



Submission On:

Proposed Plan Change 10 (Lake Rotorua Nutrient Management)
to the Bay of Plenty Regional Water and Land Plan



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To: The Chief Executive
Bay of Plenty Regional Council
PO Box 364
Whakatane 3158

Submission On: Proposed Plan Change 10 (Lake Rotorua Nutrient Management)
to the Bay of Plenty Regional Water and Land Plan

Name of submitter: Federated Farmers of New Zealand

Contact person: Nikki Edwards
Senior Policy Advisor
nikki.edwards@fedfarm.org.nz

Address for service: PO Box 447, Hamilton 3240

Federated Farmers of New Zealand could not gain an advantage in trade competition through this submission.

The specific provisions of the proposal that Federated Farmers' submission relates to and the decisions it seeks from Council are as detailed on the following pages.

All recommendations assume consequential changes to give effect to the relief sought.

Federated Farmers wish to be heard in support of its submission.

INTRODUCTION

Federated Farmers welcomes the opportunity to comment on proposed Plan Change 10.

Federated Farmers of New Zealand is a voluntary member based organisation working for profitable and sustainable farm businesses. We represent most of the commercial farmers in the Lake Rotorua catchment.

We acknowledge submissions from individual members, the Lake Rotorua Primary Producers Collective and primary sector colleagues.

OVERVIEW

Federated Farmers acknowledge it has been a very long policy journey leading up to the notification of Plan Change 10 (PC10). The genesis of the rules package was over five years ago.

We acknowledge the willingness shown by Bay of Plenty Regional Council (Council) to “change tack” along the way. In particular we acknowledge the development of the “integrated” package of rules and incentives.

We recognise this package of interventions for the Lake Rotorua catchment has been developed within a very dynamic policy context. At the national level, the National Policy Statement for Freshwater 2011 (NPS-FW 2011) was gazetted after initial development of the PC10 framework. The NPS-FW 2014 was gazetted when PC10 was already at an advanced stage of development.

At the regional level, we acknowledge that work on the Lake Rotorua catchment has proceeded alongside an ambitious programme of work across the other Rotorua Lakes and across the wider Bay of Plenty region. We acknowledge and commend the strong commitment that Council has shown to supporting catchment-led solutions for improving water quality including the farmer-led Project Rerewhakaaitu (a Green Ribbon Award finalist in 2015); and the collaborative WMA processes now underway in Kaituna and Rangitaiki catchments.

We give unstinting credit to Council for the very strong programme of research that has proceeded alongside policy initiatives. The scale and substance of research and development undertaken over this last decade or more provides an extremely strong foundation for the development of effective policy interventions. We give credit to Council for taking a wide brief on solutions, from source to sink; for embracing innovation, and for the willingness to “suck it and see” on research-by-management trials. Some interventions have succeeded beyond expectations, others have not; throughout it all, Council has maintained a flexible “adaptive management” approach.

We record appreciation of the professionalism, dedication and support of Council staff throughout this contested and arduous policy journey. We re-affirm our commitment to the Oturoa principles we jointly developed and mutually agreed. A central principle is the concept of shared ownership of the problem and shared ownership of the solutions.

Our submission is made in that spirit.

KEY AREAS OF SUPPORT

We welcome Councils continued commitment to the principle that “everyone needs to be part of the solution”, and to providing an enabling framework for community-led solutions and innovation.

We wholeheartedly endorse Councils rejection of “prescriptive input-based management”, and repeated assurance that Council is not in the business of “telling farmers how to farm”.

We welcome the broader package of incentives, respecting the complex history and significance of Lake Rotorua within both the regional and national context.

We strongly endorse the commitment to ongoing review and adaptive management.

KEY AREAS OF CONCERN

The notification of PC10 has presented an opportunity to pause and take stock of the policy journey, the scientific and technical developments, and the progress that has been made on-farm, in-lake and across the Lake Rotorua catchment in the years since the initial PC10 framework was first proposed.

We know a great deal more now, than we did then. We have achieved a great deal more now, than we had then. We believe that – if we knew then what we know now – PC10 would have been crafted differently.

It is our submission now that one too many things have changed in the scientific, statutory and social context over the last five years, even within just this last year. This plan change process presents the opportunity to explicitly table and assess those changes and developments; to test the PC10 framework against that new context; and to consider alternate approaches for achieving our mutual objectives as expressed in the Oturoa Agreement.

A key change in the statutory framework has been the promulgation of the NPS-FW 2011 and the NPS-FW 2014. The obligation on Council is to give effect to the NPS-FW, including the requirement to set limits. Critically, the NPS-FW requires that limits be set to achieve community values and objectives; and that limits are landed after iterative analysis of options, costs and achievability.

It is currently our understanding that Council may be assuming that the task of landing objectives and limits for Lake Rotorua is a “done deal”, and that the only remaining task is to “nail the rules”. In effect, it seems that Council is assuming that the TLI objective in the RWLP gives effect to the NPS-FW, notwithstanding that the RWLP was made operative some years prior to the NPS-FW 2011; that the nitrogen reduction target set in the RPS gives effect to the NPS-FW, notwithstanding that submissions on the RPS had already closed before the NPS-FW was gazetted; and that the development of rules in PC10 divorced from the expectation of iterative analysis against objectives and limits gives effect to the policy requirements set out in the NPS-FW 2014.

Further, it appears that Council may be assuming that catchment communities across the region may enjoy the opportunity to participate in WMA processes to give effect to the NPS-FW, with the exception of Rotorua lakes, including Lake Rotorua. This is an extraordinary omission. We have sought clarification on this point from Council staff in recent weeks: to date they have been unable to provide a straight answer.

The Oturoa Agreement sets out a clear expectation that – alongside agreeing targets to assist in achieving a mediated solution on RPS appeals – those targets would be subject to ongoing review as part of regular plan changes. PC10 is a plan change. Notwithstanding this, Council propose that the RWLP objectives and RPS targets are “out of scope” for submissions.

Council staff advise that this position is based on legal advice. We have requested that advice but to date, we are advised that that advice is subject to legal privilege. We advise Council that this is a regrettably unhelpful stance.

We acknowledge that any change to the RPS would need to proceed as a separate process. That is not the case however for the RWLP objectives.

For clarity: we do not seek changes to either the RWLP TLI objective or the RPS nitrogen reduction target at this time. Any changes would more properly be considered after the 2017 Science Review. It is however our very strong submission that the objectives and targets must be in scope for submission to the extent they are relevant to the approach proposed in the methods and rules.

A second change in the statutory framework is the 2013 amendments to the RMA, including acknowledgement of efficiency of use of existing investment, and provision of more specific guidance on robust section 32 analyses. We note that the Decisions Report on the RPS recorded that cost-benefit analysis was at a “*conceptual*” level; and that the PC10 S32 report records that it is intended as a “*record of the policy journey*” and not as a rigorous cost-benefit analysis of options. We have not checked the quality of s32 analysis supporting the RWLP: it is however our understanding that – at the time the RWLP was notified in 2002 – perhaps eleven submissions were received relating to the TLI objective proposed at that time.

In short: the NPS-FW job has not yet been done for Lake Rotorua and Council need to confirm that it will be done as part of the Rotorua Lakes WMA scheduled from 2020.

In the course of taking stock of developments over this recent period, we have tracked back through the voluminous body of science accumulated since the Lake Rotorua TLI target was first proposed in the 1980s. The PC10 s32 report records that the TLI target has been subject to regular scientific re-assessment and re-confirmation since that time. We respectfully disagree.

It is evident to us that the TLI objective has been “taken as read” since the day it was proposed. All the succeeding reports commissioned by Council have been briefed with “how to meet” the targets, not with re-evaluating the targets themselves. The Terms of Reference for the Lakes Water Quality Technical Advisory Group are similarly restricted. A notable exception is the report commissioned by MfE in 2003 which recommended more work was needed to “*clarify the relationships between catchment nutrient loads and lake nutrient dynamics, to set a range of targets for nutrients entering the lake, and in the lake waters*”.

Further, it is evident to us that the TLI parameters developed in the 1980s were proposed in the context of concern about lake weed (perhaps under-estimating the contributing and confounding influence of introduced invasive weeds at that time); and in the context of focussing on Rotorua sewage discharges to the lake.

Importantly, the TLI parameters proposed at that time assumed no internal nutrient load. Equally importantly, the 1989 report clearly described this assumption. If the “0” in the internal nutrient column wasn’t plain enough; the statements in that report that the model was developed “*neglecting internal inputs*” and that “*a worst-case scenario is that internal inputs might persist for some years*” leave no room for doubt.

In the event of course, internal nutrient inputs have persisted. The recent unexpected turnaround in the lake TLI subsequent to alum treatments in two streams is perhaps most significant in highlighting the ongoing importance of internal nutrients as a key driver of algal dynamics in Lake Rotorua.

The second significance is in signalling a possible change in the lake towards phosphorous (P) limitation. This shift has profound implications for the nutrient management framework.

We respectfully suggest that nutrient management has proceeded through three broad phases. In the first, we assumed that the critical nutrient to control was P. In response, we initiated land treatment of Rotorua sewage and a comprehensive programme of sediment/P reduction works in the Kaituna catchment. In the second phase, we realised the importance of legacy nitrogen (N) loads in groundwater. In response, we initiated a comprehensive modelling programme, alongside developing interventions to reduce N loads to the lake. In this third phase we need a “dual nutrient” approach.

Currently PC10 is focussed almost exclusively on N and only peripherally on P. It is our very strong recommendation that the recent advances in our knowledge compel an adaptive management approach. Specifically, the scope of PC10 must be broadened to address nutrient reduction pathways for both N and P.

A further point relating to the targets: acknowledging Councils repeated assurances that “science says”, we respectfully make the point that the task of landing objectives and limits is not one for the scientists alone. The NPS-FW is of course an instrument of the RMA and both make clear that the final decisions – while they absolutely must be informed by the best science available – must be made “in the round”.

Turning now to the loads: for most of the last five years while PC10 was under development, we have relied on Overseer version 5.4 to estimate nitrogen loads both historic and recent, and at both farm-scale and catchment scale. The Rotan load estimates published in 2011 relied on Overseer 5.4 and achieved an acceptable match with measured stream concentrations if zero attenuation was assumed.

The release of Overseer version 6.2 tipped this assumption on its head. It is now clear that N losses from land were under-estimated, as were sub-catchment attenuation factors. It is our understanding that work is currently underway to re-estimate both loads and attenuation factors based on Overseer 6.2; and that the results may be available in mid-2016.

In the meantime, farm losses have been re-estimated in 6.2, but the RPS target load reduction is based on 5.4. It is a truism that farm and catchment loads must be aligned within the same version of Overseer. Unless and until such time as the RPS N target is re-assessed using Overseer 6.2, PC10 cannot rely on farm numbers in version 6.2.

Council have proposed a “Reference File” methodology in an attempt to get around the reality of ongoing Overseer version changes, without going to the trouble of plan changes. In effect, the proposed reference files are “averages of the average”, with inputs stripped back to simplified defaults to streamline administration and to get around “bugs”. We observe that – as recently as the day Council approved notification of PC10 – a bug was detected prompting fall-back to yet another “default” setting.

We advise Council that this is an unacceptably “dumbed down” use of Overseer. It completely undermines the value and virtues of Overseer as a farm decision support tool, and as a tool for tracking progress across the catchment. Equally, if not more importantly, it risks compromising the result we all want for the lake, in the interests of simplified bureaucratic procedures. This idea will not fly.

The primary significance of the changes wrought by Overseer 6.2 is that it is now clear that attenuation is not zero. Previously the policy framework has assumed – reasonably at that time – that achieving the result for the lake required controlling nitrogen at source. The practical effect of the change is that the mitigation portfolio can now be expanded to consider opportunities for attenuating N along the transport pathways, alongside maintaining commitment to reducing N at source. Specifically, this means broadening the scope of PC10 to provide an enabling framework for that wider portfolio.

We acknowledge here that Council has already done excellent work looking at options including enhanced/constructed wetlands and sediment detainment bunds. Now that attenuation is back on the table, we are keen to work with Council to see what can be done. We already have ideas.

Returning to the targets; we can perhaps all agree the N reduction target is ambitious. We can perhaps also agree that achieving it is a whole-of-community challenge. This point was much debated through the RPS process; and the operative RPS reflects agreements made in that process. In brief, all sectors of the community are expected to implement reasonable, practicable and affordable measures to avoid, remedy or mitigate nutrient losses. Above that benchmark, the RPS is clear that achieving further reductions to address legacy issues and to meet community values and objectives carries public and private benefits and should be funded accordingly.

We acknowledge the significant contributions being made by the Crown and Council to the Incentives Fund. The fund is now in its second year and is yet to do any deals. We suggest that part of the problem may be the relatively narrow focus of the fund, which was shaped alongside the narrow focus of the PC10 rules. Whatever the reason, we can all agree the imperative to invest those funds wisely and well to deliver enduring improvements for Lake Rotorua. We suggest it is timely to relook at the funding criteria, not least in the context of the new science to hand.

Our specific concern with the Incentives Fund is that the PC10 rules have been deliberately – we might say cynically – designed to achieve the compulsory conversion of 40% of Rotorua farmland to forestry. Council documents make it very clear that the 2032 N target is being “hardwired” into the rules to achieve exactly that result.

We register in the strongest terms our implacable opposition to a rule requiring that we show how we are going to achieve a 2032 target sixteen years in advance. We register in the strongest terms our implacable opposition to a default rule making farming a “non-complying” activity. We observe that the farming sector – and the farming sector alone – has been singled out for this treatment. We advise Council that this stance appears to us significantly at odds with philosophies of enabling innovation, R&D and adaptive management to achieve multiple objectives, including a resilient farming sector.

If the terms of trade of the Incentives Fund are not sufficient to attract willing buyers and sellers, we need to urgently get around the table and discuss alternate pathways forward. The alternative of using regulation to “force” large-scale landuse conversions for the greater good is unacceptable.

We acknowledge that Council does have authority to restrict land use for the greater good. Nevertheless, that licence is not unfettered. The tests and protections are firstly, the requirement for robust s32 analysis (with the bar set somewhat higher than “conceptual”); and secondly, the RMA s85 tests against the unreasonable imposition of restrictions on private property. Importantly, the s85 tests cannot be answered in the general, or for the “average” or “representative”: they must be answered in the specific case.

We acknowledge that Council has made efforts to understand the economic implications of the PC10 rules. We note that Council understand that the impacts on some farms are likely to be “devastating”. We are astonished that this recognition did not give Council pause for thought at that time before proceeding to notification.

To date, the economic analyses commissioned within and outside Council have necessarily focussed on macro-economic impacts. The reality is that assessing the micro-economic effects on specific properties requires firstly, that everyone has a reliable and agreed benchmark; secondly, that everyone has a reliable and agreed target; and thirdly that everyone is able to second-guess the costs and management implications of achieving the 2032 target, sixteen years in advance.

This is a hopelessly “catch-22” situation. Council is not unaware of the level of stress that this situation has imposed on farming families. We register in the strongest terms our disappointment that Council has come to the point of being willing to dispose of the farming community in this cavalier manner.

Just three years ago, Council signed the Oturoa Agreement recognising the importance of the rural sector in respect of investment, employment, support of local businesses and environmental stewardship. We hold you to that Agreement.

We think that things may have come to this pass not least because Council has been immersed in a multi-headed programme of work, across all departments, and in all catchments across the region. We acknowledge and respect the dedication applied in each and all of these endeavours. We think one too many messages may have been “lost in translation” between the science and policy spheres. We respectfully suggest that it is time to stop and “join the dots” before re-charting our way forward.

If not, the risk is not just to relationships. The risk is also to the effective and efficient investment of the Incentives Fund. And ultimately, the risk is that we go the long way round to achieving the result in the lake, when we could have gone the short way, and brought the people with us.

INTEGRATED NUTRIENT MANAGEMENT FRAMEWORK

We propose a modified integrated framework for nutrient management that truly is an integrated framework. It includes nutrient reduction targets and management pathways for both N and P.

The framework returns to the base shared principles which have held steady throughout this turbulent policy journey. The framework is not based on “command-and-control” or “telling farmers how to farm” or the forced conversion of 40% of Rotorua farmland into pine forests.

Instead the framework respects the history of land use change over the last 100 years, respects the complexity of Lake Rotorua dynamics, and respects the shared commitment of all parties, including landowners, to do a better job of looking after the lake.

The framework is both regulatory and non-regulatory, but we propose a different balance. We believe the scale and complexity of the challenge demand generous engagement, not grudging compliance. We see the primary role of Council as providing an enabling framework to engage the pragmatism, ingenuity and innovation of the catchment community to drive improvements, while also guarding the gains we have made and protecting against going backwards.

It acknowledges progress, and the investments already made on catchment farms over-and-above the Rule 11 caps. It includes an expectation of industry leadership and resourcing to support continued uptake and implementation of on-farm best practice. The focus is reducing nutrient losses from current land use at source.

The framework we propose is not original. In fact it relies on the very good body of work commissioned by Council over these last years, including recommendations made by Rutherford in 2003 and 2011 for more fine-grained information at sub-catchment scale; and the more recent work from ERI presenting nutrient loads disaggregated by sub-catchment.

Sub-catchments are central to the framework. Specifically, we propose the active resourcing of Sub-catchment Action Plans, to map hotspots significant at catchment scale and to prioritise nutrient reduction opportunities along the source-transport-sink pathway. Our expectation is that these Sub-catchment Action Plans would help give effect to the higher-level Lakes Action Plan; and that they would provide a forum for the active engagement of all sectors of the sub-catchment community – farmers, lifestyle, urban communities – alongside Council science expertise and land management team support.

Critically important: the Sub-catchment Action Plans would be strongly informed by data specific to the sub-catchment. We acknowledge and commend Council for the very good science now available at sub-catchment scale to make this approach possible.

The focus would be reducing nutrient losses from legacy landuse. We expect that these Sub-catchment Action Plans may identify collective solutions, eg, opportunities for landuse change across farm boundaries, or farm re-configurations, or development of “green” infrastructure at strategic points. We anticipate that the Incentives Fund may be in a position to look favourably at these opportunities.

We recommend that we continue to proceed in the spirit of adaptive management: that we check and re-check our progress against the Lake TLI objective; that we set managed reduction targets for both N and P at multiple scales – catchment, sub-catchment, farm, city - and track our progress towards them; and that we are willing to “ring the changes” if changes are called for.

We invite Councils consideration of this modified Integrated Nutrient Management Framework. We would welcome the opportunity to discuss it with you.

GOING FORWARD

Federated Farmers thank Council again for this opportunity. We have all been deeply immersed in the details these last years, including hammering out hard agreements along the way. We believe the notification of PC10 is now a timely opportunity to re-check our earlier positions and assumptions, to re-test the PC10 framework against the context we are now operating in, and to be willing to re-chart our way forward if necessary.

We request that:

1. Council acknowledge the significant shifts in the science, including in the significance of internal bed nutrients, flood-flow particulate nutrients, sub-catchment attenuation processes and pathways, and the increasing likelihood of P-limitation in the lake
2. Council acknowledge the significant shifts in load estimates from Overseer version 5.4 to version 6.2 alongside recognition of catchment attenuation; that Rotan estimates of catchment loads are currently being revised; and that this revision will necessitate review of the RPS load numbers and load reduction targets
3. Council acknowledge the 2017 Science Review is intended to review and update all the changes in the science and technical context; and that this may necessitate review of the RWLP TLI objective and/or the RPS load reduction target
4. Council acknowledge – pending that review – that an Integrated Nutrient Management Framework for Lake Rotorua should include catchment and internal loads of both N and P, and management of reductions along the source-transport-sink pathway
5. Council acknowledge that the “Rules and Incentives Package” developed five years ago to focus on landuse change to reduce N at source now requires review in light of the significant changes in the scientific and technical context in the intervening period

6. Council acknowledge that the Incentives Fund and PC10 should provide an enabling framework for a wider portfolio of nutrient reduction strategies, including with specific attention to enabling landuse change at sub-catchment scale; and that this may include opportunities for landuse change across farm boundaries, or farm re-configurations, or development of “green” infrastructure at strategic points
7. Council acknowledge that the Incentives Fund is intended to deliver the majority of the nutrient reductions in the period to 2022; with the pastoral and urban sectors responsible for achieving the balance to meet the 2022 Managed Reduction Target
8. Council acknowledge that recent science illuminates significant patterns in sub-catchment loads of N and P; that this information can assist in prioritising sub-catchments delivering significant nutrient loads to the lake; can assist sub-catchment communities in developing Sub-catchment Action Plans to prioritise critical source areas significant at sub-catchment scale, and cost-effective interventions for reducing high nutrient base flow and flood flow loads to the lake; and that these interventions would appropriately be considered by the Incentives Fund
9. Council re-prioritise resources to invest in increased land management team support and independent coordination for the development of Sub-catchment Action Plans; based on the successful Project Rerewhakaaitu model
10. Council confirm its rejection of prescriptive input-based management; and accordingly, remove all references in the rules to Council control of farm plans
11. Council confirm that - pending the Rotan review and any consequential review of the RPS target - numerical NDAs will not be included in the rules
12. Council confirm that the Rotorua Lakes WMA scheduled for 2020 is intended to give effect to the NPS-FW 2014; that this process will be informed by the results of the Science Review; and that this process will include review of values, objectives, limits and methods preliminary to a further RWLP Plan Change

For our part:

13. We confirm – notwithstanding that N and P load reduction targets may change – our undiminished commitment to the health of the lake and to meeting our part of the 2022 Managed Reduction Target
14. We support the existing rules for “capping” nutrient discharges; including that the rules be extended to include properties in the catchment not previously included in Rule 11, in order to guard the gains we have made and to protect against going backwards
15. We commit to support farmers to achieve the 2022 Pastoral MRT. We have already made significant progress; and we would welcome the opportunity to work with Council, in particular prioritising Hamurama/Awahou with 11 of the 24 dairy farms in the Lake catchment; and Ngongotaha/Waitete sub-catchments with 38 of the 68 farms in the Lake catchment
16. We re-affirm our commitment to the principles and core intentions of the Oturoa Agreement in continuing to work with Council for a clean and healthy Lake Rotorua and to resolving any differences in the spirit of that Agreement.

PC10: INTRODUCTION**Provision:** title**Amend:****Reason:** to give better effect to intent.**Relief Sought:** amend to read: Plan Change 10: Lake Rotorua Integrated Nutrient Management**Provision:** Preamble**Amend:****Reason:** for improved clarity. It is important that the catchment community can refer to PC10 as the primary reference for relevant objectives, policies, methods and rules.**Relief Sought:** amend to read:

The Lake Rotorua Integrated Nutrient Management provisions are being introduced into the Bay of Plenty Regional Water and Land Plan as a separate subject.

Objectives, Policies and methods are contained in Part II of the Bay of Plenty Regional Water and Land Plan (RWLP) and the rules (including the definitions and schedules) are contained in Part III. Both parts of this subject are identified by the unique identifier “LR”.

Principal objectives, policies and methods are re-stated here to support Plan Change 10 (PC10) to stand alone as the primary reference for the Lake Rotorua catchment.

Provision: Title**Amend:****Reason:** as above**Relief Sought:** amend to read: Part II LR: Lake Rotorua Integrated Nutrient Management

Provision: Introduction

Amend:

Reason: to give effect to the intent of an integrated framework.

Relief Sought: add section as follows:

Scope

These plan change provisions apply to the Lake Rotorua groundwater catchment, as shown in Map LR 1, excluding land outside BoPRC boundaries.

Scope is restricted to the integrated management of landuse activities and legacy sources which contribute nutrient loads (nitrogen and phosphorous) to Lake Rotorua.

Contributing landuse activities include agriculture, horticulture, cropping, forestry, gorse, lifestyle blocks, urban sewage and stormwater, non-reticulated septic systems and point source discharges.

Contributing legacy sources include lake bed sediments and old groundwater.

Provision: Introduction

Add

Reason: PC10 currently jumps in “cold turkey”. It is important that all stakeholders are clear on the purpose, or at the least have the opportunity to debate it.

Relief Sought: add section clarifying purpose as follows:

Purpose

The general purpose is to achieve the purpose of the Resource Management Act – the promotion of sustainable management in the Lake Rotorua catchment.

The specific purpose of PC10 is to assess progress to date within the nutrient management framework set out in the RWLP, and to reframe regulatory and non-regulatory methods for improved alignment of individual and collective resources to reduce the effects of current and legacy nutrient loads.

The objective is to maintain the trajectory of reductions in nutrient losses to Lake Rotorua to support achievement of the RWLP TLI objective.

The Integrated Nutrient Management Framework is designed to ensure that:

- interventions are well-informed by science and well-targeted to deliver outcomes in the most efficient and effective manner
- Incentive Funding is invested wisely and well to deliver enduring outcomes for the lake and for the lake catchment community

In the period 2020-2023, the Rotorua Lakes WMA process will review values, objectives, limits and methods for the Lake Rotorua catchment, preliminary to a further plan change to give effect to implementation of the National Policy Statement for Freshwater 2014.

Provision: Introduction

Add

Reason: giving effect to the National Policy Statement for Freshwater is critical statutory context for PC10, and material to relief sought later in our submission

Relief Sought: add section clarifying national statutory context as follows:

Statutory Context: National

The **Resource Management Act** sets the framework for promotion of sustainable management:

- Section 5 provides for managing the use, development and protection of resources in a way, and at a rate, which enables people and communities to provide for their social, economic and cultural well-being while safeguarding the life-supporting capacity of water and ecosystems; and avoiding, remedying or mitigating any adverse effects of activities on the environment.
- Section 30 provides that every regional council shall have functions including control of the use of land for the maintenance and enhancement of the quality of water in water bodies; and for the maintenance and enhancement of ecosystems in water bodies
- Section 31 provides that territorial authorities have functions including the control of any actual or potential effects of activities in relation to the surface of water in rivers and lakes
- Section 32 requires that an assessment be made assessing the efficiency and effectiveness of the proposed provisions; and identifying other reasonably practicable options for achieving the objectives. This assessment should be to a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal

The Act provides for a framework which includes national policy statements. The **National Policy Statement for Freshwater 2011** (NPS-FW) was gazetted on 1 July 2011, requiring Regional Councils to make or change regional policy statements or regional plans to the extent needed to set freshwater objectives and limits.

