

SUBMISSION

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To: MINISTRY FOR THE ENVIRONMENT

On the: DISCUSSION DOCUMENT – PROPOSED AMENDMENTS TO THE
NATIONAL POLICY STATEMENT FOR FRESHWATER MANAGEMENT

By: FEDERATED FARMERS OF NEW ZEALAND

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OVERVIEW

The current water reforms being undertaken by the government are critical to New Zealand's future. New Zealand's comparative advantage is our ready supply of clean water which underpins environmental, economic, social and cultural values and uses.

We confirm Federated Farmers general support for the Government's freshwater reform programme; and note that these proposed amendments to the NPS build forward from recommendations made by the Land and Water Forum; and are generally consistent with the direction signalled in *Freshwater Reform 2013 and Beyond*.

We support the presentation of a national "menu of values and uses"; and welcome the development of the banded framework. We expect this will significantly assist community discussion and decision-making.

We strongly endorse the emphasis on robust, reiterative analysis with community collaboration before landing objectives and limits; and commend the related Government initiatives to improve the quality of section 32 analysis and reporting.

We support national bottomlines for critical attributes clearly impacting on critical values and arrived at after robust science and measurement to help establish cause/effect and cost/benefit analysis.

KEY CONCERNS

We register our very strong concern that the proposals for bottomlines have not been developed and tested against explicit cause/effect, risk/cost criteria; that there are no nationwide economic studies of the costs of meeting national bottomlines; and that the injudicious application of multiple bottomlines may significantly compromise community flexibility and initiative in getting on with the job of doing the things that make a difference and choosing the most effective and cost-effective path for getting there.

We register our equally strong concern that proposals for a multiplicity of bottomlines are being matched by proposals for a multiplicity of exceptions. We urge the Government to refocus attention on providing a framework of values and bands and guidance to support community decision-making; but tightly constrain both bottomlines and exceptions against explicit criteria.

The architecture of the water management framework must be founded on robust and predictable principles. We suggest:

- The first principle must be to establish bottomlines defensible against explicit criteria
- The second principle is well-established in the reform programme – that a coherent, catchment-based management framework requires the engagement of all players (be they urban, rural or industrial)
- The third principle is well-articulated in the discussion document – that this will take time and in some cases remediating decades of human impacts may take decades
- The fourth principle relates back to the first - that any transition periods or exceptions should be very tightly constrained against explicit criteria.

It is of significant concern that the criteria against which national bottomlines can be developed, tested and defended (both now and in the future) can be inferred but are not explicitly stated, either in the discussion document or in the supporting scientific and economic assessments.

This is a key weakness. We propose criteria, inferred from the documents; and it is currently our assessment that a number of the proposed bottomlines fail to meet reasonable cause/effect and cost/benefit criteria

Robust cost/benefit analysis is critical before landing any national bottomlines. Currently:

- there are no nationwide economic impact studies on the costs and benefits of meeting bottomlines
- in the absence of national data, detailed case studies were carried out in Southland and Canterbury to assess the potential impacts – in spite of the work done to date, additional work is needed to fill in remaining gaps
- The regional work undertaken in Canterbury and Southland focussed only on nitrate and to a lesser extent, e. coli bottomlines.

To our knowledge there has been no cost-benefit analysis undertaken for cyanobacteria, periphyton, nor lakes (notwithstanding that 28% of monitored lakes (32) are assessed as being “unacceptable” against the proposed bottomlines).

We make the point that these omissions are at best incongruous within the context of a document which otherwise does an excellent job of specifying the requirement for robust, reiterative analysis before landing objectives.

We acknowledge the difficulties of extrapolating from measured to modelled data, linking environmental to economic variables, and operating models at the outer limit of their inter-operability. But the bottomline is: they don't pass go without cost-benefit analysis.

In short: the most important point is to get the bottomlines right. If national bottomlines are restricted to critical parameters clearly impacting on critical values, and arrived at after robust process – then it should be very rare that any exceptions are required.

SUMMARY OF KEY RECOMMENDATIONS

We recommend that the Controller and Auditor-General be charged with a more active role auditing the quality of process underpinning the development of regional limits (in particular those councils proposing region-wide “default’ limits).

We recommend that catchment inventories be developed alongside industry and territorial authorities to maximise synergies, minimise inefficiencies and safeguard data privacy.

We recommend the national value for the cleansing/assimilative capacity of water be re-instated.

We recommend amendments to the following value descriptors:

Ecosystem health: the freshwater management unit supports a resilient ecosystem
indigenous specific to that freshwater body type.

Mahi Mara/cultivation: the freshwater management unit supports a resilient primary production sector ~~this value applies to freshwater management units that can support primary production~~

Au Putea/economic or commercial development: where the ~~use of the~~ freshwater management unit is used for industry and commerce, reflecting its economic and social importance ~~provides economic opportunity~~

We recommend inclusion of an attribute for Introduced species pressures (fauna and flora).

We recommend the following amendments to attribute descriptors:

Nitrate toxicity: the narrative descriptors be amended to more clearly describe risks/impacts, especially for indigenous species

Periphyton: the narrative descriptors be amended to clearly describe ecological effects; and the numeric bands be re-calibrated with further work undertaken to develop an appropriate breakpoint between the C and D bands

Lakes: the numeric bands be re-calibrated

E. coli: the rationale for proposing the band numerics be made explicit, specifically the decisions about exposure time which determine the risk assessment.

Contact recreation: this value currently sits awkwardly in the framework – we recommend it be developed in guidance about the “pick-and-mix” across optional values.

We recommend that all attribute descriptors specify that compliance will be assessed against 5 year averages of annual statistics

We recommend that the NPS clarify that the meaning of “maintain or improve” is a broad assessment against the overall value(s) and not a piecemeal assessment against attributes or bands.

We recommend that explicit criteria be agreed against which to develop and test national bottomlines.

We recommend the following amendments to proposed bottomlines:

Periphyton: We recommend that this attribute is retained in a banded framework, with no national bottomline

Lakes: We recommend that TN and TP are retained in a banded framework and that chlorophyll-a is set as a national bottomline.

