	**0**	**0**	**0**	
Lake Rotoiti																
Sewerage Reticulation	4,920	3,093	(1,827)	0	63%		At risk		1,547	2,460	0	1,547	0	0	0	Underspent due to the delay in agreement with land owners (lease from Maori Trust), which setback the start date for construction of the treatment plant.
Ohau Wall Reconsenting	514	22	(492)	0	4%		At risk		11	257	128	11	0	0	0	Underspent due to environment court hearing for reconsenting not required. Change request?
Total Lake Rotoiti	**5,434**	**3,115**	**(2,319)**	**0**					**1,558**	**2,717**	**128**	**1,558**	**0**	**0**	**0**	
Rotorua District																
Treatment and Disposal	0	0	0	0	0%		At risk		0	0	0	0	0	0	0	
Total Rotorua District	**0**	**0**	**0**	**0**					**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Total Programme by Council																
Rotorua Lakes Council	5,240	3,123	(2,117)	0					1,562	2,620	0	1,562	84	0	0	
Bay of Plenty Regional Council	10,284	4,356	(5,928)	2,698					2,178	5,117	2,745	2,178	48	0	0	
	15,524	**7,479**	**(8,045)**	**2,698**					**3,740**	**7,737**	**2,745**	**3,740**	**132**	**0**	**0**	
Total Programme Expenditure	**15,524**	**7,479**	**(8,045)**	**2,698**					**3,740**	**7,737**	**2,745**	**3,740**	**132**	**0**	**0**	

Indicator Key		
Less than 20%		On track
Between 21 - 29%		Moderate risk
Greater than 30%		At risk

Programme reserve account interest accrued

5.4.2 (a) Note 1: Funding detail - Council (includes provision)		
RLC general funding	1,562	2,620
RLC reserve	1,562	84
BoPRC reserves	3,527	0
BoPRC targeted rates	1,764	0
BoPRC general funding	1,764	0
Total funding detail - Council	**10,177**	**2,704**
5.4.2 (b) Note 2: Funding detail - any other source	0	0
Miscellaneous income	**0**	**0**
Total funding from any other source		

Rotorua Te Arawa Lakes Programme - Report C
Draft - CFO Forum Financial Detailed Statement - Annual Report 2017/18 Year End

