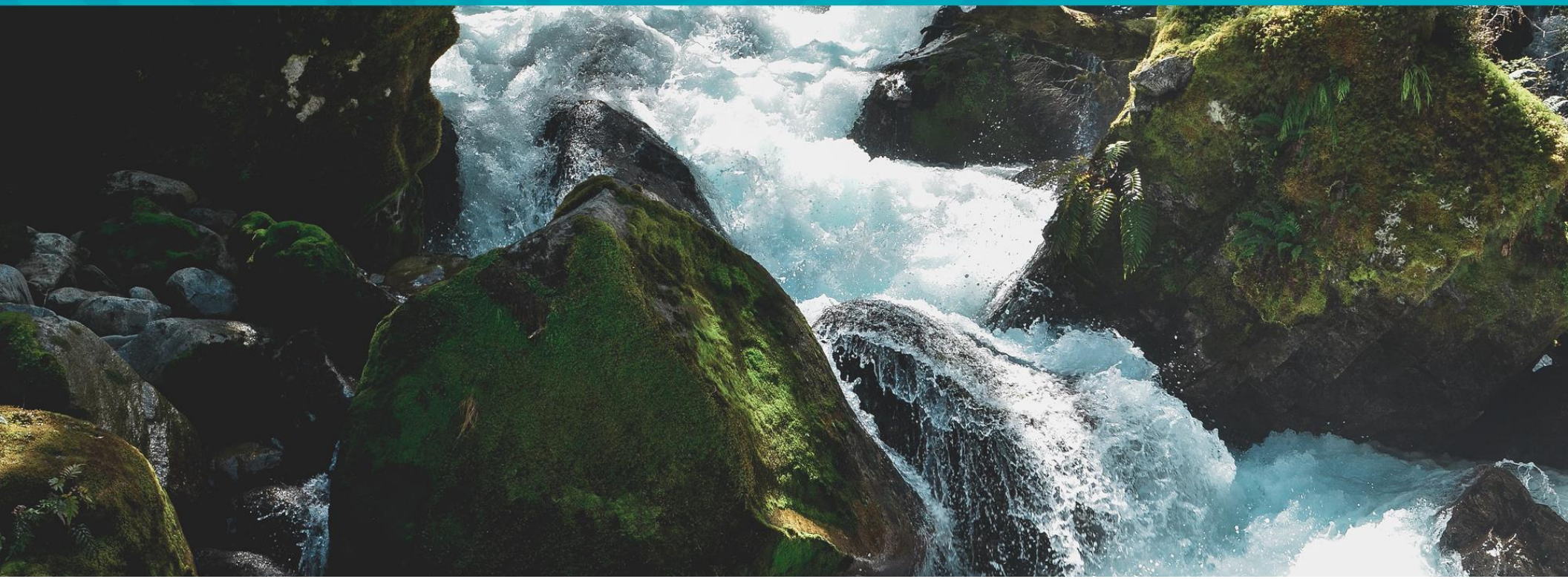
Wastewater Standards Technical Review Group

Discharge to water



Legislation relating to wastewater standards

Feedback on legislation relating to wastewater standards

- There was a summary of the existing legislation and proposed changes to it that have been announced by the Minister of Local Government.
- There were a number of questions about the proposed change to the legislation and how it will work (particularly around the “single standard” proposal which, when a wastewater environmental performance standard is in place, will remove regional council discretion about imposing treatment requirements that are more or less restrictive than a standard).
- There was also discussion about the proposal to replace the existing requirements in the Water Services Act and Taumata Arowai – the Water Services Regulator Act relating to Te Mana o te Wai with a requirement on the Water Services Authority – Taumata Arowai (the Water Services Authority) to take account of the National Policy Statement for Freshwater Management (NPS-FM) and any regional freshwater plans when exercising its functions under legislation.
- Regional Councils will still be required to give effect to Te Mana o te Wai, through implementing the NPS-FM. The group noted that the Government has announced that the concept of Te Mana o te Wai will be rebalanced as part of a broader review of the NPS-FM.
- The group also noted that as originally envisaged Te Mana o te Wai was always intended to apply at place, rather than operating as a national or universal approach.

Problem definition

Feedback on the problem definition

- As part of the problem definition, there was discussion about Government policy which is that environmental requirements for discharges will not be lower as part of standards - setting (Factsheet template (dia.govt.nz)).