Nitrate: We recommend that this attribute is retained in a banded framework pending robust assessment against explicit criteria

E. Coli: We recommend that this attribute is retained as a banded framework pending more robust cost/benefit analysis of the proposed bottomline.

We recommend that there be no exceptions framework (or at the minimum, the discretion to grant exceptions should be tightly constrained to exceptional cases, and exercised only at national level).

Supporting information and other more detailed recommendations are presented in the attached pages, structured in response to the MfE questions. We look forward to the opportunity to discuss our key concerns and recommendations in more detail.

Proposed Amendments to the NPS: Responses to MfE Questions

Questions for section 2: problems

1. **Have we correctly identified the problems currently associated with implementing the NPS-FM?**

No

2. **If not, what problems, if any, you have faced with implementation?**

The description of problems canvasses a number of issues but fails to articulate the key issue, ie, that early councils (*eg, Horizons*) attempted to uplift “guidelines” and impose them as region-wide limits, uninformed by good NPS process (*values/objectives cascade, collaborative process, robust analysis, reiteration between objectives and methods*).

In this context, it is concerning that MfE have uncritically reported¹ that a further five Regional Councils (*Southland, Canterbury, Wellington, Bay of Plenty, Auckland*) intend to implement region-wide “defaults” followed by progressive catchment-based plan changes by 2030. The risk is that another generation of Regional Council plans are implemented, with limits arrived at ill-informed by the practicalities and costs of how to achieve them.

The development and implementation of NPS limits - be they region-wide or catchment based – must be informed by excellent scientific and socio-economic information (economic drivers, jobs, catchment GDP etc); and by the same expectations of disciplined, iterative, collaborative processes.

Questions for section 3: options

3. **Do you agree that amending the NPS-FM would solve the problems identified in section 2?**

No.

The proposed amendments usefully emphasise the importance of the iterative process between the “what” and the “how” before landing objectives and limits; but provision should be made for independent audit of the quality of process undertaken by regional councils.

4. **If not, would additional guidance be sufficient to solve the problems identified?**

No.

¹ Regional Council Freshwater Management Methodologies, Vol 1, pg 121

The NPS Implementation Guide would usefully be extended to incorporate additional guidance related to the proposed amendments, particularly in areas where problems have been identified; but again this is not sufficient to assure robust process and quality outcomes.

5. Is there another solution to the problems? Why would that be preferable?

We recommend that the Controller and Auditor-General be charged with a more active role auditing the quality of process underpinning the development of regional limits, particularly while the proposed amendments are still bedding in, and particularly in the regions proposing “default” limits.

Questions for section 4.1: accounting

6. Do you agree with requiring councils to account for all water takes?

Yes.

7. Do you agree with requiring councils to account for all sources of contaminants?

Yes, subject to comments below.

8. Do you think that the requirements in policies CC1 and CC2 of the proposed NPS-FM amendments have the right balance between national prescription and regional flexibility?

Yes, subject to comments below.

9. Do you think the time period allowed for councils to develop accounting systems is appropriate?

Yes.

We recommend that Section CC be retitled: “ Catchment Accounting for freshwater takes and contaminant loads”.

The current emphasis on “takes” and “contaminant loads” is important, but it is equally important that catchment inventories include attention to the full range of pressures impacting on values, including physical habitat requirements and pressures from introduced species.

Consistent with this point, **we recommend** Objective CC1 be amended to read: “To improve information on freshwater takes, sources of freshwater contaminants and other key pressures on freshwater resources, in order to...”

We support Policy CC1, in particular the requirement that accounting systems be established at a level of detail appropriate for the significance of the issues in each freshwater management unit. We note that the National Air Quality Strategy equally has a base requirement for profiling key sources within airsheds: the approach taken here for water should be broadly consistent.

We emphasise that industry is already taking a lead in this area; and expecting to work with councils to provide information, aggregated to an appropriate scale. We caution against councils seeking to duplicate existing industry commitments: the focus should rather be looking for synergies and efficiencies. **We recommend** that catchment inventories be developed alongside industry and territorial authorities to minimise transaction costs and duplication.

We emphasise the importance of respecting privacy and data ownership. The key issue here is aggregation of data at a scale appropriate to the requirements of catchment inventories (*ie, sufficient to inform the development of strategies targeted to key issues*). We note that information to support catchment inventories is not contingent on a consent framework; and that in many catchments, estimates may be appropriate for the purpose (eg, estimating stock water takes).

Conversely, in catchments with important values at stake, modelled estimates and “annual averages” and “paper” allocations may be appropriate for first-cut ballparks, but more sophisticated ground-truthing (including spatial-temporal patterns and pressures) will be required to inform cost-effective targetting of environmental investments.

We support the intent of Policy CC2, but **recommend** it be reworded to clarify that this provision is about *updating* inventories. We support the expectation that water quantity inventories be updated annually; and that water quality and catchment economic inventories be updated at least five yearly.

Questions for section 4.2: NOF Values

10. Should there be a national set of values as outlined in appendix 1 of the proposed NPS-FM?

Yes.

We support the presentation of a national “menu of values and uses” and the expectation that communities will consider whether these values and uses apply across a freshwater management unit. While the compulsory values will apply to all waterways, it is most likely that optional values will not apply across an entire FMU, but will be prioritised across different waterbodies within it in order to arrive at a working balance across all value sets. In arriving at an appropriate balance, it is important to emphasise that councils and communities can choose not just *whether* particular values apply within a FMU, but also (very importantly) *where* and *when* and to *what level* of protection.

11. Are there any additional values that should be included? Why are these values nationally significant/important (recognising that councils can use other values if they wish)?

Yes.

One of the current NPS national values has been omitted without supporting discussion, ie, the value that speaks to the cleansing capacity of water (assimilating and attenuating wastes from natural and human activities). **We recommend** it be re-instated.

12. Are there any values that should be deleted from appendix 1 of the proposed NPS-FM and why?

No.

13. Do you agree with the descriptions of the national values in appendix 1 of the proposed NPS-FM?

We ***recommend amendments*** (underlined) to the following value descriptors:

Ecosystem health: the freshwater management unit supports a resilient ecosystem indigenous specific to that freshwater body type.

