

Report No.	17-57
Information Only - No Decision Required	

ONE PLAN EVALUATION REPORT: NUTRIENT MANAGEMENT AND WATER QUALITY

1. PURPOSE

- 1.1. To inform members of the findings of last year's evaluation of the water quality provisions of the One Plan, and provide an outline of next steps.

2. EXECUTIVE SUMMARY

- 2.1. Freshwater is a challenging and rapidly developing area of resource-management practice nationally. The One Plan, in its time, was innovative; many of its provisions were new and untested. Such innovation is necessary if we are to improve on the status quo, but bears with it a risk of unintended consequences.
- 2.2. The paper provides an overview of the first phase of evaluation of Horizons' One Plan, focussing on Chapter 5 Water, and Chapter 14 Discharges to Land and Water. While many aspects of the Plan are effective, nutrient management rules present significant workability issues and would benefit from formal plan review.
- 2.3. National policy will require us to refine other aspects of our freshwater management framework. This will include adjustments to freshwater values and objectives, greater attention to public health outcomes (including "swimmability"), and inclusion of catchment limits.
- 2.4. Further evaluation phases are to be undertaken in relation to water allocation, erosion and sedimentation. Once these are complete, around the middle of this calendar year, we will provide further recommendations on how a plan review might best be structured.
- 2.5. In the meantime, we must continue to implement the One Plan in its current form. A clear communications strategy will be important to ensure public confidence in Council processes.

3. RECOMMENDATION

That the Committee recommends that Council:

- a. receive the information contained in Report No. 17-57;
- b. note that formal review of the One Plan's freshwater management provisions is recommended;
- c. invite staff to present a proposed approach to plan review to Council later this calendar year.

4. FINANCIAL IMPACT

- 4.1. This item does not have direct financial impacts. It is expected that there will be resourcing implications for actions recommended in this report in due course, which would be dealt with through the normal long-term and annual planning processes.

12 April 2017

5. COMMUNITY ENGAGEMENT

- 5.1. This is a briefing paper for Council and does not include content that would require community engagement. Water quality is, however, a high-profile topic. The findings of this evaluation should be reflected in general communications and engagement on the subject.

6. SIGNIFICANT BUSINESS RISK IMPACT

- 6.1. This paper is for information, there are no immediate business risks.

7. BACKGROUND

- 7.1. The One Plan incorporates the Regional Policy Statement, the Regional Plan and the Regional Coastal Plan as a consolidated framework for resource management planning in the Manawatū-Whanganui Region. It became operative on 19 December 2014.
- 7.2. The **Resource Management Act (RMA)** sets minimum requirements for local authorities to monitor the efficiency and effectiveness of policies, rules, or other methods in policy statements and plans. It is good practice to implement policy evaluation as early as possible to ensure that the framework of policy and regulatory provisions is successful in resolving the issues identified. Monitoring and evaluation is an ongoing process throughout the life of a plan and helps to determine the need for further action, and any changes or improvements that may be needed to ensure that the plan can best address identified issues in practice.
- 7.3. A programme of evaluation commenced in December 2015. The first phase focused on water quality and nutrient management. The evaluation could not rely on state of the environment data as a gauge for policy effectiveness: it is too early to attribute any impact of the policy framework with in-river response. The key questions have thus been whether the One Plan rules, policies and methods are workable, and whether they can reasonably be expected to deliver on its water-quality objectives.
- 7.4. We have focused on the freshwater management framework, including alignment with the **National Policy Statement for Freshwater Management (NPSFM)**, in managing point-source discharges and the effects of intensive land use. The evaluation has taken into account our experience of implementation, and proceeds from an understanding that the practicability of the Plan's provisions is critical to its effectiveness in achieving its intended outcomes.
- 7.5. The body of work forming the evaluation has been led by the Policy Team with input from Consents, Science, Freshwater, and Rural Advice. External advice and technical reports have been obtained to provide expert opinion on specific aspects; stakeholder outreach has resulted in feedback and information from district councils, Dairy NZ, and a number of iwi groups.