- There was feedback that treatment requirements set as part of wastewater standards should not be set at a level that continues or preserves the status quo given the age of many plants and their associated consents, and rather ensures that environmental outcomes are not lowered, and where possible, improved.

- There was feedback that the part of the report which states that the aim of performance standards is to "minimise further deterioration" is not consistent with an aspiration to improve water quality given the state of New Zealand's freshwater.

- There was feedback that it should be a priority for treatment requirements set as part of wastewater standards to protect public health. The group provided further feedback on this theme (summarised in subsequent slides) about how the options proposed in the report do not appear to include a public health focus relating to wastewater treatment.

- There was discussion about how wastewater standards will set clear expectations for councils and communities about what wastewater treatment should be, to enable infrastructure investment (and planning for that investment, including funding and financing).

- There was a question about whether public/private partnerships for funding and operation of wastewater treatment plants is enabled by the framework. There is already significant flexibility in the existing provisions of the Local Government Act 2002 and Infrastructure Funding and Financing Act 2020 to allow for arrangements of this nature, including long-term contracts, joint ventures, and special purpose vehicles. However there is no intention to allow privatisation of council water services.

Feedback on the problem definition (cont.)

- There was discussion about whether wastewater standards will help to lift the burden from iwi and hapū during engagement on treatment plant upgrades. The feedback was that, while many iwi and hapū struggle with consenting processes, they still want to participate and strive for better involvement and outcomes. This is consistent with the themes arising from case studies conducted by EY Tahi.
- Current legislation means the Water Services Act does not allow minimum consent durations to be set as part of a wastewater standard. There was feedback that this is an important part of standards-setting. Wastewater treatment plant infrastructure should be treated as long-term if it meets standards given the significant planning, designing and investment relating to it. The Water Services Authority undertook to ensure this feedback is considered as part of changes to legislation.
- There was feedback that, if plant bypass is not covered by a discharge to water standard, consenting timeframes and percieved delays may still occur where bypass consenting is required and is integral to the operation of a wastewater treatment plant.
- There was feedback that standards should not address detailed plant operating requirements provided the asset owner can demonstrate appropriate operating protocols are in place if requested, then so long a the standard is met the operating detail should not be required.

Feedback on the problem definition (cont.)

- There was feedback about the water quality for standards.
- Generally ocean discharge is less sensitive than lakes and rivers/streams. Nationally reported results show the majority of our freshwaterways are highly degraded:
    - almost 70% of freshwater streams are below average condition NPS - FW bands D and E for microbiological parameters and therefore unsuitable for swimming;
    - for Total N(lakes) and Ammonia Nitrogen (rivers) – 90% of waterways are indicated as achieving bands A and B;
    - for Total Phosphorus (Bottom line is set for lakes) - more than 50% exceed the Australian and NZ Guideline default values and indicate quality in bands C and D. But for Dissolved Reactive Phosphorus(rivers) around 40% of sites are in bands C and D;
    - based on macroinvertebrate scoring 25% of NZ waterways indicate severe pollution and 65 % moderate to severe pollution
    - Only approximately 6% of streams are considered pristine (band A for all parameters)

Case studies

Feedback on the case studies

- Following a summary of the implications of case studies for discharge to water standards, there was discussion about iwi / Māori perspectives on national standards, and potential impacts on "at place" engagement and ability to influence quality of discharges. Many iwi and hapū who participated in the case studies wanted to know what the treatment requirements would be as part of standards, and were open to standards if it would result in improvements to local outcomes and they could maintain their important role as kaitiaki.
- There was feedback that a "single" national wastewater standard largely removes discretion for local/at place considerations unless addressed by exemption - this appears at odds with the experience of TRG members in dealing with mana whenua and significantly diminishes iwi opportunity to influence outcomes. Iwi may struggle sometimes to meet all requests for input but would prefer some opportunity than none at all. All case study engagement emphasized that mana whenua seek active participation in all phases of the wastewater treatment process as a bottom line.
- There was a discussion of whakanoa and how infrastructure has been designed to respond to it. This concept involves an understanding of why wastewater is tapu – because it represented a significant health risk to Māori communities, wastewater was handled in very specific ways to ensure that people did not get sick. This usually involved burying human waste, and never disposing of it in water.
- There are a number of different ways that treatment plants have included infrastructure that responds to this. Examples are the use of a rock outfall with specifically carved pou (poles) at Cambridge, a papatūānuku chamber at Tahuna, or an artificial wetland at Wellsford to ensure that waste has the appropriate amount of contact with land.