The **National Policy Statement for Freshwater 2014** came into effect on 1 August 2014, requiring regional councils to make or change plans to the extent needed to ensure the plans establish freshwater objectives and limits in accordance with Policies CA1-CA4. These policies require, inter alia, that every regional council identify freshwater management units (FMUs) and:

- apply the following processes in developing freshwater objectives for all FMUs:
 - consider all national values and how they apply to local and regional circumstances
 - identify the values for each FMU, which must include the compulsory values
 - identify the attributes listed in Appendix 2 that are applicable to each value in formulating freshwater objectives
- consider the following matters at all relevant points in the process:
 - the current state of the freshwater management unit, and its anticipated future state on the basis of past and current resource use
 - the limits that would be required to achieve the freshwater objectives
 - any choices between the values that the formulation of freshwater objectives and associated limits would require
 - any implications for resource users, people and communities arising from the freshwater objectives and associated limits including implications for actions, investments, ongoing management changes and any social, cultural or economic implications
 - the timeframes required for achieving the freshwater objectives, including the ability of regional councils to set long timeframes for achieving targets

- Where FMUs do not meet the objectives developed in accordance with Policies CA1-CA4, every regional council is to specify targets and implement methods – either or both regulatory and non-regulatory - to assist the improvement of water quality.

Provision: Introduction

Add

Reason: as above. It is important to locate PC10 within the wider regional planning context; and critical to understand the regional programme for giving effect to the NPS-FW.

The RPS was notified in 2010 prior to gazettal of the NPS-FW in 2011. It incorrectly describes National Policy Statements as “optional”¹.

Implementation of the NPS-FW is of course not optional, but work proceeded outside the RPS planning framework. The RPS was made operative in 2014 making only brief reference to the NPS-FW and not including details of the planned implementation programme.

In response to submissions challenging the impact of the N reduction target, Council advised that “*evaluation of benefits and costs in relation to RPS policy is at a conceptual level*” and indicated that more detailed analysis would be undertaken as part of regional plan changes².

In the meantime, Council documents make it clear that work on scoping the PC10 rules package began in 2010. In 2011, Council papers record some confusion about the requirements of the new NPS-FW: at that time they were still awaiting guidance from MfE.

Subsequently, MfE did publish guidance which was updated in 2015. It elaborates on the new values/objectives/limits framework, including requirements as follows:

- Identify values, including where and when and to what level they apply across a catchment
 - where values conflict, council would need to arrive at an agreed balance between the levels at which each value will be provided for
 - the two compulsory national values are not prioritised above others: it is for regional communities, facilitated by regional councils to consider values and priorities locally
- Setting of objectives must be made in the context of environmental, economic, social and cultural considerations
 - objective setting will be an iterative process
 - final decisions about objectives should only be made after analysis of options and should be fully informed by an understanding of their costs and achievability
- The process for setting limits should be informed by the best available information and scientific and socio-economic knowledge
- The NPS provides flexibility in terms of which methods can be adopted
 - a mix of approaches – regulatory and non-regulatory – can be tailored to the individual catchment and targeted to local issues, interests and parties
 - this means working collaboratively with water users is important in setting targets, timeframes and methods at a catchment scale.

MfE emphasise the expectation of an iterative process and regular review:

- Each component of this chain helps to inform decisions about the next part. It is important to note, however, that in reality this is unlikely to be a linear, step-by-step process. At each point councils will need to consider how their decision would affect the following parts of the chain (eg, what limit may be required based on what freshwater objective is chosen) and the most appropriate process is likely to be an iterative one where earlier decisions are revisited throughout.

¹ RPS 1.5.1, figure 1

² Council Decisions, 2012

- When freshwater objectives are first set, regional councils are required under Policy CA2(f)(v) to consider the effects that the associated limits will have on resource users and communities. If further refinement of limits is required in later plan changes (either to better reflect what's needed to achieve the objective, or because the objective itself is changed), it will be important for regional councils to carry out thorough analysis of how changes will affect resource users
- A limit is not simply the maximum resource use an FMU can withstand; it is the maximum use of a resource that will allow the relevant freshwater objective to be achieved. Therefore, limits on resource use should ensure specific freshwater objectives can be met, rather than reflect more generic aspirations. If time shows that the freshwater objective can be met within more relaxed limits, the limit and objective combination will need to be reviewed during the next plan change, to decide whether to aim for a more aspirational objective or to increase the limit to allow more use of the resource.

The NPS-FW provides that regional councils can set long timeframes for achieving targets and this point is reiterated in MfE guidance:

- Engagement with communities and robust, durable solutions can take time. The NPS-FW recognises the importance of quality rather than quick fixes and frameworks
- Longterm monitoring data should be used both to assess current state and to determine progress
- In large catchments, more monitoring sites might be needed to help isolate hotspots.

Federated Farmers are clear that Council have not as yet given effect to the NPS-FW for Lake Rotorua; and that PC10 does not give effect to the NPS-FW. Instead, it appears obvious to us that the planned WMA for Rotorua Lakes is the step which will give effect to the NPS-FW.

Our relief seeks that this be stated plainly.

We make the point that this has significant implications for PC10, ie, the primary focus of PC10 should be the period 2016-2022 or thereabouts.

To a large extent, it is apparent that, to date, Council have relied on "science says". Firstly, to support the N reduction target in the RPS and secondly, to propose that the targets are 'out of scope' for PC10.

We make the point that NPS "limits" framework for water management was first developed in a report commissioned by MfE³ on technical and scientific considerations when setting measurable objectives and limits. The report emphasised that it is not the scientists who make the value judgements:

- "The role of science in this process is to describe the effects of various management options, on environmental, social and economic values, so that informed choices between the options can be made by decision makers, not scientists"

Relief Sought: that the following section be added

That the plan be amended to state that the planned Rotorua Lakes WMA and consequential RWLP plan change is intended to give effect to the NPS-FW 2014

Statutory Context: Regional

The **Regional Water and Land Plan** was notified in 2002 and made operative in 2008, including:

- Objective 11 which established the Lake Rotorua TLI objective 4.2
- Method 41 which provided for development of Action Plans where lakes did not meet TLI objectives
- Rule 11 which "capped" nitrogen losses from rural landuse

³ NIWA 2010

A subsequent review⁴ of Rule 11 found that:

- “There was a strong willingness expressed by landusers to work with Council on the ground on practical farm based initiatives rather than at a theoretical or policy level”
- “To address the concern that Rule 11 is not sufficient to reverse water quality trends, consideration should be given to engaging with landowners about the economic drivers that influence landuse change, with consideration also to achieving better integration between Regional Plan and District Plan rules to enable landuse change”

The **Regional Policy Statement** (RPS) was notified in 2010 and made operative in 2014, including:

- Policy WL 3B providing for the establishment of limits for the amount of nitrogen and phosphorous that can enter Rotorua lakes to achieve the target TLIs set out in the RWLP
 - including that the total amount of nitrogen that enters Lake Rotorua shall not exceed 435t per annum
- Policy WL 6B directing that rural landuse activities minimise nutrient losses as far as is reasonably practicable
 - and additionally setting a target for the managed reduction of 218t of nitrogen loss in the Lake Rotorua catchment by 2022

In late 2012, Council adopted the BoPRC **NPS Implementation Programme** in response to the NPS-FW 2011, providing for the staged development of a regional framework of values and principles for integrated management; and for the staged identification of priority catchments.

In December 2015, Council updated the programme in response to the NPS-FW 2014, in particular to meet the requirement that objectives and limits be determined in accordance with Policies CA1-CA4.

The updated Implementation Programme identifies nine Water Management Areas (WMAs) across the region for progressive implementation of the NPS-FW 2014. Rangitaiki, Kaituna/Maketū and Pongakawa/Waitahanui WMAs commenced in 2015. The order of other WMAs is indicative and will be confirmed in 2016.

In accordance with Policies CA1-CA4, the Implementation Programme provides for:

- detailed modelling of different options including environmental, social, economic and cultural outcomes to clarify trade-offs and balance
- an iterative process to develop and agree the limits and management options to be included in the WMA plan change

Lake Rotorua is part of the Rotorua Lakes WMA, currently scheduled for a values/objectives/limit-setting process from 2020-2023.

⁴ EMS 2009

Delivery year NPSFM 2014 implementation programme	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Region wide water quantity plan change											
Kaituna/Maketū and Pongakawa/ Waitahanui											
Rangitāiki											
Tarawera											
Tauranga Harbour											
Rotorua Lakes											
Ōhiwa and Waiotahi											
Whakatāne and Tauranga											
Waioeka and Otara											
East Coast											

Table 1: Time limited stages for implementation of the National Policy Statement for Freshwater Management 2014 in the Bay of Plenty Region by 31 December 2025.

The planning documents developed within each WMA will go through the full RMA plan making process: an outline of the four phase implementation steps is presented below

Phase 1: 12 months	Project planning and set up	<ul style="list-style-type: none"> ✓ Collaborative process selected (Involve) ✓ High level planning ✓ Governance Structure agreed
	Establish structure and processes	<ul style="list-style-type: none"> ✓ Develop Regional Freshwater Framework ✓ Specific project work packages agreed
	Establish and undertake processes to recruit community group	<ul style="list-style-type: none"> ✓ EOI process agreed ✓ EOI section process underway ✓ Set up Community Groups
	Collate all existing information	<ul style="list-style-type: none"> ✓ Current State Project and Gap Analysis ✓ NOF Attributes information collated
Phase 2: 12 months	Baseline knowledge: understand and expand on existing information; agree on what the story tells us from all perspectives	<ul style="list-style-type: none"> ✓ Gap filling prioritised (science) • Gap filling (social, economic, cultural) • Compelling "Story" collated – Key Messages, RARI, WMA
	Freshwater objectives: Use the National Objectives Framework to identify values, attributes and attribute states (collectively termed freshwater objectives)	<ul style="list-style-type: none"> • Confirm values (using existing values as a starting point) • Define Freshwater Management Units • Map Values against National Objectives Framework attributes • Review attributes against current state • Identification of outstanding freshwater bodies

Phase 3: 12 months	Assess needs: does current water quality and quantity provide for identified freshwater objectives; determine the gaps and priorities for focus; determine limits/targets to explore	<ul style="list-style-type: none"> • Translate into objectives (maintain approach) • Determine appropriate limits • Impacts and opportunities discussion • Confirm priorities and gaps
	Scenario and impact analysis: detailed modelling of different options including environmental, social, economic and cultural outcomes; clarify trade-offs and balance	<ul style="list-style-type: none"> • Initial modelling strategy agreed • Confirm level of modelling, gather additional data and analyse output with Community Group • Development of potential scenarios
	Evaluation: assessment of scenarios (use tools such as focus groups, evaluation matrix); revise and reassess as needed	<ul style="list-style-type: none"> • Utilise tools to support agreement on preferred scenario
	Develop policy and regulatory framework: iterative process to develop and agree on the policy and rule regime (limits and management options) to be included in the plan change	<ul style="list-style-type: none"> • Development of policy and rules with community group feedback
	Consult on framework: not required but best practice to consult on this 'draft' stage prior to notification	<ul style="list-style-type: none"> • Wider community consultation on "draft" • Preparation of proposed plan change • Establish monitoring plan and accounting system and monitoring

Phase 4: 12 months (approx. Not including appeals)	Council notifies proposed plan change	<ul style="list-style-type: none"> • Schedule 1 process • Submissions and further submissions received • Submissions assessed • Hearing reports prepared
	Hearings panel appointed and hears submissions and deliberates	<ul style="list-style-type: none"> • Schedule 1 process
	Council decision notified	<ul style="list-style-type: none"> • Schedule 1 process
	Environment Court appeals, hearings and decisions	<ul style="list-style-type: none"> • Schedule 1 process
	Regional Water and Land Plan operative	<ul style="list-style-type: none"> • Schedule 1 process

Provision: Introduction

Add

Reason: add section summarising Rotorua District Council statutory responsibilities, in particular as they relate to the development of flexibility mechanisms to enable landuse change to assist meeting nutrient reduction objectives.

Relief Sought: add section summarising RDC responsibilities for controlling landuse relevant to water quality; and updating on the mediated outcomes on District Plan provisions relating to Transferable Development Rights.

Provision: Introduction

Add:

Reason: important context for PC10 and material to relief sought

Relief Sought: that the following section be added

That PC10 be amended in its entirety to give better effect to the RWLP plan review process

Statutory Review

The Act requires Council to monitor the efficiency and effectiveness of its policies and plans; and to report at least every five years with a review of every provision at least every ten years.

RWLP objectives, policies, methods and rules relevant to Lake Rotorua nutrient management were made operative in 2008. These provisions are subject to review and amendment in PC10, and will be further reviewed in the Rotorua Lakes WMA scheduled for 2020-2023, in particular to give effect to the NPS-FW 2014.

The RWLP plan review process includes that, in reviewing the plan, Council will:

- determine the efficiency and effectiveness of the policies and methods in achieving the objectives
- determine if there are any additional issues that have arisen that require attention in the regional plan review
- review the efficiency and effectiveness of voluntary methods for achieving objectives and consider the use of regulatory methods for achieving objectives, and consider the use of regulatory methods in areas where environmental performance targets have not been met.
- Give consideration to technological changes, changes to community's environmental expectations and natural environmental changes.

RPS objectives, policies and methods relevant to Lake Rotorua nutrient management were made operative in 2014. RPS provisions are not subject to amendment in PC10, but may be subject to review after the Science Review scheduled in 2017; or at the five year review in 2019.

Provision: Introduction

Add:

Reason: the development of Action Plans pursuant to Method 41 of the RWLP is important context for PC10, and material to relief sought later in this submission.

It is also material to understand the context of the changing targets alongside the development of PC10.

Relief Sought: that the following section be added.

That a method be included for the development of sub-catchment action plans to give better effect to the Lakes Action Plan

Lakes Rotorua and Rotoiti Action Plan

RWLP Method 41 requires the development of Action Plans where lakes do not meet TLI objectives. The main aims of the Action Plan are to:

- (i) Identify factors that affect lake water quality and any necessary research.
- (ii) Include equitable and workable provisions to address effects on existing land uses where it is necessary to restrict land use to maintain or improve water quality. Such provisions include, but are not limited to, criteria for possible financial assistance and land acquisition.
- (iii) Identify efficient, cost-effective and equitable measures and options to reduce inputs of nitrogen and phosphorus from the lake catchment to maintain or improve lake water quality
- (iv) Determine if the TLI in Objective 11 can be realistically achieved, and a practicable timeline for achieving the target TLI.

The **Lakes Rotorua and Rotoiti Action Plan** was developed as a non-statutory plan in 2009. The Plan describes key factors impacting water quality while noting the intent not to attribute blame for practices thought to be acceptable and even promoted at the time, but to find solutions:

- **Nutrients already in the bottom sediments in the lake:**
 - Key contributors are urban sewage discharges and near-lake septic tanks
 - estimated loading 1920-2007⁵: 7,200t N and 1,700t P
 - Lake Rotorua internal loading currently estimated at 360t N and 36t P
- **Nutrients already in groundwater but yet to reach the lake:**
 - A key contributor to N loading is agriculture. Estimated N loading 1920-2007⁶
 - forestry/gorse 9,000t N, dairy 8,000t N, drystock 19,000t N
 - A key contributor to P loading is dissolution of high P rock in deep groundwater
 - estimated P loading 1920-2007⁷: 3,000t P
- **Nutrients currently entering the lake:**
 - In 2009, P input was estimated at 39t P pa
 - including 3t P pa from the Rotorua land treatment system (RLTS)
 - N inputs were estimated to total 780t pa⁸, including from
 - urban/lifestyle/septic 100t pa
 - agriculture/forestry 580t pa

The 2009 Action Plan set Lake Rotorua **nutrient reduction targets 250t N and 35t+ P by 2029** and allocated responsibility for achieving them:

- **in-lake:** identify cost-effective methods to reduce internal nutrient release by 25t P
- **urban:** upgrade infrastructure to reduce N by 50t and P by 4t
- **rural:** contribute to progressive reduction of 170t N and 10t P
 - 30t N using economically viable best management practices
 - 56t N and 3.5t P expected to be achievable with known technologies
 - 84t N and 6.5t P as research/management initiatives evolve over time

The Action Plan sets out an interventions framework, intended to be developed over time as knowledge improves about potential regulatory and non-regulatory interventions and their ability to reduce nutrients. The framework is intended to support improved relationships between stakeholders by adopting a collaborative approach to land management; and including analysis of macro and micro level costs and benefits of interventions.

To date, the work programme has taken a wide angle on solutions, recognising that individual and collective costs can be minimised by efficient targetting, ie, prioritising investments along the source-transport-sink pathway, eg:

- Source: enhanced on-site wastewater systems around the lake edge
- Transport: enhancement or construction of wetlands in strategic locations to intercept and attenuate nutrients
- Sink: alum treatment in selected streams entering the lake

⁵ Estimates derived from Rutherford 1989 (table 1) and Rutherford 2011(table 6)

⁶ Estimates derived from Rutherford 2011(table 6)

⁷ Estimates derived from Rutherford 1989 (table 1)

⁸ Estimates derived from Rutherford 2011(table 6)

Provision: Introduction

Add:

Reason: the Deed Funding is central to the integrated framework.

Relief Sought: add section as below

Funding Deed

In 2008, the Funding Deed between the Crown, BoPRC and RDC recorded agreements to share the costs of strategic actions to restore four Rotorua lakes (Rotorua, Rotoiti, Rotoehu, Okareka). Central Government committed \$72m which BoPRC and RDC are matching dollar for dollar.

In 2015, the shared costs⁹ schedule was updated:

<u>Financial Years</u>	<u>Crown</u>	<u>BoPRC</u>	<u>RDC</u>	<u>Total</u>
<u>2008-2015</u>	<u>\$37m</u>	<u>\$19m</u>	<u>\$18m</u>	<u>\$74m</u>
<u>2015-2022</u>	<u>\$33m</u>	<u>\$25m</u>	<u>\$8m</u>	<u>\$66m</u>
<u>2022-2032</u>	<u>\$2m</u>	<u>\$2m</u>	<u>\$0m</u>	<u>\$4m</u>
<u>Total</u>	<u>\$72m</u>	<u>\$46m</u>	<u>\$26m</u>	<u>\$144m</u>

Over half of this fund is earmarked to help achieve Lake Rotorua nutrient reductions:

- The target set in 2008 (reconfirmed in 2013) was to **reduce N by 250t and P by 35t** (25t from lake sediments, 10t from the catchment)
- The target was varied in May 2015 to express the N target as an outcome (435t); and to change the P reduction target to 37t (now 7t from lake sediments, 30t from the catchment).

A primary objective is that programmes identify interventions that most **effectively and efficiently** deliver on the outcomes, recognising that each lake requires different combinations of interventions to deal with nutrient sources which are:

- naturally occurring, eg, geothermal
- legacy, eg, derived from lake sediments
- current, eg, sourced from current land uses.

The 2008 Deed was prescriptive, favouring existing interventions and preventing flexibility of actions arising from development and research. In July 2011, Cabinet agreed to a more flexible funding arrangement that enabled the Rotorua Te Arawa lakes programme to adopt a more adaptive management approach. The works programme uses the “treatment train” approach:

- mitigations at source, eg, reticulating septic systems
- mitigations along the transport pathway, eg, alum treatment in tributary streams
- mitigations in the lake, eg, harvesting weed biomass

The work programme continues to be subject to regular review and the Funding Deed requires independent assurance of progress at 3 yearly intervals.

⁹ The shared cost schedule excludes investments from the agricultural sector

In 2014, the **Independent Quality Assurance Review** found, inter alia, that the programme will come to a juncture where the broader benefits should be considered:

- public perceptions of success are likely to be broader than just TLI levels
 - there are nuances to consider such as that when the lakes become clearer then there may be a growth in weeds which will impact community use
- We suggest that once the Incentives Scheme has been designed and begun implementation that the benefits are reviewed to consider the opportunities to take a wider focus, and in doing so, to engage with the local community and partners to consider trade-offs.

The next Independent Quality Assurance Review is scheduled for 2017.

Provision: Introduction

Add:

Reason: as above. The Incentives Scheme is central to an integrated framework, central to RPS policies, central to PC10 rules and material to relief sought later in our submission

Relief Sought: that the following section be added.

That Council review the funding criteria for the Incentives Fund to consider opportunities for a wider focus.

Incentives Scheme

The Incentives Scheme was set up in November 2014. The objective is to achieve a permanent reduction in N entering Lake Rotorua by 100t pa within a budget of \$40m by 2022.

The intention is to retain economic pastoral units¹⁰.

Experience to date indicates that achievement of the objective may be challenging¹¹. No deals have been settled as yet. Gorse conversion deals have also been slow. Key factors include;

- “bridging the gap between landowner understanding and expectations around price and quantum, coupled with the limited amount of funding available”
- “a number of small block holders have registered interest but economies of scale will be an issue as the transaction costs relative to a satisfactory return will be challenging”
- changes in Overseer estimates and recognition of attenuation as a significant factor have introduced significant uncertainty and complexity into administration of the fund

The Scheme is currently structured to purchase rights to discharge nitrogen below the level established by Nitrogen Discharge Allowances (NDAs) to be allocated to landowners based on Overseer modelled estimates of nitrogen leaching losses from land.

Review of the scheme to consider opportunities for a wider focus will be scheduled prior to the next Independent Quality Assurance Review in 2017.

¹⁰ PC10, s32 report, 11.7.2

¹¹ Lake Rotorua Incentives Board, report to Rotorua Te Arawa Lakes Strategy Group, 17 March 2016

Provision: Introduction

Add:

Reason: Overseer is central to the PC10 framework

Relief Sought: that the following section be added.

That - pending the Rotan review and any consequential review of the RPS target - numerical NDAs are not included in PC10 rules.

That use of Overseer in monitoring progress toward managed reduction targets is assessed as five year rolling averages

That a method be developed to recognise mitigation methods which are not currently recognised by Overseer

That a method be developed which supports prioritisation of interventions at sub-catchment scale

Overseer

The OVERSEER model has underpinned the nutrient management framework over the last decade:

- Rule 11 used Overseer estimates to benchmark and cap nitrogen losses from farms
- ROTAN used Overseer estimates to predict nitrogen loads and reduction targets
 - assuming zero attenuation except in the Puarenga sub-catchment
- Development of a methodology for allocating farm NDAs relies on Overseer estimates
- The Incentives Fund relies on Overseer estimates for purchase of nitrogen discharge rights

During this period, Overseer has undergone several version changes. Rule 11 benchmarks were initially developed in Overseer version 5.4. With the subsequent release of version 6.2, farm estimates have been adjusted, changing both absolute estimates of leaching losses and relativities across sub-catchments, sectors and properties.

ROTAN estimates of catchment loads and attenuation were also based on Overseer version 5.4 achieving a satisfactory fit with measured N concentrations if zero attenuation was assumed¹².

- The satisfactory match indicates
 - either, nitrogen exports have been under-estimated and attenuation is non-zero
 - or, nitrogen exports have been estimated correctly and attenuation is negligible
- The latter was selected as the basis for modelling catchment loads, while acknowledging
 - if this is true, there may be limited opportunity to increase catchment attenuation, eg, through wetlands or riparian buffers

In the event, Overseer version 6.2 now indicates that the former is more likely:

- the corollary is that attenuation is more than zero, and opportunities for enhancing catchment attenuation can now be considered
- a review of ROTAN is currently underway to re-estimate catchment loads and attenuation
- alongside this review, research into attenuation is currently a high priority for Council including investigation of specific trial work to support estimates derived from ROTAN modelling

The results of this further modelling and research – alongside the wider Science Review in 2017 - will necessitate a review of catchment load estimates and reduction targets. In particular, the RPS N reduction load number and reduction target will need to be updated to Overseer 6.2.

¹² Rutherford 2009

The results of the work underway on attenuation are likely to expand the portfolio of mitigation opportunities to achieve the outcomes sought in the lake.

Alongside work to update ROTAN, Council identified that attention was required to assess whether Overseer is “fit for purpose”. A programme of work was initiated to review use of Overseer by other regional councils, to identify uncertainties associated with the model, and to develop recommendations for appropriate use.

A stocktake of regional council uses of Overseer in regulation signalled unease about the use of the Overseer model as a rigid regulatory tool.¹³ The Overseer model is subject to inevitable uncertainties: of particular relevance in the Lake Rotorua context is that estimates beyond calibration/validation range include pumice soils and high rainfall systems.

In 2015, AgResearch undertook work to compare measured N leaching values against Overseer predictions, using data from SFF research trials at Wharenuī and Parekarangi Trust¹⁴. Key findings:

- accurate comparison of measured and modelled N leaching values should be based on similar drainage values
- analysis showed that when drainage values align, the comparison with measured values was reasonable - the converse was also true
- this analysis highlighted an issue with Overseer estimates of drainage at both of these sites with large implications for estimated N leaching losses

Work is now being commissioned in collaboration with industry to calibrate Overseer to local conditions, specifically:

- data collection from two Rotorua dairy farms in high rainfall areas on pumice and podzol soils
- the results could be incorporated into Overseer after 2020, at which time a further review of ROTAN catchment load estimates and farm leaching estimates may be required

S-Map is a critical input into Overseer and the BoP region has complete S-Map (soils) coverage. As noted above, some underlying soil physics data may not be as accurate as initially thought: alongside the calibration project, LandcareResearch have recently been approached to help address this issue¹⁵

Part of the uncertainty in Overseer derives from the use of annual inputs with a longterm average climate model. To reduce uncertainties associated with this disjunct, protocols for use¹⁶ include that:

- input data should be the average from multiple years - using annual inputs requires significantly more data entry time; or, where annual inputs are used
- interpretation of the output should apply to multiple years, eg, the use of a rolling average, or trend analysis to reduce the impact of year-to-year variability
- In addition, the uncertainty of Overseer predictions can be reduced if the focus is on a percentage change over time, rather than an absolute change.

Overseer Best Practice Data Input Standards provide options for inputs, generally prioritising:

- Farm specific data first, then locally available information, then Overseer defaults
- The more precise the inputs, the more ability to test sensitivity to management changes
- Standardised input values are useful for tracking changes in aggregate loads through time, but are less useful at farm-scale to identify and prioritise opportunities for reducing nutrient losses

¹³ Aspiring Environmental 2015

¹⁴ AgResearch, 2015

¹⁵ LandTAG meeting, 29 February 2016

¹⁶ Overseer Best Practice Data Input Standards, 2013; Tukituki Statement of Evidence: D Wheeler/AgResearch, 2014

The use of Overseer estimates as the basis for tradeable/enforceable NDAs depends in part on the ability to incentivise and recognise efficiencies and innovations. The Lakes Action Plan distinguishes:

- a first tranche of economically viable best management practices
- a second tranche expected to be achievable with known technologies
- a third tranche expected to come on line as research/management initiatives evolve over time

In this context, it is important to understand which practices are recognised within the Overseer model. A recent review¹⁷ of strategies to mitigate the impact or loss of contaminants from agriculture found that NZs changeable weather patterns - floods, droughts, el nino cycles - affect the timing and amount of run-off, and the capacity of farm-scale mitigations to remove contaminants:

- three classes of mitigation methods were assessed: at source, interception along hydrological pathways, and bottom-of-catchment
- the report found that the majority of strategies assessed are not captured in current models

The key implications arising are:

- the need for a mechanism to recognise mitigation methods which are not currently recognised by Overseer¹⁸
- the need for a policy framework which supports catchment-scale interventions as well as farm-scale initiatives

Provision: Introduction

Add:

Reason: understanding state and trends in Lake Rotorua is central to development of an appropriate portfolio of methods and rules, and material to relief sought later in the submission.

