Report to the Collaborative Stakeholder Group – for Agreement and Approval

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Date:	24 August 2015
To:	Collaborative Stakeholder Group
From:	Chairperson – Bill Wasley
Subject:	Policy option of a property-level limit for nitrogen and phosphorus
Section:	**Agreement and Approval**

Disclaimer
This report has been prepared by Waikato Regional Council policy advisors for the use of Collaborative Stakeholder Group Healthy Rivers: Wai Ora Project as a reference document and as such does not constitute Council's policy.

1 Purpose

The purpose of this report is to outline how a property-level limit for phosphorus and/or nitrogen could work.

Recommendation:

1. That the report [Policy option of a property-level limit for nitrogen and phosphorus] (Doc #3476854 dated 24 August 2015) be received, and

2. That the Collaborative Stakeholder Group (CSG) confirm that WRC staff continue to investigate a policy approach for managing nitrogen that relies on specifying a phosphorus and/or nitrogen property-level limit, and bring back more detail to the CSG.

3. That investigation of property-level limits will involve WRC implementation staff, the Technical Leaders Group and any interested CSG members, on the use of the OVERSEER® (Overseer) nutrient model, including the two options set out in Section 6 of this report:
    a. A nitrogen property-limit option which operates as a 'hard limit' on diffuse nitrogen discharge, where the landholders initial allocation of nitrogen cannot be exceeded without triggering a need for resource consent or some compliance action.
    b. A phosphorus and/or nitrogen limit which operates as a 'direction of travel' where landholders are required to undertake actions to manage phosphorus loss or nitrogen leaching, but are not held to a particular nitrogen leaching number for their property.

2 Property-level limit: definition

For the purposes of this report, a property-level limit is an approach where landholders have flexibility to manage activities and land use, as long as they don't exceed a specified amount of diffuse discharges of nitrogen or phosphorus from an individual property.

When a property-level limit is used, inputs to a farm system are not specified (such as the amount of fertiliser used or activities undertaken). Instead, individual landholders decide how they will meet their limit. To do this, they need to be able to link their nutrient related farm inputs, activities, land use and practices, with the resulting amount of nitrogen leaching or phosphorus runoff.

Other terms sometimes used for this approach are a performance standard or more often, 'effects-based approach', because the focus is on defining a certain level of effect from land use and land activities on the water body receiving environment.

A community-accepted level of certainty about the amount of measured or modelled contaminant leaving a property, is a pre-requisite when considering a property level limit.

Where property-level limits are currently used

Of the six regional plans that currently use a property-level limit approach, all are focused on nitrogen, and use the OVERSEER® (Overseer) nutrient model. See Appendix 1 for a brief summary of Overseer use in policy development by regional councils. The property limit is either written as kilograms of nitrogen leached per hectare per year or a total tonnage of nitrogen from a property. In each case, the policy approach is a 'hard limit' on diffuse nitrogen discharge, where it cannot be exceeded without triggering a need for resource consent or some compliance action. For instance, Waikato Regional Plan rules include a nitrogen property-level limit for the Lake Taupo catchment, where, once the resource consent is granted, and the tonnage of nitrogen specified, exceedances trigger compliance action (Rule 3.10.5.3).

3 Alternatives to property-level limits

Alternatives to a property-level limit must be considered if there is not a community-accepted level of certainty of the modelled or measured amount of contaminant leaving a property.

Section 6.2 of this report sets out an option which don't rely on nutrient models to determine and then monitor a property limit (Option 2 Manage 'Direction of travel' of nutrient loss on farms). In this option, the quantum of nitrogen is not specified as an absolute number that must be complied with. It is the relative change in diffuse nutrient discharge that is important. Landholders are required to make changes on farm that reduce the risk of phosphorus and nitrogen entering groundwater, rivers, lakes and streams. Overseer is still important in assisting decisions about which practices are most effective on each farm.

4 Background material already considered by CSG

While the CSG has not discussed a nitrogen or phosphorus property level limit in any detail, a number of workshops and reports have covered elements of the approach set out in Section 6. These are summarised below.

Other Council approaches
A summary of other council approaches to property-level nitrogen limits was given to CSG in 2014[1]. Canterbury, Bay of Plenty, Waikato, Otago and Manawatu-Wanganui Regional Council approaches were summarised.

Key findings of the report were that

1. Property-level limits are often phased in, including for the following reasons:
   - Taking time to build awareness and capacity amongst landowners
   - When improvements in water quality are required.
2. Some councils have opted for a hierarchy of planning controls[2] where more scrutiny of landholder effects on water bodies occurs where there is higher:
   - sensitivity of the receiving environment or
   - risk of adverse effects on water quality, higher environmental performance or increasingly specific conditions on resource consents can be required in sensitive areas.