8. OUR FRESHWATER MANAGEMENT FRAMEWORK

- 8.1. The One Plan sets out to maintain or enhance freshwater quality, to safeguard the life-supporting capacity of the Region's water resource and to provide for Schedule B freshwater management values. The Plan encompasses both non-regulatory and regulatory methods to pursue these outcomes. Regulatory mechanisms address intensive farming, domestic and municipal wastewater, and industrial discharges. These activities impact on water quality through the release of nutrients, bacteria and pathogens into groundwater and surface-water bodies.
- 8.2. The NPSFM requires that regional councils identify freshwater objectives, set catchment limits to achieve those objectives, and manage resource meet limits. This may be done through regulatory or non-regulatory methods, or a combination of both. This framework is

to be in place by 2025. The 2014 amendments to the NPSFM introduced the **National Objectives Framework (NOF)**, which aims to provide greater consistency in the expression of freshwater values and in monitoring methodologies used across New Zealand. The main thrust of the proposed 2017 amendments is to change measures associated with recreational use from secondary contact (“wadeability”) to primary contact (“swimmability”).

- 8.3. At the time the One Plan was developed, aspects of its approach – particularly the nutrient management provisions – were innovative and at the leading edge of practice in New Zealand. As a result, we have a planning framework that precedes, but largely gives effect to, the NPSFM. The process around the Plan’s development and implementation has also significantly advanced acceptance across the Region of the need for all sectors to take action to address freshwater quality. And indeed, while it is too soon to attribute changes to the Plan, general trends in water quality are encouraging – suggesting that the broad pattern of council, industry, and community action over the past decade or so is reducing our environmental impact.
- 8.4. The other side of the coin is that the nutrient-management mechanisms built into the Plan were largely untested at the time it was written. Understanding how effective they are in practice has been a major focus of this block of evaluation. While we have most elements of the NPSFM framework, with the benefit of hindsight they don’t necessarily all connect as well as they might – the relationship between in-stream values and objectives, through catchment loads, to regulatory and non-regulatory interventions at a property or activity scale could be improved.
- 8.5. Approaches to managing diffuse sources of contaminants have continued to develop in the years since the One Plan was created: other councils have built on the work that was done here, and have sought to address some of the difficulties inherent in our framework. No region has yet hit upon a perfect solution, and the presence of more refined approaches does not in itself invalidate ours. This is an evolving area of practice, though, in which we should expect improvements to our approach to be possible (and even necessary) in the years ahead.

9. FRESHWATER VALUES AND OBJECTIVES

- 9.1. The One Plan contains a robust set of freshwater values and objectives. These will require refinement in due course; in the interim, they support the effective functioning of the Plan.
- 9.2. Schedules B and E of the One Plan largely address the requirements of the NOF (and will continue to do so, should nitrogen, phosphorus, and macroinvertebrates be added). Language and measures differ somewhat between the two documents, and will need to be aligned at some point before 2025. Coverage of groundwater will also need to be considered. Public health outcomes are less explicit in the One Plan than the NPSFM; like other aspects of the NOF, the proposed national “swimmability” targets differ in their detail from the One Plan’s *E. coli* targets. These, too, will need to be reviewed.
- 9.3. Feedback received from iwi groups through this evaluation suggests that coverage of cultural values in the One Plan is not as robust as it might be. Amendments proposed to the NPSFM are likely to heighten expectations on regional councils in this regard. Developing an understanding of these values – and associated measures – to a point at which they could be effectively incorporated into the Plan is likely to take a significant period of engagement with iwi and hapū across the region.
- 9.4. When we do review values and objectives, it is likely that they will need to be set with closer attention to what is achievable in particular catchments, and over what period of time. The progression from values to limits to interventions is laid out in this paper in a linear fashion for clarity; to some extent, however, it is an iterative process. Because regional councils are required to plan to achieve their objectives, those objectives must logically be *achievable* with a set of interventions that the community is willing to accept.

