Essential Freshwater 86: Progressing multiple initiatives to address excessive nitrogen quickly

Date Submitted:	1/04/20	Tracking #: 2020-B-06609	
Security Level	In-confidence	MfE Priority:	Urgent

	Action sought:	Response by:
To Hon David Parker, Minister for the Environment	Forward this briefing to the Minister of Agriculture if you wish to discuss this topic further Discuss the options in this paper with the Minister of Agriculture	2/04/20

Actions for Minister's Office Staff	**Forward** this report to the Minister of Agriculture, Hon Damien O'Connor, if Minister Parker wishes to discuss this matter further. **Return** the signed report to MfE.
Number of appendices and attachments 2	Appendix 1: Average fertiliser use per dairy farm in selected regions Appendix 2: Revised Schedule 1 with farm numbers from Agribase

Ministry for the Environment contacts

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Essential Freshwater 86: Progressing multiple initiatives to address excessive nitrogen quickly

1. You have requested advice on the potential to progress multiple options to reduce excessive nitrogen in the near term, and the likely impact of this.

Context

2. As part of the *Action for Healthy Waterways*, we consulted on three options for reducing excessive nitrogen use in the short-term:
    i. ***Option 1:*** *Nitrogen discharge threshold* **–** a consent requirement for all dairy and low-slope dry stock farms that have nitrogen discharges over a threshold value (we consulted on a range, from the 70th to 90th percentile of a catchment's highest dischargers) and are located in catchments listed in a schedule (Schedule 1). Granting of a consent would be conditional on:
        i. reducing discharges to the threshold over five years; or if this is not possible
        ii. implementing best practicable options to reduce discharges.
    ii. ***Option 2:*** A national per hectare nitrogen fertiliser cap.
    iii. ***Option 3:*** A requirement for farms in Schedule 1 to have a freshwater module of a farm plan (FW-FP) in place by 2022.
3. Following public consultation (briefing 2020-B-06431 refers) the IAP recommended adopting options 1 and 3. MfE supported the IAP's recommendations as we considered:
    i. a **nitrogen discharge threshold regime** (option 1) would send an important signal to high nitrogen dischargers, and as a mechanism it aligns with the future framework for managing nitrogen more generally (i.e. it is an output-based policy, requiring farmers to manage total nitrogen down to a limit)
    ii. **targeted rollout of enforceable Government-mandated FW-FPs** (option 3) will be the best near-term tool to improve on-farm practice, and reduce discharges caused by poor practice in key catchments.
4. Following this advice, you have agreed with the Minister of Agriculture to present options 2 (a fertiliser cap) and 3 to Cabinet for final policy decisions on Essential Freshwater. We have drafted the Cabinet paper to reflect this, noting that:
    i. for option 2, the cap will initially be set at 200kg of nitrogen per hectare per year, with a review on whether the cap should be adjusted at a later date
    ii. for option 3, FW-FPs will be mandatory and enforceable, but will need to be delivered over a longer timeframe, due to the need to develop the operational details of FW-FPs through separate regulations.
5. We understand you have concerns that those with high nitrogen discharges may avoid the effect of a fertiliser cap by importing high nitrogen content feed (eg, palm kernel expeller (PKE)) before FW-FPs are rolled out, and that you wish to explore the need for further near-term regulation (eg, adding option 1) to address this.

We have identified two approaches for further near-term initiatives to address excessive nitrogen

6. We have identified two approaches for further initiatives focused on nitrogen in the near term. As discussed further below, we do not recommend progressing with either approach.
    1. **Approach 1:** Progress a nitrogen discharge threshold regime (i.e. option 1 from public consultation), subject to refinements set out in briefing 2020-B-06431. The nitrogen discharge threshold would not apply in Canterbury as the regional plan already caps nitrogen discharges.
    2. **Approach 2:** further controls on supplementary feed (i.e capping the use of these).
7. We understand you have discussed a methodology for reducing nitrogen discharges from high polluters with Beef + Lamb New Zealand and Dairy New Zealand. We have not considered this option as we understand the proposed methodology focuses on how to achieve limits that will eventually be set by regional councils, rather than near-term reductions before limits are set, which is the focus of the proposals in this briefing.