Clause 5.2 / 5.4.2 (e) Interventions	(A) Council Annual Plan Budget	(B) Actual expenditure to date 2017/18	(C) Remaining forecast expenditure to year end	D = (B+C) 5.2.2 a Total actual + forecast expenditure to year end 2017/18	E = (A-D) Forecast variance to Annual Plan over/(under) spend 2017/18	Provision for signed agreement not yet released	Year end forecast under/overspend status	(F) Council funding 5.2.2 C (i) Council funding	Council reserve	(G) Crown Funding 5.2.2 D Forecast Annual Work Programme Crown Funding 2017/18	Programme reserves MfE surplus / (deficit)	Reserve interest received	(H) Funding from any other sources	(I) = (F-G) Total funding required	(J) = (A-I) Total Programme over/(under) spend	2016/17 Opening reserve balance commitment	5.4.2 (e) Forecast funding committed to deferred works
Lake Rotoehu	$000	$000	$000	$000	$000	$000		$000	$000	$000	$000	$000	$000	$000	$000	$000	$000
Weed Harvesting	100	39	0	39	(61)	0	Underspend	10	10	25	5		0	39	(61)	0	0
Land Management Change	0	0	0	0	0	0		0	0	0	0		0	0	0	0	0
Phosphorus Locking Soda Springs	136	134	0	134	(2)	0	Underspend	33	33	68	1		0	134	(2)	0	0
Aeration	0	1	0	1	1	0		0	0	0	(1)		0	1	1	0	0
Sediment capping	0	1	0	1	1	0		0	0	0	(1)		0	1	1	0	0
Wetlands	0	0	0	0	0	0		0	0	0	0		0	0	0	0	0
Total Lake Rotoehu	**236**	**175**	**0**	**175**	**(61)**	**0**		**44**	**44**	**93**	**5**		**0**	**175**	**(61)**	**0**	**0**
Lake Ōkāreka																	
Sewerage Reticulation	0	0	0	0	0	0		0	0	0	0		0	0	0	0	0
Land Management Change	50	35	0	35	(15)	0	Underspend	9	9	25	7		0	35	(15)	0	0
Outlet Structure	0	0	0	0	0	0		0	0	0	0		0	0	0	0	0
Total Lake Ōkāreka	**50**	**35**	**0**	**35**	**(15)**	**0**		**9**	**9**	**25**	**7**		**0**	**35**	**(15)**	**0**	**0**
Lake Rotorua																	
Advice and Support	501	337	0	337	(165)	0	Underspend	84	84	251	82		0	337	(165)	50	0
Phosphorus Locking	750	720	0	720	(30)	0	Underspend	180	180	375	15		0	720	(30)	0	0
Tikitere Diversions	684	833	0	833	149	0	Overspend	208	208	342	(75)		0	833	149	0	0
Gorse	547	118	0	118	(430)	0	Underspend	29	29	137	78		0	118	(430)	200	0
Wetlands	0	0	0	0	0	0		0	0	0	0		0	0	0	0	0
Land Incentive Payments	6,000	1,477	0	1,477	(4,523)	2,698	Underspend	369	369	1,018	279		0	1,477	(4,523)	750	928
Land Incentive Board Administration	500	444	0	444	(56)	0	Underspend	111	111	250	28		0	444	(56)	0	0
Low Nutrient Land Use Fund	501	194	0	194	(307)	0	Underspend	49	49	126	28		0	194	(307)	0	0
Sewerage Reticulation	320	30	0	30	(290)	0	Underspend	8	8	0	(15)		0	30	(290)	160	0
Total Lake Rotorua	**9,804**	**4,154**	**0**	**4,154**	**(5,650)**	**2,698**		**1,038**	**1,038**	**2,498**	**421**		**0**	**4,154**	**(5,650)**	**1,160**	**928**
Lake Rotoiti																	
Sewerage Reticulation	4,920	3,093	0	3,093	(1,827)	0	Underspend	773	773	0	(1,547)		0	3,093	(1,827)	4,103	2,476
Ohau Wall Reconsenting	514	22	0	22	(492)	0	Underspend	6	6	128	117		0	22	(492)	0	0
Total Lake Rotorua	**5,434**	**3,115**	**0**	**3,115**	**(2,319)**	**0**		**779**	**779**	**128**	**(1,430)**		**0**	**3,115**	**(2,319)**	**4,103**	**2,476**
Rotorua District																	
Treatment and Disposal	0	0	0	0	0	0		0	0	0	0		0	0	0	0	0
Total Rotorua District	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**0**	**0**	**0**		**0**	**0**	**0**	**0**	**0**
Total Programme - Expenditure	**15,524**	**7,479**	**0**	**7,479**	**(8,045)**	**2,698**		**1,870**	**1,870**	**2,744**	**(996)**		**0**	**7,479**	**(8,045)**	**5,263**	**3,405**
Programme Expenditure by Council including interest																	
Rotorua Lakes Council	5,240	3,123	0	3,123	(2,117)	0		781	781	0	(1,562)	84	0	3,123	(2,033)	4,263	2,476
Bay of Plenty Regional Council	10,284	4,356	0	4,356	(5,928)	2,698		1,089	1,089	2,744	566	48	0	4,356	(5,880)	1,000	928
Total Programme	**15,524**	**7,479**	**0**	**7,479**	**(8,045)**	**2,698**		**1,870**	**1,870**	**2,744**	**(996)**	**132**	**0**	**7,479**	**(7,913)**	**5,263**	**3,405**
Funding by Authority including interest																	
MfE	7,762	3,740	0	3,740	(4,022)	0		0	0	2,744	0	132	0	(1,128)	0	5,263	
Rotorua Lakes Council	2,620	1,562	0	1,562	(1,059)	0		781	781	0	0	0	0	0	0	(4,263)	
Bay of Plenty Regional Council	5,117	2,178	0	2,178	(2,964)	2,698		1,089	1,089	0	0	0	0	0	0	(1,000)	
Total Funding by Authority	**15,499**	**7,479**	**0**	**7,479**	**(8,045)**	**2,698**		**1,870**	**1,870**	**2,744**	**0**	**132**	**0**	**(1,128)**	**0**	**(0)**	