Case Study – Lake Taupo Catchment
In early 2014, policy and implementation staff provided the Collaborative Stakeholder Group with a case study of a policy development and implementation process for property-level limits to meet water quality outcomes (Report to CSG workshop 2 Case Study I: Lake Taupo catchment property-level nitrogen discharge limits document number 3034258).

Reporoa CSG meeting farmer presentation
In a presentation to CSG, a Reporoa dairy farmer made the point that to achieve fairness between farmers using the same good practice and farm inputs, there would need to be some sort of delineation between different soil types. He noted that if "line in the sand" limits were proposed, they would be far more difficult to achieve on very free draining 'nitrogen leaky' pumice soils in higher rainfall areas.

Recent CSG policy option discussions
The option of a property-level limit was raised by CSG in mid 2015. Policy options for managing nitrogen, phosphorus and microbes leaving a property were discussed by the Collaborative Stakeholder Group (CSG) on day 2 of the July 2015 workshop (CSG 13). A list of initial region-wide rules or methods was developed. Policy staff were asked to work with industry sector members and implementation staff. At the August 10-11th CSG meeting, staff provided several summary reports. One report was about progress on investigating region-wide rules and the other report was an outline of the option of a tailored farm plan, either led by Council or agriculture industry bodies.

Since the last CSG meeting in mid August, staff have produced an updated list of all policy options under consideration by CSG for the August 26th-27th meeting (Report to CSG entitled "Summary of policy options being investigated" Document number 3482625 dated 24 August 2015).

Initial Allocation

CSG discussed initial allocation of nitrogen at a property level, and general implications for different land uses and sectors, on 10th August 2015. A report[3] provided the CSG with

[1] Waikato Regional Council 2014 Regional Council approaches to diffuse discharges and water quality– Report prepared for the Collaborative Stakeholder Groups workshop 5, dated 20th March 2014 DM# 2325986.

[2] Plans usually contain more than one rule category. Rule categories range from permitted activities which can be undertaken as of right as long as rule conditions are complied with, through to those that require resource consent (controlled, discretionary, restricted discretionary, non-complying), to prohibited activities where no consent may be applied for or granted.

information about the context for and the range of, initial allocation options at a property level to discharge contaminants. The CSG decision was to re-visit initial allocation options once the results of modelled future scenarios are understood and total load of nitrogen and/or phosphorus is determined.

A key point in the allocation report was that initial allocation is a 'hot button' for many people, because of the feeling that their future prosperity is being curtailed by the choice of option. This can be the case even if current profitability is not immediately affected.[4]

Use of nutrient models in policy limit-setting processes

Some brief points about the use of Overseer and Mitigator models from the Technical Leaders Group (TLG) were included in the agenda pack for CSG August 10th and 11th. These were not presented by TLG at the workshop, but a CSG member sought to clarify the nature of the scientific concerns raised by TLG[5]. One recommendation of this report is to further investigate the use of Overseer in a property-level limit.

5 Property level limits - Acceptable level of accuracy

A community-accepted level of certainty of the amount of contaminant leaving a property (direct measurement or modelling), is a pre-requisite when considering a property level limit.

Once the desired future state is established (in the form of water body limit), CSG has to decide what needs to change on the land.

Which contaminants can be measured or modelled at an individual property level?
The Technical Leaders Group have stated that the amount of sediment or *E.coli* in a water body that is coming from land use activities can be estimated at a subcatchment level using models. When considering a property-level limit in a Regional Plan, there is an additional level of certainty required. The contaminant has to be able to be modelled to a community-accepted level of certainty when spending public money or regulating. The CSG decided for this reason, sediment and microbes cannot be allocated to individual properties in the same way that nitrogen and phosphorus can[6]. In policy option discussions, CSG concluded that it is feasible to set property level limits of nitrogen and phosphorus.

Overseer model
OVERSEER® (Overseer) is a freely available online application, developed by AgResearch Limited, with support from the Ministry for Primary Industries and the Fertiliser Association of New Zealand.

> Overseer enables farmers and growers to examine nutrient losses, including nitrogen, phosphorus and greenhouse gases, which are directly attributable to their operation. They can calculate the impacts of management changes on discharges, including by testing "what if" scenarios, providing information to land managers to assist decisions on farm. By combining this environmental information with knowledge of their operation, and financial advice, managers are able to adopt practical solutions that benefit the environment and may also have associated financial gain (Arbuckle 2015, in prep, p3)

As the model is updated by the owners, new versions are released, and existing versions are no longer publically available. This is an important factor to consider in policy

[3] Report to CSG entitled "Initial allocation options to permit discharges of contaminants at a property level and the sharing of costs" Doc #3109567 dated 27 July 2015.