Other important matters (include) pressures from introduced fauna and flora.

Fishing: for waterbodies within freshwater management units valued for fishing...

Contact recreation: waterbodies within the freshwater management unit can be used for recreation...

Mahi Mara/cultivation: the freshwater management unit supports a resilient primary production sector ~~this value applies to freshwater management units that can support primary production~~

Au Putea/economic or commercial development: where the ~~use of the~~ freshwater management unit is used for industry and commerce, reflecting its economic and social importance ~~provides economic opportunity~~

NOF Attributes

14. Do you agree with the attributes associated with the values in appendix 2 of the proposed NPS-FM?

Yes, but biological attributes are under-represented in the framework, significantly counter to international movements towards increased use of biological indices for ecosystem health. **We recommend** priority be given to the development of attributes for indigenous fish and macro-invertebrate species.

Introduced fauna and flora (trout, perch, rudd, hornwort etc) are highly significant stressors across a range of aquatic systems including lakes, wetlands and rivers. **We recommend** inclusion of attributes for introduced species pressures (fauna and flora).

We emphasise the critical point that the attributes – sometimes singly, more often in complex multi-factorial relationships – contribute to providing for the values and objectives, ie, achievement of the overall objective is the critical driver with the supporting attributes subordinate to that (*related to the concept of Te Mana o te Wai, ie, speaking to relationships rather than to individual elements*).

15. Do you agree with the numeric attribute states in appendix 2 of the proposed NPS-FM?

In part only, subject to amendments below.

We emphasise the importance of communicating in language legible for lay readers to support communities engaged in developing aspirations for their waterways; and recommend using concrete rather than statistical descriptors for this reason, particularly for ecosystem health.

16. Do you agree with the narrative attribute states in appendix 2 of the proposed NPS-FM?

In part only, subject to amendments below.

We recommend amendments to the narrative/numeric descriptors for the following attributes:

- **Lakes:** we note that the supporting science² discusses attributes in terms of TLI-3 (ie, a multi attribute index) with particular emphasis on chlorophyll-a as the primary indicator for lake trophic status. In this context, it is of significant concern that the discussion document disaggregates the index to single attributes, each equally weighted within the framework. This is a significant departure, presented without explanation. At the least, this approach may be premature pending future inclusion of other important attributes impacting on lake ecological values. At worst, the risk is that communities focus on single attributes to the detriment of a more strategic assessment of pressures and opportunities for cost-effective investments to improve the health and resilience of indigenous lake communities.

We note that DairyNZ have analysed the proposed lakes attributes with reference to NZ and international data, and propose significant amendments. Lakes will be primary drivers of up-catchment investments and it is critical that we take the time to get these attributes right - fully informed by the science and appropriately calibrated to NZ conditions.

We recommend that:

- Chlorophyll-a be the primary attribute for determining lake trophic status
 - The proposed numeric bands for chlorophyll-a, Total Nitrogen and Total Phosphorous be re-calculated, in particular those for shallow lakes (with particular reference to the analysis and recommendations made by DairyNZ)
 - That compliance be assessed against median values, not maximum (for the reasons set out by DairyNZ)
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- **Nitrate toxicity:** we recommend that the narrative descriptors be amended to more clearly describe risks/impacts, especially for indigenous species which are the focus for this value. The recommendations below are derived from the supporting science³; and are intended not least to ensure that narrative descriptors are expressed as clearly as possible to support community understanding and discussions (*amendments underlined*):
 - **A:** high conservation value systems; no observed effect on any species tested
 - **B:** slightly to moderately disturbed systems; negligible risk/insignificant impact for NZ resident species; very low/minor impact for Lake Trout fry/fingerlings

² Classification and Objective Bands for Monitored Lakes

³ Updating nitrate toxicity effects on freshwater aquatic species, pg 5,19

- C: highly disturbed systems which have seasonally elevated concentrations for significant periods (1-3 months); negligible risk?/insignificant impact? for native fish larvae/fry; very low risk/minor impact for rainbow trout fry/fingerlings; low risk/moderate impact for Lake trout fry/fingerlings
- D: highly disturbed systems which have seasonally elevated concentrations for significant periods (1-3 months); negligible risk?/insignificant impact? for aquatic invertebrates; negligible risk?/insignificant impact? for native fish; negligible risk/insignificant impact for mature rainbow trout; very low risk/minor impact for rainbow trout fry/fingerlings; low risk/moderate impact for Lake trout fry/fingerlings

In respect of the proposed numeric bands, we note that:

- these bands are calibrated to thresholds for chronic effects (eg, reduced growth rate) and not acute triggers (eg, resulting in death)
- the supporting database⁴ clearly shows an order of magnitude difference in sensitivity between the most sensitive species (Lake trout) and the indigenous species tested (inanga, mayfly)
- Lake trout are only recorded as resident in Lake Pearson, Canterbury
- the assessment of “low risk” with “moderate effects” for Lake trout fry/fingerlings at the proposed bottomline would equate to “a 10% growth reduction and be 16-times below the lethality threshold”⁵.
- the supporting science (p5), in fact indicates that probable chronic effects on multiple species may occur at median concentrations >20mg/L.

In short: the proposed numeric bands are calibrated at the very low end of risks of any effects from nitrate toxicity for any of the species assessed.

We acknowledge however that research with indigenous species is currently limited (two species only), and on this basis, we concur with the numeric bands as proposed. We question however whether these numbers meet criteria for the imposition of national bottomlines, and we return to this point below.

- **Ammonia toxicity: we recommend** the narrative descriptors be amended to more clearly describe ecological effects (*as for nitrate above*). We note that assessment of compliance is linked to temperature and pH which acknowledges inter-relationships across multiple parameters.
- **Dissolved oxygen (below point sources):** we note and support application of the proposed DO bands below point sources only as this acknowledges in the gaps and limitations in current monitoring data.

