

Water Quality Technical Advisory Group

Rotorua Te Arawa Lakes Programme

Meeting Notes - 25 May 2022

Meeting held in Rotorua and ZOOM.

Attendees: Grant Tempero, Ian Kusabs, Paul Scholes, Deniz Ozcundacki, Justine Randel, Dean Meason, Max Gibbs, Ian Kusabs, Kit Rutherford, Andy Bruere, Chris McBride, Mariana Te Rangi, Alison Lowe, Paul White, James Dare, Helen Creagh (note taker).

Apologies: Piet Verberg, Craig Depree, Rob Donald.

Meeting Started – 9am

Summary on Progress from Actions from previous meeting (refer previous minutes):

Action One – Andy has circulated objective of review for comment and Michelle Lee's memo on the setting of the TLI Targets. **CLOSE.**

Action Two – Keith Hamill working on TLI review with draft due at the end of the June 2022. Kit Rutherford able to assist as required. Agenda item below to discuss. **CLOSE.**

Action Three: Three step Review for NPS internal lake loads and reduction targets – underway, James Dare working on this for us. Piet looking to deliver draft report soon. **ONGOING.**

Action Four: Sub-group to finalise brief on climate change and bring back to TAG. Considered that current brief would unlikely add significant value on top of what we already know. **CLOSE** - Instead Deniz to lead work to quantify additional change that may be required in our catchments due to climate change – this is within the Research Themes work UoW.

Action Five – Nano bubbles - Andy has circulated notes and no further input from TAG required. **CLOSE.**

Action Six – Piet has circulated nutrient limitation paper. **CLOSE.**

Action Seven – Underway – Rotoehu alum, low dosing rate continued until new consent application moves through process. **CLOSE.**

Action Eight and Nine – Monitoring of Lake Rotoehu inflows cut down to quarterly. James has reviewed correlation between sites but has found limited linkages between them. **CLOSE.**

Action Ten – PC10 Science Review – Agenda item included below. **CLOSE.**

Action Eleven – Puarenga data presented by Alison in relation to monitoring around wastewater disposal site. **CLOSE.**

Action Twelve – Nicki Wilson presenting on research project during meeting. **CLOSE.**

Action Thirteen – Paul White below looking at available data for Lake Rotorua to see if any relationships emerge in relationship to DO events in the lake. **ONGOING.**

1. Presentation from Nicki Wilson – Masters Thesis

Presentation from Nicki Wilson on her thesis regarding flows of water and nutrients to Lake Tarawera and connected lakes. Objective to improve understanding of groundwater flows in and out of the Lake Tarawera Catchments, using water isotopes as an environmental tracer and also a water balance to describe flows and nutrient flows through the lakes. Acknowledgement expressed by members for the impressive amount of work that has gone into this thesis.

2. Ōkaro Model

Completed. Deniz to get finalised version.

New Action One to ensure that there is public access to new Ōkaro model through Regional Council and University Websites. (Andy/Deniz).

3. Plan Change 10 Science Review

Noted that this is currently underway, have prioritised undertaking some of the 48 actions from the last review. Priority is showing land use change, retirement areas and reductions in nutrient load using geospatial and accounting tools. Prof Warwick Vincent from Canada who completed the last review will undertake this one also. Will be completed this year.

New Action Two for Andy to circulate Terms of Reference for Science Review.

4. Lakes and Freshwater Chair Research Themes

Deniz presented his research themes for the Chair role which he has worked with stakeholders to determine and propose as follows:

1. Climate Change impacts of freshwater ecosystems
2. Ecological restoration/emerging restoration techniques
3. Connectivity and sustainable catchments
4. Remote sensing and automation of monitoring
5. Mātauranga Māori and taonga species
6. Outreach/citizen science

Deniz also explained the Nationwide Lake Ecosystem Modelling Platform, MBIE Smart Ideas Project. Aimed at assisting lake management, developing robust modelling for 100 lakes and then calibrating for all lakes across the country. This work aims to make models as useful as possible for environmental decision making, with the aim of reducing uncertainty and providing a user-friendly interface.

New Action Three for University and Te Arawa Lakes Trust to connect regarding research themes (particularly Mātauranga Māori and taonga species) and look at pathways forward with that theme. May be potential for collaboration with Te Arawa River Iwi Trust.