10. CATCHMENT LIMITS

- 10.1. The NPSFM requires regional plans to set limits for all **Freshwater Management Units (FMUs)**. These provide a bridge between the outcomes sought in-stream and the constraints placed on activities on land.
- 10.2. The approach adopted with respect to nitrogen in developing the One Plan was conceptually similar to that required by the NPSFM: target catchment loads were calculated from target in-stream concentrations, and current catchment loads estimated from our understanding of land-use patterns and leaching rates. Loads associated with implementation of the proposed set of interventions (intensive land use rules, stream fencing, municipal wastewater upgrades, etc.) were also estimated for some catchments. These fell somewhere between the current state and the long-term target state.
- 10.3. Explicit “catchment limits” did not find their way into the Plan. In hindsight this is unfortunate, since the overall logic of how much of a reduction in nitrogen is expected to be delivered over the life of the Plan is only apparent by delving into historical evidence. Where sustainable limits are exceeded, establishing timeframes by which the Plan’s interventions aim to reach target levels may help with consistency of expectations. Conversely, working back the other way through catchment loads may help to clarify whether freshwater objectives are achievable.
- 10.4. Our changing understanding of catchment dynamics in this region serves to illustrate that limit-setting is not, and will likely never be, an exact science. Catchment systems are complex. Most of our assumptions and estimates have changed since the One Plan was developed: typical leaching rates for particular crops and whole farms, with different rainfalls on different soils; the physical area used for dairy farming and rates of conversion between land uses; denitrification below the root zone; surface- and groundwater interactions; factors affecting periphyton growth. This is not a reason for inaction, but a reality that needs to be factored into our policy approach.
- 10.5. Setting limits will not be useful for all aspects of freshwater management (it might be theoretically possible, for instance, to define a “limit” for stream shading, but doing so may not add much value). Nonetheless, for factors such as nitrogen and phosphorus loads, limits are a useful concept – even in light of the challenges outlined in the previous paragraph. The core difficulty with the One Plan’s framework is not in using (uncertain, modelled) numbers to articulate what we understand to be sustainable limits for catchments as a whole; it is in using them directly to determine activity status and compliance in individual consent applications. This issue is discussed below.

11. MANAGING DIFFUSE SOURCES

- 11.1. Consenting intensive land-use activities has proven to be difficult, contentious, and time-consuming. The consenting process is delivering reductions in nitrogen leaching of roughly ten percent in most target catchments (see Figure 1 below). This is broadly consistent with what one might expect the framework to deliver, bearing in mind uncertainties and assumptions that necessarily feature in its design. There are, however, substantial challenges in implementation of the rule stream. These centre on the questions of who requires a consent, and how applications are assessed.