Report movement summary comments:	Opening Reserve Balance 2017/18	1st Qtr. Report - Forecast year end movement (expenditure & revenue)	6 Month Report - Forecast year end movement (expenditure & revenue)	Qtr 3 Report - Forecast year end movement (expenditure & revenue)	Qtr 4 Report - Year end movement (expenditure & revenue)	2017/18 Year end reserves balance	Comments
By Intervention							
Lake Rotoehu	0	0	10	59	(5)	5	
Lake Ōkāreka	0	1	0	0	(7)	7	
Lake Rotorua	1,595	1,131	1,020	993	(421)	2,016	
Lake Rotoiti	4,022	2,460	2,439	1,139	1,430	2,592	
Rotorua District	0	0	0	0	0	0	
	5,617	**3,592**	**3,469**	**2,192**	**996**	**4,621**	
By Council							
Rotorua Lakes Council	3,954	2,620	2,485	1,185	1,562	2,392	
Bay of Plenty Regional Council	1,664	972	984	1,007	(566)	2,229	
	5,617	**3,592**	**3,469**	**2,192**	**996**	**4,621**	
Accrued interest	0	116	119	144	132	(132)	
Provision funded	0	0	0	0	1,349	(1,349)	
Forecast reserve balance	**5,617**	**3,476**	**3,350**	**2,048**	**2,213**	**3,405**	

Receives Only – No Decisions

Report To: Rotorua Te Arawa Lakes Strategy Group

Meeting Date: 02 November 2018

Report From: David Phizacklea, Regional Integrated Planning Manager

Changing the On-site Effluent Treatment Regional Plan - implications for Rotorua Te Arawa Lakes

Executive Summary

On-site effluent treatment (OSET) systems are for treating human wastewater on a property. Bay of Plenty Regional Council is responsible for the management of discharges from these systems to ensure discharges do not contaminate the environment.

Draft Plan Change 14 (OSET) is to replace the current On-site Effluent Treatment Region Plan, by including updated policies and rules into the Bay of Plenty Regional Natural Resources Plan.

The key changes between the current On-site Effluent Treatment Regional Plan and Draft Plan Change 14 are:

- The requirement to upgrade an existing system to an AWTS+NR within 200 metres of the lake shore has been removed.
- Existing soak holes are to be prohibited and must be replaced by a trench system.
- Rules for communities where reticulation is planned have been written as 'holding patterns' prior to reticulation.
- New rules for un-reticulated papakāinga developments have been included.
- New rules for composting toilets and greywater discharges have been included.

A presentation will be given at the meeting.

Recommendations

That the Rotorua Te Arawa Lakes Strategy Group:

1 Receives the report, Changing the On-site Effluent Treatment Regional Plan - implications for Rotorua Te Arawa Lakes;

1 Purpose of report

To provide an overview of Draft Plan Change 14 (On-site Effluent Treatment - OSET), including implications for the catchments of the Rotorua Te Arawa lakes.