International experience and options

Feedback on international practice (cont.)

- There was discussion about how the information in the draft report relating to treatment limits in other jurisdictions focuses on aquatic ecology, eutrophication and fish (environmental performance and outcomes). There is no real information about treatment that will protect public health outcomes other than chlorine treatment which would not be appropriate in many areas in New Zealand because of its toxicity.
- Public health measures such as microbiological levels for discharge to both coastal and freshwater is important because recreational uses such as shellfish gathering and bathing are common across New Zealand and yet these activities come with significant risk if there are uncontrolled pathogens in these waters from direct or indirect wastewater discharges of human waste.
- Feedback was that New Zealand is significantly ahead of other jurisdictions in how it deals with treatment of pathogens and viruses, and any treatment requirements in wastewater standards should reflect this (rather than, for example, focusing on chlorination). Some form of disinfection of the final effluent will be required, with the most common method being UV disinfection which is now widespread across the country – although standards should not exclude chlorination entirely which may be relevant for coastal discharges

Feedback on international practice

- There was discussion about how the draft report focuses international best practice examples where there is a core range of contaminants (TSS and BOD), with other contaminants only subject to limits on a case-by-case basis or where other frameworks apply – the main example of this approach is the EU, which is signalled in the report as the preferred approach.
- However, there are a number of issues with application of the EU model in New Zealand, including:
    - The EU directive for Urban Wastewater relies on a number of other regulatory frameworks (for example the Bathing Water directive, and Shellfish Waters directive) which do not exist in the same form in New Zealand;
    - If standards based on the EU model were implemented in New Zealand, they would not apply to the significant majority of wastewater treatment plants (because of the size profile and discharge locations in New Zealand);
    - The Government's priority is for a standards framework that sets contaminant limits for the main contaminants that are discharged from wastewater treatment plant to provide structure to infrastructure upgrades / reconsenting, which is a particular challenge in New Zealand given the age of infrastructure and large number of plants that require consents in the next decade.

Feedback on international practice

- Information in the draft report relating to the USA should be revised as there are many more parameters listed, often not at State EPA level, and quite commonly different between the east / west coasts and mid-continental States (which only have freshwater receiving environments).
- Many USA states are now adopting standards for “recycled or reused water” – these should be a completely separate category to a national wastewater standard relating to discharge from plants to water.

Options presented in report

Feedback on the options presented in the report

- **Option 1 –** is a single set of treatment requirements, regardless of size of plant or receiving environment. This approach would not be fit for purpose because while providing national consistency, it doesn't reflect treatment differences based on receiving environment or population. This would result in inappropriate treatment (and significant expense) where treatment requirements were not suited to the plant or receiving environment.

- **Option 2 –** is a set of standards where treatment requirements vary based on the receiving environment. This was seen as the most viable option in the New Zealand context and discussion about it is summarised in the following slides.

- **Option 3 –** is a set of standards where a small number of treatment requirements vary based on receiving environment categories, with all other parameters continuing to be set through resource consents. This option is broadly based on the EU Directive for Urban Wastewater. For the reasons outlined in the slides on international practice, this would not result in an effective standards framework in the New Zealand context.

Feedback on option 2 (cont.)

- Discussion focussed on option 2 in the draft report and how it might be amended or improved to ensure it is fit for purpose.
- There was feedback that definitions of different types of water body / receiving environment would need to be developed, so the standards are an objective framework that can be easily applied by regional councils.
- There was support for four discharge regimes (two to marine/coastal water and two to freshwater). The suggestion was made that a fifth regime of “groundwater” could be developed covering discharges via deep well injection or unlined ponds and wetlands and seepage beds.
- There was feedback that discharges to open ocean did not require high levels of BOD treatment. There was also the suggestion that nutrient treatment parameters should not apply for discharge to open ocean. Ocean outfalls have very high dilution and requirements for the proposed BOD and nutrient concentrations as proposed in the draft report would be extremely costly to meet.

Feedback on option 2 (cont.)