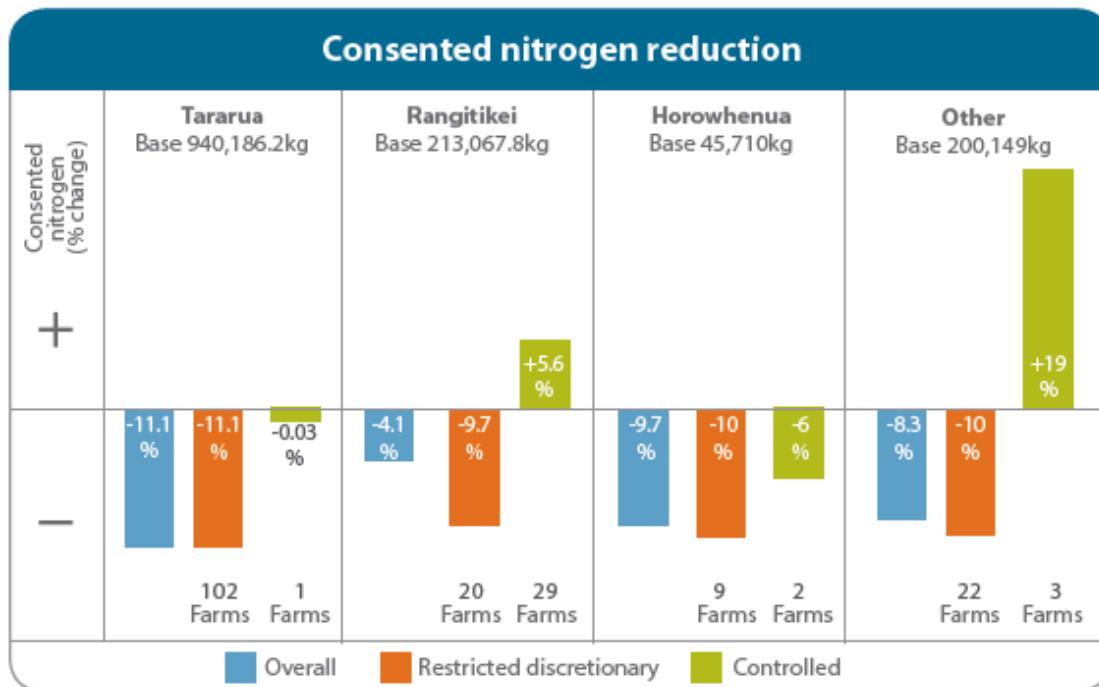


Figure 1: Consented nitrogen reduction rates, by catchment

Target Catchments and Intensive Land Uses

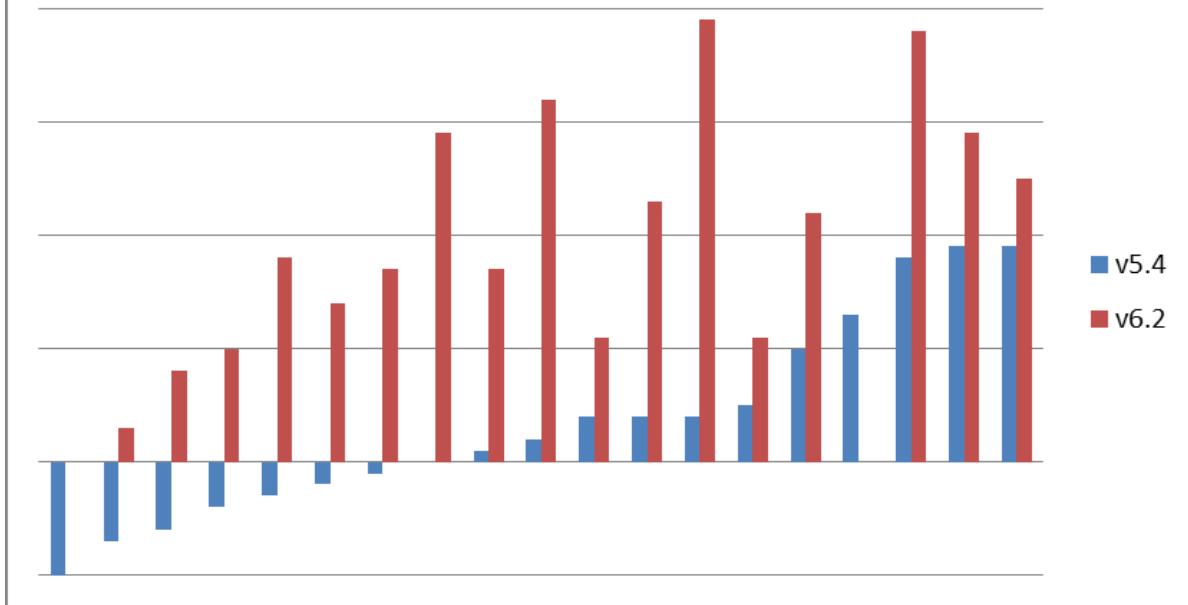
- 11.2. The One Plan's nutrient management rules focus on the intersection of three factors – catchments with degraded water quality; nitrogen as a contributor to that issue; and intensive land use as the major source of nitrogen. This, at the time, was a bold step forward. As our understanding evolves – in part through the experience of implementing the framework we have – some difficulties with this approach have become clear.
- 11.3. While managing nitrogen was an important place to start, it has become increasingly apparent over the past few years that nitrogen concentrations have only a probabilistic relationship with water-quality outcomes. That is, achieving a particular nitrogen concentration will not guarantee a better outcome, and failing to achieve it will not necessarily preclude one. A number of factors influence ecosystem health or suitability for swimming. We must, of course, continue to manage nitrogen: if we are to achieve community aspirations, however, we should consider more targeted management of other contaminants such as phosphorus and bacteria. This would flow from limit-setting, discussed above, into a reevaluation of which risk factors are to be managed (and how) in which parts of the region.
- 11.4. Similarly, definitions in the Plan of “intensive land use” and the conceptual separation of “existing activities” and “conversions” have been a good starting point, but bear re-examination. Feedlots, for example, are not considered an intensive land use; it is not entirely clear whether dairy support is or isn't. If crops are planted only occasionally, is that a conversion or an existing use? How do we deal with a small parcel of land being added to an existing operation? Is it a conversion? We can, of course, deal with all of these questions through practice – but doing so adds to the work required to implement the Plan and erodes community confidence.
- 11.5. When we come to consider alternative approaches, there is also a question of whether managing the diffuse effects of farming activities should necessarily default to requiring a resource consent, or whether better use could be made of permitted activity rules. Consenting farms has helped to build understanding of the issue (particularly on the part of applicants) and of real-world practicalities (on the part of Council staff). It has provided the Council with a wealth of data about some of our catchments. But it is has also proven to be