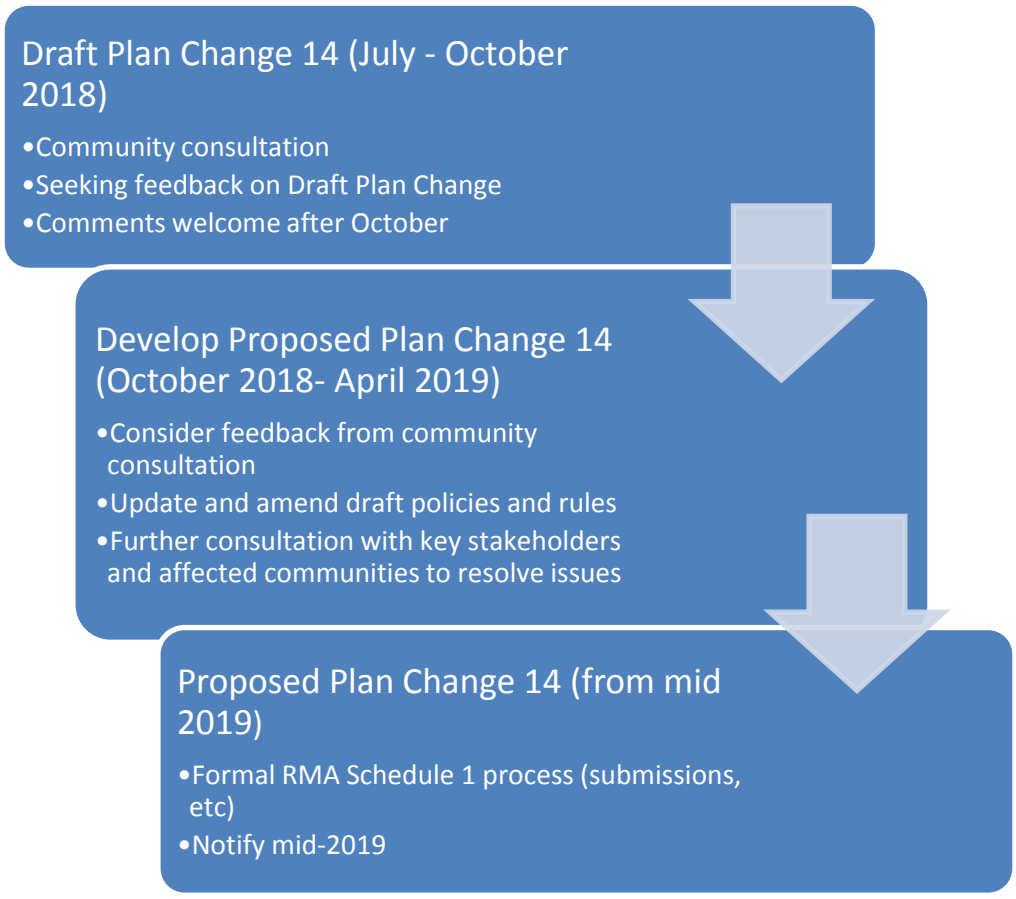
A presentation will be given at the meeting.

2 Draft Plan Change 14 (OSET)

On-site effluent treatment (OSET) systems are for treating human wastewater on a property. These include septic tanks and aerated wastewater treatment systems (AWTS), composting toilets, greywater use, long drops, and alternative technologies such as incinerating toilets.

Under the Resource Management Act 1991 (RMA) the Bay of Plenty Regional Council (BOPRC) is responsible for the management of discharges from OSET systems to ensure discharges do not contaminate the environment. BOPRC has a current On-site Effluent Treatment Regional Plan to help manage these discharges but it is more than 10 years old and needs updating. Draft Plan Change 14 (OSET) is to replace the current plan, and include the updated rules into the Regional Natural Resources Plan. Draft Plan Change 14 does not apply to dairy shed effluent or municipal sewerage discharges. There are separate rules in the Bay of Plenty Regional Natural Resources Plan for these.

3 Draft Plan Change 14 process



4 OSET management in the catchments of the Rotorua Te Arawa Lakes

When developing Draft Plan Change 14 (OSET), these key principles were applied:

- Protect lake water quality, particularly from nutrients and bacteria discharged from OSET systems.
- In the Lake Rotorua catchment, co-ordinate OSET management with Plan Change 10 (Lake Rotorua Nutrient Management).
- Ensure the public health risks from OSET are managed.
- Consider the individual characteristics of each lake, including reticulation status and land use. This has led to sets of rules an individual lake or group of similar lakes.
- Take a practical and pragmatic approach.

5 Key changes in Draft Plan Change 14

The key changes between the current On-site Effluent Treatment Regional Plan and Draft Plan Change 14 are:

- The requirement to upgrade an existing system to an AWTS+NR within 200 metres of the lake shore has been removed. This is because settlement areas near the shore have either been reticulated, or reticulation is planned. There are very few systems within the 200 metres limit in the rural lake catchments.
- Existing soak holes are to be prohibited and must be replaced by a trench system. Soak holes do not provide the additional treatment and nutrient removal that a land application method (e.g. soakage trenches) allows. They are also a higher risk to the environment by discharging wastewater potentially close to groundwater. Timing issues around when existing soak holes are to be replaced need to be resolved.
- Rules for communities where reticulation is planned have been written as 'holding patterns' prior to reticulation.
- New rules for un-reticulated Papakāinga developments. The current Plan contains rules for the Western Bay of Plenty only. These rules have been extended to the rest of the region. In the Rotorua Te Arawa Lakes catchments, the Papakāinga rules link to the rules for individual lakes (i.e. what types of OSET systems are permitted or require resource consent).
- New rules for composting toilets and greywater discharges. There are some nutrient management issues to resolve around composting toilets.