5. Lake Load Reduction Report

New Action Four – *Defer Lake Load Reduction report presentation to next meeting – work being led by Piet Verberg.*

6. Lake Rotorua Nutrient Limitation and Aluminium Toxicity

6a) Lake Rotorua Nutrient Limitation

Grant presented work he is undertaking regarding nutrient limitation (N or P) of Lake Rotorua. Discussion around changes to the alum dosing to try and establish the effect on the lake that the dosing is having, particularly around lowering or turning off dosing. Grant's recommendation is that turning dosing up may be a better way to establish the impact of dosing on the lake, in terms of further research. Andy noted limitations of new consent around dosing – particularly in summer and maintaining dilution ratios. We are still unsure about where aluminium is ending up, i.e. need to work out whether it is going down Ōhau Channel or staying within the lake to continue to work.

New Action Six - *for Regional Council to discuss with University of Waikato options for more investigation of where aluminium is ending up and options for optimising dosing and recycling of phosphorous. Could be Masters' research topic.*

6b) Toxicology for Aluminium

Grant presented his work on aluminium toxicity on koura and trout in dosing on Lake Rotorua. Noted that the toxicity tested was twice the maximum alum toxicity created by dosing (only within short distances from stream dosing point and not whole lake), noted from questions that didn't use species from Rotorua as pre-exposed species can be adapted to the contaminant being tested and that no koura present on Puarenga due to geothermal nature.

New Action Seven - *For Regional Council, University and TALT to talk on further work on toxicology of alum, e.g. on kakahi (sedentary species).*

Lunch 12.45-1.30

7. Alum Dosing on Rotorua and Rotoehu and Algae Blooms

Justine Randell presented data on dosing rates and phosphorous levels for alum dosing sites, across Rotorua, Rotoehu and Ōkaro. Note that low stream levels over summer meant that we couldn't maintain protocol dosing rate for Lake Rotorua. Discussed options for improving dosing based on challenges being faced, including algae blooms over summer and low flow rates, e.g. for Rotoehu through dosing in deeper parts of lake (current consent application).

New Action Eight: *for Regional Council staff to meet with Max and Grant and review Lake Rotorua alum dosing protocol and see whether there are improvements to be made.*

James Dare presented monitored cyanobacteria sites over the past 12 months against the biovolume banding (green, orange, red). Every monitored site has exceeded potentially toxic biovolume over

the last year which is relatively unusual. James also presented Satellite Imagery which is now being used to establish extent of blooms across the lakes and noted that satellite imagery provides a useful tool for establishing extent of bloom and that the sampling programme does not necessarily detect activity in the middle of the lake.

James also covered off the target attribute states that have been set by the National Policy Statement for Freshwater and how they have been set.

New Action Nine: Presentation of WET tool for next hui, James to circulate link in mean time.

8. TLI Review

Keith presented on the scope of his review of the TLI's that he is doing for the Lake Catchments as part of the Plan Change 10 science review and wider questions around suitability of TLI targets as part of NPS-FM process. This work will ultimately be bought back at a later meeting and Keith will connect with Kit for his input as required.

9. Alum Dosing Consent Progress

Andy gave brief update on progress with consent renewals for Rotorua (granted), Okaro and Rotoehu alum dosing. There was some discussion on the long term sustainability of on-going alum dosing in Ōkaro, and will land use change achieve the targets TLI. Discussion led to comments that BOPRC and UoW need to talk about science needed to answer this question and also that this will be critical in the NPS-FM planning process.

10. Rotoehu Weed Harvest Update

Justine gave a short presentation on recent removal of weed washed up at the Lake Rotorua lakefront as the result of a recent storm (for amenity purposes) and at Lake Rotoehu following that for the annual activity of weed removal for nutrient removal. Andy also touched on weed issues for Okawa Bay and need for connection between science advice re weed spraying and the operation of the weed management plan with biosecurity team.

11. Lake Rotorua water quality relationships with DO

New Action Ten: This presentation is on hold for a future date due to delays with data. (Paul White).

12. Tarawera Geology, groundwater and geothermal review.

Paul presented regarding geology, groundwater and geothermal models of the Tarawera catchments, including the 3D models on age of the geothermal systems and geological formations over time in that catchment, including historic lakes.

13. Other Matters

- Andy noted new Live Monitoring Data from the seven buoys across the lakes which is available on the Regional Council website portal and provides a wonderful resource for lake management.

New Action Eleven: *Defer Biotreatment discussion relating to Lake Rotoehu for next time.*

Meeting Closed 3.30pm