We support the proposed narrative descriptors which are clearly linked to ecological effects, ie:

- **A:** no stress caused by low dissolved oxygen (DO) on any aquatic organisms that are present at matched reference (near pristine) sites

⁴ Updating nitrate toxicity effects on freshwater aquatic species, p13

⁵ Updating nitrate toxicity effects, p18

- **B:** occasional minor stress on sensitive organisms caused by short periods (a few hours each day) of lower DO. Risk of reduced abundance of sensitive fish and macro-invertebrate species.
 - **C:** moderate stress on a number of aquatic organisms caused by DO levels exceeding preference levels for periods of several hours each day. Risk of sensitive fish and invertebrate species being lost.
 - **D:** significant, persistent stress on a range of aquatic organisms caused by DO exceeding tolerance levels. Likelihood of local extinctions of keystone species and loss of ecological integrity.
- **Periphyton:** *we recommend* changes to the proposed narrative descriptors and numeric bands for periphyton, consistent with the supporting science⁶ and to align more closely with the effects-based descriptors and band breaks proposed for other attributes.

The current descriptors (“nuisance” blooms) may be appropriate for recreational values but need to be calibrated in this case to the effects on the health and resilience of indigenous ecological communities.

Consistent with proposed descriptors for other attributes, the C Band could be expected to represent periodic moderate stress on a number of species; while the D Band should represent a high risk of significant, persistent stress, particularly related to significant and extended fluctuations in dissolved oxygen. The narrative descriptors for dissolved oxygen provide a useful template.

We acknowledge the paucity of research with indigenous species; and the difficulties in correlating periphyton levels with impacts on fish or invertebrate communities⁷.

We note however that the supporting science attempts to link periphyton levels to macro-invertebrate indices. The proposed C band has been correlated with MCI >100 which is indicative of “good” status – or to quote the supporting literature “indicative of possible, mild pollution”; and the proposed D band has been correlated with MCI <100, indicative of “fair” status. To the extent that the macro-invertebrate index may be used as a proxy for estimating ecological effects of periphyton, a more appropriate break point for the D band would be MCI <80, which is indicative of “poor” status.

An important confounding factor in MCI calculations is the nature of the substrate: separate indices have been developed for “soft-bottom” streams thereby acknowledging natural differences in community composition. In this context, it is perhaps less surprising that key areas predicted to fall in the proposed D Band are well inland, notably soft hill country in Rangitikei and Wairarapa.

The supporting science attempts to handle this by proposing a separate “productive” category of streams. More to the point however: the key issue in soft hill country areas is arguably sediment. It is less clear that periphyton levels are the key issue impacting on native species in these areas but this is a key question to groundtruth in the context that the

⁶ National Objective Framework for Periphyton, Review of the NZ instream plant and nutrient guidelines

⁷ particularly recognising the confounding effects of multiple other attributes including predation, sediment, temperature, eg, mayflies reported as absent from rivers with annual maximums >21.5

periphyton attribute is being proposed in advance of work on sediment. At risk of second-guessing that ground-truthing exercise, we expect that community investments will be better directed to the existing hill country erosion programmes and we expect that programmes to reduce sediment could also deliver co-benefits for periphyton levels and macro-invertebrate communities.

We note that the supporting science⁸ proposes 200mg/m² as the guideline value to support trout fishery/angling; and further that this number is proposed with the caveat that it requires further data collection to refine it. Clearly, trout fishing/angling is a different value set; and it is at the least surprising, that this is the very number proposed as the national bottomline for indigenous ecosystem health.

We recommend that the numeric bands be re-calibrated as follows:

- The breakpoint between B and C bands be set at 200mg/m²
- further work be undertaken to develop an appropriate ecological breakpoint between the C and D bands

We recommend that the narrative descriptors be amended to clearly describe ecological effects (not amenity) as below:

- **A:** rare blooms; no stress caused by low dissolved oxygen on any aquatic organisms that are present at matched reference (near pristine) sites
 - **B:** occasional blooms; occasional minor stress on sensitive organisms caused by short periods (a few hours each day) of lower DO. Risk of reduced abundance of sensitive fish and macro-invertebrate species.
 - **C:** periodic, short duration blooms; moderate stress on a number of aquatic organisms caused by DO levels exceeding preference levels for periods of several hours each day. Risk of sensitive fish and invertebrate species being lost.
 - **D:** regular and/or extended duration blooms; significant, persistent stress on a range of aquatic organisms caused by DO exceeding tolerance levels. Likelihood of local extinctions of keystone species and loss of ecological integrity.
- **E. coli:** the supporting science⁹ describes issues and options but does not make any recommendations for the exposure/risk assessments which underpin the proposed numeric bands.

Specifically: the report canvasses various options for secondary contact exposure time (one-half that of primary contact recreation, one-third, one-quarter, one-fifth, one-tenth) and suggests (pg 4) that one-tenth could be considered based on studies cited.

The proposed amendments however are based on assumptions of one-quarter exposure time. No reasoning is presented but it should be mandatory that the explicit reasoning is presented to enable informed debate of the options.

We recommend that the reason for proposing one-quarter exposure time be made explicit to enable informed debate of the proposed numeric bands.

We note that the proposed narrative descriptors for primary and secondary contact recreation are not well-aligned. In particular, the contact recreation guidelines recognise

⁸ Review of NZ In-Stream Nutrient Guidelines, p70

⁹ Issues in setting secondary contact guidelines

that recreation is less likely during periods of heavy rainfall (ie, the periods when higher levels of e. coli are likely). It is appropriate that this also be recognised in respect of secondary contact recreation and **we recommend** amendments for improved alignment, eg:

- C Band: caution should be taken during periods of high rainfall, and secondary contact recreation avoided if water is discoloured
- D Band: people are exposed to a high risk of infection (> 5% risk), particularly the very young, the very old, and those with compromised immunity.

Currently it is proposed that compliance be assessed against median flows: **we recommend** that consideration be given to excluding flood flows.

- **Contact Recreation:** this value has been introduced with no supporting discussion or analysis, and currently sits awkwardly in this framework.

This value differs from the others presented in two respects: firstly, this is an “optional” value while the others are all attributes proposed for “compulsory” values. More importantly, the derivation of the “suitability for recreation” grade relies significantly on the presence of “potential” contaminant sources in a catchment (eg, the presence of a wastewater treatment plant) rather than measured compliance as is proposed for other attributes.