4 Ibid page 3.

5 Collaborative Stakeholder Group Workshop 14 Notes. 10th and 11th August 2015, DM 3471459

[6] Instead, the sediment or microbes policy options discussed by the CSG focus on meeting water body limits through requiring activities which are known to reduce the amount of ending up in water bodies (CSG workshop12 DM #3419983 and 13 DM #3439320 notes).

development. Problems can arise when the 'measuring stick' changes but nothing else has changed on farm. WRC has worked around this in its current policy approach in Lake Taupo Catchment by requiring a consistent 'measuring stick'[7]

The Technical Leaders Group has been using Overseer to support catchment modelling and establish water quality contaminant loading under different future scenarios.

National work on the use of Overseer in water quality limit-setting processes
In early 2015, work began on a national project to assist councils who are using or considering use of Overseer to manage the adverse effects of nitrogen and phosphorus on water quality. The first stage is due to be completed at the end of August 2015, and summarises how regional councils currently use Overseer in policy, regulation, compliance and advice, and identifies regional council priorities for guidance material on using the model.

The project came about because regional councils are currently using Overseer in a variety of ways across policy development, regulation, compliance and advice, and use is expected to increase substantially as councils begin to implement the National Policy Statement for Freshwater Management 2014 (NPS-FM).

The project brief notes that:

> Implementation of the NPS-FM involves setting limits for water quality. The use of Overseer to inform limit setting and managing within limits enables "effects-based" controls on outputs, especially nitrogen. Such output controls are seen as preferable to input controls as they are regarded as more flexible, efficient and effective.
>
> Many councils are using Overseer to inform catchment land use scenario analyses which often underpin the limit setting process. However, it is the application of limits at the farm scale that is most contentious. Although the use of Overseer to set limits has withstood some legal challenges, there is much less clarity on its use for compliance. There are challenges in incorporating Overseer numbers into regional plans due to version changes (Stocktake of Overseer Model Project brief MPI 2015, page 1).

6 Options for a property-level limit

6.1 Option 1 Manage nitrogen using a 'hard limit'

This option is a nitrogen property-limit option which operates as a 'hard limit' on diffuse nitrogen discharge, where the initial allocation of nitrogen cannot be exceeded without triggering a need for resource consent or some compliance action.

How it would work:

The Plan Change would include:

- Objective(s) to achieve a particular nitrogen load at specific points in rivers of the Waipa/Waikato catchment.
- Policy that sets out the course of action to achieve the objective, for instance:
    - That limits will be allocated to individual landholders
    - What these will be (initial allocation)
    - Whether reductions in nitrogen will be required, and if so, by when.

[7] See Appendix 1 of this report for differences between Councils. In the Lake Taupo catchment rules, the version of Overseer is specified in the policy and rule. WRC has an agreement with Overseer owners to continue to be able to use the specified version 5.4.3 (current publically available version is 6.1.1)

- Methods, including rules, to ensure that affected landholders must not leach more nitrogen than the limit set for their property, an up to date farm nutrient management plan is the basis for compliance, and Overseer is used to define the mix of actions in the nutrient plan.

This option is most like:

- Existing rules in Regional Plans that rely on the use of Overseer to set and maintain the nitrogen limit: Bay of Plenty Regional Council Rotorua lakes, Horizons Manawatu One Plan, Otago Regional Plan lakes rules, Lake Taupo Catchment Rules.
- Lake Taupo Farm rules example:
    - Overseer is used to calculate the initial allocation. Farmers are granted a resource consent with the total annual nitrogen discharge set out in the consent, and a requirement to maintain an up to date nutrient management plan.
    - Farmers must not exceed this nitrogen property-level limit, unless they have negotiated and formally confirmed a nitrogen transfer with another Taupo farm. In that case, their resource consent is adjusted and both landholders involved are given their new total annual nitrogen discharge.
    - WRC monitors and checks compliance with the nutrient management plan, which is a list of nitrogen-related farm inputs (e.g. number and type of stock wintered, fertiliser used).

6.2 Option 2 Manage the 'direction of travel' of nutrient loss on farms

This option is a phosphorus and/or nitrogen limit which operates as a 'direction of travel' where landholders are required to undertake actions to manage nutrient. The quantum of nitrogen is not specified as an absolute number that must be complied with. Instead, it is the relative change that is important. Landholders are required to make changes on farm that reduce phosphorus and nitrogen.