We do not recommend adding further near-term regulations for nitrogen

8. In looking to reduce the highest nitrogen discharges (ie, shift the right end of the bell curve to the left), we recommend you only use one tool in addition to early and targeted roll out of FW-FPs. You should consider the advantages and disadvantages of each tool. Broadly speaking these are:
    i. a fertiliser cap would apply everywhere, and is more simple to administer, but is relatively blunt
    ii. a nitrogen discharge threshold regime would have better compliance mechanisms through resource consents, but would be narrow in scope (geographically) and be relatively complex administratively.
9. Our analysis suggests that adding further near term regulations on excessive nitrogen is unlikely to have much additional benefit. This is because:
    i. the nitrogen fertiliser cap will likely affect around 20% of farmers – in some cases it will target the same group of farmers as would any nitrogen discharge threshold regime (particularly in Southland), which would effectively double up regulatory requirements
    ii. we now consider there are reasonably strong economic constraints on bought in feed to substitute for reduced nitrogen fertiliser, meaning regulating feed directly is probably not justified
    iii. we think the timeframes for rolling out a nitrogen discharge threshold regime or additional regulation to cap supplementary feed, will be about the same as an early targeted rollout of FW-FPs (and FW-FPs will cover good practice for all nitrogen management, including fertiliser management and supplementary feed).
10. Further, proceeding with a nitrogen discharge threshold regime or a cap on supplementary feed would likely impose significant administrative costs in the affected catchments, which risks overburdening them, and/or would be difficult to establish.

Analysis

A fertiliser cap will likely require reductions in fertiliser use for an estimated 20 percent of dairy farms (about 2,000 total), including many in Southland who may be subject to a nitrogen discharge threshold

11. We do not have detailed data on the distribution of nitrogen fertiliser rates applied by farmers so we are unable to calculate the number of farmers affected by a 200 kg N/ha fertiliser cap. However an estimate can be made using regional average rates applied in 2017/18, and applying assumptions about the distribution of fertiliser use in each region. Appendix 1 provides a breakdown of the available information.
12. Under these assumptions, around half of South Island dairy farms would have to reduce fertiliser rates,[1] and less than 10 percent of North Island farms. Across New Zealand an estimated 2,000 of the 11,000 dairy farms would need to reduce fertiliser rates.[2]
13. We expect that any nitrogen discharge threshold regime would only apply to about 700-800 farms in the reduced list of Schedule 1 catchments (mainly in Southland and the Hauraki Plains) (Appendix 2 provides a list of what would be the affected catchments).
14. While we cannot be certain that all these farmers would be affected by the fertiliser cap, it seems a reasonable assumption that many of the Southland farms would be captured by both initiatives. We therefore consider that proceeding with a nitrogen discharge threshold regime would place a considerable financial and administrative burden on them (and councils administering both regimes) on top of a fertiliser cap.

Supplementary feed is unlikely to significantly undermine the fertiliser cap

15. Following further investigation we now consider the risk of supplementary feed undermining a fertiliser cap to be low. A recent report by AgFirst found that the cost of purchased supplementary feed is around twice that of nitrogen fertiliser for boosting feed intakes.[3] Many farmers chose to use supplementary feed only if/when animal welfare requires it, for example in times of drought (and it is critical farmers continue to have access to the option in such circumstances). The cost will likely dissuade many farmers from substituting.
16. We do acknowledge that some farmers focus on maximising production over profits and therefore not all farmers may be put off by higher feed costs. Nonetheless, our view is that there are enough economic (and other practical) constraints on the widespread use of supplementary feed as a substitute for fertiliser, that it is unlikely to undermine the overall integrity of the fertiliser cap policy.

A nitrogen discharge threshold and/or regulation of supplementary feed wouldn't be much quicker to implement than FW-FPs

17. Any nitrogen discharge threshold regime would likely take just over two years to implement (large numbers of Overseer runs would need to be completed and verified, then consents applied for).
18. Similarly, we estimate that establishing an effective regime to cap supplementary feed, including an exemptions regime for animal welfare reasons and a credible mechanism for compliance, would take 18 months to two years.