In effect, the current national guidelines have simply been transposed into this framework, with the addition of a new “minimum acceptable state”. In the absence of any supporting analysis, it is difficult to assess the practical import of this change; but this analysis is a pre-condition for any nationally directed bottom-lines. At the least, this value requires explanation of how communities are expected to apply it: **we recommend** this explanation may be more appropriately developed in guidance about the “pick-and-mix” across optional values.

Compliance Criteria

The supporting science consistently emphasises the importance of robust, longer-term assessment. Short periods of data are generally insufficient to determine if a site meets the objective; and particularly inappropriate for determining compliance with nationally mandated bottom-lines. This should direct attention and investment to waterbodies which are clearly and consistently failing to meet minimum acceptable states, rather than reacting to annual fluctuations. This point is well-made in a number of the supporting reports, eg:

- *We emphasise in particular that considerable care must be taken in assessing whether locations are meeting periphyton objectives using monitoring data. It is clear that it is not possible to assess whether objectives are met from short periods of monitoring (eg, < 3 years). The considerable inter-annual variation in the drivers of periphyton, high flows in particular, mean that short periods of monitoring data (eg, 1-2 years) will be insufficient to determine if a site meets the objective over the long run¹⁰ This method resulted in some waterbodies moving between bands on an annual basis, due to fluctuations in climatic or environmental conditions. This rapid and natural movement between bands suggests that a monitoring statistic based on annual data is not suitable for consistently characterising a waterbody and informing catchment planning over the*

¹⁰ NOF for periphyton, p20, p38

longerterm. A second alternative based on using two-year averages was then assessed; however, we recommend further investigation of exceedances frequency is undertaken that uses longer timeframes, eg, exceedances over a three-year period¹¹

Indeed the discussion document (p31) strongly suggests that the intent of the framework is that compliance will be assessed by:

- *Providing the relevant statistic for each attribute (eg, a median annual value) which is averaged over a specified number of years, eg, 5 years*

This expectation is also consistent with emerging regional council practice; and **we recommend** that this point be made explicit in the proposed amendments to the NPS, ie:

- **Lakes:** assess compliance against 5 year average of annual statistics
- **Nitrate toxicity:** assess against 5 year average of annual statistics
- **Periphyton:** assess against 5 year average of annual statistics
- **E. coli:** assess against 5 year average of annual statistics
- **Contact recreation:** the assessment of MAC (*measured e. coli levels*) should be consistent with the current national guidelines, ie, a minimum of 100 data points (*weekly samples through the bathing season for five years*). The application of the SIC (*catchment grading*) to this compliance framework needs to be clarified.

Timing

17. Do you agree with putting a NOF in the NPS-FM now, including only the attributes for which there is adequate evidence, and updating it as the scientific basis for further attributes and states becomes available?

We support inclusion of the values and banded framework now, alongside further work to continue fleshing out the framework. We support the planned review in 2016-2019; and emphasise the importance of continued investment in underpinning science and monitoring, especially with indigenous species.

18. Or should the Government delay putting the NOF into place until a more comprehensive set of attributes has been developed?

Government should delay implementation of any proposed bottomlines which have not been subject to explicit assessment against robust cause-effect and cost-benefit criteria.

¹¹ Cyanobacteria band testing, p8, 21

Processes for freshwater objective setting

19. Do you agree with having the process requirements to link values and freshwater objectives directed in policy CA1 in the proposed amendments? If not, why not?

We support the inclusion of process requirements in policy CA1 to streamline regional implementation. In the same spirit that the (amended) preamble to the NPS clarifies that NOF is intended as a decision support tool to underpin and assist council and community planning. We particularly commend the “Managing Freshwater” diagram – succinctly depicting the process and clearly communicating the expectation of community engagement and robust, reiterative analysis.

The NOF in effect replaces a number of guideline documents, most of which incorporate decision support frameworks to underpin the use of guideline values. Briefly illustrating the point: the ANZECC guidelines suggest a multi-step process for linking values and objectives, including:

- *identify catchment attributes on demographic, employment, industry, income and other relevant measures*
- *Identify the values, decide what values will apply where, determine level of protection for specified values*
- *Identify environmental concerns; determine major natural and anthropogenic factors affecting the ecosystem*
- *Determine management goals, according to community needs and desires. Management goals should reflect specific problems or threats to values, eg, endemic species, key agricultural or aquaculture species, primary or secondary recreation*
- *Select relevant indicators relevant to concerns and goals; identify appropriate values, depending on level of protection*
- *Set water quality objectives, taking account of social, cultural, political and economic concerns.*

The intention now is that NOF will have more “teeth” than those guidelines, which makes it more imperative that NOF is well supported with excellent process guidance. In the spirit of not inventing wheels, the National Air Quality Strategy offers a useful template. Key steps in the preparation of an Airshed Action Plan include:

- *Assess current state*
 - *What you know; equally importantly, what you don't know*
 - *Profile of key sources*
 - *Important sensitive or peak impacts*
- *Estimate future state*
 - *Assess base case – current programmes, improvements expected*
 - *Determine what else may be necessary*
- *Identify and prioritise*
 - *Give careful attention to costs and/or benefits of imposing new regulatory policies (typically payback takes months or years)*
 - *Prioritising involves balancing between what is necessary and what actually can be done*
- *Action*
 - *Most likely a combination of regulatory and non-reg methods*

20. Do you think the process outlined will work? If not, why not?

No.

The process proposed in CA.1 truncates several critical steps outlined in the Managing Freshwater diagram, and in the decision support frameworks outlined above. We recommend it be developed to serve as a more strategic framework (elaborated in additional guidance material), not simply for the derivation of limits, but more importantly to provide for the overall objective of the NPS, ie, a management framework for enabling growth with a lower environmental footprint.