It is not sufficient to rely on the issue description in the operative RWLP.

Consideration of the NPS-FW National Objectives Framework is also material to consideration of PC10: clearly PC10 does not include NOF. Equally clearly, at some point we will need to address NOF for Lake Rotorua. Most sensibly, in the Rotorua Lakes WMA.

The science informing the lake objectives, targets and management relies on both data and models. MfE guidance on freshwater accounting¹⁹ emphasises an estimate produced by a model is only complete if it is accompanied by a statement of the uncertainty:

- It is important that stakeholders understand the uncertainty associated with load estimates, particularly in setting limits
- This uncertainty should be explicitly stated

MfE referenced earlier work²⁰ which recommended three areas require research in NZ:

- Quantification of the error associated with load estimates
- Examination of the causes, and variability in errors, among sites and contaminants
- Examination of the implications on subsequent management decision and action

¹⁷ Agresearch/NIWA 2013

¹⁸ LandTAG minutes, 26 November 2014

¹⁹ MfE 2015

²⁰ Aqualinc 2014

MfE followed up this last point:

- In high priority FMUs with issues of over allocation, it may be necessary to reduce the uncertainties in order to provide the necessary confidence in the outcomes of decisions
- In situations where decisions have to be made despite high levels of uncertainty, additional processes should be put in place to manage the associated risk
- It may be appropriate for a programme of work to be outlined where, over time, uncertainties can be reduced and estimates refined (for example, through improved input data as a result of better monitoring practices) to allow decisions to be reviewed in the future.

It is our strong submission that Lake Rotorua is one of the priority catchments where we need to **reduce the uncertainties** to provide the necessary confidence in decisions. Not least decisions on investment of the Incentives Fund.

It is also our submission that key pieces of science informing Lake Rotorua targets and management have explicitly declared various assumptions and uncertainties; but that these have been “glossed over” and forgotten with the passage of time and in the transition from science to policy.

The PC10 s32 report records that: “the sustainable nitrogen limit was first identified in 1986 and has been re-assessed and confirmed three times”. The same statement was made in the RPS Decisions Report. **This statement is incorrect.** Repeating it does not make it true. Prefacing it with “sustainable” every time does not make it so.

Relief Sought: that the following section be added.

That Council amend the plan in its entirety to acknowledge significant shifts in the science, including in the significance of internal bed nutrients, flood-flow particulate nutrients, sub-catchment attenuation processes and pathways, and the potential shift to P-limitation in the lake

That the plan be amended to state that the planned Rotorua Lakes WMA and consequential plan change will give effect to the NPS-FW 2014, including the National Objectives Framework.

That a method be included for developing improved understanding of requirements for safeguarding indigenous species, preliminary to the Rotorua lakes WMA scheduled in 2020

Lake Rotorua: State, Trends, Targets

In 2011, the NPS-FW introduced a National Objectives Framework (NOF) with compulsory values for safeguarding indigenous ecosystems, including bands and national bottomlines for lake water quality.

The compulsory value for safeguarding ecosystems directs that the outcome should be that ecological processes are maintained, there is a range and diversity of indigenous fauna and flora, and there is resilience to change.

Matters to take into account include management of adverse effects of excessive nutrients, high sediment levels, low oxygen, invasive species and changes in flow regime.

The compulsory value for safeguarding the health and mauri of the people includes managing levels of bacteria to support secondary contact recreation.

The following table shows 2012 lake data in the NOF Bands: bracketed values are the TLI target parameters thought to reflect water quality in the post-war period:

NOF Lakes Ecosystem Health	TP mg/m3, median	TN mg/m3, median	Chlorophyll mg/m3 mg/m3, median
A healthy ecological communities			
B slight algae impacts from elevated nutrients	15 (20)	334 (300)	
C moderate algae impacts from elevated nutrients			7 (10)
D excessive algae, losing oxygen in bottom waters, at risk of regime shift			

The NOF requirements will be considered as part of the Rotorua Lakes WMA, including with attention to the lake managed flow regime, introduced species impacts, and potentially broader indicators for safeguarding the indigenous fauna and flora in the lake. Work to date has been relatively limited but includes:

- An overview report on taonga and mahinga kai species²¹ recording the collapse of the customary fisheries for inanga and kokopu after the introduction of trout
- A review of crustacean zooplankton communities over 40 years from 1955-1995²² which found that, despite major changes in nutrient inputs, species composition had not changed.

In the meantime, the key indicator for the lake as set in the RWLP is the Lake TLI. A key driver for the Lake TLI objective is reducing excessive weed. The target TLI is 4.2 (rolling 3 year average): **in recent years, the target TLI has been met.**

During the 1970s, it was recognised that water quality was deteriorating as a result of increased nutrient loads, including from:

- discharge of sewage to the lake
 - the population of Rotorua doubled in the 1960s/70s
 - 1965, population 25,000 discharging 70t N to the lake pa
 - 1976, population 50,000 discharging 150t N to the lake pa
- farm runoff
 - a lot of country was cleared in the 1920s, then reverted to gorse and scrub during the depression before a significant period of clearance in the post-war period
 - the area in drystock farming trebled post-war
 - 1940 5,000 ha
 - 1958 15,000 ha
- aerial topdressing
 - in the 1970s government encouraged development with fertiliser incentives, livestock incentive loans and cheap land development loans

In 1984, water quality trends in Lake Rotorua were examined for the period 1966-1983²³. That report found that both meteorological conditions and nutrient inputs can influence lake water quality:

- lake quality deteriorated during 1967-1970 largely because meteorological conditions favoured lake stratification
- during 1978-1983, water quality deteriorated at the same time as - and probably as the result of - an increase in available nutrient from sewage input

²¹ NIWA 2007

²² Chapman and Green, 1999

²³ Rutherford, 1984

The same report recorded that many people assumed that eutrophication was responsible for the excessive growths of exotic macrophytes during the 1960s, but that:

- it is now generally accepted that exotic macrophyte proliferation was coincidental with, but not necessarily the result of, any eutrophication which may have occurred at the time.

The TLI target was proposed in the 1980s²⁴: a group of scientists and engineers suggested the aim was to restore the lake condition to that which prevailed in the post World War Two era before the population doubled, before the land was cleared for ballot farms, and before invasive weed was flushed out of the trout hatchery:

- the target chlorophyll concentration was proposed as 10 mg/m³, thought to reflect lake conditions in that post-war period
- to achieve the target chlorophyll level, the target TP was proposed as 20 mg/m³
- assuming the TP target could be achieved by external load reductions – neglecting internal inputs - it was determined that a new equilibrium would be reached, at which time lake TN “will be close to 300 mg/m³”
- alternatively and more likely – if internal nutrient loads persisted – a new equilibrium would be established with
 - TP average 50 mg/m³ (range 30-90)
 - TN average 450 mg/m³ (range 340-640)

Internal nutrient loads are in fact a significant contributor to lake nutrient cycling:

- the internal TP load (60t) is greater than the estimated catchment load (48t)²⁵
 - the internal TN load (360t) is 40% of the estimated catchment load (560t)²⁶
- notwithstanding the significance of internal loads, the target taken forward in policy was the former (300mg/m³) **which assumed no internal load**, and not the latter (450 mg/m³) which recognised internal bed load

In 2003, Council commissioned NIWA²⁷ to:

- determine the load of N and P from the catchment that will attain a TLI of 4.2 or less
- the brief was subsequently adjusted to more simply determine the reduction in catchment loads to attain the target lake loads - excluding internal loads - as estimated in 1989
- consideration of whether internal nutrient loads were affecting lake water quality was outside scope
- likewise, the target itself was outside scope

The report highlighted a number of uncertainties in the science:

- annual average lake chlorophyll concentration is only weakly correlated with annual average TN and TP concentrations
- there are clearly factors affecting phytoplankton abundance that are not satisfactorily captured by the combination of an annual nutrient mass balance model, and a fixed chlorophyll/nutrient ratio
- chlorophyll concentrations may vary depending on the sample collection method (surface scoops or depth tubes) – it is not possible to determine if sampling method has biased the available chlorophyll data
- it is desirable to re-examine the question of the bio-availability of particulate nutrients and the effect of flood flows on lake nutrient and chlorophyll concentrations

²⁴ Rutherford et al, 1989

²⁵ David Hamilton, science presentation, April 2016

²⁶ Action Plan, 2009

²⁷ Rutherford, 2003

- an increasing TN/TP ratio suggests that if either nutrient limits phytoplankton growth it is increasingly more likely to be P than N
- **there is not a clear consensus about the desirable target N/P ratio for the lake, and the external loads**

The report went on to recommend:

- Given evidence of a widespread and significant increase in baseflow stream nitrate concentration, it is desirable to make a more detailed study of catchment nutrient loads. Such an analysis needs to include:
 - the contribution from storm flows and particulates
 - transport pathways for the delivery of nitrate and the time delays involved
 - opportunities to intercept nitrate
 - opportunities to reduce nitrate generation
- It is important for management to know which parts of the catchment are connected to which streams or springs, the time it takes water and nitrate to travel along each of these pathways, and the amount of attenuation that occurs along each pathway
- If this information were available it would be possible to determine where mitigation measures could be located in the catchment, eg, wetlands and/or riparian buffer zones that reduce nitrate by de-nitrification
- It would also enable areas to be identified where mitigation measures would not be effective

In 2008, Rutherford reviewed the technical work underpinning estimation of catchment loads²⁸, and in 2011 Rutherford used the ROTAN model to predict the timing²⁹ of nitrogen loads to the lake:

- **In both cases – as in the 2003 review – the targets were assumed as a given**
- Given this, the 2011 review then assessed how long it would take to reach the target load (435t), ie, what level of N reductions would achieve the target over what timeframe.

Three reduction scenarios were selected – R-250t (as above), R-300t, R-350t. The results indicate:

- R-250: the target N load would be reached some time at or after **2090**
- R-300: the target N load would be reached around **2090**
- R-350: the target N load would be approached around 2050 - assuming a step change in land use into pines in 2015 - and reached around **2080**

On the strength of these results, NIWA proposed:

- total N exports need to be reduced from the current value of 720t/pa by about 320t/pa to achieve the 1986 target of 435t N (including 30t sewage)

On the strength of this advice, Council notified the RPS to that effect, ie, the catchment load target was proposed as 435t N; and the load reduction required to achieve it was in excess of 300t.

²⁸ Loads. Not targets.

²⁹ Timing. Not targets.

The ROTAN model was presented with a number of provisos, including that :

- reliable estimates of monthly or annual load have not been published for individual streams
- some of the *observed* concentrations are low - reasons for outliers need to be identified
- ROTAN assumes no attenuation of N exports from land to water
 - except Puarenga where ROTAN assumes
 - zero attenuation from pasture
 - 40% attenuation from Rotorua Land Treatment of Sewage (RLTS)
 - 50% attenuation from forestry (from 4kgN/ha/pa to 2kgN/ha/pa)
 - Wetlands are common in the Puarenga catchment, and NIWA postulated that N removal in the wetlands may explain the low stream concentrations and the need to “adjust” the attenuation factor

Consistent with the 2003 report, NIWA suggested the best strategy now may be to move beyond the broad catchment models to:

- focus mitigation measures on those land parcels where it is easiest - for economic or social reasons - to reduce/attenuate N exports
- more detailed modeling could be used to explore spatial distributions of land use change

The NIWA work³⁰ emphasised that, despite the overall increasing trend in TP and TN at that time, the average TLI did not show a permanent decreasing trend over the period 1967-2002:

- The finding that annual average lake chlorophyll concentration is only weakly correlated with annual average TN and TP concentrations is in contrast with the public viewpoint that water quality is steadily deteriorating
- this perception may be driven by problems associated with invasive plants.

Problems with **invasive plants** in Lake Rotorua have been apparent since the late 1950s³¹

- the first oxygen weed species to establish was *Elodea canadensis*, possibly flushed out from the Ngongotaha trout hatchery
- by the mid-1950s *Lagarosiphon major* had appeared in Lake Rotorua; by the late 1950s, major weed problems were apparent
- from 1958 on, large onshore accumulations of weed drift occurred after storms, resulting in an aquatic weed nuisance unprecedented in New Zealand
- hornwort was first recorded in 1975 and *Egeria densa* in 1983
- by 1988, *Egeria densa* had established weed beds around most of the lake, covering an area of 440ha and resulting in a peak Invasive Impact Index of 90%
- in the early 1990s, *Egeria* underwent a major decline and has never recovered
- while the impact from *Egeria* has been less than expected, the impact from hornwort has exceeded all expectations with this species now ranked as NZs worst aquatic plant pest.

The 1986 review of lake water quality was prompted principally by a concern to “turn back the clock” to the lake conditions experienced prior to the weed problems experienced from the late 1950s:

- “a suggested aim is to restore the lake condition to that which prevailed prior to the 1960s, before widespread public concern about phytoplankton growths developed”³²

³⁰ Rutherford, 2003

³¹ NIWA, 2015

³² Rutherford 1989

At that time it was thought that the weed problems were principally due to increased sewage loads:

- “the rate at which the bottom waters of the lake lose oxygen during calm summer conditions has more than doubled since 1970, in parallel with increasing sewage nutrient inputs”
- “when bottom waters of the lake become anoxic, phosphorous and nitrogen are released from the sediments; when the lake mixes again, these nutrients stimulate phytoplankton growth”

The authors of the 1989 review developed a TLI formula, setting targets for reducing P loads (to 37t) and N loads (to 435t). These targets did not include **internal nutrient inputs**, but the authors noted:

- “we might expect the lake to recover quickly if internal inputs decrease immediately after nutrient diversion”
- “it is likely however that internal nutrient inputs will continue for some time”
- “a worst case scenario is that internal inputs might persist for some years”

The worst case scenario has in fact prevailed. Lake TP concentrations today average around half of the very high levels observed in the mid-2000s; but in 2007, a report on options for dredging bed sediments³³ found a large pool of available P in the upper sediments in the deepest part of the lake:

- the release of this P during periods of anoxia is believed to be the primary driver of lake eutrophication
- internal nutrient loads are estimated at 360 t/N and 36 t/P
- in an unusually calm and hot summer, eg 1969/70 it has been known to stratify for 20-40 days, driving trout in-shore
- in years of prolonged stratification (weeks) these de-oxygenation events may produce internal nutrient loads comparable to incoming catchment loads
- in 2003, the release of sediment N was estimated at 300 tons, and release of sediment P was estimated at 24 tons during two stratification events

From 1992-2000, the lake experienced a warming trend of 0.19 degrees pa, with long, warm, calm periods and the development of sediment-water interface anoxia³⁴.

- the anoxia resulted in large releases of soluble P and N to the lake water
- single episodes produced 178% and 84% of the annual loads of DRP and TP respectively, and 66% and 32% of the annual loads of TIN and TN respectively
- when the lake had a period without anoxic episodes from July 1998-June 1999, the TLI was 4.3, down from 4.8 the previous year

In summary:

- The lake TLI target parameters proposed in the 1980s assumed no internal nutrient load
- Notwithstanding this assumption, a key driver of algal dynamics is the internal nutrient load
- Nevertheless, the initial lake targets have continued to underpin policies and strategies over the last 30 years
- The Science Review scheduled for 2017 is now expected to review the lake targets with appropriate recognition of legacy internal nutrient load.

From 2006, alum treatment trials began in two tributary streams to reduce P inputs to the lake. Unexpectedly, the trials delivered dramatic and rapid improvements in the lake TLI. A report assessing the results and implications³⁵ tested alternate loadings of N and P in model scenarios:

- importantly, only those scenarios where alum dosing was included consistently met or bettered the TLI target
- the possibility that recent observed improvements result from a regime shift towards more frequent P limitation is an important consideration for management of the lake.

³³ AER 2007

³⁴ Burns et al, 2005

³⁵ Hamilton 2015

While the magnitude of the change was unexpected, the results confirm the significance of legacy sediments in shallow lakes; and highlight the complexities of short and longterm strategies for improving ecological health and recreational values in Lake Rotorua.

In 2003, the Ministry for the Environment (MfE) commissioned a review of management options for Lakes Rotorua and Rotoiti³⁶. The report suggested that – while a number of good studies have been done over the last 35 years – the science has not been coordinated as well as it might be to produce a whole system understanding that leads to the best management options.

The report emphasised that the broader ecosystem health of the lakes must be the ultimate aim of any management. In the shorter-term, the report recommended that BoPRC focus on investigations that will set clear targets for:

- an annual total catchment load for Lake Rotorua for P and N that builds in capacity for future development around the lake
- internal lake P and N load targets
- annual average stream P and N concentration targets for each of the nine sub-catchments

The report identified that a major issue for short-term management is to determine the role of internal lake nutrient loads in promoting algal blooms. In Rotorua, these loads could be at least half the catchment loads and they occur at the worst time of the year for blue-green algae. Therefore:

- it is believed more work needs to be done to **clarify the relationships between catchment nutrient loads and lake nutrient dynamics to set a range of targets**
- the aim for these targets is to minimise unwanted algal blooms and focus both short-term and longer-term management measures

The report recommended a raft of catchment and in-lake measures, including as a high priority:

- extend monitoring into sub-catchments with the highest nutrient inputs to characterise any point sources that may become a priority for management
- urgently investigate options to strip phosphorous from streams that have high levels of P coming from springs, starting with Hamurama, Awahou and Waingaehe
- continue trials with nutrient stripping materials such as alum and Phoslock, and begin trials with direct oxygenation, separately and in combination, to determine the best methods to reduce N and P in the lakes and manipulate the N:P ratio
- establish a zero target for nutrient inputs from the Rotorua RLTS
- construct or enhance wetlands where there are opportunities to intercept high nutrient base flows in the catchments and on the foreshore
- understand the role of storm flows as they may trigger undesirable algal blooms at certain times. If this is the case, management measures could be put in place relatively quickly

The report emphasised the importance of monitoring catchments to quantify nutrient inputs from different landuses and land types, and to measure the results of often expensive management measures. Further to that, the report recommended:

- building simple sub-catchment models that can be used to work with landowners to show how they contribute to nutrient reductions across the catchment, and how their management efforts are working.

The short and longterm complexities of restoring shallow lakes have been contrasted with deeper lakes such as Lake Taupo where management of catchment nitrogen loads is the focus. The ROTAN model (Rotorua and Taupo Nitrogen Model) deals with one aspect of a system that is more complex in the case of Lake Rotorua. In 2004, Council commissioned a report which suggested³⁷:

- in contrast to Taupo, Lake Rotorua requires both short-term measures to reduce the impacts resulting from bed sediments, and longterm measures to deal with nutrient exports from the catchment
- supported by ecosystem models which are capable of predicting the interaction of complex interventions with one another and with the environment they are intended to influence.

³⁶ Dr Bruce Hamilton, 2003

³⁷ MDL 2004

A review of the ROTAN model is currently underway; alongside this, Council have signalled the need for consideration of a successor model as part of the 2017 Science Review.

Provision: Introduction

Add:

Reason: important context and material to relief sought

Relief Sought: add section as follows

Amend the Method LR M2 to include review of whole system understanding to support effective and efficient interventions; and to include consideration of wider ecosystem health outcomes.

Science Review

In the decade or more since the MfE Review, Council have implemented many of the recommendations as part of a comprehensive programme of research, management and research by management (RBM) across the Rotorua lakes, including Lake Rotorua.

Lake TLI peaked in the 1980s but a recent review³⁸ found longterm improvements since 2001:

- The similarity in direction, magnitude and statistical significance of longterm trends of TLI parameters at both monitoring sites underscores the likelihood of basin-wide improvements in water quality within Lake Rotorua since c. 2001

The 2017 Science Review has been scheduled to take stock of progress and learnings. The focus, as in 2003, is to **improve whole system understanding to support effective and efficient interventions.**

- Pending that review, key science findings to date include that:
- There has been a consistent improving trend in lake TLI since 2003 and improvements have been stronger over the last few years (2011, 2012, 2013)
- These trends coincide with low level alum dosing in Utuhina (beginning 2006) and Puarenga (beginning 2010)
- Other processes also appear to be important as improving water quality trends commenced three years prior to alum dosing
- **Algal growth in Lake Rotorua appears to be primarily limited by phosphorus** availability because of the greater relative reduction in phosphorus and Chlorophyll-a than nitrogen
- **Internal nutrient loading is currently the main driver of algal dynamics in the lake** and release from internal stores is the primary mechanism for supply of P during critical periods for algal growth
- Alum is believed to be locking up internal phosphorus loads, hence the accelerated improvement to water quality since greater alum dosing in 2011

³⁸ ESR 2012

- Trend analysis indicates that levels of nitrate in inflow streams are increasing, as are levels of nitrate in the lake outflow. There does not appear to have been any adverse effects of this increasing nitrate trend on algal biomass
- Knowledge about catchment and in-stream attenuation processes is almost non-existent and is a major gap
- **The sustainable loads of N and P required to achieve a TLI of 4.2 in the long-term are uncertain and need revision to take account of new information** on P-limitation, effects of alum-dosing on internal P-loads and better understanding of N & P attenuation in the catchment
- Predictions from ROTAN indicate that external loads of N to the lake will continue to increase until loads reach equilibrium with current land use
- The likelihood of maintaining a lake TLI of 4.2 or less is:
 - Low, if current alum dosing is stopped
 - Low, if catchment P mitigation replaces alum dosing in the short-term (internal load would not be effectively controlled by catchment mitigation in short term)
 - High, if catchment P controls are put in place long-term **and** internal P load is controlled (e.g. through alum-dosing and eventual flushing)

Critical knowledge gaps include:

- Understanding of the key drivers and processes leading to the observed improvement in lake water quality prior to alum dosing (2003-2006)
- Whether the current N and P load estimates to achieve a TLI target of 4.2 are still accurate given the recent response of the lake to P reduction
 - a. The importance of catchment and in-stream attenuation processes
 - b. Whether the phytoplankton community will remain P-limited
- The catchment groundwater boundary and reliability of this estimate
- Is alum dosing sustainable long-term?

In November 2015, a Council Workshop identified that upcoming science priorities³⁹ include:

- Groundwater boundary validation
- Local calibration of Overseer
- In-lake science, especially the N and P balance
- Identification of P sources and mitigation options is vital – the current Collective SFF bid may assist
- Viability of mitigated and alternate low-N farm systems - farmers need more confidence in the options before investing/changing. While there is existing science on such systems, the challenge was adapting them to Rotorua conditions and demonstrating them. Solutions need to account for the wide range of soil/rainfall types. Agreement that value chain analysis is important for alternative landuses

³⁹ BoPRC Land Science Priorities meeting, 9 November 2015

The workshop agreed that major new science is in the pipeline, notably P21 projects that look at N and P plus economics; and agreed that **science advice has always been to tackle both N and P:**

- Much existing NZ research is relevant to Rotorua but hasn't been brought into the picture
- Better connects are needed between the science and the outputs to the farming community
- Both ongoing science effort and the 2017/2022 reviews are critical, especially Council willingness to "ease off" N reductions if there is a good science case to do so.

The 2017 Science Review will review all findings to date and reset the science programme going forward. It is expected to make recommendations for any amendments necessary to the RPS and RWLP if the science supporting the TLI objective or nitrogen reduction target materially alters.

Provision: Introduction

Add:

Reason: important context and material to relief sought later in the submission

Relief Sought: add the following

Statutory and Non-Statutory Reviews: Summary of Timelines 2016-2022

Science/Modelling:

- 2016 ROTAN review of catchment loads/attenuation factors to take account of revised groundwater boundaries, revised Overseer 6.2 estimates and updated measured stream concentrations
- 2017 Science Review
- 2020 results of Overseer local calibration; re-estimation of farm and catchment load and attenuation factors if necessary
- 2022 Science Review

Interventions/Funding:

- 2016 review focus for Incentives Scheme
- 2017 Independent Quality Assurance Review
- 2019 Review/renewal of alum consent
- 2020 Independent Quality Assurance Review

Policies/Plans:

- 2016 confirmation of WMA timelines
- 2016/17 review of On-site Effluent Treatment (OSET) Plan
- 2018 five year review of RPS, including review of RPS Policy WL6B load estimates and reduction targets in light of ROTAN revision and Science Review
- 2020 Rotorua Lakes WMA - review RWLP values/objectives/limits/methods
- 2024 ten year review of RPS

Provision: introduction

Add:

Reason: important context and material to relief sought

Relief Sought: that the following section be added

That council amend the plan in its entirety to give better effect to these principles and approaches.