6 Remaining issues to resolve

Consultation to date on Draft Plan Change 14 in relation to the Rotorua Te Arawa Lakes has identified the following issues. These will be worked through and resolved prior to notification of any proposed plan change in mid-2019.

- Ensure suitable OSET 'holding patterns' for Mamaku Village, Lake Tarawera, Ngamotu (Doctors Point) – Lake Rotomā, Tumoana Point – Lake Rotoiti, and Ngamimiro Bay and Ōtautū Bay - Lake Rotoehu. This is to appropriately manage the costs and benefits before a long-term solution is implemented. For Lake Tarawera, this is reticulation. For Mamaku Village, the long-term solution is still to be investigated.

- Ensure rules for composting toilets (i.e. the discharge of composted material) are appropriate in the lake catchments.

- Consider new technology that achieves the required OSET discharge of 15 grams nitrogen per cubic metre limit to future-proof the rules (e.g. allow for 'add on' technology for septic tanks, etc).

- Check the OSET requirements and rules are clear, can be achieved and enforced, and make sense for individual lakes and their communities.

7 How Draft Plan Change 14 affects Māori

Draft Plan Change 14 does not affect households, marae or papakāinga that are connected to a reticulated sewage scheme.

7.1 Households

Costs to individual households vary depending on location, if the area is planned for reticulation, and if OSET system upgrades are required. The requirements and cost implications will be carefully considered prior to the notification of the proposed plan change. This is particularly important for Mamaku Village, Ngamotu (Doctors Point) – Lake Rotomā, Tumoana Point – Lake Rotoiti, and Ngamimiro Bay and Ōtautū Bay - Lake Rotoehu. The Tarawera Sewerage Steering Group is working on the reticulation of Lake Tarawera community.

7.2 Marae

Marae often play an important role within a community. They can also be used during civil emergency and so their OSET systems need to be robust and be able to operate well even under high loads during events.

Bay of Plenty Regional Council is working on developing a proposal for a Marae OSET project. Overall, the knowledge about the risk to the environment from Marae OSET systems in the Bay of Plenty is low. This problem has been previously raised, with the view that a project should be started to improve that knowledge, and provide a good basis for assisting Marae on this matter.

The key point of a project is to understand whether or not Marae in the Bay of Plenty have issues relating to their wastewater, and, if it's appropriate, looking at ways in which Bay of Plenty Regional Council can help. The end goal of a Marae OSET project is to protect the environment, protect peoples' health, and to keep Marae fit for purpose.

7.3 Papakāinga Housing Developments

The draft plan change provides for papakāinga to enable development of multiple-owned Māori land, while making sure the OSET systems are designed to protect the environment and peoples' health. Bay of Plenty Regional Council staff also provide support and assistance on onsite effluent treatment issues where resource consent is needed.

8 Next steps in the Plan Change 14 process

The next step is to develop a proposed plan change for formal notfication for public submissions. Proposed Plan Change 14 will be developed over October 2018 to April 2019 and will involve:

- Considering the feedback received on Draft Plan Change 14.
- Further consultation with key stakeholders and affected communities to resolve issues, or provide an update of changes to be made to the OSET requirements.
- Working with the district and city councils to ensure the policies and rules are clear and appropriate. Regional Council will be working with Rotorua Lakes Council staff on a work programme for the communities listed in section 6 above.

Subject to the above, Proposed Plan Change 14 (OSET) and its Section 32 evaluation report will likely be publicly notified in mid-2019. At this point the formal process is followed, with submissions, further submissions, hearing and decisions.

Ruth Feist
Team Leader - Integrated Planning

for Regional Integrated Planning Manager

23 October 2018