We recommend the following amendments to Objective CA1:

To provide for an approach to establishing freshwater objectives for national values and any other values that

- a) Is national consistent
- b) recognises regional and local circumstances
- c) enables community decision-making in arriving at an appropriate overall balance across values

We recommend that Policy CA1 clarify what is meant by maintain or improve. It is our strong submission that this must be a broad assessment against the value and NOT a reductionist approach to each of the supporting attributes. The real promise of catchment-based collaboration lies in enabling communities to “*twiddle the knobs*”, ie, to develop and deliver the strategies that will make the difference. It is our understanding that “enabling communities” to get on with the job is at the heart of the Government’s freshwater reforms; and we signal here our strong concern that this over-riding objective may be undermined by the new drive for “bottomlines”. Currently, ten attributes are proposed, each and all of them with bottomlines attached (with another 40 odd potential attributes proposed for consideration 2016-2019): the risk is that injudicious application of multiple bottomlines will undermine key tenets of the freshwater reform programme (and we return to this point below).

We recommend the following amendments (underlined) to policy CA.1 and strongly recommend this framework be elaborated in further guidance, drawing on the reference material above and other pertinent literature:

- b) identifying the values of those freshwater management units including where and when they apply
- d) for those attributes specified in appendix 2 which also specify a national bottomline, assigning an attribute state at or above the bottomline for that attribute
- e) iii) Where an attribute applies to more than value, particular consideration should be given to where and when the values apply across the FMU and to what level of protection, to assist in arriving at an appropriate balance across value sets ~~the most stringent freshwater objective for that attribute is adopted~~

21. Do you agree with the proposed matters in policy CA1(f) that must be considered when establishing freshwater objectives? If not, why not?

No.

We recommend the following amendments:

f) considering the following matters at all relevant points in the process

i) current state of the FMU including environmental, economic and socio-cultural values and it's anticipated future state on the basis of community aspirations across all value sets ~~past and current resource use~~

ii) spatial scale, including identifying and prioritising spatial-temporal patterns, pressures and opprtunities

iii) the range of matters to take into account including water quality, quantity and physical parameters including those outlined in the attribute descriptors ~~the limits that would be required to meet the freshwater objectives~~

iv) the range of catchment management options , and assessment of scenarios, including assessment of the base case scenario; any choices between the values that the formulation of freshwater objectives and their associated limits would require

v) any implications for resource users, people and communities arising from the choice of freshwater objectives and associated limits including for actions, investments, ongoing management changes and any social and economic implications; reconsider values, objectives and alternate scenarios if necessary before landing the objectives and associated limits

22. Is it clear that setting freshwater objectives is an iterative process which involves consideration of the impacts of the limits, management methods, and timeframes required to meet a potential freshwater objective?

No. See amendment to CA1 (f) (v) above: it is insufficient to merely consider implications. It is critical to direct that objectives and limits cannot be landed without full community understanding of achievability and implications.

23. Do you agree that regions should have discretion to determine timeframes for meeting freshwater objectives?

Yes.

24. Are there any aspects of the process that are not clear?

Yes (As above).

Questions for section 4.3: Compulsory values

25. Do you agree that ecosystem health should be a compulsory value?

Yes.

26. Do you agree that human health for secondary contact recreation (such as boating and wading) should be a compulsory value?

Yes.

27. Do you think there should be more compulsory values? If so, what should they be, and why? What attributes should be associated with them?

No.

The other national values should not be compulsory, but part of the portfolio assessment by councils and communities. Decisions on how and where these other values are expressed across a catchment should properly be the subject of intimate local engagement to arrive at an overall balance sensitive to community and context. Informed trade offs rather than uninformed trade offs must be made by the community.

The further development of banded frameworks for a wider range of values and attributes would not detract from, but could materially assist, communities engaging in this task.

Questions for section 4.4: National bottom lines

28. Should there be numeric bottom lines for attributes of the compulsory values?

Yes for critical values explicitly tested against robust cause/effect and cost/benefit criteria.

It is important to note that the proposed introduction of national bottom-lines applicable to all waterways is a significant shift in the water management framework: the directive is that communities would not have discretion to “*maintain*” but must actively “*improve*”. This proposal derives from the LaWF recommendation that:

- *Bottomlines be defined for a limited range of freshwater state parameters.*

We expect that bottomlines for this “limited range” will direct community attention explicitly to the critical parameters where improvement is non-negotiable to achieve the value. It can also be expected – recognising the import of this shift – that the selection and development of national bottomlines will be the subject of explicit criteria, and robust analysis against those criteria.

Currently the discussion document proposes that bottomlines be set for each and all of the attributes presented (somewhat at odds with the LaWF recommendation above). Before turning to the detail of each of the proposals, however, it is important to frame the discussion against the criteria for setting national bottomlines.

It is at this point that we have a key weakness: the criteria against which national bottomlines can be developed, tested and defended (both now and in the future) can perhaps be inferred but they are not explicitly stated.

Currently, the discussion document proposes (section 4.4) that:

- *the bottomlines set the minimum level at which the values are provided for*
- *the proposed bottomlines are set at a level that support resilient ecosystems. They are set at a level that protects against significant adverse effects, and in some cases are set a safe distance above where you might expect to see irreversible damage to the ecosystem*

The narrative descriptors present more specific statements:

- *ecological communities are at a high risk of a regime shift to a persistent, degraded state*
- *starts approaching acute impact levels (risk of death) for sensitive species*
- *likelihood of local extinctions of keystone species*
- *high risk of infection, especially for the very young, the very old and those with compromised immunity*

The Regulatory Impact Statement similarly suggests (p10) that the D Band represents that state where:

- *the value is no longer achieved and recovery may be difficult*

The NOF Reference Group suggested (pg 6) amending this principle to:

- *set bottomlines at a sufficient buffer above any tipping point to provide resilience. For this purpose, the term ‘tipping point’ means the point below which recovery to a higher banding would become difficult or impossible.*

The reports from the science panels consistently emphasise confounding variables and data deficiencies, and the particular difficulties of landing on a breakpoint between the C and D bands. They do not explicitly state criteria for proposing bottomlines, although again they can be inferred, eg:

- *setting a bottomline that should avoid a tipping point in a lake (Classification and objective bands for monitored lakes, p4)*
- *generically, a higher level of conservatism is generally recommended for more highly toxic contaminants, such as metals (Updating nitrate toxicity effects, p15)*
- *we propose that D-grade waters are those in which sensitive aquatic organisms suffer “considerable” thermal stress with fish moving to cooler refugia (if they can) while some macroinvertebrates will be locally extinguished (NOF – temperature, DO & pH, p25)*
- *the high variability in tolerance between species and lack of data specific to NZ species makes defining DO limits for macro-invertebrates challenging (NOF – temperature, DO & pH, p48)*
- *Class D waters are those in which there is a high likelihood that sensitive fish and macroinvertebrate species will be absent, whilst other species will be subject to chronic stresses (NOF – temperature, DO & pH, p52)*

In summary, three clear principles are apparent:

- Firstly, that the D band represents high risk, acute impacts, likelihood of local extinctions
- Secondly, that the D band may be set to provide a buffer above a “tipping point” into a persistent, degraded state
- Thirdly, that a higher level of conservatism may be applied to more toxic contaminants.