Integrated Nutrient Management: Principles and Approach

In 2007, the **Memorandum of Understanding** between the Crown and the Rotorua Lakes Strategy Group agreed principles, including:

- “We recognise that preserving and protecting the lakes will take a great deal of time, effort and financial resources to accomplish the restoration of the lakes
- We recognise there are legacy problems that have been created over a long period of time
- We recognise that restoration of the lakes will require adaptive management, where actions and approaches may change as our understanding of the lakes changes with future research
- We recognise that cost sharing is appropriate”

The principle of cost-sharing was agreed in part following work commissioned by Council in 2004⁴⁰. The report elucidates a policy framework concerned with two objectives:

- Implementing least cost means of achieving changes required to meet the desired reduction in nutrient levels; and
- Allocating the costs of change in a manner that best supports the achievement of a longterm solution
- This requires developing funding mechanisms that are
 - Accepted as legitimate
 - Have the minimum possible impact on freedom of choice in the exercise of private or collective property rights
 - Encourage flexibility and innovation rather than prescribe “one right way”

The report discussed regulatory intervention in the context of the relationship between incentives, actions and property rights:

- An inflexible regulatory intervention can significantly increase cost by denying the opportunity for people to choose – from their experience, knowledge and innovative capability – the least cost means of achieving the desired outcomes
- **A more flexible regulatory approach, focussed on outcomes and providing an incentives based approach rather than a “command-and-control” approach provides greater scope for realising desired outcomes in a least cost manner**

⁴⁰ MDL 2004

The report did not directly discuss the costs of regulatory or other interventions, except to make the point that the greater the potential cost of remediation, the more difficult it may be for those immediately involved to afford the cost:

- International literature clearly suggests that, although it is normal practice for the costs of environmental regulation (especially in terms of future conduct) to fall on the parties affected, it is also clear that this is a matter of degree
- If the impact is relatively marginal, then imposing costs on the parties concerned is seen as perfectly legitimate
- However where the cost of regulation is significant in relation to the private wealth of the actors involved, there is a strong sense that considerations of equity and fairness argue against requiring those individuals to bear the cost, ie, that **particular individuals should not suffer significant economic loss because of the unforeseen consequences of lawful activity.**

The report records a further difficulty – particularly in relation to agriculture – where the activities concerned were not only legal but actively encouraged:

- Internationally, there has been considerable reluctance to impose retrospective liability for activities which, at the time they were carried out, were in conformity with the applicable law, and in accordance with acceptable industry practice
- In New Zealand, maximising agricultural output was a primary focus of successive governments in the post-war years with government acting both as a major developer and as a funder
- In the 1960s, Government interventions included subsidies on phosphate fertiliser, favourable tax treatment for livestock, and subsidised lending through the State Advances Corporation; in the 1970s, interventions included the Livestock Incentive Scheme and the Land Development Encouragement Loan Scheme

Specifically in the Rotorua context, the report records:

- The success of Sir Apirana Ngata in securing land for development by the Board of Maori Affairs
- The activities of the Lands & Survey Department: from 1944 to 1980, the Rotorua branch settled 10,500ha in over 1,000 farms (700 dairy, 300 sheep); in addition to farming 70,000ha to be made available as ballot farms

The report concludes that applying the “polluter pays” principle in the Rotorua situation would offend against both the general legal principle that people should not be held accountable for the costs of action which was lawful, and indeed encouraged by government; and against considerations of fairness and equity.

The report then considered the efficiency of **mechanisms for cost-sharing**, noting two issues arise:

- Minimising transaction costs, ie, choosing funding means that impose minimal cost in terms of collection and enforcement
- Choosing means that have a minimal economic cost, ie, not inhibiting otherwise desirable economic activity

Specifically re agriculture, the report offered experience from England where farmers were generally supportive of a tiered cost-sharing arrangement:

- Basic plan: requiring farmers to comply with existing regulations and adopt ‘Tier One’ basic good practice; with eligibility to apply for cost-share grants for “Tier Two” measures
- Plan Plus: a funding package to finance the proactive, advanced planning and farmer networking required to achieve rapid change in priority catchments.

This **three-tier approach** is consistent with the Lake Rotorua Action Plan; and consistent with the nutrient management framework developed by the Lake Rotorua Primary Producers Collective, ie.

- Enabling collective approaches where farmers work in partnership to define and ‘own’ the problem and invest in effective solutions that produce viable and enduring results
- Staged reduction targets that are achievable and allow for adaptive management responses over time
- Recognition that the most cost-effective nutrient reduction package is likely to be a complex mix of best practice, land management change, land use change, off-site mitigation and possibly future unknown technologies
- Farmer responsibility for implementing agreed nutrient management best practices that cover both N and P losses, and account for different farm systems
- Enabling flexibility wherever possible, provided agreed net reductions are still achieved
- Financial assistance to “buy’ nutrients using proven methods that go beyond defined best practice, including major farm reconfiguration, infrastructure investment, multiple farm deals and off-farm mitigation, eg, wetlands, watercress
- Establishing a governance structure to manage nutrient reduction funds, potentially involving a nutrient trading regime
- Transparent progress monitoring, with associated audit and compliance processes
- Ongoing development, testing and extension/promotion of innovative nutrient management methods, with links to wider New Zealand initiatives and experiences
- A collaborative working relationship with BoPRC to design and implement a comprehensive nutrient management policy, and joint work programme that is practical, equitable and sustainable across all four well-beings.

In 2013, the **Oturoa Agreement** between BoPRC, Federated Farmers and Lake Rotorua Primary Producers Collective cemented this commitment to a collaborative relationship. The parties agreed principles and core intentions, including that:

- The parties recognise the importance of a clean and healthy Lake Rotorua
- The parties recognise the importance of the rural sector to the Rotorua economy
- The parties are committed to reducing nutrient emissions from landuse in the catchment
- The parties agree that the Collective with the support of BoPRC and in collaboration with industry research organisations will work with farmers to develop individual farm plans and collective solutions to meet nutrient reduction targets.

Similarly, the **RPS emphasises integrated catchment management** approaches:

- “Taking a whole of catchment approach is promoted. It means considering the full mix of purposes, uses or activities within a catchment, in terms of how these interact and contribute to outcomes within the catchment and for receiving environments beyond. This approach suggests a need to work with multiple parties to establish shared objectives for a catchment and to ensure uses and activities are working towards the same goals”
- “The achievement of sustainable management will require integrated management of resources, a continuous monitoring and research effort, the acceptance of changing individual and community aspirations and values, and flexibility to take account of the findings of monitoring and allow for technological advancement and human ingenuity”
- “Effective and efficient resource management requires an integrated approach and working with other parties. It also requires taking a non-regulatory approach to achieve desired outcomes. For integrated management to be effective and efficient it requires a coherent and consistent approach with agencies working together in a collaborative manner”

- “Just as it is essential to recognise and manage resources in an interconnected way, it is also vital to involve people in a meaningful way. Natural and physical resources are better managed when the social, economic and cultural factors that surround and drive their use or protection are taken into account. Decisions made about the management of resources are more effective and lasting if they reflect choices made by the community in terms of what it is best or most able to do”

Consistent with the Lake Rotorua Action Plan; and the nutrient management framework developed by the Lake Rotorua Primary Producers Collective, the RPS distinguishes between:

- On-farm best management practices which should be implemented to ensure that all rural production land use activities minimise their nutrient losses as far as is reasonable, practicable and affordable. The aim is to ensure that all rural production land users are operating in accordance with industry best practice.
- The cost of achieving any further reduction in nutrient losses over and above on-farm best practice in a particular catchment will have a mix of public and private benefits and should be funded accordingly

Plan Change 10 is intended to give practical expression to these agreed principles and approaches.

Provision: Introduction

Add:

Reason: It is our submission that PC10 was initially crafted over five years ago, and has stayed “stuck in a groove”, notwithstanding material shifts in the scientific, economic, statutory and social context.

In matters as important as the future of farming in the Lake Rotorua catchment, it is critical that we keep a clear line of sight on the problem we are trying to solve. If the problem shifts, we need to shift with it. The following section records some of those significant shifts.

The following section also records some of the alternate solutions packages canvassed over the last five years. It is our submission that some of these options were too lightly discussed and too quickly dismissed.

For some of the very significant decisions – including the scale and pace of change – the “trail goes cold” on when and why Council made fundamental decisions on the urgency of the timeframes. We request that Council make these transparent.

At the moment, the PC10 s32 report relies on statements to the effect that “the faster we go, the quicker we’ll get there”. We advise Council in plain language: this is not good enough.

MfE guidance⁴¹ clearly directs Councils to identify a sufficient range of options to address the problem or issue, and critically compare these before narrowing in on a preferred option or options:

- a well-defined problem forms a strong foundation for an evaluation
- The degree of clarity about the problem will influence the type and range of policy solutions considered and the quality of analysis of the options

It is our submission that the range of options was generally dismissed too quickly, in favour of the proceeding with the already determined path. **PC10 now presents the first formal, public opportunity to review the critical decisions made in the development of PC10.**

One critical decision is the “hardwiring” of the 2032 target into the rules, in order to ‘force’ farmers into landuse change via the Incentives Fund.

Again we advise Council in plain language: this position is untenable and unacceptable. Council documents make it clear that the LRIB is struggling, but is currently relying on regulatory pressure, alongside financial pressures, to force farmers to do deals.

⁴¹ MfE 2014

We query the level of certainty that any deals made will in fact deliver the result for the lake in the most efficient and effective manner. We query whether LRIB deals focussed on buying nitrogen from land use change at the high end of the cost abatement curve represent the most efficient and effective investment of Crown and Council funds.

This context is material to our relief sought on the rules.

Relief Sought: that the following section be added.

That Council amend the plan in its entirety to give better effect to RMA s5.

That Council provide analysis of the impacts of the proposed rules on individual properties against the RMA s85 tests

That Council amend the plan to remove regulation of farms to achieve the 2032 N target

That Council amend the plan to remove prescriptive controls of farm plans and inputs.

That Council clarify if “align well” with the NPS-FW has the same meaning as “give effect to”.

Development of Plan Change 10

In 2010, Council asked staff to scope how to establish rules that give effect to the policy intent of the proposed RPS regarding the Rotorua Te Arawa lakes.

A key part of scoping the rule making process was the legal mandate. A report⁴² was commissioned to look at the legal authority Council has to impose controls on land owner rights; specifically, the authority Council has to impose such rules, their extent and the key matters it must consider. The report found that Council can impose controls but emphasised the importance of the quality of analysis against RMA s32 and s85 tests.

In 2011, Council determined⁴³ that “the real issue is not whether we can set rules but the merit of the control we set”, including that:

- **Controls must promote the sustainable management purpose of the Act (s5)**
- Setting controls must be justified and stand on their merits
- **The appropriate balance between controls and property rights must be struck**
- There are a number of statutory safeguards that need to be considered; cost and benefit analysis, and the consultation and merit procedures under Schedule one of the Act
- Macro level analysis of the control needs to be undertaken, and **where controls particularly affect individuals, a site specific assessment may be required.**
- If a planning control is proven to place an unreasonable burden on the landowner, the control may need to be altered

The principal purpose of the rules was to give effect to the proposed RPS. At that time submissions on the RPS had closed but hearings were still to be scheduled. On 1 June 2011, Council determined that the proposed RPS requirements for improving lake water quality “align well”⁴⁴ with the proposed NPS-FW. The NPS-FW was gazetted on 1 July 2011

⁴² Berry 2010, Planning Controls and Property Rights

⁴³ SPP Committee, 14 June 2011

⁴⁴ SPP Committee, 14 June 2011

In 2011, Council commissioned a report⁴⁵ which tested alternate reduction targets alongside various scenarios of land management change or land use change. The reduction targets derived from the Rotan work in 2011, ie, R-250, R-300, R-350. The report took as read that R-300 was the preferred target. **Key findings included that the cost of change reduces when undertaken over a longer time period, eg:**

- Option one costs \$43m when implemented over 10 years; but when implemented over 50 years this is reduced to \$15m

The team recommended a package to be programmed over a 25-50 year timeframe to enable intergenerational transition.⁴⁶

- Notwithstanding this recommendation, Council determined that quicker would be better, partly in the belief at that time that the new NPS-FW required limits to be set by December 2014.

The report recommended an integrated package of regulatory and non-regulatory methods – broadly 20-30% regulatory and 70-80% non-regulatory:

- **It is unlikely that regulation alone could bring about change to the degree necessary to achieve the objective**
- The initial actions should come about because people know and understand the problem and how it can be resolved
- **Greater wins can be achieved through incentivisation, cost-sharing or otherwise recognising the benefits of individual and community actions.**

Notwithstanding this recommendation, Council determined that “rules would be the main driver for change; incentives are just tools that can help achieve the target”⁴⁷. Specifically the decision was made that the 2032 farm NDA target would be embedded in the rules. A key driver was the Incentives Fund:

- “Operating the Incentives Scheme becomes problematic (if) there was no regulatory based NDA requirement and this would create an increased risk to achieving the required incentives target”⁴⁸

Notwithstanding the expectation that the 2032 NDAs would “force” landowners to sign up to Incentives funding, the NDAs remain practically problematic:

- “changes in Overseer and the recognition of attenuation as a significant factor in determining in-lake nitrogen continues to create challenges for the LRIB”⁴⁹
- A further practical difficulty is “bridging the gap between landowner expectations around price...with the limited amount of funding the LRIB has available”

The LRIB is cognisant of high stress levels in the pastoral/dairy sector:

- “the continuing decline in the dairy payout combined with the pending rules and corresponding pressure from financial institutions is unlikely to decrease
- while the intention is always to operate in a fair and ethical manner, the objective is to secure nitrogen reductions and that will remain the key focus”

⁴⁵ Beca, 2011

⁴⁶ SPP Committee, 3 August 2011

⁴⁷ SPP Committee, 31 July 2012

⁴⁹ LRIB report to Rotorua Te Arawa Lakes Strategy Group meeting, 17 March 2016

Alongside the decision to “hardwire” the 2032 target into the rules, another key decision was made to take a “streamlined” approach to developing rules for the Rotorua lakes, including Lake Rotorua⁵⁰;

- “It is unlikely that a collaborative decision-making process can be undertaken for developing Lake Rotorua rules at this stage
- Council is too far down the track to enter into collaboration in good faith
- **Many important decisions have already been made for Lake Rotorua; the target water quality, trophic level index, sustainable nitrogen load and the date for achieving them have all been set”**

Within this “streamlined” context, Council staff, farmers and industry representatives subsequently developed a framework for achieving reductions in N losses from rural land. Council had already determined that “this was not about allocating nitrogen to forest, urban or sewage. There is a risk that inputs associated with these sources may change over time. For example, urban losses may increase if the Rotorua population grows”⁵¹.

The intent at that time was to incentivise efficiency and innovation through the use of outcome-focussed NDAs:

- Farmers retained flexibility to achieve Overseer NDA targets
- Council was adamant - and farmers agreed - that Council was not in the business of “telling farmers how to farm”⁵². A key consideration was “retaining flexibility for farmers to manage the adjustment to a low N leaching economy, alongside a desire to encourage innovation in the pastoral sector”⁵³
- **Prescriptive input-based regulation was assessed as “expensive and inefficient** because it takes a blanket approach that doesn’t recognise the actions farmers could and would take to improve environmental outcomes”. This option “will not be effective in achieving the environmental target with certainty and would not incentivise efficient resource use”⁵⁴
- An NDA framework was agreed for proportional reductions from dairy and drystock sectors.

The release of Overseer version 6.2 significantly complicated these agreements. Farm NDAs were re-estimated in version 6.2, notwithstanding that the disjunct between farm NDAs in version 6.2 and catchment loads in version 5.4 was still to be resolved.

The new version increased estimated losses across the board, but also altered relativities across farms and sectors. The magnitude of change in estimated N leaching losses from version 5.4 to version 6.2 was estimated by one author⁵⁵:

- for drystock the range was 41% to 181% increase
- for dairy, the range was 57% to 165% increase

The same author suggested that “just over half of the modelled farm systems were able to achieve their provisional NDA targets utilising the scenarios developed in the original study”:

- The corollary of course is that half couldn’t
- The author recommended more work to address an apparent gap as to “what additional mitigations might be required by those farm systems previously thought to have made enough system change to meet the earlier 35/13 targets” which were based on version 5.4
- By this time the dairy payout had dropped dramatically, and the author noted that “revised expectations of lower medium-term milk prices clearly demonstrated how changes in the prices of inputs and outputs can alter the perceived and actual economic impacts of meeting N loss targets”.

⁵⁰ Regional Council workshop, 27 June 2012

⁵¹ SPP Committee, 31 July 2012

⁵² BoPRC RDD Meeting, 14 December 2015

⁵³ BoPRC, PC10, s32 Evaluation report

⁵⁴ BoPRC, PC10, s32 Evaluation report

⁵⁵ PerrinAg, updated report, 2016

The shift from version 5.4 to version 6.2 has significantly complicated the task of undertaking robust cost-benefit analysis of the proposed PC10 rules framework:

- The nitrogen load reduction target set in the RPS was based on version 5.4. Cost-benefit analysis at that time was “at an appropriately conceptual level”⁵⁶
- The RPS target has not as yet been re-estimated in Overseer 6.2

The s32 report developed to support PC10 does not include cost-benefit analysis of the target, be it in version 5.4 or 6.2. Neither does it revisit earlier decisions regarding appropriate timeframes and the appropriate mix of regulatory and non-regulatory methods for achieving targets:

- “the s32 report is the record of the policy journey. It is not a separate analysis of what could have been done, ie, it is not a cost-benefit analysis. It brings together the relevant information that policy staff have gathered and puts it in a format prescribed by MfE”⁵⁷

Notwithstanding any constraints of the MfE format, several analyses of macro-economic implications of the farm NDAs in version 6.2 have been undertaken within and outside Council. One analysis⁵⁸ highlighted:

- Key impacts across all scenarios are:
 - **a reduction in dairy area of around 40%**
 - **a reduction in sheep and dairy support area of 37%**
 - a significant increase in forestry area (around 60-85% increase)
- For the purpose of comparing profit streams from these landuses, forest profits were annualised. The report notes however that, in reality, returns from forestry are highly episodic
- Capital impacts are significant across all landuses. This poses particular risks in relation to the equity position of farmers.
- These capital impacts are of significant concern due to the possibility of debt exceeding equity for some farms, creating significant social disruption
- **Profit data and regional analysis masks significant risk to existing farm businesses and potential for adverse social impacts as a result of negative equity positions**

In December 2015; “Councillors agreed that the reductions are very significant to farmers and that although most will be able to carry on farming, there will be significant economic cost, and the impacts on some individual farmers could be devastating”⁵⁹

- Notwithstanding this recognition, micro-economic analysis to satisfy RMA s85 tests against the unreasonable imposition of restrictions on private property were not undertaken.

In December 2015, another significant change was made to PC10⁶⁰, ie:

- “Significant change to the rules from previously being framed as discharge rules to now being framed as landuse rules
- Changes focus for compliance – monitor farmers activities against their management plans rather than having to assess adverse effects of discharges”

Nitrogen Management plans would be used as the compliance tool:

- “Enforcing rules that relate to loss of nitrogen would be much more difficult to enforce than rules that link to a defined use of land
- **The regulatory/compliance focus would be on controlling farm inputs**
- Essentially the question becomes ‘is there more stock than specified in the nitrogen management plan’ versus “is there an increased loss of nitrogen from the property”?

⁵⁶ Council Decisions on provisions, 15 March 2012

⁵⁷ PC10, S32 Evaluation Report

⁵⁸ Doole et al, 2015

⁵⁹ BoPRC, RDD workshop, 2 December 2015

⁶⁰ RDD Workshop, 2 December 2015

For clarity: farm plans would be a vehicle for “prescriptive, input-based management” notwithstanding that this option had already been robustly dismissed; and notwithstanding that this rule structure was fundamentally different to the agreements earlier made with STAG.

In December 2015, Council were advised:

- “Legal advice confirms the 435t limit has already been set and is not ‘open for debate’⁶¹
- “The draft rules have been reviewed by experts (planning, legal, economic) and are regarded as fit for purpose and robust against judicial review”

In February 2016, Council notified PC10.

Provision: Introduction

Add

Reason: the s32 report is important context and material to relief sought

We commend Council on providing comprehensive links to supporting documents.

Other than that, it is our submission that the s32 report is manifestly inadequate in relation to the scale and significance of the subject at hand.

It contains material errors and omissions. These errors and omissions need to be tabled for explicit discussion as part of this PC10 process. In order, and restricting our comments and questions to main points:

1.1 “The purpose is to reduce N losses from rural land to meet the N limit set by the RPS”

- The purpose is to meet the RWLP TLI objective
- We direct Council to LTAG minutes of 26/11/2014 clarifying that TLIs are negotiable as part of RWLP reviews
- The RPS is a superior document; nevertheless the N target is subordinate to the RWLP objective and is in fact designed to support it
- We request Councils clarification as to whether the RPS N target means a “limit” set in accordance with the NPS-FW 2014

1.2 “The why has already been worked through at the RPS level. Therefore the s32 focusses on the how”

- We request Councils clarification as to whether this gives effect to the RWLP requirements in respect of plan reviews
- We request Councils clarification as to whether this gives effect to NPS-FW 2014

⁶¹ Council have subsequently advised that that legal advice is subject to legal privilege

1.3 'Key Background reports'

- We recommend the following be added:
 - MfE 2003 "Review of short-term management options"
 - MDL 2004 "Government Funding of lakes Restoration"
 - NIWA 2008 'Storm Nutrient loads'
 - Beca 2011 'Intervention Packages'
 - ESR 2012 "Analysis of water quality trends"
 - ERI 2015 "Phosphorous loads to Lake Rotorua"

4.1 "The best available science indicates that the sustainable limit for N is 435t/pa and the current amount of N is around 755t"

- At best this statement is out of date
- Strongly recommend the issue statement be updated prior to the hearing

4.2.3 'The RPS directs managed reduction by way of rules'

- This is not correct
- The RPS decisions version was amended to read "including by way of rules"

6.5.6 "All future communications will tell the whole story of what is and has been done to put the regulatory component in context"

- We agree on the importance of the whole story
- PC10 and the s32 report omitted material chapters
- Our submission is intended to fill some of those gaps

7.3 "there is a constrained policy context, eg, lake load and timelines"

- We request Councils clarification of this position relative to the Oturoa Agreement

9.2.1 'Assumptions made: assumes that this shift to a low N farming economy is economically viable'

- We request clarification from Council as to the extent to which this assumption is in accord with advice from your Technical Advisory Groups
- We request clarification of any advice from those groups on timelines for the shift

9.4.1 "Six taonga species – koaro, koura, tuna, kakahi, inanga, morihana"

- Mention of indigenous fish is fleetingly made on pg 67
- We request Councils clarification as to the extent to which this is intended to meet NPS-FW requirements for safeguarding indigenous species

9.4.2 *“There is little confidence that P reductions can be achieved to allow any consideration of relaxing the N target”*

- We request clarification from Council as to the extent to which this assumption is in accord with advice from your Technical Advisory Groups
- We direct Council to minutes of the Land Science Priorities Meeting, 9 November 2015
- We direct Council to David Hamilton’s science presentation in April 2016

10.10.2, footnote 65 *“figures are based on overseer 5.4 values, which have been updated in the version used for allocation”*

- This is a very large matter to be tucked into a footnote
- Unless and until such time as the RPS target is re-assessed in Overseer 6.2, PC10 cannot sensibly use either version 5.4 values or version 6.2 values

10.2.4 *“Some options were eliminated as not suitable. A key consideration was retaining flexibility for farmers to manage the adjustment to a low N leaching farming system, without the Council telling farmers how to farm. There was also a desire to encourage innovation within the pastoral sector”*

- We strongly endorse this point
- We request Councils clarification of the extent to which this position is consistent with the PC10 rules as notified

10.5.2 *“Properties not demonstrating managed reduction will be non-complying. This activity class was recently tested in the Environment Court where the judge supported it”*

- We request the reference for that case please

11.1 *“The N limit was first identified in 1986, and has been re-assessed and confirmed three times”*

- We request a link to the 1986 paper please
- We request that Council direct us to the specific reports and specific sections in those reports, where the N target was re-assessed and re-confirmed

11.2.1 *“The sooner changes are made, the sooner the results will be seen”*

- We request Councils clarification of timelines to achieve “the results” (how soon is soon)

11.2.1 *“The timeframe of 15 years proposed in the rules is a relatively long period of time to address a current issue”*

- We request that Council provide documentation of the decision-making which rejected recommendations for inter-generational change over 25-50 years, in favour of 15 years

11.7.1 *“Prescriptive input-based regulation: this option would not be effective in achieving the environmental target with certainty, and would not incentivise efficient resource use”*

- We request Councils clarification of the extent to which this position is consistent with the PC10 rules as notified

11.7.5 *“Reliance on industry best practice: it is likely that this option would generate the best level of industry and farmer buy-in”*

- We recommend Council relook at this statement – it should give significant pause for thought that it has been too lightly dismissed

11.7.5; *“Investigations found that ‘GMP will not achieve reductions in catchments which are significantly over-allocated, such as Lake Rotorua’*

- Allocation status can only be determined with reference to NPS limits
- We request Council’s clarification of whether the RPS N target is a limit which gives effect to the NPS-FW 2014
- We agree that in catchments with significant legacy issues – such as Lake Rotorua – collective investments are required to put right the effects of earlier collective decisions
- This is in fact our understanding of the rationale for the Funding Deed

Appendix 4: *“The health and mauri of the people and of the water is a compulsory value in the NPS-FW 2014”*

- We request Councils clarification as to whether PC10 gives effect to those compulsory values in accordance with Policies CA1-4

Appendix 4: *“the rules will have varying impacts – those people whose livelihoods are tied to their properties may be most impacted. The impacts on profit are distributed unevenly across sectors, land uses and geophysical zones. Reduced profitability may make it difficult for farmers to service debt, and decreased land values associated with N restrictions may mean that for some farmers, debt will exceed equity”*

- We request Councils clarification of the extent to which these findings have been tested against RMA s85 tests against the unreasonable imposition of restrictions on private property

Appendix 4; *“As milk solids prices fall, the lost income from reducing N becomes less”*

- We seek Councils clarification of the extent to which this comment was material to decision-making

Appendix 4: *“Reducing N discharges will generally be easier and cheaper where it can be achieved by farm management changes rather than land use change”*

- We request specific cost-benefit analysis prior to hearings on PC10

Appendix 10; *‘Implementation Costs – processing returns, checking Overseer files, quality control on nitrogen management plans, monitoring and compliance’*

- Total implementation costs are just under \$700,000
- 80% is for administration (5.5 positions)
- 20% is for action on the ground (2.4 land management officers)
- We strongly recommend Council reverse the resourcing proportions
- We recommend Council invest a proportion in independent coordinators to facilitate the development of sub-catchment Action Plans, based on the successful Project Rerewhakaaitu model

Appendix 11; *‘Response to feedback on the Draft s32’*

- We request Councils clarification as to why the feedback provided jointly by Federated Farmers and the Primary Producers Collective on 7 August 2015 was not included

Relief Sought: we seek that:

- Council provide responses to the questions and clarifications sought
- Council amends the plan to update the “issue” as described in the operative RWLP and as relevant to PC10
- Council reduce staff resources on administration and micro-management of Overseer files and Farm Plans (from 5.5 to 1.5), increase staff resources to support action on the ground (from 2.4 to 4.5 LMOs) and invest the balance in independent sub-catchment coordination (equivalent to 2 FTEs)
- Council undertake more robust cost-benefit analysis of the PC10 proposals prior to the hearing; alongside analysis of alternate proposals, including in this submission, for meeting the Lake Rotorua TLI objective and for maintaining the trajectory of nutrient reductions from the catchment.