[1] Legal advice is that a fertiliser cap in a NES would not affect farms with an existing regional land use consent that specifies fertiliser rates (under section 43B(6A)), until those consents expire or are reviewed under section 128(1)(ba). We need to investigate the extent to which fertiliser rates are set in resource consents.

[2] The dairy industry has data that would improve these estimates (Dairybase) but this information is not currently available to us

[3] Journeaux et al, 2019. The Value of Nitrogen fertiliser to the New Zealand Economy

19. We expect the new FW-FPs could be in place in key catchments within an estimated two and half to three years. Given the FW-FPs will cover both fertiliser management and supplementary feed, and that they will include actions that are enforceable, we see little benefit from proceeding with an additional regulatory regime for nitrogen that would, in effect, provide only 6 to 12 months of benefits.

A nitrogen discharge threshold regime would impose significant extra costs on farmers and Councils

20. We estimate that a nitrogen discharge threshold regime would require between 3,500 and 4,000 Overseer runs (a total cost of about $11 million if we assume $3,000 per run). New Overseer runs will be necessary for the farms in these areas as we understand that existing Overseer files are not of high quality outside of areas where it is used for regulatory purposes. In addition, most of the affected drystock farms are not likely to have existing Overseer information.
21. On top of Overseer runs for farms in each catchment, the cost for resource consents would be about $2 million in total, assuming roughly 20 percent of farms in the targeted catchments (700-800 farms in total) will need a resource consent, and a resource consent cost of about $3,000.
22. The 700-800 farmers affected would need to provide a new Overseer budget to support the consent application, showing the reductions in nitrogen losses that will be achieved through practice change, estimated at $6500/farm or $5 million in total. These Overseer budgets will be more costly than the initial budgets, because a range of scenarios for reducing nitrogen losses down to the threshold would need to be tested.
23. Councils would also need to process a substantial amount of Overseer information, then quality check/verify that information before setting the catchment threshold. This would also add significant costs, though we have not quantified these.
24. We note that, once in place, FW-FPs would include auditing, which if bundled with Overseer requirements (eg, in specific catchments as part of an FW-FP) could provide the necessary oversight to ensure Overseer results are robust, much more efficiently than councils needing to verify the information themselves.

Regulating supplementary feed would be difficult and administratively costly to implement

25. Our view is that establishing an effective regime to cap supplementary feed would be difficult and administratively costly to implement, without the infrastructure of FW-FPs to support it.
26. Without an FW-FP regime in place, councils would need to establish an interim system for monitoring supplementary feed use (on top of fertiliser). We consider this would duplicate efforts to roll out an FW-FP system, and therefore see little marginal benefit in progressing with further regulation of supplementary feed now.
27. In addition, tracking the effectiveness of policies through changes in national use data would be difficult for supplementary feed. Tracking national use of nitrogen fertiliser is already in place under the climate change legislation. While we could monitor imports of PKE, other forms of feed such as maize silage and grain are grown and traded in New Zealand and are likely to be very difficult to trace.

The Essential Freshwater package and an allocation regime will manage nitrogen over the medium and long-term

28. In the long-term, excessive nitrogen will be addressed through regional councils setting catchment limits on resource use (eg, how much nitrogen is acceptable to go into

waterways) and an allocation regime to allocate who can use those limited resources. The FW-FP regime will complement and support resource use limits and any future allocation regime(s).

29. Meeting resource use limits will require a combination of practice change for existing land-uses, and land use change if good practice and emerging new technological solutions are not sufficient.

30. This is illustrated in Canterbury where water quality limits have been set, and farm environment plans are in place: nitrogen fertiliser rates on Canterbury dairy farms (which had been increasing) declined over the period 2015/16 to 2017/18 (the latest year we have data for).[4]

31. Even where hard limits are not set for nitrogen, over time FW-FPs will weed-out bad practice on farm, and any excessive nitrogen discharges that are caused by that bad practice.