We support these principles. It is proposed that three further principles can be inferred but need to be explicitly stated:

- The banded framework, including any bottomlines, must be supported by robust, defensible cause-effect data, preferably strongly calibrated to NZ species and conditions

- The burden of proof for proposing national bottomlines is higher than that required for proposing attribute bands, recognising the import of requiring improvement rather than maintenance
- National bottomlines are appropriate for attributes with clear cause-effect relationships and established risk thresholds for acute, significant and irreversible impacts; they are not appropriate for attributes which contribute to more subtle shifts in ecosystem composition in complex multi-stressor relationships (noting here that the response of aquatic ecology to multi-pressures is a key area of research in the EU¹²).

One further principle also requires explicit statement:

- that national objectives, including any bottomlines, are subject to the same cost-benefit disciplines which apply more generally at all levels of the water management framework.

We recommend that these (or other) principles be explicitly agreed as criteria against which to develop and test national bottomlines. We strongly suggest this is a pre-condition to effectively working through the debates which will inevitably arise about bottomlines – which attributes and where they are pitched.

Robust cost/benefit analysis is critical before landing any national bottomlines and we note that attempts have been made to estimate the implications of the proposed bottomlines. We particularly commend the body of work undertaken in Southland. Having said that, we note¹³:

- *there are no nationwide economic impact studies on the costs and benefits of meeting bottomlines*
- *in the absence of national data, detailed case studies were carried out in Southland and Canterbury to assess the potential impacts – in spite of the work done to date, additional work is needed to fill in remaining gaps.*

The regional work undertaken in Canterbury and Southland focussed on proposed nitrate and to a lesser extent, e. coli bottomlines. To our knowledge there has been no similar cost-benefit analysis undertaken for:

- *lakes (notwithstanding that 28% of monitored lakes (32) are assessed as being “unacceptable” against the proposed bottomlines)*
- *periphyton (acknowledging that some work was done in Southland but noting that key areas implicated as breaching bottomlines – albeit the statistics are confusing across the various reports - include large areas of Manawatu and Wairarapa hill country which have not been subject to any cost/benefit analysis)*

We make the point that these omissions are at best incongruous within the context of a document which otherwise does an excellent job of specifying the requirement for robust, reiterative analysis before landing objectives. We acknowledge the difficulties of extrapolating from measured to modelled data, linking environmental to economic variables, operating models at the outer limit of their inter-operability. But the bottomline is they don't pass go without cost-benefit analysis.

¹² Regional Council Freshwater Management Methodologies, p113

¹³ S32 Report, p25, 26

29. Do you agree with the proposed level at which bottom lines would be set for each attribute of ecosystem health? If not, at what level should they be set?

No.

We have assessed the proposed bottomlines against the criteria outlined above and recommend the following changes.

- **Periphyton:**
 - not well-supported by robust cause-effect data
 - principally implicated in complex multi-stressor relationships
 - no cost-benefit analysis in the key areas predicted to fail the proposed bottomline
 - **Recommendation:** retain banded framework (with amendments as discussed above), no national bottomline

- **Lakes:**
 - It is currently our understanding that chlorophyll-a is a robust primary indicator of lake “tipping points”
 - TN and TP are subsidiary attributes (*as they are for periphyton*) and principally implicated in complex multi-stressor relationships
 - no cost-benefit analysis has been undertaken
 - **Recommendation:** retain banded framework for TN and TP (with recalibration of the numbers as discussed above), establish a national bottomline for chlorophyll-a (after robust re-assessment of the proposed numbers)

- **Nitrate:**
 - the bands and the proposed bottomline are calibrated to chronic growth effects, not acute mortality thresholds; and to a low level of effects (10% growth reduction)
 - economic analysis has been undertaken showing significant implications in Ashburton; but it is less clear whether the costs/benefits have been explicitly weighed
 - **Recommendation:** retain banded framework pending robust assessment of the proposed bottomline against explicit criteria

30. Do you agree with the proposed level at which bottom lines would be set for each attribute of human health for secondary contact recreation? If not, at what level should they be set?

No.

We have assessed the proposed bottomlines against the criteria outlined above and recommend the following changes.

- **E. Coli:**
 - The assumptions/justification for the exposure/risk assessments have not been made explicit
 - very limited cost/benefit analysis to date (for example, the Southland work was premised on base flows only (not flood flows), the costs and cost-effectiveness of hill

country fencing has not been made not explicit; we understand that work is underway in Waikato work but this work is not yet in the arena)

- **Recommendation:** retain as banded framework pending explicit discussion of the exposure/risk assumptions, and more robust cost/benefit analysis of the proposed bottomline
- **Cyanobacteria:**
 - We are not currently aware that any cost-benefit analysis has been undertaken for the proposed cyanobacteria bottomline (but understand also it may have significant implications for some catchment communities, eg, the economic cost of achieving the proposed cyanobacteria bottomline may be significantly higher than the cost of achieving the proposed nitrate bottomline for Te Waihora/Lake Ellesmere)
 - **Recommendation:** retain as banded framework pending more robust cost/benefit analysis of the proposed bottomline

31. Do you agree that transitional arrangements should be provided to allow councils and communities to set objectives below a national bottom line for a short time?

his question is more closely related to the one following re the exceptions framework. In brief:

- The first principle must be to establish bottomlines defensible against explicit criteria
- The second principle is well-established in the discussion document – that in some cases, remediating decades of human impacts may take decades
- The third principle is that any transition periods or exceptions should be tightly constrained against explicit criteria.