Provision: Introduction

Add

Reason: It is our strong submission that the significant shifts in the technical, science, economic, policy and regulatory space even just within the last year compel consideration of a different approach for Lake Rotorua. In parallel with the policy developments summarised above, significant science developments have been underway as also outlined above. Briefly summarising:

- With the release of Overseer version 6.2, it is now apparent that attenuation in the catchment has been under-estimated
- The first implication is that the portfolio of nitrogen reduction opportunities now includes both mitigation at source and attenuation along the transport pathways
- The second implication is that experience in overseas jurisdictions and emerging experience in New Zealand⁶² highlights that targetting investments based just on Overseer estimates of losses from the rootzone may “miss the mark”
- At the same time, the importance of internal nutrient loads has been receiving increased scientific attention
- Nutrient release from bed sediments in single stratification events may be of a similar order of magnitude as annual catchment loads
- The unexpected and dramatic results of alum dosing in tributary streams serve principally to highlight the critical role of internal load driving algal dynamics
- Science is now signalling a potential shift to P-limitation in Lake Rotorua
- Scientists are now urging that we “get to work” on reducing P.

The net result is that the portfolio of nutrient reduction options should include both N and P; must include both catchment sources and internal load; and should address mitigation options along the treatment train, ie, source, transport and sink.

We propose an alternate Integrated Nutrient Management Framework to give effect to these new imperatives. The framework is outlined in this next section and developed within the PC10 methods. We have not nailed all the details; we would welcome the opportunity to work with Council and other catchment stakeholders to improve and flesh out the framework we propose.

The framework returns to the base shared principles which have held steady throughout this turbulent policy journey. The framework is not based on “command-and-control” or “telling farmers how to farm” or the forced conversion of 40% of Rotorua farmland into pine forests.

⁶² FLRC 2014, 2015, 2016

Instead the framework respects the history of land use change over the last 100 years, respects the complexity of Lake Rotorua dynamics, and respects the shared commitment of all parties, including landowners, to do a better job of looking after the lake.

The framework is both regulatory and non-regulatory, but we propose a different balance. We believe the scale and complexity of the challenge demand generous engagement, not grudging compliance. We see the primary role of Council as providing an enabling framework to engage the pragmatism, ingenuity and innovation of the catchment community to drive improvements, while also guarding the gains we have made and protecting against going backwards.

We advise Council that the goodwill of the farming sector has been tested through this process. Nevertheless, we remain committed to the health of the lake and committed to continuing to put our best foot forward to reduce nutrient losses from our farms and catchments.

The framework we propose is not original. In fact it relies on the very good body of work commissioned by Council over these last years. **Sub-catchments are central to the framework**, ie, drilling back behind the annual averages and aggregate loads to understand and address nutrient losses at a more fine-grained scale. Not least to support landowner understanding of cause-effect relationships between the farm and the lake – on the ground, not just modelled; and to support pragmatic and equitable cost-sharing arrangements within sub-catchment communities – lifestylers and urban as well as farmers.

We have been guided not least by the recommendations made by Rutherford in 2003 and 2011 for more fine-grained information at sub-catchment scale; and also by the more recent work from ERI⁶³, including that:

- This report is intended to support an integrated framework of catchment management including control of loads for both P and N
- It notes that load reduction targets for the lake currently exclude storm flow
- It recommends that management of particulate nutrient loads should be a high priority for reduction as they will be most amenable to management, eg, erosion control and stormwater detention
- **Identifying sub-catchments where these practices would provide the greatest benefit should be a priority, and allow prioritisation of expenditure**
- Further investigation to identify discharges with significant loads and potential critical source areas in these catchments is needed
- Increasing the spatial extent of stream gauges would also greatly improve the provision of load estimates from major streams

Importantly, this 2015 report provides nutrient loads dis-aggregated not just by sub-catchment, but also by flow band (base flow, storm flow). **It is this quality of information that makes possible the development of sub-catchment action plans based on sub-catchment specific data.**

Other Council publications are equally valuable in supporting a sub-catchment approach, including:

- Analysis of storm nutrient loads⁶⁴
 - Eg, the finding that Ngongotaha Stream has high flow variability and 44% of total flow is delivered by storms
- Work highlighting the importance of critical source areas (CSAs)⁶⁵
 - Eg, the finding that CSAs account for the majority of P loss but occupy only a small part of the farm or catchment
- Survey of the distribution of gorse by sub-catchment⁶⁶
 - Eg, the suggestion that applying the package of gorse management options was considerably more cost-effective (half the cost) than the estimates for landuse change

⁶³ ERI 2015

⁶⁴ NIWA 2008

⁶⁵ AgResearch 2010

⁶⁶ Opus 2012

Acknowledging the excellent sub-catchment data that is now on the table, it may also be that another level of more fine-grained data is still required:

- current hydrological data collections are commonly limited to catchment outlets, which make it impossible to validate spatially-varying critical source areas (CSAs). Focussed landscape-scale studies are needed in representative catchments to better define the CSA hydrology for water quality management⁶⁷
- Concentrations of nutrients were shown to vary predictably with stream discharge...reflecting that periods of elevated flow associated with **storm events contributed disproportionately to annual nutrient loads**. A practical solution to the problem of obtaining data relating to loads during high flow periods could be the installation of turbidity sensors in inflowing streams. With adequate calibration, these sensors may provide high frequency estimates with suitable accuracy and relatively minor financial outlay⁶⁸

In 2010, Council commissioned a comprehensive report evaluating wetland feasibility for nutrient reduction, including at sub-catchment scale⁶⁹. Now that attenuation is on the table, we can dust off the recommendations. In brief, that report found that:

- once installed or rejuvenated, **well-maintained wetlands are a relatively low-energy, low cost, long life tool for nutrient removal**
- within the Lake Rotorua catchment there would appear to be sufficient areas of land (suitable for restoring or constructing wetlands) to enable wetlands to significantly reduce the nutrient load entering the lake (25% of the N target, up to 20% of the P target)
- wetlands are not the whole solution to reducing nutrient loads to Lake Rotorua but they should certainly be considered as part of the solution
- consideration could be given to investing more than the \$1m currently allocated: in addition to nutrient attenuation, this could provide benefits for biodiversity, cultural values and recreation

Opus recommended further work to undertake a CBA of the wider social and economic benefits/costs of wetlands compared to other interventions for reducing nutrient loads:

- Size: **the cost/ha of establishing a treatment wetland reduces with increasing size**. Our analysis assumed constructed wetlands would be 3ha, thus creating wetlands >3ha will make wetland packages more cost effective
- Site selection: wetlands are much more effective at reducing nutrient loads when they receive high concentration inputs and when water temperatures are warmer. This suggests streams with a geothermal influence (eg, Waiohewa catchment) should be a priority
- Augmentation: there may be potential for detention dams - these would moderate flows as well as retaining sediments and associated P
- Management: the effectiveness of many wetlands can be significantly enhanced by ongoing management, eg, removing sediment from sediment traps, or periodic grazing by sheep
- Harvest: opportunities for harvesting plant material/nutrients (eg, watercress) could be considered

⁶⁷ Srinivasan 2007

⁶⁸ Abell thesis, 2013

⁶⁹ Opus 2010

The report used the term “nutrient farming” to describe using wetlands to reduce nutrient loads across the landscape:

- If this is to occur on a wide scale, the right incentives need to be put in place. Treatment wetlands could most efficiently be created in the landscape by providing incentives for landowners
- If landowners need to go through a lengthy expensive RMA process to get permission to plant a wetland on their property, they may be somewhat deterred
- The Overseer model currently only allows crude adjustments for N removal by wetlands. Refinements may be needed if there is to be promotion/uptake of wetlands as an option for N removal
- Leasing arrangements may provide an incentive for landowners to provide wetlands
- If reverse auctions were used they would need to allow the sale of many small packages of nutrient credits (and not be limited to purchasing only large packages).

This approach is consistent with work commissioned by MPI⁷⁰ to assess options for managing nutrients in Rotorua, Horizons and Hurunui. That report noted that regional models presented nutrients as totals lost from the paddock on an annual average basis, but emphasised:

- It is important to consider how loadings at source can be related to limits at the point of interest
- Understanding catchment loss/attenuation processes or variations in effects with season or flow rate is necessary to make achieving the goal as efficient as possible
- **Individual and collective costs can be minimised by efficient targetting and timing**

These recommendations are right on song with international thinking. A recent OECD report⁷¹ highlights an international movement beyond broad modeling approaches towards **more sophisticated and efficient targetting of environmental investments**. The report emphasizes that:

- Where big decisions with big consequences are on the table, policy-makers need to be as informed as possible about the risks associated with their decisions based on the confidence they can have with their numbers
- There are a range of models which link economic and policy variables to bio-physical parameters and ecological qualities. A major focus of this modeling effort is to reveal the relative economic effectiveness and environmental efficiency of different policy instruments for diffuse source pollution
- The focus is on the costs and benefits of marginal changes: information on total or average costs is of less policy relevance than information on how they vary (with changes in management and water quality)
- **While relatively crude figures - annual loads, annual averages - may be sufficient to shape overall policy directions, more accurate figures may be needed to guide practical/marginal design issues for individual catchments, and negotiations between local stakeholder groups.**

The OECD report notes that many countries have tended to use a uniform approach in applying policies to address nutrient management, but that models do not appropriately account for spatial and temporal variation:

- contrary to this “uniform” approach, an increasing body of international research is indicating that spatial-temporal targetting can have a positive impact on environmental outcomes.
- For example: to date many modeling studies have simulated the impact of mitigation strategies on annual pollutant loss as opposed to pressures during seasonal ecological windows.
- Further development of these models to improve the targeting of policies needs to pinpoint specific ecological windows of opportunity (eg, spawning season) as opposed to annual loadings and their abatement.

⁷⁰ LCR 2012

⁷¹ OECD 2012

It is worth noting that the OECD followed up with a comprehensive report assessing water quality trading markets in the international context: the discussion of baseline-and-credit markets may be relevant to consideration of an expanded brief for the Incentives Fund.

A final point: a critical success factor in developing and implementing sub-catchment action plans is coordination. We suggest there would be merit in engaging independent coordinators:

- Just down the road, Bob Parker has done excellent work on Project Rerewhakaaitu, with all credit due to Council for supporting for this programme
- Just up the road, the NZ Landcare Trust is headquartered in Hamilton (catchment coordination is of course NZLCT core business)

Of course that raises the question of resourcing. It is our understanding that currently Council may propose spending of the order of \$600,000 on administrative staff to count the beans and approve stocking numbers on a weekly basis. We respectfully recommend that most if not all of this budget would be far better invested in supporting action on the ground.

Relief Sought: add section as follows

Integrated Nutrient Management Framework

Key elements of the framework are, firstly, that it is an integrated framework; secondly, that it provides for tiers of responsibility; and thirdly, that it is staged in the spirit of adaptive management.

This **integrated** nutrient management framework includes:

- Nitrogen and Phosphorous
- Rural and urban
- Source and transport and sink
- Regulatory and non-regulatory methods

It is a **tiered** nutrient management framework:

- **Enterprises:** focus on mitigating **current** landuse at **source**
 - urban responsibility for “best practicable option”
 - rural responsibility for “reasonable/practicable/affordable” industry best practices
 - **Industry** in the lead on best practice development/extension and reporting sector progress
 - Industry prioritise sub-catchments for one-on-one support, eg. dairy prioritise Awahou/Waimehia/Waitete for development of Sustainable Milk Plans; Beef & Lamb prioritise Ngongotaha/Waitete for development of LEPs
 - Overseer nutrient budgets used as farm decision support tool and track progress against managed reduction targets
 - farm plans used by farmers and their consultants to identify and prioritise farm nutrient hotspots
 - farmers own their own farm plans and nutrient budgets; including entering data and testing scenarios with their industry representatives or farm management consultants
 - progress tracked against the Overseer MRTs; and against farm plan and sub-catchment plan milestones
 - Farmers maintain compliance with industry commitments, eg, Sustainable Dairy Accord; and with BoPRC and RDC rules for farm activities, eg, farm effluent, stock exclusion, earthworks
 - **Farmers pay** to implement industry best practice guidelines specific to the farm context to reduce nutrient losses

- **Sub-catchments:** focus on attenuating **legacy** loads along the **transport** pathways
 - prioritise sub-catchments to develop sub-catchment action plans
 - identify/prioritise sub-catchment nutrient hotspots, eg, N/gorse, P/RLTS
 - in sub-catchments dominated by nutrient rich legacy groundwater, prioritise options for attenuation, eg, springs/wetlands/riparian; continue alum dosing in selected streams
 - in sub-catchments dominated by flood flow particulate nutrients, prioritise options for mitigating, eg, sediment bunds, retiring the back gully, putting blocks into trees
 - Use models to help prioritise; then groundtruth with science tools, eg, LIDAR; and with landowners, eg, the lay of the land and the opportunities
 - **Independent** coordination; supported by science, eg, Richie McDowell/AgR/P hotspots, Chris Tanner/NIWA/constructed wetlands; plus council LMOs; plus sub-catchment committee of landowners/lifestylers/urban
 - Develop flexibility mechanisms, eg, TDRs, baseline-and-credit trading, offsets for new entrants/developments
 - **Incentives Fund pays** for best-bang-for-buck enduring solutions; either permanent landuse change or “green” infrastructure or to enable farm reconfigurations
- **Lake:** focus on mitigating **legacy** internal load, ie, the **sink**
 - prioritise interventions to improve ecological health and recreation/aesthetics
 - Improve understanding of values, including competing values, eg, indigenous fish vis-à-vis trout
 - Improve understanding of nutrients/invasive plants/cyanobacteria dynamics
 - **Science** to the forefront, develop integrated modelling capability
 - Develop short/medium/longterm solutions for managing internal nutrient loads
 - Continue selective harvest of summertime lake edge weed
 - **BoPRC** in the lead, working with the Rotorua Te Arawa Lakes Strategy Group

It is a **staged** nutrient management framework:

- **Phase One 2005-2015**
 - Capping nutrient losses from farms (Rule 11)
 - Very strong programme of underpinning science and R&D
 - Trialling innovations and interventions – some worked, eg, alum; some didn’t, eg, Hamurama diversion
- **Phase Two 2016-2022**
 - Extend the ‘benchmark and cap’ rules to catchment properties outside Rule 11
 - Industry prioritise resources to support farmer achievement of the 2022 Pastoral Managed Reduction Target
 - Develop sub-catchment action plans to prioritise opportunities to reduce legacy nutrients along the source-treatment-sink pathway
 - Broaden the scope for the Incentives Fund to improve uptake and targetting of best-bang-for-buck enduring solutions
 - Review Rotan load estimates and attenuation factors; undertake Science Review 2017
 - Re-assess nutrient loads; agree reduction targets at multiple scales – catchment, sub-catchment, sector, city, rural properties and farms
- **Phase Three 2020-2023 Rotorua Lakes WMA**
 - Stocktake catchment progress; review/refresh/finetune the values/objectives/limits/methods/rules for Lake Rotorua

Provision: Introduction

Amend:

Reason:

Relief Sought: amend for clarity to read:

This plan change gives effect to the following ~~requirements~~ provisions in the Regional Policy Statement.

This plan change provides for a staged implementation of these ~~requirements~~ provisions.

A future plan change for the Rotorua Lakes WMA including Lake Rotorua is scheduled to commence in 2020 to give effect to the values/objectives/limit-setting requirements of the NPS-FW 2014.

Provision: PC10 structure

Amend:

Reason: the current layout of PC10 is a bit “messy” and confusing. Most of the narrative would preferably be located in the introductory section; and the maps would preferably be located at the back with the schedules.

Relief Sought: give consideration to re-structuring the layout for a cleaner presentation of issues, values, objectives, policies, methods, rules etc

Provision: Introduction

Amend:

Reason: there are other RPS objectives and policies relevant to PC10 methods and rules.

Relief Sought: that additional RPS provisions be added as follows.

That RPS provisions be in scope for submissions to the extent they are relevant to the approach proposed in the methods and rules.

Water Quality and Land Use: A management framework for land and water in the Bay of Plenty needs to recognise the interrelationship between land use activities that occur in catchments and the cumulative adverse effects that subsequently occur in waterways by:

- Setting clear objectives for the required future state of the regions water bodies and the land use activities within their catchments, including for the Rotorua Te Arawa lakes
- Adopting a catchment-based management approach to the Lake Rotorua catchment
- Recognising that Industry-led initiatives are underway with the intention of reducing nutrient exports from land to water

Objective 26

The productive potential of the region's rural land resource is sustained and the growth and efficient operation of rural production activities are provided for.

Objective 27

The quality and mauri of water in the region is maintained or, where necessary to meet the identified values associated with its required use and protection, enhanced

Objective 28: Enhance the water quality in the lakes of the Rotorua District and other catchments at risk.

Policy IR 3B: Adopting an integrated approach

Adopt an integrated approach to resource management that:

- (a) Recognises the interconnected nature of natural and physical resources, including as they adjust to changes;
- (b) Recognises the multiple values of natural and physical resources;
- (c) Responds to the nature and values of the resource and the diversity of effects (including cumulative and reverse sensitivity effects) that can occur;
- (d) Seeks to maximise benefits by considering opportunities to align interventions (including regulatory and non-regulatory) and/or to achieve multiple objectives;
- (e) Encourages developments, activities or land-use changes to:
 - 1 Provide for the relationship between land use and water quality and quantity
 - 2 Recognise the advantages and constraints of land use capability;
 - 3 Provide for infrastructure and;
 - 4 Benefit the economic wellbeing of communities.
- (f) Takes a long term strategic approach which recognises the changing environment and changing resource use pressures and trends;
- (g) Applies consistent and best practice standards and processes to decision making; and
- (h) Recognises different community values and social needs; and regards these as positive effects.

Policy UG 18B: Managing rural development and protecting versatile land

The productive rural land resource shall be protected for rural production activities by ensuring that to the extent practicable subdivision, use and development in rural areas does not result in versatile land being used for non-productive purposes outside existing and planned urban-zoned areas, or outside the urban limits for the western Bay of Plenty shown in Appendix E, unless it is for regionally significant infrastructure which has a functional, technical or locational need to be located there.

Particular regard shall be given to whether the proposal will result in a loss of productivity of the rural area, including loss of versatile land, and cumulative impacts that would reduce the potential for food or other primary production.

In the catchments of the Rotorua Te Arawa Lakes, land-use change to achieve reduced nutrient losses may justify over-riding this policy. Any such changes in land use must however be integrated and co-ordinated with the provision of appropriate infrastructure.

RPS Policy UG 23B: Providing for the operation and growth of rural production activities

In providing for the operation and growth of rural production activities, regard should be had to:

- (a) Appropriate plan provisions, including zoning of land;
- (b) Access to and use of resources;
- (c) Transportation and infrastructure requirements; and
- (d) Protection from reverse sensitivity effects.

Explanation

The operation and growth of rural production activities in the Bay of Plenty is important to the region's economy. The use of and access to natural resources (such as land, minerals, soil and water), or physical resources (such as transportation infrastructure) are important factors in providing for the operation and growth of these activities.

Policy WL 1B: Enabling land use change

Regard as a positive effect any significant reduction in contaminant discharge (including nitrogen and phosphorous) likely to result from land use change proposals.

Policy WL 2B: Defining catchments at risk

Control contaminant discharges in the following catchments at risk:

- (a) The catchments of Lakes Rotoiti, Rotorua, Rotoehu, Ōkaro, Ōkāreka, Rotomā, Ōkātina, Tarawera, Tikitapu, Rotokākahi, Rerewhakaaitu and Rotomāhana; and
- (b) The catchments of other water bodies when they are defined and included in the Regional Water and Land Plan or Regional Coastal Environment Plan.

Policy WL 3B: Establish limits for the total amount of specified contaminants that enter the receiving waters within a catchment at risk including:

- (a) Contaminants to be managed to avoid compromising public health and each catchment's ecology, mauri, fishability, swimmability and aesthetics;
- (b) For the Rotorua Te Arawa Lakes the amount of nitrogen and phosphorus that can enter each lake in order to achieve its target trophic level index; and
- (c) For Lake Rotorua the total amount of nitrogen that enters the lake shall not exceed 435 tonnes per annum.

Explanation

Within the region, both surface water and groundwater are used for a wide range of purposes. Each use requires water of a corresponding quality. Some uses potentially conflict with others; the assimilation of contaminants may compromise consumptive uses. Water management policy, while enabling people and communities to provide for their social, economic and cultural well-being, must ensure that statutory water quality requirements are met.

Nutrient limits are necessary to meet the regional community's water quality targets for all at-risk catchments within the Rotorua Te Arawa lakes area.

The operative Bay of Plenty Regional Water and Land Plan sets trophic level indices (TLIs) for lakes of the Rotorua District as a means of measuring long-term trends in water quality to see whether each lake is improving or declining. Target TLIs for each lake have been determined through a public process, and are contained in the Regional Water and Land Plan. The TLI system is used as a means of measuring water quality based on the amount of total nitrogen, total phosphorus and chlorophyll A (algae) present in a lake, and the clarity of the water.

The 435 tonne annual sustainable nitrogen load for Lake Rotorua includes stream and groundwater flows, rainfall, and treated sewage effluent and excludes internal loads from the lake bed.

The 435 tonnes is required to achieve the 4.2 trophic level index target currently set in the Regional Water and Land Plan.

When the target TLIs are reached, they may need to be reviewed to ensure that statutory (sections 70 and 107 of the Act) water quality requirements are met.

Policy WL 4B: Requiring consent for increased discharges in catchments at risk

Require that, in catchments at risk, a change in land use likely to result in the discharge of increased amounts of nominated contaminants be allowed only if resource consent is obtained.

Explanation

Land use change, subdivision and development activities likely to result in increased discharges of contaminants should be subject to a rule requiring a consent to be obtained; this would allow close scrutiny of a proposal and the setting of conditions to keep any contaminant discharge within established limits or for consent to be refused. However, it is accepted that some farming practices, such as crop rotations, result in year to year fluctuations in nutrient leaching and this needs to be provided for. The effect on water quality from discharges is in relation to the whole of the water body as the receiving environment for that discharge, including downstream effects.

Policy WL 5B: Allocate among land use activities the capacity of Rotorua Te Arawa lakes and other water bodies in catchments at risk to assimilate contaminants within the limits established in accordance with Policy WL 3B having regard to the following principles and considerations:

- (a) Equity/fairness, including intergenerational equity;
- (b) Extent of the immediate impact;
- (c) Public and private benefits and costs;
- (d) Iwi land ownership and its status including any Crown obligation;
- (e) Cultural values;
- (f) Resource use efficiency;
- (g) Existing land use;
- (h) Existing on farm capital investment; and
- (i) Ease of transfer of the allocation.

Explanation

Each water body is able to assimilate a certain amount of nutrients or other contaminants before the values of the water body are unacceptably compromised.

Essentially, what is being allocated is the capacity of Lake Rotorua and other at-risk catchments to assimilate a discharge of a contaminant. A 2005 amendment to the Act introduced as a new function of regional councils the establishment of regional rules to allow the allocation of this resource on other than a first-come/first-served basis. Thus, allocation mechanisms are implemented through rules in regional plans. This policy seeks to direct this by requiring, and providing principles and considerations for, allocation.

Policy WL 6B: Require, including by way of rules, the managed reduction of any nutrient losses that are in excess of the limits established under Policy WL 3B by ensuring that:

- (a) Rural production land use activities minimise their loss of nutrients as far as is reasonably practicable by implementing on-farm best management practices;
- (b) Any land use change that is required within the Rotorua Te Arawa lakes catchments to achieve the limits takes into account an equitable balancing of public and private costs and benefits; and
- (c) No discharges shall be authorised beyond 2032 that results in the limit for Lake Rotorua being exceeded. A Managed Reduction Target for the managed reduction of nitrogen loss is to be set to achieve 70% of the required reduction from 746 t/yr to 435 t/yr by 2022.

Explanation

Managed reduction in the amount of nutrients derived from land use activities is necessary to halt the decline in water quality in at-risk catchments.

On-farm best management practices should be implemented to ensure that all rural production land use activities minimise their nutrient losses as far as is reasonable, practicable and affordable. The aim is to ensure that all rural production land users are operating in accordance with industry best practice.

For Lake Rotorua, current on-farm best practice alone will not achieve the nitrogen load reduction required to reach the sustainable nitrogen load of 435 tN/yr and land use change will be necessary. Beyond 2032 only discharges which enable the 435 tN/yr to be met will be authorised. The development of further resource management policy will have regard to the Oturoa Agreement.

The cost of achieving any further reduction in nutrient losses over and above on-farm best practice in a particular catchment will have a mix of public and private benefits and should be funded accordingly. Consequently, the implementation of Policy WL 6B will require the development of further policy under the Regional Council's Resource Management Act 1991 and Local Government Act 2002 responsibilities.

Nutrient reduction targets have been established to enable lakes such as Rotorua, Rotoiti, Ōkaro, Rotomā, Rotoehu and Ōkāreka to meet their target trophic level indices (TLIs).

These objectives and policies are provided for information purposes only and are not part of the plan change. These provisions are from the Operative Regional Policy Statement for the Bay of Plenty, and are ~~not~~ open for submission to the extent they are relevant to the approach proposed in PC10 methods and rules.

Provision: preamble

Amend:

Reason: this section forgot to mention the Oturoa Agreement.

Relief Sought: amend for clarity, accuracy and completeness as follows:

The ~~need to achieve the sustainable target~~ lake load of 435 tonnes of nitrogen per annum and 37 tonnes of phosphorous per annum is based on the best science available in 1986. These targets were proposed to meet a TLI of 4.2, thought to represent water quality conditions in the post-war period before problems with invasive lake weeds became evident in the late 1950s and 1960s. These targets do not include internal nutrient loads, which have now been determined to be major drivers of algal dynamics in the lake.

Adaptive management is a core element of the implementation of nutrient management for the Lake Rotorua groundwater catchment. This includes regular science and policy reviews and responding to the outcomes of these reviews.

In 2013, the Oturoa Agreement confirmed that the nitrogen reduction target would be subject to regular review as part of ongoing plan changes; and further, that the intermediate 2022 target established in the RPS would be confirmed as part of the rules and incentives programme which was under development at that time.

Achieving ~~Reviewing~~ the lake load targets for nitrogen and phosphorous also forms part of the National Policy Statement for Freshwater Management (NPSFM 2014) implementation. Council ~~may~~ will need to consider further changes to the Plan to address these and other NPSFM 2014 attributes of relevance ~~at some point in the future~~ as part of the Rotorua Lakes WMA values/objectives/limits process, currently scheduled from 2020-2023

In addition to documenting the target load, the RPS also includes a current load estimate (746 tN/pa): this estimate was based on Overseer 5.4 and is currently being re-estimated in version 6.2. That revision may necessitate a review of the RPS load target. Pending that revision, all estimates of loads in PC10 are based on Overseer 5.4.