much more resource-intensive than the controlled / restricted discretionary status of the consents suggests. Land-use consents will continue to have their place; we could perhaps do better at targeting them toward high-risk activities.

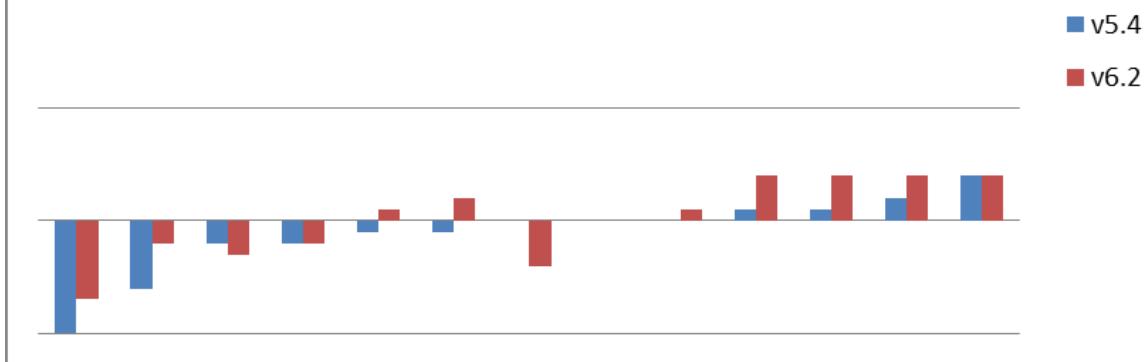
Leaching Rates, Land-Use Capability, and OVERSEER

- 11.6. How applications are assessed has been the most contentious aspect of Plan implementation to date. This has been driven by difficulty for many operators in achieving the target nitrogen leaching rates laid out in Table 14-2 of the Plan – and divergent views on the environmental effect of not reaching the Table, and what Council officers should do about it. It bears emphasising that the focus of this evaluation is not how well implementation has proceeded, but rather on whether the Plan itself is workable and likely to deliver its intended results.
- 11.7. **Land-use capability (LUC)** is a philosophically attractive way of allocating limited resource among users. The most intensive land uses are guided towards higher-quality soils, maximising economic returns, while managing the overall environmental impact. While the science around nitrogen loss from farming systems is more advanced than for other diffuse-source contaminants, it is impractical to measure actual leaching rates for each farm requiring a consent. Losses are instead modelled, using OVERSEER. Table 14-2 is not indexed to any particular version of OVERSEER, because it is not an OVERSEER table per se. OVERSEER was, however, central in testing the economic impact of the then-proposed allocation regime and in settling on the degree of “stretch” that the Table represents.
- 11.8. This degree of stretch is important. Nitrogen leaching rates listed in Table 14-2 will not deliver the in-stream nitrogen targets listed in Schedule E: they address that proportion of the total nitrogen load coming from a defined set of intensive land uses; for those land uses, they represent a step *towards* the in-stream targets which was believed to be affordable for most operations. A relatively small proportion of exceptions was anticipated, and was to be addressed through a restricted discretionary consenting pathway.
- 11.9. While Table 14-2 is a fixed allocation mechanism, OVERSEER is subject to upgrades and enhancements. Changes between version 5.4 and version 6.0 significantly affected the relationship between the LUC and OVERSEER models. This has changed our *understanding* of how much nitrogen is leaching from individual farms, and significantly affected the workability of the Plan. It has not affected the amount of nitrogen *actually* leaching through soils or present in river systems. We will need to update our catchment models as we work through review of in-stream values, loads, allocation and target dates across the Region to account for changes in our knowledge base.
- 11.10. The Plan anticipates that some individual farms will have to make significant reductions in nitrogen leaching, and that this will be difficult. In the Mangatainoka, at least, it is no longer “some farms” but “most farms” that fall into that category. Figure 2 below shows the difference between target “year one” leaching rates and estimated baseline leaching rates for a number of farms in the Mangatainoka, using OVERSEER version 5.4 (used in economic analysis supporting the One Plan) and OVERSEER version 6.2 (the version currently used in consenting). There are limits to how much we should read into this data set, and for that reason numbers are not shown nor farms identified. What should be clear is that many farmers face a very different situation now to what projections suggested at the time the consultation on the Plan took place. The Council correspondingly now faces a substantially different regulatory challenge.

