[11] Please update the integrated framework to reflect the application of Overseer version 6.2.3. To what extent do these new numbers mean that proportionately greater contributions to the 2032 nitrogen catchment load target are expected from the dairying and drystock sectors, and from the incentives scheme?

Summary

The Integrated Framework is based on in-lake values and updating to an OVERSEER® version would introduce a mix of rootzone and in-lake values – unless attenuation is incorporated which results in the values remaining as unchanged in-lake figures.

Potentially proportionally greater (or lesser) contributions to the 2032 nitrogen catchment load from the dairy and drystock sectors may occur as a result of the combination of OVEERSEER® version changes, changes to the base data and as a result of having a fixed allocation methodology.

These are likely to be of minor variance to the Integrated Framework agreed reductions and importantly do not translate to changes at the property level. At the property level allocation is fixed and reference files are used to maintain proportionality.

The variance that has been observed to date is between 35.3-36% for Dairy and between 17.2 - 18.3% for Drystock and is a product of mathematical relationship in response to the factors identified above.

Introduction

The Integrated Framework was constructed at a point in time. As part of this construction, sector contributions (as percentages) were agreed - Dairy 35.3% and Drystock 17.2% - and these have been used for the allocation process using OVERSEER® 6.2.0. The allocation at a property level, through the use of reference files, is designed to maintain proportionality of effort and is fixed from the allocation methodology under OVERSEER® 6.2.0.

The **three** tables below show how the Integrated Framework on a catchment accounting basis can be transitioned from ROTAN2011 through OVERSEER® 6.2.0 and 6.2.3.

Note that the ROTAN2011 areas and numbers differ from subsequent tables. This is primarily because the ROTAN2011 groundwater catchment definition and discharge coefficients were subsequently refined to a far greater granular data set based on property level benchmarking, and a GNS groundwater catchment study. Data corrections/additions and introduction of specific methodologies since the initial allocation in August 2015 have also had an influence (for example, how grazed trees are treated and changes to benchmarks).

Table 1

	Sector	Area (ha)	Average N discharge (kgN/ha/yr)	Root zone load (tN/yr)	Lake load (tN/yr)	Actual sector reduction
Rotan loads and reductions						
Loads	Dairy	5050	54.1	273	273	-35.3%
	Drystock	16125	15.7	253	253	-17.2%
	Bush and scrub	21182	3.6	75	75	
	Forestry					
	Grazed trees					
	House (Septic)	3691	16	60	60	
	Urban					
	Tikitere	28	1071	30	30	
	WWTP	300	112	34	34[1]	
	Rain on lake	8337	3.6	30	30	
	Total Load	**54713**		**755**	**755**	
Reductions	Dairy			-96	-96	
	Drystock			-44	-44	
	Incentives			-100	-100	71.4%
	Engineering			-50	-50	
	Gorse			-30	-30	
	Total Reductions			**-320**	**-320**	
Grand	**Total**	**54713**		**435**	**435**	

Table 2

	Sector	Area (ha)	Average N discharge (kgN/ha/yr)	Root zone load (tN/yr)	Lake load (tN/yr)	Actual sector reduction
6.2.0 Loads and reductions						
Loads	Dairy	5001	100.2	501	246	-35.5%
	Drystock	15861	31.8	505	288	-18.3%
	Bush and scrub	9994	3.0	30	30	
	Forestry	9163	2.5	23	23	
	Grazed trees	1346	8.9	12	7	
	House (Septic)	396	68.7	27	27	
	Urban	3936		39	39	
	Tikitere			30	30	
	WWTP			34	34	
	Rain on lake	8091	3.7	30	30	
	Total Load	**53789**		**1231**	**755**	
Reductions	Dairy			-178	-87	
	Drystock			-92	-53	
	Incentives			-193	-101	71.4%
	Engineering			-50	-50	
	Gorse			-30	-30	
	Total Reductions			**-543**	**-321**	
Grand	**Total**	**53789**		**688**	**433**	

From the above tables the actual % sector reductions achieved from each sector vary slightly from the target reductions. This is a product of the fixed ranges and standard sector % reductions, and varying base data. The actual sector percentages achieved are greater than the target sector reductions (35.3% and 17.2%) because the allocation methodology fixes the ranges and standard

---

[1] The reduction to the consented 30 TN WWTP load is reflected in the "Engineering" reductions row of the table.

sector % reductions while the base benchmarking data is being allowed to change (where people demonstrate their benchmark should be different or data is corrected).

This difference can vary positively or negatively over time (under or over achieving the target) and doesn't result in a change to individual property allocations.

Tables 3 below has been updated to OVERSEER® 6.2.3. This includes any changes in data incorporated since the OVERSEER® 6.2.0 allocation point[2]. Because of the changes in relative loads between the Dairy and Drystock sectors, in relation to the Integrated Framework objective of achieving the 435 TN, the sector reductions are 36% for the Dairy Sector and 18% for the Drystock sector. Maintaining the 35.3% and 17.2% sector reductions would produces a lake load of 443 TN.

Table 3

6.2.3 Loads and reductions (based on the revised 6.2.3 allocation)						
	Sector	Area (ha)	Average N discharge (kgN/ha/yr)	Root zone load (tN/yr)	Lake load (tN/yr)	Actual sector reduction
Loads	Dairy	4990	95.9	478	246	-36.0%
	Drystock	15873	34.7	550	288	-18.0%
	Bush and scrub	9994	3.0	30	30	
	Forestry	9163	2.5	23	23	
	Grazed trees	1346	11.6	16	9	
	House (Septic)	396	68.7	27	27	
	Urban	3936		39	39	
	Tikitere			30	30	
	WWTP			34	34	
	Rain on lake	8091	3.7	30	30	
	Total Load	**53789**		**1258**	**757**	
Reductions	Dairy			-172	-89	
	Drystock			-99	-52	
	Incentives			-194	-101	-71.4%
	Engineering			-50	-50	
	Gorse			-30	-30	
	Total			**-545**	**-321**	
Grand	**Total**	**53789**		**713**	**436**	

Discussion on proportionality

While there are some differences as a result of the shift to more accurate accounting and through OVERSEER® versions the outcomes are very similar. The changes shown above are likely to continue to be seen in the dataset however, as noted above, this does not result in a change to individual property allocations. This is because allocation is fixed.

Proportionality can also vary between sectors (see Mr MacCormicks EIC para 66) – and in relation to other elements within the table. For example "rain on lake" will not vary but will be a greater or lesser part of the total as OVERSEER® version produce different values.

This is part of the reason why allocation was undertaken at a point in time on an agreed basis. It is not feasible to constantly re-allocate property rights on a moving target basis. For example, if the Integrated Framework/OVERSEER® 6.2.3 was to be used for allocation there is the potential for there to be varying degrees of change at the individual property level[3].

---

[2] See paragraph 61 in Mr MacCormick's EIC.
[3] See figure 11 in Mr MacCormick's EIC.

The Incentives Scheme is purchasing nitrogen on a willing buyer/willing seller basis. With OVERSEER® versions, discharge rates can vary however in the general sense the amount of effort remains the same. While, for example, a cow may be modelled as discharging more nitrogen than previously the value of the cow's productivity remains constant in this respect. The financial challenge for the Incentives Scheme does not change irrespective of what the rootzone number is.