The ~~nitrogen nutrient~~ load to Lake Rotorua from current and historic activities will be reduced through an integrated programme of source/transport/sink interventions, including rules, ~~regulated~~ land use ~~nitrogen nutrient~~ reductions (~~Nitrogen Discharge Allowances~~), hard and soft engineering solutions, incentives and gorse conversion, and in lake management of nutrient release and nuisance algal growth.

Provision: preamble to Table LR 1

Amend:

Reason: for improved accuracy and completeness.

For clarity; Federated Farmers do not seek changes to the TLI objective, N reduction target or intermediate target at this time. That re-consideration will be better made after the 2017 Science Review.

Relief Sought: add title and amend narrative as follows:

Nitrogen Management Framework

~~This One element of the package of interventions forms the Integrated is the~~ Nitrogen Management Framework, summarised in Table LR 1 below.

Nitrogen entering the lake is above the target set in the RPS to achieve the RWLP TLI objective 4.2. The aim is to minimise unwanted algal blooms.

In 2011, the ROTAN model tested scenarios for reduction targets – recognising legacy loads - to achieve the target lake load by around 2080-2100:

- R-250 would approach the 435t target around 2090
- R-300 would approach the target around 2085
- R-350 would approach the target around 2080

The author proposed that the reduction target be set at around 320t N/pa. The RPS adopted a reduction target of 311t N/pa while noting that cost-benefit analysis had been undertaken only at a conceptual level. The Science Review in 2017 may revisit the science behind the target N load reduction; and the Rotorua Lakes WMA is expected to review objectives and set limits, supported by that science review, and supported by iterative analysis of options, costs and achievability as required by the NPS-FW.

~~The Integrated Framework summarised in Table LR 1 below was developed through a “streamlined” consultation process with the Lake Rotorua Stakeholder Advisory Group process.~~

It was adopted by the Regional Council on 17 September 2013 as being the preferred approach to managing nitrogen losses from rural land use activities in the Lake Rotorua groundwater catchment at that time. It provides the basis for the proportional nitrogen reductions being implemented through these rules and for the allocation methodology.

The framework was developed prior to the Overseer version change from 5.4 to 6.2; prior to the lake meeting the TLI target; prior to research indicating the main driver of lake algal dynamics is the internal nutrient load; prior to the results of alum dosing indicating the lake may now be P limited; prior to results indicating potential significance of flood flow particulate nutrients; and prior to results disaggregating legacy groundwater baseflow nutrients by sub-catchment.

ROTAN re-estimates of catchment loads in Overseer version 6.2 are expected mid-2016. These revised estimates may necessitate a variation to the RPS load which was estimated in Overseer version 5.4.

Provision: Table LR 1

Amend:

Reason: For improved accuracy and readability.

The 755t load in the first column should be amended to 746, consistent with the RPS

The internal nutrient loads are added for completeness.

Rain is excluded: this is not manageable.

It is not clear whether the RPS target includes or excludes flood flow particulate nutrients; this should be clarified in any review of the targets following the 2017 Science review

It is not clear whether the RPS target includes or excludes nitrogen losses from bedload sediment; this should be clarified in any review of the targets following the 2017 Science review

Relief Sought: amend Table LR 1 as follows:

Table LR 1: Lake Rotorua Integrated Nitrogen Management Framework – indicative annual catchment loads and managed reductions targets

Modelled Steady-State Load to the Lake	Required Managed Reductions <u>Targets</u> to 2022				Sustainable <u>Target</u> Lake Load
755-716 tN/yr catchment load (includes excludes rain on lake 30t) 360 t/N Bed load	320 281 tN/yr RPS reductions target (excludes rain on lake 30t) 196 tN/yr MRT by 2022	50 tN/yr reduction from engineering solutions <u>by 2022</u>			435 405 tN/yr sustainable <u>target</u> load (includes excludes rain on lake 30t)
		30 tN/yr reduction from gorse removal <u>by 2022</u>			
		100 tN/yr reduction from Incentives Scheme <u>by 2022</u>			
		240 tN/yr reduction from the pastoral sector	140 131 tN/yr reduction from on-farm pastoral sector reductions required by rules	96 90 tN/yr reduction from dairy sector (69%) 11 tN/yr by 2022 (69%)	
		16t N/yr by 2022	44 41 tN/yr reduction from drystock sector (31%) 5 tN/yr by 2022 (31%)		
		100 tN/yr reduction from Incentives Scheme			

Table notes: (a) The values used are based on OVERSEER® 5.4 for pastoral land uses and reflect the best science ROTAN 2011 estimates of nitrogen entering the lake; catchment loads and attenuation factors are currently being re-estimated in Overseer 6.2

(b) tN/yr is the load to the lake in “tonnes of nitrogen per year” assuming no attenuation

Provision: preamble to Table LR 2

Amend:

Reason: for improved accuracy and completeness

Relief Sought: amend preamble to Table LR 2 as follows

The Integrated Nitrogen Management Framework developed in 2013 contained the following principles for proportional reductions for the dairy and drystock pastoral farming sectors (Table LR 2) which are used in the allocation methodology. More work is still required for dairy support to ensure managed reduction targets are set in line with the RPS requirements for reasonable, practicable and affordable measures in line with industry best practice.

In the period to 2022, the Incentives Fund is intended to achieve the majority of reductions sought through supporting land use change.

Provision: Table LR 2

Amend:

Reason: The 2032 sector allocation targets cannot be landed prior to the 2016 Rotan review, the 2017 Science Review and the 2020 Rotorua Lakes WMA.

Relief Sought: delete reference to 2032 NDAs; and amend Table LR 2 as follows

Table LR 2: Indicative Pastoral farming sector loads and proportional reductions

Sector	ROTAN ⁷² 2011 Area (ha)	ROTAN 2011 Load (tN/yr)	2032 Sector allocation 2022 pastoral MRT (tN/yr)	Reduction (tN/yr)	Proportional reductions from sector as % of sector load
Dairy	5,050	273.2	176.8 <u>262</u>	96.4 <u>11</u>	35.3% <u>4%</u>
Drystock	16,125	253.2	209.6 <u>248</u>	43.6 <u>5</u>	17.2% <u>2%</u>

Table note: The values used are based on OVERSEER[®] 5.4 numbers and reflect the best science estimates of nitrogen entering the lake as modelled by ROTAN 2011, assuming no attenuation. ~~The dairy and drystock areas are effective grazing areas (including fodder crops).~~

~~The pastoral farming sector proportional reductions are carried through into the methodology used to allocate nitrogen loss entitlements to individual properties/farming enterprises~~

⁷² ROTAN is the Rotorua and Taupō Nutrient Model. This is a geographic information system based catchment hydrology and water quality model developed to predict nitrogen yields and exports in the catchment under different scenarios.

Provision: preamble to Table LR 3

Amend:

Reason: for improved accuracy and clarity.

Overseer version 6.2 numbers cannot be used in advance of the 2016 Rotan review and consequential review of the RPS load target.

Relief Sought: amend preamble to Table LR 3 as follows;

~~Allocation of nitrogen losses~~ Table LR 3 is based on ~~benchmark~~ Rotan information applied to the 2014 GNS groundwater boundary area and expressed as OVERSEER[®] 6.2.0 5.4 values. ~~Table LR 3 contains the basis for the modelled 2015 sector contributions to achieve the sustainable lake load.~~ Modelled catchment loads have not yet been updated to OVERSEER[®] 6.2.0 values.

Provision: Table LR 3

Amend:

Reason: consistent with intent for integrated whole-of-community framework.

All tables should use Overseer 5.4 values.

Relief Sought: amend Table LR 3 as follows

Table LR 3: Indicative Sector contributions.

Sector	Sector area (ha)	(Integrated Framework)	Sustainable Rotan lake load by sector (tN/yr)	Average nitrogen loss rate to achieve target sustainable lake load (kgN/ha/yr)	Rotan 2010 Standard nitrogen loss rates (kgN/ha/yr)
Dairy	5,016	35.3%	324- 273	64.5 35	56
Drystock	16,266	47.2%	446 236	25.6 13	16
Forestry	19,215				
• Plantation Forestry	8,946		22.5 72.2		2.5 4
• Bush/Scrub • Puarenga forest	10,269		30.9 6.4		3 4
<u>Gorse</u>					
House blocks	468		20.2		43.2
<u>Lifestyle</u>	1,053			12	16
<u>RLTS</u>	300		56.1	140	187
<u>Septic Tanks</u>	308		25.8	64	85
<u>Urban/UOS</u>	3,353		33.7	7.5	10

Puarenga forest.

Gorse was not included as a separate category in Rotan 2011, but has subsequently been determined to be a significant source

Table note: ~~dairy and drystock~~ all values are OVERS EER[®] 6.2.0 5.4 numbers derived from Rotan 2011.. All assume no attenuati on, including RLTS and

Provision: Table LR 3

Add:

Reason: for completeness and to support the intent of the integrated framework

Relief Sought: add new Table LR 3A as follows

Table LR 3A: Indicative sector loads including small blocks and urban

	Urban	< 4ha	< 40ha	>40ha drystock	> 40ha dairy	Total
Number	25,000 dwellings	1000	500	75	25	
Area	3000 ha	1100 ha	4500 ha	10,500 ha	5000 ha	
N loads from land	33 t	16t	72t	168t	273t	
N loads from septic	10t	10t	5t	0.75t	0.25t	
RLTS	56					
Total t/N/pa	100	26	77	170	270	643 t
N load averaged by nine subcatchments	11	3	9	19	30	72

Table note: all values are OVERSEER[®] 5.4 numbers derived from Rotan 2011.. All assume no attenuation, including RLTS and Puarenga forest.

Properties less than 40ha assumed as drystock.

Numbers of rural properties sourced from PC10 S32 report (3.1)

Septic tank contribution assumed as ROTAN total 26.2 t, applied as one HUE (2.8 people, 10kg N/pa) to the number of rural properties in each sector, balance to urban

Numbers rounded for readability.

Provision: new table

Add:

Reason: very good science has recently become available which is material to PC10 and should be included

Relief Sought: add new table LR 3B and supporting narrative

Catchment loads represent 55% and internal loads represent 45% of total N loads.

Nine main streams enter Lake Rotorua; Table LR 3A shows nitrogen contributions by sub-catchment;

The table highlights that most sub-catchments are dominated by baseflow (groundwater dominant).

Nevertheless 3 sub-catchments have particulate N loads greater than 20% of total subcatchment load.

The targets are indicative only, based on meeting the managed reduction target of 196t N by 2022, and broadly averaged across the sub-catchments.

Table LR 3A: Sub-catchment Nitrogen Loads and Indicative Targets

MRTs are indicative only for the purpose of illustrating the sub-catchment concept

Sub-catchment	Baseflow (age)	TIN Load t/pa		Flood flow (% total flow)	Part.. N Load (% total load)		TN Load t/pa	Indicative MRT
Hamurama 15 km2	2468 L/s (110 yo)	55		26 L/s 1%	5 8%		60	30
Awahou 20 km2	1468 L/s (61 yo)	61		127 L/s 8%	5 8%		66	30
Puarenga 80 km2	1099 L/s (37 yo)	63		612 L/s 36%	16 20%		79	35
Utuhina 60 km2	1162 L/s (48 yo)	42		683 L/s 37%	16 28%		58	25
Waiowhiro 15 km2	255 L/s (42 yo)	11		103 L/s 29%	2 15%		13	5
Ngongotaha 80 km2	963 L/s (16 yo)	44		771 L/s 44%	24 35%		68	30
Waitete 60 km2	788 L/s (40 yo)	47		368 L/s 32%	3 6%		50	25
Waiohewa 10 km2	207 L/s (40 yo)	28		112 L/s 35%	4 13%		32	15
Waingaehe 10 km2	209 L/s (127 yo)	10		19 L/s 8%	1 9%		11	5
Minor streams 70 km2								
Catchment 500 km2	8619 L/s	361 83%		2821 L/s 25%	76 17%		437 t	200 t
Lake sediment							360 t	
TOTAL							797 t	

Table note:

Baseflow, flood flow, N loads 1992-2005: source NIWA, 2008;

Sub-catchment area: source ERI 2015; age of water: source GNS 2006

Provision: new section

Add:

Reason: recent science shows that PC10 should include P as a key contributor to lake algal dynamics.

Relief Sought: add new section, table LR 3B and supporting narrative

Phosphorous Management Framework


The 2015 variation to the Funding Deed between the Crown, BoPRC and Rotorua District Council agreed the phosphorous load target as 37t, being 30t from the catchment and 7t from lake sediments.

The 2022 target is indicative only, assumed as 70%.

Recent science⁷³ confirms that the current load figures should now be updated to:

- Catchment load 48t
- Bed load 60t

Table LR 3B: Lake Rotorua Phosphorous Management Framework – indicative annual loads and managed reduction targets

Current Load		Indicative Managed Reduction Targets 2022			Indicative Target Load
47 tP/yr Catchment load		35 tP/yr Catchment load			30 tP/yr Catchment load
36 t/P Bed load		16 t/P Bed Load			7 t/P Bed load

Provision: new section

Add:

Reason:

Relief Sought: add new section, table LR 3C and supporting narrative

Catchment loads represent 55% and internal lake loads represent 45% of total P loads.

Flood flow particulate P is around 45% of the catchment load.

Table LR 3C shows phosphorous contributions by sub-catchment.

⁷³ David Hamilton, science presentation, April 2016

The targets are indicative only, based on achieving 70% of the indicative P target (37t) by 2022.

Table LR 3C: Sub-Catchment Phosphorous Contributions and Indicative Targets

MRTs are indicative only for the purpose of illustrating the sub-catchment concept

Sub-catchment	Baseflow (age)	DRP Load		Flood flow (% total flow)	Part.. P Load (% total load)		TP Load	Indicative MRT
Hamurama 15 km2	2468 L/s (110 yo)	6.28		26 L/s 1%	0.88 12%		7.16	1
Awahou 20 km2	1468 L/s (61 yo)	3.56		127 L/s 8%	0.51 13%		4.07	1
Puarenga 80 km2	1099 L/s (37 yo)	2.26		612 36%	4.72 68%		6.98	2
Utuhina 60 km2	1162 L/s (48 yo)	3.13		683 37%	2.82 47%		5.95	2
Waiowhiro 15 km2	255 L/s (42 yo)	0.33		103 29%	0.5 60%		0.83	
Ngongotaha 80 km2	963 L/s (16 yo)	1.39		771 44%	2.74 66%		4.13	2
Waitete 60 km2	788 L/s (40 yo)	1.3		368 32%	1.25 49%		2.55	0.5
Waiohewa 10 km2	207 L/s (40 yo)	0.21		112 35%	0.97 82%		1.18	0.5
Waingaehe 10 km2	209 L/s (127 yo)	0.77		19 8%	0.24 24%		1.01	
Minor streams 70 km2		7.11			6.33 47%		13.44	2
Catchment 500 km2	8619 L/s	26t 55%		2821 l/s 25%	21t 45%		47t	35t
Lake sediment							60t	16t
TOTAL P							107t	51t

Table note: catchment P mean of 2007-2014 data: source ERI 2015

Provision: new section

Add:

Reason: to give better effect to intent for integrated framework

Relief Sought: add new section heading, new table LR 3C and supporting narrative

PC10: INTEGRATED NUTRIENT MANAGEMENT FRAMEWORK

Integrated Nutrient Management Framework

Table LR 3C integrates TN and TP loads for each sub-catchment.

It includes indicative details of each sub-catchment community: farmers, lifestylers, urban.

It indicates the approach to identifying source/transport/sink options for reducing nutrients, informed by data specific to the sub-catchment

Sub-Catchment Action Plans will be developed to prioritise efficient and effective options for reducing nutrient losses over-and-above farmers, lifestylers and urban communities taking responsibility for reasonable and practicable best practice steps.

The focus will be nutrient hotspots significant at the catchment scale, and options for intercepting and attenuating nutrients along the flow paths; while maintaining short to medium term options for reducing nuisance algal growth, eg, alum treatments in selected streams and harvesting of summer shoreline weed.

The Incentives Fund will consider applications for sub-catchment land use reconfiguration or change, and for the development of “green” infrastructure which will deliver permanent or longterm and enduring reductions in nutrient exports to the lake.

The table can assist analysis of nutrient reduction options.

For example, the strongest sub-catchments for dairy are Awahou/Waimehia (8 farms) and Waitete (7 farms). The strongest sub-catchments for drystock are Ngongotaha (20 farms) and Waitete (18 farms); These sub-catchments are expected to be priorities for industry support.

If these farms reduced nutrient losses, perhaps by 40% by 2032, the P and particulate N reductions may be measurable relatively quickly while the dissolved N reductions would become apparent more slowly, eg:

- Ngongotaha 2048, Waitete 2072, Awahou/Waimehia 2092

It is expected that Mamaku farmers in the Lake Rotorua groundwater catchment would be invited to contribute to the development of sub-catchment plans for Hamurama and Awahou.

The table can assist identification of priorities for the development of sub-catchment action plans, eg:

- 2017 Ngongotaha, Waitete
- 2018: Hamurama, Awahou
- 2019: Puarenga, Utuhina, Waiowhiro
- 2020: Waiohiwa, Waingaehe

Table LR 3D: Indicative sub-catchment contributors, loads and nutrient reduction portfolios

Sub-catchment	Farms Lifestyle Urban	Nutrient Load TN, TP	Baseflow dominant TIN, DRP	Floodflow significant Part. N, P	Natural wetlands (potential)	Critical source areas	Xport	Sink
Hamurama Hauraki 15 km2	Dairy x 3 S&B x 5 < 40ha x 55 <4ha x 110 Urban	60t 7t	55t 6t	.	4ha (2ha)	Spring		
Awahou Waimehia 20 km2	Dairy x 8 S&B x 4 <40ha x 55 <4ha x 110 Urban	65t 4t	61t 4t		100ha (2ha)	Spring		
Puarenga 80 km2	Dairy x 3 S&B x 3 <40ha x 55 <4ha x 110 Urban	80t 7t	63t 2t	16t 5t	60ha (14ha)	RLTS Dense gorse	Flood flows	Alum
Utuhina 60 km2	Dairy x 0 S&B x 7 <40ha x 55 <4ha x 110 Urban	60t 6t	42t 3t	16t 3t	(12ha)		Flood flows	Alum
Waiowhiro 15 km2	Dairy x 0 S&B x 2 <40ha x 55 <4ha x 110 Urban	15t 1t	11t 0.3t		42ha (26ha)			
Ngongotaha 80 km2	Dairy x 3 S&B x 20 <40ha x 55 <4ha x 110 Urban	70t 4t	44t 1t	24t 3t	7ha (15ha)		Flood flows	
Waitete 60 km2	Dairy x 7 S&B x 18 <40ha x 55 <4ha x 110 Urban	50t 3t	47t 1t		70ha (22ha)			
Waiohewa Rotokawa 10 km2	Dairy x 0 S&B x 9 <40ha x 55 <4ha x 110 Urban	30t 1t	28t 0.2t		4ha (6ha)	Dense gorse		
Waingaehe Waitawa 10 km2	Dairy x 1 S&B x 0 <40ha x 55 <4ha x 110 Urban	10t 1t	10t 1t		3ha (13ha)	Dense gorse		
Catchment Total		440 t N 48 t P			300ha (100ha)			

Table notes:

Number of dairy and drystock farmers; source BoPRC Land Management.

Numbers of small block and lifestyle properties sourced from s32 report and assumed as average across the sub-catchments.

Urban suburbs, settlements and point source discharges yet to be described.

Wetland area/potential; source Opus

Dense gorse areas; source Opus

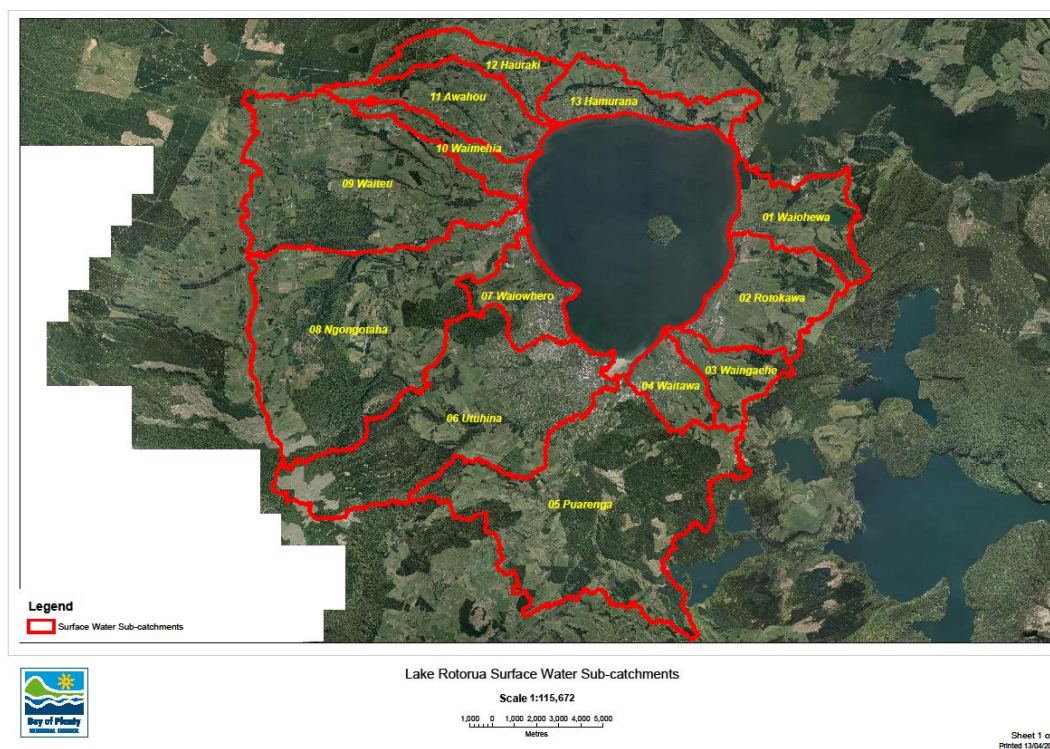
Provision: new map

Add:

Reason: for improved understanding and readability

Relief Sought: add new map LR 1A

Map LR 1A: Lake Rotorua Nutrient Management – sub-catchment boundaries



Provision: new map

Add:

Reason: for improved understanding of sub-catchment communities and contributors

Relief Sought: add new map LR 1B

Map LR 1B: Lake Rotorua Nutrient Management – urban areas and 200m OSET buffer



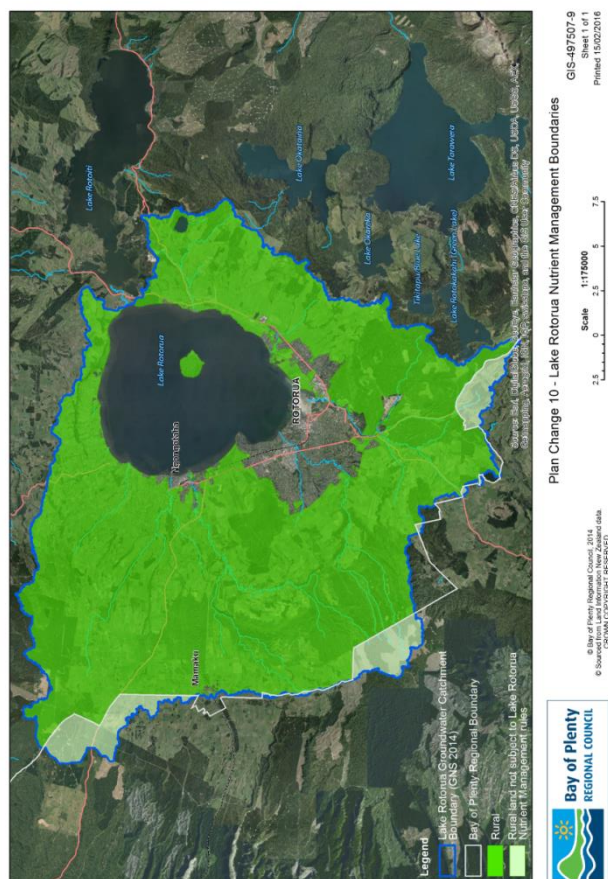
Provision: Map LR 1

Amend:

Reason: intent and application of the map is not clear.

Relief Sought: add text to clarify meaning of “rural land not subject to Lake Rotorua Nutrient Management rules”

Map LR 1: Lake Rotorua Nutrient Management – Groundwater Catchment Boundary and Rural Land.



PC10: OBJECTIVES

Provision: narrative after Objectives

Amend:

Reason: for completeness and accuracy.

The RPS objective should be located with the earlier section including RPS provisions.

The RWLP objective was proposed in 2002 and made operative in 2008. It is our understanding that perhaps eleven submissions were received at that time.

Some commentators are now suggesting that wider objectives for the lake might be considered, rather than relying just on the TLI.

We do not propose changes at this time.

That wider consideration can be expected as part of the Rotorua Lakes WMA.

Relief Sought: shift the RPS objective back to the earlier RPS section; and amend as follows:

~~No new objectives are required because the following objectives from the Operative Regional Policy Statement and Operative Regional Water and Land Plan already establish the freshwater objectives for Lake Rotorua.~~

The objective requires that water quality be ‘maintained or improved’ to meet the TLI.

Lake Rotorua has met the TLI objective in recent years.

These objectives will be subject to review in the Rotorua Lakes WMA – currently scheduled 2020-2023 – which will review values, objectives, limits and methods, including for Lake Rotorua.

Regional Policy Statement

Objective 28: ~~Enhance the water quality in the lakes of the Rotorua District and other catchments at risk.~~

Regional Water and Land Plan

Objective 11: The water quality in the Rotorua lakes is maintained or improved to meet the Trophic Level Index of 4.2 for Lake Rotorua

These Objectives are provided for informational purposes only and are not part of the Plan Change. They are ~~not~~ open for submission to the extent they are relevant to the approach proposed in the methods and rules.

Provision: new objectives

Add:

Reason: to give better effect to RPS objectives and policies

Relief Sought: add new objectives as below:

New Objective LR xx: The productive potential of the Lake Rotorua catchment rural land resource is sustained and the growth and efficient operation of rural production activities are provided for.