The Waikato and Waipa Catchment Plan Change would contain detailed policy that establishes the way the water body limit(s) will be achieved. Nutrient limits that apply to different parts of the catchment, would be described in the policies in the Plan. The regulatory element would be a requirement for a regularly updated nutrient management plan. Overseer and other tools are important in assisting decisions about which practices will be most effective for a particular farm. The latest version of an approved nutrient model would be used to assist development of the nutrient plan.

How it would work:

The Plan Change would include:

- Objective(s) to achieve a particular nitrogen load at specific points in rivers of the Waipa/Waikato catchment.
- Policy that sets out the course of action to achieve the objective:
    - What is expected of individual landholders, so that nitrogen leaching activities will be managed to achieve the outcome. For instance, policies that spell out whether nutrient reductions are needed for each part of the catchment and that a regularly reviewed nutrient management plan is required
- Rules that require farm plans to have a nutrient management component[8]
- A formal agreement with the landholder (in the form of a resource consent or an industry 'contract') would set out the actions required on farm, and a timeline for achieving them.

This option is most like:

- The existing CSG idea of a tailored farm plan (industry-led or done via a WRC resource consent process). In this case, the farm plan template will contain nutrient mitigation actions. The DairyNZ Sustainable Milk Plan template is an example of a template that contains detailed sections about some of the nitrogen and phosphorus farm activities and inputs (e.g. area of land irrigated by dairy shed washdown, location of fences around streams and wetlands that exclude dairy cattle).

7 Discussion

The similarities are that both options:

a) Seek to limit upwards creep in nitrogen from ongoing use of existing pastoral, cropping and vegetable growing land
b) Could be used to achieve nutrient reductions or control land use change if required. If the objective was that less phosphorus and/or nitrogen at a particular river monitoring locations was required, a stringent policy and rule framework could require landholders to reduce nitrogen or phosphorus losses over time. Rules could set out staged requirements for percentage changes in nutrient losses from individual properties[9].
c) Assume that the landholder (or their expert advisor) would use nutrient models to run some farm-level scenarios to assess the estimated amount of nutrient loss from their current or potential future nutrient inputs and land use activities. Overseer model would be used for this, and/or Mitigator model (when it is freely available in several years time[10]).
d) Both options require considerable resources for implementation, including:
    a. decisions about which practices are undertaken on farm
    b. high demands of farmer knowledge of the effects of inputs and practices on nutrient loss, and time to plan this into day to day operations
    c. expert advice from nutrient and farm systems specialists[11]
    d. consideration of how to phase in (and pay for) actions on farms to achieve outcomes
    e. high demands of implementing agency resourcing (staff to assist nutrient plan development, and tracking of actions undertaken).

The key difference between the options is that a property-specific hard limit:

a) Could only apply to nitrogen at present[12].
b) Has been used by councils where the receiving water body is very sensitive to the effect of any increases in nitrogen from diffuse discharges to land or water, and there is subsequent community demand for councils knowing the quantum of nitrogen leached from farms and closely monitoring it.
c) Assumes that the rule could be drafted to address Overseer model version change. The principle in doing so, could be that landholders should not be penalised for the

[9] For instance, this general approach is being used, or is in the process of being developed, by Hawkes Bay Regional Council, Bay of Plenty Regional Council and Canterbury Regional Council.

[10] Currently the Mitigator model is in development by Ballance Agrinutrients, but with a public funded programme for its general release in several years.

[11] WRC implementation staff note that this expertise is getting more widespread as time goes on, e.g. Fonterra and DairyNZ staff and more and more rural professionals and becoming capable of providing this expertise

[12] It is assumed that Overseer is currently freely available and the phosphorus targeted nutrient model Mitigator is not yet fully developed and widely available.

'measuring stick' changing, if they have not changed their inputs in a way that increases the risk of nitrogen leaching.

8 Summary

Many of the policy options discussed by the CSG so far, have focused on managing sediment losses from farms, and by doing so, reducing the amount of phosphorus and microbes entering water[13].

The option of a nitrogen or phosphorus property-level limit was raised by CSG in mid 2015. For the purposes of this report, a property-level limit is an approach where landholders have flexibility to manage activities and land use, as long as they don't exceed a specified amount of diffuse discharges of nitrogen or phosphorus from an individual property.

A community-accepted level of certainty about the amount of measured or modelled contaminant leaving a property, is a pre-requisite when considering a property level limit.