- There was discussion about how in freshwater environments, nutrient treatment parameters could vary according to high / low flow situations in the receiving environment (which occurs across seasons). This approach mirrors the arrangement in some consents and results in treatment that is less expensive (higher levels of treatment only required in low flow situations.
- There was discussion about how in freshwater environments, nutrient treatment parameters could vary according to loading in the receiving environment – for example, where there is high levels of nitrogen in the receiving environment, higher levels of treatment are required to reflect the need to improve the overall load. This approach mirrors the arrangement in some consents.
- One approach to these areas could be to use trigger values as in some resource consents.
- There was a question about how aspects of the ANZEC guidelines will apply (for example where a discharge include contaminants that are toxic to the receiving environment.

Feedback on option 2 (cont.)

- There was feedback that there is widespread use of central parameters to set wastewater performance standards – particularly TSS, BOD and Chemical Oxygen Demand (COD), and the numerical limits for these values appear to have been sourced from international performance standards. Concerns exist if the receiving environment is sensitive or of high value and cannot assimilate these concentrations.
- With regards to nutrient limits, there was feedback that as nutrients are a key focus under NPS -FM most modern plants are specifically designed to incorporate nutrient removal as many waterways are sensitive to eutrophication. Ammonia and nitrates (forms of nitrogen which can be found in wastewater effluent) are highly toxic to aquatic life.
- Nevertheless there is often very close scrutiny of effluent quality from point sources. The wider rural land use practices or natural sources are often much larger contributors of TSS and nutrients and there seems to be little limitation or control around agricultural nutrient sources in NZ.

Feedback on option 2 (cont.)

- There was feedback about exemptions that could be included as part of a standards regime.
- The NPS-FM has an exemption for naturally occurring processes/background levels and one possibility would be to replicate this for a national standard, targeting particular contaminants (such as phosphorus, nitrogen or TSS).
- There could be an exemption for wastewater discharges upstream from drinking water sources.
- There could be an exemption for receiving environments which has high values – such as those considered pristine (circa 6% in band A NPS-FM).
- There could be an exemption for receiving environments where there is high risk of eutrophication or other nutrient-related concerns
- There could be an exception for discharges to very small or low flow streams.

Monitoring and reporting options

Feedback on monitoring and reporting

- There was support for standardised requirements for end-of-pipe monitoring of parameters that are imposed as part of a wastewater standard.
- There was not support for a wastewater standard to impose receiving environment monitoring of parameters, or other wider catchment characteristics.
- There was support for monitoring based on size of plant – for example:
    - Plants serving populations > 10,000 - continuous monitoring (or alternatively, one composite (flow-proportion or time based 24 hour) sample per week)
    - Treatment plants serving populations between 1,000 and 10,000 - weekly sampling
    - Treatment plants serving populations less than 1000 – monthly sampling
    - Testing based on the 90th percentile

Feedback on monitoring and reporting

- There was discussion about the challenges relating to reporting. Annual reporting (relating to all aspects of a plant and compliance with its consents) currently required by most regional councils, together with reporting by exception where a plant breaches a condition of its consent.
- There was support for reporting arrangements along the following lines:
  - Any breach of a parameter required as part of a wastewater standard must be reported to the regional council immediately;
  - Monthly reporting of compliance against parameters in a wastewater standard – on publicly available website maintained by operator and to regional council
  - Annual reporting to regional council and water services authority about compliance against parameters in a wastewater standard.
- There was a discussion about the benefits of a single national reporting platform where all compliance reporting could be located.

Proposals for discussion document

Proposals for discussion document

- We propose to further refine the treatment parameters in option 2 of the draft report. This will require further advice, which we propose to commission from consultants.
- This will include an overall review of the proposed treatment parameters, including comparison with treatment limits in case study consents and other selected consents, to provide an additional level of assurance.
- This advice will be commissioned from consultants who are independent of the draft report authors.
- There is a table outlining the areas of change. In summary, the changes to the treatment parameters, and areas for further refinement, are as follows.

Classification of receiving environments

- Based on feedback we would like to refine classification of receiving environments.
- We would like to consider classification of freshwater bodies based on dilution rather than description of receiving environment. This is an objective requirement that is easier to apply than “fast-moving” and “static”, and links more directly to the treatment parameter and its impact on the environment. We would like to consider including estuaries in this dilution classification arrangement given their sensitivity.
- We would like to develop clear definitions of coastal receiving environments (inshore coastal and open ocean) to ensure standards are objectively easy to apply.
- At this stage we do not propose to include another classification of receiving environment based on groundwater (encompassing deep well injection, unlined wetlands and ponds, and seepage beds). These areas would need to be considered separately (different treatment requirements would apply to each) and may be considered as part of future standards arrangements. For unlined wetlands and ponds, we may develop standards that have specific application to small plants.