New Objective LR xy: recognise the multiple values of natural and physical resources by aligning interventions to achieve multiple environmental, social, cultural and economic objectives within a longterm strategic approach

PC10 POLICIES

Provision: narrative after Policies

Amend:

Reason: consistent with the inclusion of relevant RPS policies; and to support PC10 standing as the primary statutory reference for the catchment

Relief Sought: add RWLP policies as below:

Regional Water and Land Plan

These Policies are provided for informational purposes to support Plan Change 10 standing as the primary reference for Lake Rotorua. They are relevant to the approach proposed in the methods and rules.

Policy 23 To develop equitable and workable provisions in relation to existing land uses, where investigations indicate that changes to existing land management practices, or landuse restrictions are required to maintain or improve water quality.

Policy 24 To recognise and provide for people and organisations who have adopted proven good environmental management practices.

Policy 25 To encourage and provide for community involvement in the management of water, and land resources.

Policy 28 To develop and maintain accurate information on soil and water (including groundwater) resources in the region.

Policy 29 To continue to monitor and investigate the cause and effect of biological responses to the adverse effects of use and development activities. This includes, but is not limited to, aquatic weed, algal blooms and lake 'foams'.

Policy 32 To allow resource use and development where there are beneficial effects on the social, cultural and economic wellbeing of people and communities; and adverse effects on the environment are avoided, remedied or mitigated.

Policy 33 To promote and support land use change and/or land management practices in the catchments of the Rotorua Lakes that will achieve lake water quality improvement.

Provision: Policies LR P1 to LR P17

Amend:

Reason: most of the policies currently read like rules, but need amendment to express higher intent, including to give better effect to RPS and RWLP objectives and policies and the overall purpose of the RMA.

Amendments are proposed for internal consistency.

Property sizes should be based on total area, not “effective” area; consistent with guidelines for the use of Overseer as whole farm averages; and to respect existing investments in planting or setting aside areas for reducing nutrient losses and improving biodiversity and other outcomes.

Provision should be made for developing managed reduction targets at a range of scales and across all contributing sectors (including urban and point source discharges) and sub-catchments.

We support RPS Policy WL 4B requiring consent for increased discharges in catchments at risk; and that rules be extended to properties not previously included in Rule 11.

We acknowledge the role of the Incentives Fund in supporting land use change; and strongly support provision for flexibility mechanisms, eg, offsets, transfer, trading, to enable development while maintaining or reducing nutrient losses.

We recommend a mechanism for recognising management practices and innovations which are not in Overseer.

We recommend permitted activity status for all landuses which are not increasing nutrient losses; supported by appropriate monitoring.

It is our strong submission that resource consents are not required to drive uptake of industry best practice to meet the 2022 pastoral managed reduction targets. Appreciating that the Incentives Fund is supporting the majority of the reductions required in the period to 2022, the balance required from the pastoral sector is relatively modest in this period and achievable without requiring the additional transaction costs associated with controlled activity status.

The targets for the period to 2032 will properly be considered as part of the Rotorua Lakes WMA

It is also our strong submission that regulation cannot be used to require nutrient losses beyond the requirements of RPS Policy WL 6B, ie, reducing losses as far as is reasonably practicable by implementing on-farm best management practices.

The RPS and RWLP both provide extensive policy direction on non-regulatory methods for meeting TLI and other objectives, and PC10 policies should be amended to included stronger use of non-regulatory methods.

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Relief Sought: amend as follows including to provide for;

LR P1 To reduce nitrogen losses from land to Lake Rotorua to support achievement of the Lake TLI objective, and achieve the 2032 sustainable lake load 2022 managed reduction target as required by established in the Regional Policy Statement and to monitor this target through science and policy reviews.

LR P2 To manage reduce phosphorus loss to Lake Rotorua to support achievement of the Lake TLI objective through the implementation of management practices that will be detailed in Nitrogen Management Plans prepared for individual properties/farming enterprises. and to monitor this target through science and policy reviews.

LR P3 To recognise the balance between certainty and the use of the best science and good environmental data in the management of nitrogen nutrients within the Lake Rotorua groundwater catchment by using: developing integrated catchment models which account for all contributing sources of both nitrogen and phosphorous including internal lake loads; and by improving the use of sub-catchment data to inform effective and efficient nutrient reduction strategies

- (a) ~~the 435 tonne sustainable annual nitrogen load for Lake Rotorua from the operative Regional Policy Statement Policy WL 3B(c);~~
- (b) ~~the 755 tonne load to Lake Rotorua estimated by the ROTAN model in 2011 as the position from which nitrogen loss reductions will be determined;~~
- (c) ~~OVERSEER® 6.2.0 for nitrogen discharge allowance allocation purposes; and~~
- (d) ~~the pastoral sector reductions within the Integrated Framework approach.~~

LR P4 To implement adaptive management in the management of nitrogen nutrients within the Lake Rotorua groundwater catchment through:

- (i) science reviews set out in Method LR M2 and subsequent consideration by Council of recommendations;
- (ii) regular reviews of the Regional Policy Statement and Regional Water and Land Plan objectives, policies, rules and methods under the Resource Management Act 1991;
- (iii) ~~five year individual on farm Nitrogen Management Plan review timeframes; and~~
- (iv) ~~the use of OVERSEER® reference files and proportional requirements to reduce the variability for individual property nitrogen targets.~~
- (v) Implementing the Rotorua Lakes WMA to give effect to the NPS-FW 2014

Nitrogen allocation Managed Reduction Targets

LR P5 To ~~achieve the~~ support the achievement of Policy LR P4 the RWLP TLI objective sustainable load to Lake Rotorua by allocating nitrogen discharge allowances managed reduction targets may be allocated to dairy and drystock activities within the Lake Rotorua groundwater catchment (Table LR 4) subject to further work on dairy support; and to recognise standard OVERSEER® 5.4 loss rates for plantation forestry, bush/scrub and house blocks.

Table LR 4: Allocated nitrogen loss rates to sectors.

Overseer 5.4 values to be inserted

Sector	Average nitrogen loss by sector (kgN/ha/yr) (OVERSEER® 6.2.0 5.4)	Nitrogen loss range within each sector (kgN/ha/yr) (OVERSEER® 6.2.0 5.4)
Dairy	64.5	54.6 – 72.8
Drystock	25.6	18 – 54.6

~~No property/farming enterprise will be required to reduce its nitrogen loss below the bottom of the relevant sector nitrogen loss range.~~

- LR P6** ~~To determine individual Nutrient Discharge Allowances that must be achieved by 2032 in accordance with Schedule LR One for all properties/farming enterprises that are not provided for as permitted activities by Rules LR R1 to LR R7~~
- LR P7** To enable the authorised transfer of nitrogen loss ~~entitlements~~ increases between properties/farming enterprises from 1 July 2022 through flexibility, transfer and trading mechanisms to encourage efficient outcomes, eg, transferable development rights, offset mechanisms, baseline-and-credit trading schemes; mechanisms for recognising management practices and innovations which are not in Overseer; and making provision for collective consents for multi-property nutrient reduction proposals
- LR P8** To ~~require~~ support achievement of the RWLP TLI objective and encourage whole-of-community engagement by enabling sub-catchment ~~property/farming enterprise specific Nitrogen Nutrient Action Management Plans~~ which may include sub-catchment managed reduction targets will be prepared in conjunction with the sub-catchment community ~~and require the implementation of mitigation actions to achieve and maintain Managed Reduction Targets (five yearly nitrogen loss reduction targets) and Nitrogen Discharge Allowances~~
- LR P9** To allow as a permitted activity:
- (a) All land uses until 30 June 2017 provided that the land uses do not increase their nitrogen loss.
 - (b) The use of land for plantation forestry and bush/scrub and constructed wetlands and sediment detainment bunds
 - (c) The use of land for farming activities on properties/farming enterprises 5 hectares or less in area from 1 July 2017 provided there is no intensive land use.
 - (d) The use of land for farming activities on properties/farming enterprises greater than 5 hectares in area or between 5 hectares and 10 hectares or less in ~~effective~~ area from 1 July 2017 provided there is no intensive land use.
 - (e) The use of land for farming activities on properties/farming enterprises between 10 and 40 hectares in ~~effective~~ area from 1 July 2017 to 31 June 2022 provided there is no increase in nitrogen loss and the information keeping and reporting conditions are met.
 - (f) The use of land for farming activities on properties/farming enterprises in the Lake Rotorua groundwater catchment not previously managed by Rules 11 to 11F from 1 July 2017 to 31 June 2022 provided there is no increase in nitrogen loss and information keeping and reporting conditions are met.
 - (g) The use of land for farming activities on properties/farming enterprises that can demonstrate low nitrogen loss.
 - (h) The discharge of nutrients onto or into land provided the land use associated with the discharge is authorised under Rule LR R1 to LR R11.

- LR P10** ~~To require resource consents for:~~ To allow as a permitted activity:
- (a) The use of land for farming activities on properties/farming enterprises over 40 hectares in ~~effective~~ area from 1 July 2017 provided there is no increase in nitrogen loss and the information keeping and reporting conditions are met.
 - (b) The use of land for farming activities on properties/farming enterprises between 10 and 40 hectares in ~~effective~~ area from 1 July 2022 provided there is no increase in nitrogen loss and the information keeping and reporting conditions are met.
 - (c) The use of land for farming activities on properties/farming enterprises less than 5 hectares in area or that are between 5 hectares and less than 10 hectares in ~~effective~~ area that are not low intensity land use from 1 July 2022 provided there is no increase in nitrogen loss and the information keeping and reporting conditions are met.
 - (d) The use of land for farming activities on properties/farming enterprises in the Lake Rotorua groundwater catchment not previously managed by Rules 11 to 11F that are not low intensity land use from 1 July 2022 provided there is no increase in nitrogen loss and the information keeping and reporting conditions are met.
 - (e) The discharge of nutrients onto or into land provided the land use associated with the discharge is authorised under Rule LR xx to LR Rxy.
- LR P11** ~~To classify land use consent applications for farming activities that submit a Nitrogen Management Plan demonstrating the achievement of Managed Reduction Targets and Nitrogen Discharge Allowances by 2032 as controlled activities.~~
- LR P12** ~~To classify as non-complying activities, farming activities that require a land use consent application to be made and that do not submit a Nitrogen Management Plan demonstrating managed reduction.~~
- LR P13** ~~To use OVERSEER[®] version 6.2.0 5.4 and subsequent versions~~ consistent with the catchment load estimates to determine the nitrogen loss from land. Any future version changes will need to retain consistency between catchment and farm estimates; and may necessitate a variation to the RPS
- LR P14** To consider nitrogen budgets and alternative models for determining nitrogen loss if OVERSEER[®] cannot be readily used for a specific land use. Consideration of whether alternate nitrogen budgets may be used will take into account:
- (a) The ability to reliably estimate a property/farming enterprise's long-term nitrogen loss;
 - ~~(b) The acceptability of information inputs, for example, verifiable leaching rates; and~~
 - (c) The potential availability of suitably qualified and experienced persons to develop the nitrogen budgets.
- Any alternative to OVERSEER[®] for nitrogen budgeting purposes must be authorised by the Regional Council

LR P15 To require information to be supplied for:

- (a) All farming activities on properties/farming enterprises between 5 hectares and 10 hectares in ~~effective~~ area that are not low intensity land use,
- (b) All permitted farming activities on properties/farming enterprises between 10 and 40 hectares; and
- (c) All permitted farming activities on properties/farming enterprises in the Lake Rotorua groundwater catchment not previously managed by Rules 11 to 11F that are not low intensity land use.
- (d) All permitted farming activities on properties/farming enterprises over 40 hectares in area

This information will be used to monitor compliance with permitted activity conditions.

LR P16 To grant controlled activity consents for a duration of twenty years ~~and non-complying activity consents, where granted, for durations less than 20 years.~~ The duration of consents will reflect the nature, scale and robustness of any ~~on-farm~~ mitigation options proposed to ~~achieve~~ offset any proposed increase in nutrient losses from the property/farming enterprise's benchmark 2032 Nitrogen Discharge Allowance

LR P17 ~~To decline the re-consenting of activities that have failed to achieve the required reductions in nitrogen loss.~~

Provision: new policy

Add:

Reason: to give better effect to Treasury Principles for Best Practice Regulation.

Relief Sought: amend as follows

LR P 18 When developing rules, the Council will ensure they meet the following guiding principles:

- Flexibility
 - the underlying approach is principles or effects based
 - entities have scope to adopt least-cost and innovative approaches
 - non-regulatory measures including self-regulation are used wherever possible
- Proportionality
 - proposed rules have been tested against a risk-based, cost-benefit framework
 - the burden of rules and their enforcement is proportionate to benefits expected
 - changes proposed have been tested to assure the benefits outweigh the costs of disruption
- Certainty
 - the regulatory system is predictable and provides certainty for plan users
- Growth supporting
 - economic objectives are given appropriate weighting
 - identifying and justifying trade-offs is explicit in the accompanying s32 reports
 - the need for businesses to take longterm investment decisions is taken into account, including by providing for maximum consent durations for major investments

PC10: METHODS

Provision: new methods

Add:

Reason: consistent with the approach for including relevant RPS and RWLP objectives and policies

It is of concern that these methods have apparently been disregarded in the development of PC10, and there is next to no explicit assessment of resources invested or progress made in the s32 report.

Relief Sought: that the following methods be added.

That Council amend the plan to assess the efficiency and effectiveness of current methods in accordance with the RWLP Plan Review process.

These Methods are provided for informational purposes to support Plan Change 10 standing as the primary reference for Lake Rotorua. They are relevant to the approach proposed in the methods.

Operative Regional Policy Statement

Method 28: Undertake consultation to identify water quality standards and targets for the Rotorua Te Arawa Lakes

Within the constraints of sections 69, 70 and 107 of the Act, which limit the range within which water quality standards may be set, consult by actively providing for the timely exchange, consideration of and response to relevant information by all parties with an interest in setting water quality standards for the Rotorua Te Arawa Lakes.

As widely as practicable, encourage all parties undertaking resource use, development and protection activities within the Rotorua Te Arawa Lakes' catchments to participate in the preparation and review of relevant water quality standards proposed for inclusion in the regional plan.

Method 31: Voluntary Water User Groups and agreements

(a) Promote voluntary water user groups, or agreements between water users, to assist the management of water allocation and use;

(b) Provide, where available, accurate technical information on which user groups can make decisions; and

(c) Investigate how water user groups can be used to:

(i) assist with management of water allocated to abstractors;

(ii) provide opportunities for shared investment in, and optimal use of water transport and storage infrastructure; and

(iii) make best use of available water.

Method 34: Take a whole of catchment approach to the management of natural and physical resources

Adopt a holistic catchment-based approach that recognises the inter-relationships among all elements of the environment and activities, works, operations and services that occur higher in the catchment and the downstream effects that these activities generate lower in the catchment and ultimately in the coastal environment.

Method 35: Integrated Catchment Management Plans

Prepare and implement integrated non-statutory management plans for catchments discharging into harbours at risk including Tauranga and Ōhiwa Harbours.

Method 37: Investigate the use of large scale wetlands

Investigate the establishment of large scale wetlands/settling ponds in the downstream areas of the contributory streams feeding into the regions harbours.

Method 40: Promote the development of a rural advisory panel

Promote the development of a rural advisory panel to contribute to strategic resource management issues and facilitate integrated management with the rural sector and other relevant interest groups (e.g. iwi, recreation groups).

Operative Regional Water and Land Plan

Method 25 Promote and encourage the adoption of site-specific sustainable land and water management practices

Method 26 Continue to encourage the retirement and planting of riparian areas in all areas of the region to:

- (a) Stabilise the banks of rivers, streams, lakes and estuaries to prevent erosion.
- (b) Improve water quality by mitigating the effects of land use activities, including through the reduction of sediment, nutrient and pathogen contamination.
- (c) Enhance habitats of indigenous flora and fauna, and complete ecological corridors.
- (d) Indirectly mitigate the effects of the take and use of surface water on water temperature and the assimilative capacity of rivers and streams.

Method 28 Provide information to the community on:

- (a) The natural influences on water quality, including geothermal inputs, and the subsequent limitations on the use of that water.
- (b) The water quality of rivers and lakes where this information is available.

Method 30 Promote and support community projects that aim to improve water quality through localised action. This may be carried out in conjunction with the city council and district councils, other resource management agencies, tangata whenua and other organisations as appropriate.

Method 41 Develop and implement Action Plans to maintain or improve lake water quality to meet the TLI set in Objective 11. Action Plans will be developed according to the following process.

Action Plan Stages

Stage 1 – Risk Assessment and Problem Evaluation

Stage 2 – Project Prioritisation

Stage 3 – Development of Action Plan for Lake Catchment

(a) Where lake water quality exceeds the TLI:

- (i) Identify and quantify the lake water quality problem and any necessary research.
- (ii) Identify and quantify the reduction of nitrogen and phosphorus required in the catchment to achieve the TLI in Objective 11.
- (iii) Estimate the contributing sources of nitrogen and phosphorus in the catchment, and the effects of existing land uses and activities in the catchment on the lake's nutrient load.
- (iv) Estimate the lag between actual land use change and lake water quality effects.
- (v) Establish a timeline for developing an Action Plan for the lake catchment.

(c) Develop and implement Stage 3 and 4 of the Action Plan in conjunction with an Action Plan Working Group comprising appropriate parties from the individual catchment. The Action Plan Working Group will include, but is not limited to, Rotorua District Council, iwi, community groups, landowners, and relevant resource management agencies and industry representative groups. The main aims of Stage 3 of the Action Plan are:

- (i) Identify factors that affect lake water quality and any necessary research.
- (ii) Include equitable and workable provisions to address effects on existing land uses where it is necessary to restrict land use to maintain or improve water quality. Such provisions include, but are not limited to, criteria for possible financial assistance and land acquisition.
- (iii) Identify efficient, cost-effective and equitable measures and options to reduce inputs of nitrogen and phosphorus from the lake catchment to maintain or improve lake water quality.
- (iv) Determine if the TLI in Objective 11 can be realistically achieved, and a practicable timeline for achieving the target TLI.

- (d) Identify the costs and benefits of different nutrient management and reduction methods. Such methods include, but are not limited to:
- (i) Education on nutrient management;
 - (ii) Riparian retirement;
 - (iii) Constructed wetlands;
 - (iv) Sewage reticulation;
 - (v) Review of existing discharge consents in the catchment;
 - (vi) Land use changes;
 - (vii) Land purchase or lease;
 - (viii) Engineering works;
 - (ix) Nutrient trading systems.
- (e) Take into account the macro-economic and micro-economic effects of lake water quality maintenance or improvement measures, including the value of land use and lake water quality to the catchment, district, region and wider community.
- (f) Apply existing funding policies and other funding options for lake water quality maintenance or improvement works, including, but not limited to:
- (i) Differential rating as a means of paying for works within the catchment.
 - (ii) Central government funding.
 - (iii) User charges.
 - (iv) Environmental Programmes.
- (g) Determine if regulatory measures are necessary to control the discharge of nitrogen or phosphorus, or both, from land use activities in the lake catchment
- (h) Document a timetable for implementing nutrient management and reduction options.

Stage 4 – Implementation and Monitoring of Action Plans

- (a) Implement the lake water quality improvement measures identified and agreed to in Stage
- (b) Evaluate and report progress towards achieving the TLI in Objective 11 to all parties, and the community.

Method 43: Support land use changes, and changes to land use rules, that:

- (a) Achieve lake management objectives identified in lake action plans developed in accordance with Method 41
- (b) Integrate land use planning and rules in EBoPs resource management plans and RDCs District Plan for lake catchments
- (c) Recognise that a land use change and land management practices are an important part of lake management
- (d) Actively promote and support low nutrient loss land uses and land management practices in the catchments of the Rotorua lakes

Method 45 In conjunction with appropriate parties, investigate and document best management practices for nutrient management, including reduction and mitigation measures, for urban and rural land uses.

Method 47 In partnership with landowners, develop, trial and implement where appropriate, voluntary Stewardship Management Agreements within the framework of this regional plan to give effects to the Act, to:

- (a) Promote a co-operative approach with positive, ongoing relationships with people as stewards of their land.
- (b) Have particular regard to the ethic of stewardship.
- (c) Recognise that stewardship involves both:
 - (i) The use and development of land and water resources; and
 - (ii) The protection of significant sites and of natural resources.
- (d) Enable people and communities to provide for their social, economic and cultural well-being.
- (e) Address the specific resource management issues of a property.
- (f) Promote and encourage the adoption of best management practices that are suitable for the property to achieve sustainable management of resources.
- (g) Include a process for monitoring the implementation and also reviewing the appropriateness of agreed Stewardship Management Agreements.

Method 48 Continue to promote the adoption of Environmental Programmes

Method 51 In partnership with resource user groups, and in consultation with other stakeholders:

(a) Consider establishing accreditation systems for other resource users and developers, including, but not limited to, non-forestry earthwork operators and the primary production sector.

(b) Encourage the development of industry guidelines to address the adverse effects of activities.

Method 52 Use the following process to include regulatory measures in this regional plan to control the export of nitrogen and phosphorus from land use activities in the catchment of lakes that:

- 1 Exceed their TLI specified in Objective 11, where the 3-year moving average TLI for the lake exceeds its designated TLI specified in Objective 11 by 0.2 for 2 years; OR
- 2 Are at risk of declining water quality, as identified by Method 41 Stage 1(b)(i).

Process for Regulatory Measures

(a) Investigate the cause or risk of the decline in water quality and report to Environment Bay of Plenty.

(b) Develop an action plan for the lake catchment in accordance with Method 41.

(c) Initiate a plan change in accordance with the Act to include regulatory measures in this regional plan to address the export of nitrogen and phosphorus from land use activities, including land use changes, in the specific lake catchment.

Method 62 Investigate, and if practicable, implement a nutrient trading systems within the lakes catchment for those land use changes affected by rules in section 9.4.

Method 65 Support the establishment and maintenance of community-based state of the environment monitoring programmes.

Method 71 Continue to consult with relevant regional land user and industry groups to identify any areas where research is required into land management and sustainability issues, and facilitate research projects as appropriate.

Method 72 Undertake research where monitoring indicates an environmental problem that is not currently understood or explained, and research is necessary, appropriate and practicable. Research may be in conjunction with the city council, district councils, other resource management agencies, tangata whenua, industry organisations and other organisations as appropriate.

Explanation

Objective 11 will primarily be achieved through Policies 21, 22, 23, 27, Methods 41 and 52, and rules in section 9.4. Non-regulatory methods (e.g. Method 24) will be used to maintain water quality in lakes that meet their TLI.

An explanation of each of the TLIs in Objective 11 is given in Table 6. Many of the TLIs have been set at the 1994 level, as at this time the community expressed the expectation lake water quality should be no lower than at that time during consultation on the Regional Plan for the Tarawera River Catchment. In 1993, Sigma Consultants et al, prepared a report for Rotorua District Council on the effects of land use activities on water quality. The report identified that lake water quality targets should be no less than their present (1993) quality.

Rotorua 4.9 4.2 Level set in relation to the removal of sewage from the lake. When the Rotorua city sewage discharge was moved to land disposal, water quality expectations for the lake were stated in documents associated with the consent.

Section 9.4 uses effects-based regulations for land use activities in the Rotorua Lakes' catchments, which target the export of nitrogen and phosphorus. It does not preclude specific land uses from lakes' catchments, prescribe how a land use must be carried out, or require land retirement within a catchment.

Regulations in section 9.4.1 set a nutrient cap for each property in the lake catchment, within which landowners can make their own decisions about the type of land use activity and land management practices implemented on the property. Over time it is likely that technology and innovation will reduce nutrient losses, so it is not appropriate to either prohibit or require a specific land use.

Provision: LR M1

Oppose

Reason: we suggest this provision is ultra vires in that Council has no powers to determine what goes into a LIM

Relief Sought: delete LR M1

~~LR M1 — Regional Council will supply information to Rotorua District Council for inclusion on Land Information Memorandum that:~~

- ~~(a) — clearly identifies rural properties/farming enterprises that lie within the Lake Rotorua groundwater catchment boundary and are subject to these nitrogen management rules; and~~
- ~~(b) advises landowners of rural properties/farming enterprises identified in Method LR M1(a) to contact the Bay of Plenty Regional Council for further information.~~

Provision: LR M2

Support with amendments

Reason: improved clarity and completeness

Footnote 68 needs to provide a more specific reference.

Relief Sought: amend as follows

LR M2 Regional Council will review and publish the science that determined the objectives and limits set in the RPS and the Regional Water and Land Plan for Lake Rotorua on a five yearly basis from 2017. These reviews may include:

- (a) Review of trends in Lake water quality attributes including nitrogen, phosphorus, Chlorophyll a, algal blooms, clarity, trophic level index⁷⁴ for in-lake, inflows, and outflow where relevant; review of the health of indigenous fauna and flora and review of interactions and impacts of introduced fauna and flora
- (b) Review of progress towards achieving the RWLP TLI objective RPS Policy WL-6B(c) 2022 catchment nitrogen load target

⁷⁴ Trophic Level Index is defined in the Operative Regional Water and Land Plan.

- (c) Review of the RPS Policy WL 3B(c) catchment nitrogen load, and a nominal phosphorus (external and internal) catchment load of 37 tP/yr⁷⁵, and any other nitrogen and phosphorus load combinations that catchment modelling shows would meet the Lake Rotorua Trophic Level Index of 4.2. This may necessitate:
 - (i) a review and rerun of the lake model (or any successor model), including its ability to replicate recent years data;
 - (ii) a review and rerun of ROTAN (or any successor model), including nitrogen and phosphorous loss rates, groundwater trends and attenuation rates by sub-catchment, including OVERSEER® or similar estimates;
 - (iii) an assessment of the efficacy and risks of alum dosing and an assessment of land-based or catchment-based phosphorus loss mitigation.
- (d) Review of relevant New Zealand and international lake water quality remediation science.
- (e) Recommendations to Council including for any necessary amendments to the RPS and the RWLP if the science supporting the targets or loads materially alters

Provision: LR M3

Support

Reason: important for this to be a public process

Relief Sought: retain

LR M3 Regional Council will respond to the recommendations that result from Method LR M2 science reviews through a formal and public decision making process. This may include initiation of a plan change and review of resource consent conditions.

Provision: LR M4

Amend:

Reason: for consistency with integrated intent. The reference to developing technologies is not clear.

Relief Sought: amend as follows, and clarify meaning of “developing technologies”

LR M4 Regional Council will monitor permitted activities and any developing technologies to ensure that any related risks of ~~nitrogen~~ nutrient loss to the catchment are understood and acted on if necessary.

⁷⁵ This nominal phosphorus load was first determined by Rutherford et al (1989) and confirmed in subsequent advice from the Water Quality Technical Advisory Group.