CSG discussions have touched on concerns about the use of Overseer in a policy option that specifies a annual per hectare nitrogen leaching number. This report does not go into the detail of these concerns, except to note that Overseer is continually being updated, and that problems can arise when the 'measuring stick' changes but nothing else has changed on farm. For instance, running the same farm inputs (rainfall, stock, bought in feed and fertiliser) through a new version of Overseer, may result in a different nitrogen leaching number.

Two options are set out in this report. The first is nitrogen property-limit option which operates as a 'hard limit' on diffuse nitrogen discharge, where the landholders initial allocation of nitrogen cannot be exceeded without triggering a need for resource consent or some compliance action.

The second option in this report builds on the CSG idea of a tailored farm plan approach that focuses on the physical aspects of the land (erosion, runoff) and adds in a nutrient component.

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[13] For instance, riparian planting and excluding cattle and deer from streams has benefits of keeping the banks of stream more stable, and reducing the amount of microbes and phosphorus entering waterway from dung and overland flow of soil.

Appendix 1 - Examples of WRC and other councils property-level limit rules

9 References

Arbuckle, Chris. July 2015. In prep. Stocktake of Regional Council Uses of OVERSEER® Prepared for Ministry for Primary Industries; Regional Council Resource Managers Group and Regional Government.

Collaborative Stakeholder Group Workshop 12 Notes. 4 and 5th June 2015, DM #3419983.

Collaborative Stakeholder Group Workshop 13 Notes. 2 and 3rd July 2015, DM #3439320.

Collaborative Stakeholder Group Workshop 14 Notes. 10th and 11th August 2015, DM #3471459.

Facilitation session notes from CSG Workshop 12, 4th and 5th of June 2015. DM #3419986.

Facilitation session notes from CSG Workshop 13, 2 and 3rd July 2015 DM #3445619.

Waikato Regional Council 2014. Report to CSG workshop 2 Case Study I: Lake Taupo catchment property-level nitrogen discharge limits document number 3034258.

Waikato Regional Council 2014 Regional Council approaches to diffuse discharges and water quality– Report prepared for the Collaborative Stakeholder Groups workshop 5, dated 20th March 2014 DM #2325986.

Waikato Regional Council 2015a. Assessment of policy instruments for sediment using the Draft CSG Policy Selection Criteria. Agreement and Approval report dated 25 May 2015. DM #3258508.

Waikato Regional Council 2015b. Exploring industry farm plans as a policy option; including industry-supported farm plan with regulatory backstop" DM# 3454905.

Waikato Regional Council 2015c. Policy options for sediment, microbes, nitrogen and phosphorus. Agreement and Approval report dated 22 June 2015. DM #3425911.

Waikato Regional Council (Online Version). Waikato Regional Plan. http://www.waikatoregion.govt.nz/Council/Policy-and-plans/Rules-and-regulation/Regional-Plan/Waikato-Regional-Plan/

Appendix 1 Examples of Regional Council Regional Plan use of Overseer

Table: Summary of Overseer use in policy development by regional councils

How is Overseer used in policy?	By which councils?
In NPS water quality limit development phase.	Greater Wellington Regional Council and BOPRC other areas outside Rotorua lakes (Requires updating on Overseer)
Overseer used to define a catchment load limit in Plan	ECan
As irrigation scheme load limit in Plan	ECan but not HBRC
To fix a permitted activity threshold in the Regional Plan for activities that result in diffuse discharges of nitrogen (N) below which no resource consent is required.	Otago Regional Council (ORC), Waikato Regional council (WRC), Environment Canterbury regional Council (ECan), Bay of Plenty Regional Council (BOPRC), Hawkes Bay Regional Council(HBRC) Not Horizons Manawatu Regional Council (applies to intensive Land Use Capability (LUC)
To set a property level N limit (fixed), meaning significant consequences for landowners if technical advances in the model causes property nitrogen loss numbers to exceed limits	ECan, ORC, WRC, Horizons MW (Rule 13.2)
To set a property – level N limit (varies with Overseer version, but original farm input Overseer file is "locked")	ECan, BOPRC (hybrid) HBRC
Referencing specific versions of Overseer in Plans	ORC Overseer version 6 and any other update of version 6, WRC (Lake Taupo catchment farm rules Overseer version is locked at v 5.3.4) These are the only specific version references in rules that reference Overseer. HBRC and Ecan rules reference "latest version of Overseer"
To set targeted reductions for various land uses, to achieve catchment limit targets	ECan and BOPRC (Rotorua lakes)

Source Adapted from : Arbuckle, Chris. July 2015. In prep. Stocktake of Regional Council Uses of OVERSEER® Prepared for Ministry for Primary Industries; Regional Council Resource Managers Group and Regional Government. Page 12.