Target Leaching Reduction : Mangatainoka



Target Leaching Reduction: Coastal Rangitīkei & West Coast Lakes



whether a farm is or is not complying with any numerical targets identified in the consent is likely to be problematic.

- 11.16. For reasons like these, other regions are now moving away from the use of explicit numerical targets in plan rules. In this Region, they represent a significant challenge to the One Plan's effectiveness. It might be that a refined version of LUC for different catchments offers a solution, or that a different approach to allocation is warranted. These are questions for plan review.

Striking the Right Balance

- 11.17. At a broad policy level, the One Plan sets out to deliver nitrogen reductions that achieve water quality strategies; recognise the productive capacity of land; are achievable on most farms using good management practice; and set appropriate timeframes where large changes are required.
- 11.18. The particular numbers in Table 14-2 represent a level of reduction that balanced those objectives, based on our understanding of the science at the time. The differences between Mangatainoka and West Coast catchments, illustrated above, indicate that one set of numerical leaching targets will not deliver the same balance in different parts of the region. Determining limits for specific catchments would be a useful link between outcomes and allocation.
- 11.19. The gulf between Table 14-2 and OVERSEER estimates – in the Mangatainoka, at least – also calls into question whether the balance sought through the One Plan remains viable; as a consent authority, we quite properly have little visibility of farm financial information. Farm profitability is not a matter of discretion in considering consent applications. In light of changes in OVERSEER estimates and their effect through the Plan's rule stream, however, we have sought to update our understanding of the Plan's economic impact at a policy level.
- 11.20. Current information suggest that the direct cost to landowners of implementing mitigations required through the consenting process is relatively low. For farms having to change practice or install bridges, culverts or feedpads, the economic costs to farmers increased significantly.
- 11.21. Through a small number of case studies, we also looked into how further reductions might affect economic returns. While there was often potential to further reduce nitrogen leaching, this study suggest that doing so required a high degree of expertise and came at the cost of total production. Such changes may also represent a major shift in farming systems, with attendant risks for the operator. Given our limited confidence in the marginal environment benefits of such significant farm system change, it is unsurprising that these measures have not been taken up. Should further nitrogen reduction be required in future, we would need to consider carefully where the barriers lie and how best to overcome them. Tighter regulation may not be the most effective tool.

Non Regulatory Interventions

- 11.22. Horizons undertakes a range of non-regulatory programmes to reduce nutrient, sediment and bacteria moving from farm land into waterways. These also form part of the One Plan's tool set. They include the promotion of riparian planting, stock exclusion from waterways through fencing, and the **Sustainable Land Use Initiative (SLUI)** to reduce sediment run-off from erosion.
- 11.23. At this time, no major concerns with these non-regulatory tools have been identified. Measures to address sedimentation (including SLUI), the effectiveness of our water allocation regime, and management of activities in the beds of rivers and lakes will be the subject of separate evaluation reports later this year. As we review the Plan, it will be

important to consider how these interventions, national initiatives, national regulation and regional rules work in concert to deliver freshwater outcomes.