Provision: LR M5

Amend:

Reason: consistent with recommended alternate Integrated Nutrient Management Framework

Relief Sought: amend as follows

LR M5 Regional Council will:

- (a) ~~develop and maintain a Rule Implementation Plan;~~ support the establishment and resourcing of sub-catchment committees to develop sub-catchment Action Plans for the reduction of nutrient loads to the lake
- (b) ~~report on the achievement of the Rule Implementation Plan~~ sub-catchment Action Plans on a five-yearly basis through plan effectiveness reporting;
- (c) ~~develop and maintain a Nitrogen Discharge Allowance Register, that will monitor catchment-wide progress towards meeting the RPS Policy WL 3B(c) catchment nitrogen load~~ RWLP TLI objective
- (d) provide land advisory services and incentives to support land use management change and land use change that reduces nitrogen and phosphorus loss in the catchment; and
- (e) encourage industry good practices to be implemented on rural properties/farming enterprises to reduce nitrogen and phosphorus loss in the catchment.

Provision: new method

Add:

Reason: to give effect to recommended alternate framework, consistent with RWLP Method 41

Relief Sought: add new method as follows or to similar effect

LR Method 41: Develop and implement Sub-Catchment Action Plans to maintain or improve lake water quality to meet the TLI set in Objective 11. Action Plans will be developed according to the following process.

Action Plan Stages

Stage 1 – Risk Assessment and Problem Evaluation

Stage 2 – Project Prioritisation

Stage 3 – Development of Action Plan for Lake Sub-Catchment

- (a) Where lake water quality exceeds the TLI and/or where nutrient loads exceed managed reduction targets
 - (i) Identify and quantify the lake water quality problem and any necessary research.
 - (ii) Identify and quantify the reduction of nitrogen and phosphorus required in the sub-catchment to achieve the TLI or MRT
 - (iii) Estimate the contributing sources of nitrogen and phosphorus in the sub-catchment, and the effects of existing land uses and activities in the catchment on the lake's nutrient load.
 - (iv) Estimate the lag between actual land use change and lake water quality effects.
 - (v) Establish a timeline for developing an Action Plan for the lake sub-catchment.

(c) Develop and implement Stage 3 and 4 of the Action Plan in conjunction with an Action Plan Working Group comprising appropriate parties from the individual sub-catchment and an independent coordinator. The Action Plan Working Group will include, but is not limited to, Rotorua District Council, iwi, community groups, landowners, and relevant resource management agencies and industry representative groups. The main aims of Stage 3 of the Action Plan are:

- (i) Identify factors that affect lake water quality and any necessary research.
- (ii) Include equitable and workable provisions to address effects on existing land uses where it is necessary to restrict land use to maintain or improve water quality. Such provisions include, but are not limited to, criteria for possible financial assistance and land acquisition.
- (iii) Identify efficient, cost-effective and equitable measures and options to reduce inputs of nitrogen and phosphorus from the lake catchment to maintain or improve lake water quality.
- (iv) Determine if the TLI and/or MRTs can be realistically achieved, and a practicable timeline for achieving the target TLI and/or MRTs

(d) Identify the costs and benefits of different nutrient management and reduction methods. Such methods include, but are not limited to:

- (i) Education on nutrient management;
- (ii) Riparian retirement;
- (iii) Constructed wetlands;
- (iv) Sewage reticulation;
- (v) Review of existing discharge consents in the catchment;
- (vi) Land use changes;
- (vii) Land purchase or lease;
- (viii) Engineering works;
- (ix) Nutrient trading systems.

(e) Take into account the macro-economic and micro-economic effects of lake water quality maintenance or improvement measures, including the value of land use and lake water quality to the catchment, district, region and wider community.

(f) Apply existing funding policies and other funding options for lake water quality maintenance or improvement works, including, but not limited to:

- (i) Differential rating as a means of paying for works within the catchment.
- (ii) Central government funding.
- (iii) User charges.
- (iv) Environmental Programmes.

(g) Determine if regulatory measures are necessary to control the discharge of nitrogen or phosphorus, or both, from land use activities in the lake catchment

(h) Document a timetable for implementing nutrient management and reduction options.

4 Stage 4 – Implementation and Monitoring of Action Plans

(a) Implement the lake water quality improvement measures identified and agreed to in Stage 3.

(b) Evaluate and report progress towards achieving the TLI in Objective 11 and/or MRTs to all parties, and the community.

Provision: new method

Amend:

Reason: To provide flexibility for emerging best practice.

Relief Sought; add method making provision for a process to recognise management practices and innovations which are not currently recognised in Overseer.

Provision: cross boundary issues

Amend:

Reason: .We request reasons as to why this method is not open for submission?

Relief Sought: amend as follows

The Operative Regional Policy Statement outlines the following approach to address cross boundary issues specific to Waikato Regional Council.

Regional Policy Statement Method 10: Liaise on cross boundary issues specific to Waikato Regional Council

Liaise with Waikato Regional Council and xx District Council to ensure:

- ~~Any regional plans for that~~ any landowners or territorial authorities in that part of the Rotorua Lake Catchment within the Waikato region are encouraged to participate in the development of the relevant sub-catchment Action Plan, achieve the objectives set for the lake, particularly in relation to managing land use and nutrient discharge levels

This method is provided for informational purposes only and not part of the plan change. It is not open for submission.

PC10 RULES

Provision: Rules

Amend:

Reason: for improved clarity and consistency with the RPS and RWLP.

Relief Sought: amend as follows

The LWRP rules in section 9.4.1 (including Rule 11) are subject to a mandatory review clause to clearly indicate that Council will review the applicability of the rules to each priority lake catchment in accordance with method 42 and the development of Action Plans under Method 41. It is recognised in the RWLP that the current rules are “first generation” and that the Action Plan Working Groups may identify and develop more appropriate means of controlling N and P losses from land use activities.

Method 42 provides that – in conjunction with the Action Plan Working Group – Council may review the necessity and application of the rules to individual lake catchments. The review will consider matters from the Action Plans developed in accordance with method 41; and consider how to achieve the longterm sustainable management of N and P use and discharges in the individual catchments.

The principal test for the necessity and application of RWLP rules for Lake Rotorua is in relation to achievement of the RWLP TLI Objective.

In addition, the rules should give effect to RPS Policies:

- WL 4B requiring consent for increased discharges in catchments at risk
- WL 5B allocating the capacity to assimilate contaminants which may be at a range of scales from sub-catchment to sector to enterprise; and which may include urban and rural sources
- WL 6B managing the reduction of nutrients including by way of rules; ensuring that rural landuse activities minimise their loss of nutrients as far as is reasonably practicable by implementing on-farm best management practices

Policy WL 6B clarifies that, for Lake Rotorua, current on-farm best practice alone will not achieve the reduction required to meet the 2032 target; that land use will be required; and that any land use required will take into account an equitable balancing of public and private costs and benefits.

The planning framework under the Act allows for regional rules to address both discharges and land use. Discharges are required to be authorised whereas the use of land may or may not be regulated for water-quality purposes.

Rules LR R1 to LR R13 apply to the management of land use activities on properties/farming enterprises in the Lake Rotorua groundwater catchment for the purpose of managing nitrogen loss onto or from land where it could enter Lake Rotorua.

Provision: definition of property

Oppose

Reason: definitions should be located in the definitions section

Relief Sought: delete

~~**Property/farming enterprise:** A single operating unit regardless of its ownership structure, size, arrangement and number of parcels and legal tenure.~~

~~For the purposes of these provisions, property/farming enterprise only relates to rural land within the Lake Rotorua groundwater catchment.~~

Provision: Rules LR-R1 – R12

Amend:

Reason: the alternate rules recommended give better effect to RPS and RWLP objectives and policies; and to our recommended changes to LR proposed policies.

Most importantly it is our string submission that the primary focus for these rules is the period to 2022.

From 2020-23, the Rotorua Lakes WMA is scheduled to give effect to the NPS-FW and a consequential plan change. This plan change can be expected to review and confirm targets and limits beyond 2022, alongside methods and rules for achieving them.

Relief Sought: delete Rules LR-R1 – R12, and replace with the following, and any consequential amendments.

Rule 1 - Permitted Activity

The use of land for farming activities/farming enterprises on properties which are less than 5 hectares in area are permitted provided the following condition is met:

- a) The farming activities/farming enterprises do not comprise of any of the following land use activities:
 - Commercial cropping; or
 - Commercial horticulture; or
 - Dairy farming.

Rule 2 - Permitted Activity

The use of land for farming activities/farming enterprises on properties which are greater than 5 ha in area but less than 10 hectares in area are permitted provided the following conditions are met:

- a) The stocking rate on the property does not exceed the stocking rates specified in Schedule XX at any point in time; and
- b) The farming activities/farming enterprises do not comprise of any of the following land use activities:
 - Commercial cropping; or
 - Commercial horticulture; or
 - Dairy farming

Rule 3 – Permitted Activity

The use of land for farming activities/farming enterprises on properties which are greater than 10 hectares in area, or do not meet the conditions of Rules 1 and 2, are permitted provided the following conditions are met:

- a) The use of land for farming activities/farming enterprises on properties which are less than 40 hectares in area:
 - The farming activities/farming enterprises will establish a nutrient benchmark in accordance with Schedule AA and provide that information to Council by 2017, and will not exceed it
 - b) The use of land for farming activities/farming enterprises on properties which are greater than 40 hectares in area:
 - The farming activities/farming enterprises have a lawfully established nutrient benchmark for the property and will not exceed it; or will establish a nutrient benchmark in accordance with Schedule AA and provide that information to Council by 2017, and will not exceed it
- ❖ For the purpose of Rule 3 nutrient benchmark means Council was provided with a register of the annual average export of nitrogen and phosphorus from the property for the agreed benchmarking period.

Rule 4 – Controlled Activity

The use of land for farming activities/farming enterprises on properties which do not meet Rule 3 is a controlled activity the following conditions are met:

- a) The increase in the export of nitrogen or phosphorous from the proposed farming activity/farming enterprise will be fully offset by the use of nutrient management measures on land within the same lake catchment; and
- b) The nutrient management measures used to fully offset the effects of the proposed land use do not occur on land which is covered by indigenous forest cover or is on land located within an urban area or lakeside settlement area

Matters of control

- a) Measures to offset adverse effects on water quality, including surface water and groundwater.
- b) Measures to avoid, remedy or mitigate adverse effects on aquatic ecosystems in streams and rivers.
- c) Aspects of the land use activity that cause an increase in the export of nitrogen or phosphorus from the activity.
- d) Measures to fully offset the increase in the export of nitrogen or phosphorus from the activity within the same lake catchment.
- e) Contractual arrangements with third parties where the offset measures are not applied on the property.
- f) Where the offset is not applied on the property, the change to the nutrient benchmark for both properties. The nutrient benchmark for the property where the land use activity will take place will increase, and the property where offset measures will take place will decrease accordingly.
- g) Information and monitoring requirements.

Rule 5 – Restricted Discretionary Activity

The use of land for farming activities/farming enterprises on properties which do not meet Rule 4 is a Restricted Discretionary Activity:

Matters of Discretion

- a) Measures to offset adverse effects on water quality, including surface water and groundwater, including consideration of measures which may not be recognised in Overseer

- b) Measures to avoid, remedy or mitigate adverse effects on aquatic ecosystems in streams and rivers.
- c) Aspects of the land use activity that cause an increase in the export of nitrogen or phosphorus from the activity.
- d) Measures to fully offset the increase in the export of nitrogen or phosphorus from the activity within the same lake catchment.
- e) Contractual arrangements with third parties where the offset measures are not applied on the property.
- f) Where the offset is not applied on the property, the change to the nutrient benchmark limit for both properties. The nutrient benchmark for the property where the land use activity will take place will increase, and the property where offset measures will take place will decrease accordingly.
- g) Information and monitoring requirements.

Provision: LR R13

Support

Reason: for clarity

Relief Sought: retain

LR R13 Permitted – Incidental nutrient discharges

The discharge of nutrients onto or into land in circumstances that may result in a contaminant entering water that would otherwise contravene section 15(1)(b) of the Resource Management Act is a permitted activity, provided the land use associated with the discharge is authorised under Rules LR R1 to LR R11.

Provision: new schedule

Add:

Reason: to support administration of the amendments we propose to the rules

Relief Sought: add schedule as follows

Schedule AA - Nutrient Benchmark

Information required for Nutrient benchmark

- 1) Land area;
- 2) Soils drainage class and soil characteristics;
- 3) Rainfall;
- 4) Slope/Topography;
- 5) Land cover and land uses on the property (including percentage of land area in different land uses);
- 6) Percentage of riparian area of rivers streams and lakeshore on the property that have been fenced, or in retirement plantings
- 7) Area of wetlands on the property.
- 8) Number of houses on the property.
- 9) Type of sewage treatment for the houses on the property.
- 10) Fertiliser application – type and amount of fertiliser, and percentage of amount applied in May, June and July.
- 11) Type of livestock on the property.
- 12) Peak number of livestock by stock type.
- 13) For beef properties, the percentage of female livestock.
- 14) Number of livestock taken off the property, or put onto a wintering pad/loafing pad/feedpad during winter.
- 15) Where a wintering pad/loafing pad/feedpad is used, the waste treatment and disposal system for the wintering pad/loafing pad/feedpad.
- 16) Crop type(s), and area in each crop. This includes forestry.
- 17) Volume of irrigation.
- 18) Supplementary stock feed purchased or sold off-farm.
- 19) Description of other land management practices relevant to nutrient management.
- 20) Annual exports from the property (e.g. crops, livestock, milk solids etc).

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PC10 DEFINITIONS

Provision: definitions

Add:

Reason: consistent with reasons and relief sought in previous sections

We seek clarification of the inclusion of gorse with bush.

We recommend consideration be given to providing for 'agro-forestry'.

We seek that farm area is total farm area, not 'effective' area.

We oppose the use of Reference Files; this is an unacceptable 'dumbing down' of the use of Overseer, at both farm scale and catchment scale. We appreciate that Overseer is subject to ongoing changes. But – where those changes are material, as in the case of version 5.4 to 6.2 – it must be a requirement that Council re-visit the base science and modelling assumptions, revisit the implications both environmentally and economically, and conduct a formal public plan process to update farm and catchment estimates simultaneously.

Relief Sought: that Council amend the definitions as follows

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Area: the property on which the farming activity/farming enterprise occurs and includes but is not limited to any land used for grazing, cultivation, cropping, horticulture, effluent disposal, plantation forestry or bush/scrub

Block: An area of land within a property/farming enterprise that has common physical and management attributes. OVERSEER[®] categorises blocks into types e.g. pastoral, fodder crop, trees and scrub, house. There may be multiple blocks of the same type within a property/farming enterprise reflecting the different physical or management characteristics of each of the blocks.

Bush/Scrub: Areas of native forest, bush, scrub, wetlands and exotic non-productive woody species (including gorse) ~~which are not grazed by stock.~~

Cropping: Includes a property/farming enterprise's effective area used for forage crops, fodder crops, maize and cultivation but does not include alternative pasture species.

Dairy: The ~~effective~~ area on which milking cows are grazed during the milking season and includes the animal effluent disposal area and fodder crop areas but excludes land used as dairy support, ~~plantation forestry and bush/scrub.~~

Dairy support: land used for heifer grazing or the wintering off of cows. *Note: dairy support's ~~nitrogen loss allowance is included within the drystock allocation range.~~ managed reduction target range requires further work*

Drystock: The ~~effective~~ area used for non-dairy activity, including grazing of sheep, beef cattle, goats, horses, deer, cropping and dairy support ~~but excluding plantation forestry and bush/scrub.~~

Effective area: ~~The part of the property/farming enterprise that is used for grazing, cultivation, cropping, horticulture and effluent disposal.~~

Farming Activity: dairy, dairy support and drystock activities, cropping and horticulture, ~~but not~~ including plantation forestry or bush/scrub within the farm area

Horticulture: Includes a property/farming enterprise's ~~effective~~ area used for nurseries, orchards, vineyards or growing vegetables for human consumption.

Lake Rotorua groundwater catchment: All land within the groundwater catchment boundary identified in Map 1.

Managed Reduction: The planned progressive reduction of ~~nitrogen~~ nutrient losses ~~from a property/farming enterprise over time to reach a Nutrient Discharge Allowance.~~ Managed Reduction Target

Managed Reduction Target: ~~The maximum amount of nitrogen loss that is allowed to occur from a property/farming enterprise at a target date (1 July 2022 and 1 July 2027).~~

Managed Reduction Offset: Nitrogen loss capacity that is transferred from a source property/farming enterprise for addition to the managed reduction pathway of a destination property/farming enterprise to enable landuse change and meet a Managed Reduction Target.

Nitrogen: refers to elemental nitrogen ~~as measured as Nitrogen Discharge Allowances (kgN/ha/yr) or as annual lake loads (tonnes N/yr).~~ It is noted that the predominant form of leached nitrogen is the nitrate ion (NO_3^-). In dissolved, particulate or organic forms

Nitrogen Discharge Allowance: ~~The maximum annual amount of nitrogen loss that is allowed to occur from a property/farming enterprise post 1 July 2032. Nitrogen Discharge Allowances are allocated on a block basis and these are summed to provide a property/farming enterprise total.~~

Nitrogen loss entitlement: A ~~Nitrogen Discharge Allowance~~ consent allowing for ~~or~~ Managed Reduction Offset.

Nitrogen Nutrient Management Plan: A plan prepared for a property or farming enterprise that identifies sources of nutrients associated with the farming activity and that records mitigation actions to ~~reduce nitrogen nutrient losses to meet Managed Reduction Targets and the Nitrogen Discharge Allowance, and to manage phosphorus loss.~~ The requirements of a Nitrogen Nutrient Management Plan are specified in Schedule LR Six.

OVERSEER®: OVERSEER® Nutrient Budgets model (commonly referred to as OVERSEER®) is a software application that generates information about the flow of nutrients on and off a farm. ~~OVERSEER® calculations are based on a 01 July to 30 June period.~~

OVERSEER® File: An estimate of the total nitrogen nutrient balance for a particular property/farming enterprise using OVERSEER®, taking into account ~~nitrogen~~ inputs and outputs.

Plantation forestry: Areas of planting, maintenance and/or harvesting of tree species for commercial purposes ~~which are not grazed by stock.~~

Permanently retired: The permanent removal of plantation forestry and/or agricultural production to enable a natural reversion back to native forest cover (or a land use with the same nitrogen loss rate as bush/scrub) that is legally secured.

Phosphorous: refers to elemental phosphorus in dissolved, particulate and organic forms.

Property/farming enterprise: ~~A single operating unit regardless of its ownership structure, size, arrangement and number of parcels and legal tenure.~~ means an aggregation of parcels of land held in single or multiple ownership (whether or not held in common ownership) that constitutes a single operating unit for the purpose of farm management

For the purposes of these provisions, property/farming enterprise only relates to rural land within the Lake Rotorua groundwater catchment.

Reference files: OVERSEER® files that provide a point of reference for the Lake Rotorua groundwater catchment and that represent the biophysical factors and farming systems found within the catchment.

Rural: In relation to land and properties/farming enterprises within the Lake Rotorua groundwater catchment means land identified on Map LR 1 excluding land outside BoPRC boundaries

Suitably qualified and experienced person: A person who:

- Implements OVERSEER® input best practice ~~and uses standard protocols recognised and approved by the Bay of Plenty Regional Council including those specific to the Lake Rotorua groundwater catchment; and~~
- has completed both the “Intermediate” and the “Advanced” courses in “Sustainable Nutrient Management in New Zealand Agriculture” conducted by Massey University and has at least five years’ work experience in a land use/farm advisory role; or
- ~~is approved in writing by the Chief Executive (or delegate thereof) of the Bay of Plenty Regional Council.~~

Provision: Schedule LR One

Oppose

Reason: as outlined in our relief sought in earlier sections, there are multiple uncertainties currently associated with both the loads and the targets.

Pending the 2016 Rotan review and the 2017 science review, this would be the appropriate time to further discuss the details of these formula.

Further attention to developing this methodology would properly support the Rotorua Lakes WMA scheduled from 2020-2023

Relief Sought: delete schedule LR One.

Develop straightforward methodology for determining benchmarks for properties that don't currently have them based on the existing Rule 11 protocol

Provision: Schedule LR 3

Amend:

Reason: amend cono our recommended relief on the rules

Relief Sought: amend consequential to our recommended relief on the rules

Schedule LR Three – Information requirements for Permitted Rules ~~LR R5 and LR R6~~

- (a) Contact details of landowner (and any leaseholder).
- (b) Legal description of the land and farm identifier as provided by the Regional Council.
- (c) A map or aerial photograph showing the boundaries or land areas of the property and land use cover including pasture, horticulture, crops, fodder crops and non-grazed areas (including forestry, riparian and tree areas).

And where applicable:

- (d) Stocking rate (numbers, classes and ages) including a breakdown by month.
- (e) Type, quantity and timing of effluent and fertiliser applications.
- (f) Type area and planting dates for crops.
- (g) Type and quantity of supplementary feed.

This information is to be collated for the period 1 July to 30 June each year and be provided to the Regional Council annually, or at greater intervals as demanded by the Regional Council, no later than 31 October each year. The Regional Council reserves the right to seek clarification from information provided.

Provision: Schedule LR Five – Use of OVERSEER® and Reference Files

Oppose

Reason: we oppose use of the Reference file methodology for reasons outlined earlier in our submission

Relief Sought: delete schedule LR Five

Provision: Schedule LR Six – Nitrogen Management Plan requirements

Support with amendments

Reason: we strongly endorse Council concerns with prescriptive input based management for the reasons set out in the PC10 s32 report.

Amendments proposed to give better effect to a flexible, output based management framework with reduced transaction costs.

Relief Sought: amend as follows

~~The aim of the Nitrogen Management Plan is to manage nutrient reduction so the property/farming enterprise meets the Nitrogen Discharge Allowance by 2032.~~

A Nitrogen Management Plan shall be prepared in accordance with A or B below by a suitably qualified and experienced person.

The Nitrogen Management Plan shall take into account sources of nitrogen associated with the farming activity and identify all ~~relevant~~ reasonable, practicable and affordable nitrogen management practices and mitigation measures.

The plan requirements will apply to:

- 1 A plan prepared for an individual property or farm enterprise; or
 - 2 A plan prepared for an individual property which is part of a farming enterprise or a collective of pastoral properties.
- A Nitrogen Management Plans prepared for an individual property or a farming enterprise as part of an industry environment management programme approved by the Bay of Plenty Regional Council.**
- B Nutrient Management Plans prepared for an individual property or a farming enterprise that are not derived from an industry environment management programme.**

Nitrogen Management Plans shall contain as a minimum:

- 1 Property details:
 - (a) Physical address.
 - (b) Name of a contact person.
 - (c) Description of ownership structure.
 - (d) Legal description of the land and farm identifier as provided by Regional Council.

- (e) Name and contact details of the person responsible for managing the property/farming enterprise if different from above.
- 2 A map(s) or aerial photograph at a scale that clearly shows:
- (a) The boundaries of the property.
 - (b) A block map for the property/farming enterprise.
- 3 The start point on which nitrogen loss allocation is based, relevant Managed Reduction Targets ~~and the Nitrogen Discharge Allowance allocated to the property/farming enterprise that must be achieved by 2032.~~
- 4 Any nitrogen benchmark under Rule 11 of the Regional Water and Land Plan.
- 5 A description of how each of the following management objectives, where relevant, will be met.
- (a) ~~Nitrogen management: To minimise nitrogen losses and achieve the Nitrogen Discharge Allowance allocated to the property/farming enterprise by 2032.~~ The Nitrogen Management Plan must include:
 - (i) A nitrogen budget for the property/farming enterprise that matches the current system or use of the system.
 - ~~(ii) A pathway, including a schedule of mitigation actions, that demonstrates managed reduction to achieve the Managed Reduction Targets and the 2032 Nitrogen Discharge Allowance in accordance with LR P8.~~
 - (iii) The specific data and records that will be kept to measure compliance with specific targets and mitigation actions defined in 5(a)ii.
 - (iv) A description of any specific risks related to nitrogen leaching and runoff risks and how these will be addressed.
 - (b) *Phosphorus management:* To identify the environmental risks associated with phosphorus and sediment loss from the subject property, the significance of those risks and implementation of industry best practice management to avoid or reduce the risks.
 - ~~(c) *Effluent management:* To manage the risks associated with the operation of effluent systems to ensure effluent systems are compliant with consent conditions (including permitted activity standards) every day of the year.~~
 - (d) *Gorse management:* To manage gorse to minimise nitrogen losses.
 - (e) *Water irrigation management:* To operate water irrigation systems in a way that minimises nitrogen losses from the property.
 - (f) *Fertiliser management:* To manage the risks associated with the application of fertiliser. Fertiliser must be applied in accordance with the Code of Practice for Nutrient Management 2013 or as updated; and either
 - (i) the Spreadmark Code of Practice 2015 or as updated; or
 - (ii) With spreading equipment that is maintained and self-calibrated to Spreadmark Code of Practice standards.
- 6 Nitrogen budgets must be prepared using the OVERSEER® Nutrient Budget model (or an alternative model authorised by the Regional Council) in accordance with Policy LR P13 and LR P14.
- 7 Nitrogen Management Plans shall be updated:
- (i) at no more than five yearly intervals from 1 June 2017; and
 - (ii) in response to a significant farm system change; or
 - (iii) in response to the addition or removal of leased land or land with contractual arrangements in support of a property/farming enterprise; or
 - (iv) on the transfer of Nitrogen Discharge Allowances; or
 - (v) on the transfer of Managed Reduction Offsets to meet a Managed Reduction Target; or
 - (vi) by agreement with the Chief Executive of the Regional Council.

All updated Nitrogen Management Plans must meet the intent of the original Nitrogen Management Plan and include an updated nitrogen budget.

The information requested by the Bay of Plenty Regional Council shall be provided in an electronic format compatible with Regional Council information systems and may include but shall not be limited to the following reports from OVERSEER® or their equivalent if an alternative model is used: Nutrient Budget, Nitrogen, Summary, and Nitrogen Overview.

Provision: Schedule LR Seven – Transfer of Nitrogen Discharge Allowance or Managed Reduction Offset

Support with amendments

Reason: we support the importance of flexibility mechanisms, both short-term and longterm.

A key focus for the Incentives Board is the period to 2022.

We have earlier recommended that consideration be given to reviewing the Incentives funding criteria.

We request that Council give further consideration to including a wider range of non-farming participants; and to exploring baseline-and-credit market mechanisms alongside offset mechanisms.

Relief Sought: we recommend further exploration of flexibility mechanisms.