32. The early and targeted rollout of FW-FPs to highly N-impacted catchments will help get the longer-term change off to a fast start, and will help to both enforce the fertiliser cap and control other sources of nitrogen like supplementary feed, while councils get appropriate catchment limits in place and develop regional fresh water plans.

Next steps

33. Should you wish to add further near-term regulations to address excessive nitrogen losses, we recommend you discuss this with the Minister of Agriculture, and following this discussion, instruct officials to update the draft Cabinet paper to reflect your decisions.

Recommendations

34. We recommend that you:

EITHER:

a. **Agree** not to proceed with further near-term regulations to address excessive nitrogen (that is neither a nitrogen discharge threshold regime or a regulated cap on supplementary feed);

Yes/No

OR:

b. **Forward** this briefing to the Minister of Agriculture, Hon Damien O'Connor;

Yes/No

c. **Discuss** the advice in this briefing with the Minister of Agriculture;

Yes/No

[4] Journeaux et al, 2019. The Value of Nitrogen fertiliser to the New Zealand Economy

d. **Instruct** officials to make any changes to the draft Cabinet Paper seeking final policy decisions on the *Essential Freshwater* package to reflect your conversation with the Minister of Agriculture.

Yes/No

Signature

Martin Workman
Acting Deputy Secretary
Water and Climate

Hon David Parker
Minister for the Environment **Date**

Appendix 1: Average fertiliser use per dairy farm in selected regions

Region	*Number of dairy herds*	*Average herd size*	*Average farm size (ha)*	*Cows/ha*	*Average fertiliser rate kg N/ha*
Northland	947	318	140	2.3	102
Waikato	3745	365	127	2.9	139
Bay of Plenty	858	392	141	2.8	132
Taranaki	1588	294	106	2.8	155
Manawatu	530	408	153	2.7	94
West Coast	586	402	168	2.4	175
Canterbury	1200	799	233	3.4	222
Southland	985	601	224	2.7	185

Dairy farm data is for 2018/19. Source https://www.dairynz.co.nz/publications/dairy-industry/new-zealand-dairy-statistics-2018-19/ Note that this is for the major dairying regions only so does not total to the NZ total herd numbers

Fertiliser application rates are from Journeaux et al 2019 The value of nitrogen fertiliser to the NZ economy, and apply to the 2017/18 year.

Appendix 2: Revised Schedule 1 with farm numbers from Agribase

Catchment Name	Dairy farms	Low slope beef + dairy support	Total
Aparima (Southland)	154	39	193
Mataura (Southland)	276	125	401
Oreti (Southland)	317	142	459
Piako (Waikato)	950	227	1177
Waihopai (Southland)	75	29	104
Waihou (Waikato)	829	248	1077
Waimatuku Stream (Southland)	63	6	69
Total	**2664**	**816**	**3480**
Catchments likely to be excluded on completion of analysis are:			
Parkvale (Wellington)	26	38	64
Waingongoro River (Taranaki)	259	39	298
Waipao Stream (Northland)	29	32	61
Total if Parkvale, Waipao and Waingongoro are included	2978	925	3903

Notes to the above Table:

- The revised Schedule 1 would apply if Option 1 (a nitrogen discharge threshold) were to be progressed. The original (extended) Schedule 1 for option 3 can be retained unchanged form the set we consulted on.
- The Table above excludes three catchments that we consulted on (the Motupipi, Rangitāiki and Taharua catchments). They were removed based on submissions and data from Agribase showing there are fewer than 10 dairy farms in each catchment – this is not sufficient to generate a nitrogen discharge threshold for the catchment.
- We consider that the Waipao, Parkvale and Waingongoro catchments should also be excluded because:
    - The Waipao has significant groundwater inflows from outside the catchment which the Northland regional council considers could be a significant source of nitrate. In addition there appear to be fewer than 30 dairy farms in the catchment (the regional council has only three effluent consents for the catchment, Agribase lists 29, a farmer submitter from the catchment said there were 11 dairy farms).
    - The Parkvale catchment, has only 26 dairy farms according to Agribase, as well as inflows of nitrate-rich groundwater
    - The Waingonongoro has relatively high ecological health despite the high nitrate levels.