12. MANAGING POINT-SOURCE DISCHARGES

Wastewater Treatment Plants

- 12.1. Point-source discharges received less attention through this evaluation than diffuse sources. This reflects the greater maturity of regulatory management of point-sources, and the greater difficulty currently associated with management of diffuse sources.
- 12.2. The One Plan sets a target of 2020 for treated human sewage discharges to water to be diverted to land. There are forty municipal wastewater treatment plants in the Region, most of which discharge to freshwater. Substantial central Government funding has been secured for upgrades to several of these plants over the past decade, particularly in the Manawatū. Together with the Manawatu River Leaders' Accord, this has been a major contributor to progress in this area.
- 12.3. The scale of the task for territorial authorities is daunting; the process involves a great deal of resource, whilst being subject to a high level of public scrutiny. Currently, nineteen point-source discharges are operating under 'existing use rights'. This reflects the resource intensity and lengthy decision-making processes associated reconsenting these operations. Moreover, as practice has developed, challenges with land-based treatment have become better understood. Although the policy intent remains appropriate, the target timeframe is unachievable.

On-Site Wastewater

- 12.4. Management of on-site domestic wastewater disposal is a permitted activity, provided that good practice guidelines are followed. New and upgraded systems are conforming to good practice guidelines, or hold consents with conditions to achieve the same purpose. Assessment of permitted activities is not cost-recoverable. The efficient way to check compliance would be to integrate it into territorial authorities' building consent processes. This initiative has stalled, due to districts' concerns about resourcing and transfer of legal risk.
- 12.5. Over the longer term, investigation into the type of evidence need to demonstrate that the on-site wastewater regime is having a beneficial effect on groundwater quality would be of value, although it is acknowledged that measuring the impact of these rules on groundwater resources will be difficult.

13. CONCLUSIONS AND NEXT STEPS

- 13.1. Aspects of our freshwater management framework need refining. The NPSFM will require us to revisit catchment loads and set limits – drawing clearer connections between instream objectives and requirements on resource users, and making timeframes more explicit. Work is also required to review freshwater values and objectives, particularly to better reflect cultural values and ensure consistency with evolving public expectations.
- 13.2. The regime we have in place for managing the diffuse effects of intensive land use is broadly delivering on the policy intent (of reducing nitrogen leaching within the capacity of most farms). It has, however, proven to be difficult and resource-hungry to implement. In the course of implementation, inconsistencies between some of the plan's provisions have become apparent. In order to both fully deliver on the One Plans' existing intent, and to respond to the changing expectations of central Government and the community, in time we will need to revisit whether intensive land-use regulation should remain quite so narrowly focused on nitrogen loss rates, or extend out to address other contaminants. Chapter 14 (Discharges to land and water) would thus benefit from formal plan review.

- 13.3. A review need not start from scratch. Despite the difficulties outlined in this paper, the One Plan provides a firm foundation on which we can build. Moreover, since the Plan was developed, both Horizons' body of scientific knowledge and the national body of knowledge around freshwater management have developed significantly.
- 13.4. In reviewing the Plan it will be important to both communicate openly with the community, and minimise upheaval and uncertainty for resource users. This is likely to be challenging; active communication, and clarity around process and scope should help. We will need to be clear that our intention is not to retreat from the intent of the One Plan, but to improve upon it. It must also be clear that, until such time as a new or amended Plan takes its place, we are bound to continue to implement the Plan we have.
- 13.5. Reviewing freshwater management aspects of the Plan is likely to take the full period – through to 2025 – that we have available. A series of smaller processes is likely to be necessarily over that period. Before we start, we need to complete evaluations of parts of the Plan dealing with erosion and sediment, water quantity, and beds of rivers and lakes. This work should be complete by mid-2017, and will allow us to ensure the plan review programme is properly scoped.
- 13.6. In the meantime, we will investigate how best to sequence the various aspects of the plan review programme. This will include whether and how we might apply alternative, collaborative plan-change pathways likely to become through the Resource Legislation Amendment Bill. Further advice will be forthcoming around August 2017.

14. SIGNIFICANCE

- 14.1. No decision is sought at this point which is significant according to the Council's Policy on Significance and Engagement. Should the plan review process recommended in this paper result in proposed changes to the One Plan, such changes would be significant.

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ANNEXES

There are no attachments for this report.