Proposals for discussion document (cont.)

Nutrients

- Based on feedback, we propose there will be no open ocean nutrient parameters
- Based on feedback, we propose that freshwater nutrient parameters should be based on high and low flow (cumec) and high and low load. These are highlighted in the table in red.
- Based on feedback, we propose the addition of an ammonia parameter based on toxicity (ANZECC guidelines).

E.coli / Enterococci / UVT

- Based on feedback, we propose UV transmissibility values. These would operate as an alternative to meeting E.coli / Enterococci treatment parameters – this would mean that there are clear treatment requirements for UV treatment, but the method of disinfection would be optional.
- We would like further advice on the parameter limits for E.coli / Enterococci in option 2. These limits are taken from the Ministry for the Environment's Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas (2002). However this report states these values should not be used for wastewater discharges. Any comment on whether these are the appropriate values would be appreciated.

Proposals for discussion document (cont.)

BOD / COD

- We would like to consider whether a lower BOD treatment limit is appropriate for open ocean.
- We would like further advice on whether treatment parameters should only specify BOD, and should not relate to COD (we understand a fixed relationship between COD and BOD is difficult to establish and is likely to result in additional testing).

Other treatment parameters

- We do not propose to include other treatment parameters in the ANZECC guidelines that may have toxic impacts other than ammonia (for example heavy metals). For these contaminants the regional council would continue to apply the RMA process and most likely that would continue to use the ANZECC guidelines as a guide.

Exceptions

- We would like to consider an exception for contaminants relating to naturally occurring processes / background levels (such as phosphorus, nitrogen or TSS).
- We are keeping other options for exceptions under review. Some of the proposals for exceptions would be addressed through a freshwater classification system based on dilution.

Discharge to water standard – treatment parameters

Parameter	Open ocean	Inshore water	Freshwater or estuary (high dilution)		Freshwater or estuary (low dilution)	
BOD5 (mg/l)	Consideration of proposed lower limit than recommended in draft report	<25 (or a COD limit of <125)	<25 (or a COD limit of <125)		<10 (or a COD limit of <75)	
TSS (mg/l)	<35	<20	<20		<20	
TN (kg/d)	----	<10	High load high flow	High load low flow	High load high flow	High load low flow
			Low load high flow	Low load low flow	Low load high flow	Low load low flow
TP (kg/d)	----	<10	High load high flow	High load low flow	High load high flow	High load low flow
			Low load high flow	Low load low flow	Low load high flow	Low load low flow
Ammonia	----	Based on ANZECC guidelines for toxicity				
E.Coli (cfu/100ml)	----	<130	<130		<130	
Enterococci (cfu/100ml)	<1000	<40	----		----	
UVT (alternative to E.Coli or Enterococci parameters)	Consideration of treatment requirements through advice	Consideration of treatment requirements through advice	Consideration of treatment requirements through advice		Consideration of treatment requirements through advice	

Proposals for discussion document – monitoring and reporting

- We propose to include the following monitoring and reporting requirements in the discussion document.
- The review of the proposed treatment parameters by independent consultants will include review of the monitoring requirements to provide an additional level of assurance.

Proposed recommendations for monitoring requirements

- End of pipe monitoring is required for all applicable parameters in a wastewater standard.
- Continuous monitoring is required for plants serving populations > 10,000
- Fortnightly monitoring is required for plants serving populations 10,000 – 1,000
- Monthly monitoring is required for plants serving <1,000
- Testing based on 90th percentile
- No one sample may be more than double the standard

Proposals for discussion document – monitoring and reporting

Proposed recommendations for reporting requirements

- The following proposed reporting requirements would apply to all parameters.
- Any breach of a parameter must be reported to the relevant regional council immediately
- Monthly reporting is required of compliance against parameters in applicable standards, published on a publicly available website maintained by operator and to regional council
- Annual reporting is required of compliance against parameters in applicable standards to regional council and the Water Services Authority

Other matters

- Reporting on a single platform was proposed. We agree that this would be a good option (for example, LAWA). However at this stage we do not intend to propose it as part of wastewater standards arrangements – the proposals will be focussed on minimum reporting requirements by network operators, to regional council regulators, and the Water Services Authority.