We make the point that the national framework will be significantly more robust and predictable - and significantly more likely to deliver the results where the results are needed - if:

- We are sparing with our bottomlines
- And equally sparing with any transitions or exceptions

Questions for section 4.5: Exceptions to bottom lines

- 32. Do you agree that there could be exceptions where the natural state of the freshwater management unit breaches bottom lines? Where in your region do you think this type of exception might apply?**
- 33. Do you agree that there could be exceptions where historical activities have created impacts on water quality and the reversal of those impacts is not reasonably practicable, either physically or ecologically, even in the long term? Where in your region do you think this type of exception might apply?**
- 34. Do you agree that there could be exceptions for significant existing infrastructure (eg, dams), where a choice is made to manage a freshwater management unit below bottom lines? Where in your region do you think this type of exception might apply? no?**
- 35. Do you agree that freshwater management units) good point on changing this all to Catchment rather than introduce new term) eligible under the first two exceptions above should be decided by regional councils?**

- 36. Do you agree that freshwater management units eligible for an exception due to the effects of significant existing infrastructure should be decided at a national level and included in appendix 3 of the NPS-FM?**
- 37. What should the criteria be for allowing exceptions based on significant existing infrastructure?**

The most important point – emphasised above – is to get the bottomlines right. If national bottomlines are restricted to critical parameters clearly impacting on critical values, and arrived at after robust process – then it should be very rare indeed that any exceptions should be required.

We specifically record concern that the proposed criteria should not be interpreted as licence for urban authorities (or hydro or mining) to use infrastructure as easy grounds for exceptions – noting here that rural infrastructure (drainage networks, water race networks, flood works) present equally significant challenges for rural communities.

At a very practical level, we are currently confused as to how an exceptions framework might play out on the ground recognising that urban, rural and industrial activities are inextricably linked within catchment systems (*eg*, the potential scenario of Waikato hydro dams with exemptions relative to upstream and downstream activities who are otherwise operating within catchment limits). We suggest that that the exceptions framework could play out in ways fundamentally at odds with the core precepts of enabling collaboration within and across catchment communities (with the expectation that everyone is stepping up to the plate).

We signal here a strong question as to whether there should be an exceptions framework at all. At the minimum, we emphasise that the discretion to grant exceptions should be tightly constrained to exceptional cases, and exercised only at national level.

Questions for section 4.6: Tāngata whenua values

- 38. Do you think the proposed NPS-FM adequately provides for Te Mana o te Wai?**

Yes.

- 39. Do you agree with the way tāngata whenua values are described in proposed appendix 1 of the NPS-FM?**

We note a small concern in respect of the description of some values: some terms appropriate to the traditional economy are less appropriate in the context of the modern economy (*maori are of course key players in the modern economy*). We have separately made recommendations for small changes to some value descriptors (*eg, cultivation*) to reflect this point.

- 40. Do you support adding Te Mana o te Wai to objective A1 of the amended NPS-FM as a matter that must be safeguarded? What would be the implications of adding this to objective A1 in the NPS-FM?**

No. We do not support the proposal that “natural form and character” be a compulsory value. We acknowledge and respect the importance of natural form and character, including but not exclusively, waterbodies with exceptional and iconic features. Inevitably, however, a high level of subjective judgement applies to this value; which speaks most importantly to the relationship between people and place.

The discussion and determination of how this value can best be expressed across a FMU properly belongs with the people in that place.

Questions for section 4.7: Monitoring

41. Do you agree with the new section in the NPS-FM requiring monitoring plans? If not, why not?

We support the development of monitoring plans as set out in policy CB1.; and reiterate the recommendation made above that the Office of the Auditor General should be given the responsibility of auditing local and central government performance against them.

Consistent national measurement, and resourcing to undertake it, is critical to this framework. We acknowledge efforts underway to improve the quality and consistency of environmental monitoring and reporting; and strongly endorse the importance of this work. Equally we strongly endorse the importance of robust regional and national monitoring of key indicators of socio-economic growth and employment.

We note that inadequacies and inconsistencies in current regional monitoring programmes (environmental and economic) have significantly compromised the ability to develop appropriate bands and to assess the implications of proposed bottomlines.

We strongly endorse the importance of recognising longterm trends in monitoring results; and the expectation that compliance should be assessed against 5 year averages of annual statistics.

We agree that regional councils should identify representative sites for the purpose of monitoring performance against the National Objectives Framework.

We emphasise the critical point that achievement against freshwater objectives can only be measured in the water: all other indicators, while useful, are at best proxies and marker posts.

Question for section 4.8

42. Is there anything else you would like to tell us about the issues and proposals in this document?

Glossary of terms: we commend the Government for developing a water management framework intended to support and enable active stakeholder and community participation. In that context, we suggest that some of the terminology is at risk of confusing rather than illuminating; and recommend attention be given to two new terms introduced in this discussion document:

- *“minimum acceptable state”* is a new term and currently used interchangeably with *“bottomline”* in the document. This is confusing and unhelpful: we suggest *“bottomline”* is the more simple and understandable word.
- *“freshwater management unit”* is a new term (*just when we had all got used to “catchment”!*). Appreciating the concern to be precise about different possible scales, we recommend that *“catchment”* is the more simple and understandable word (*the different scales can be explained in a glossary definition*).

We recommend also that the Glossary clarify that freshwater bodies refer to the RMA definition (and that the definition is not being artificially extended to include artificial waterbodies).

FEDERATED FARMERS OF NEW ZEALAND

Federated Farmers is a not-for-profit primary sector policy and advocacy organisation that represents the majority of farming businesses in New Zealand. Federated Farmers has a long and proud history of representing the interests of New Zealand’s farmers.

The Federation aims to add value to its members’ farming businesses. Our key strategic outcomes include the need for New Zealand to provide an economic and social environment within which:

- Our members may operate their business in a fair and flexible commercial environment;
- Our members’ families and their staff have access to services essential to the needs of the rural community; and
- Our members adopt responsible management and environmental practices.

This submission is representative of member views; and we request the opportunity to be heard.