**SUBMISSION** **Job 11011**

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| **To**: | Taumata Arowai (email: kōrero@taumataarowai.govt.nz) |
| **From:** | Lowe Environmental Impact (email: office@lei.co.nz) |
| **Date:** | 4 April 2025 |
| **Subject:** | Questionnaire Response: Submission on proposed wastewater environmental performance standards |

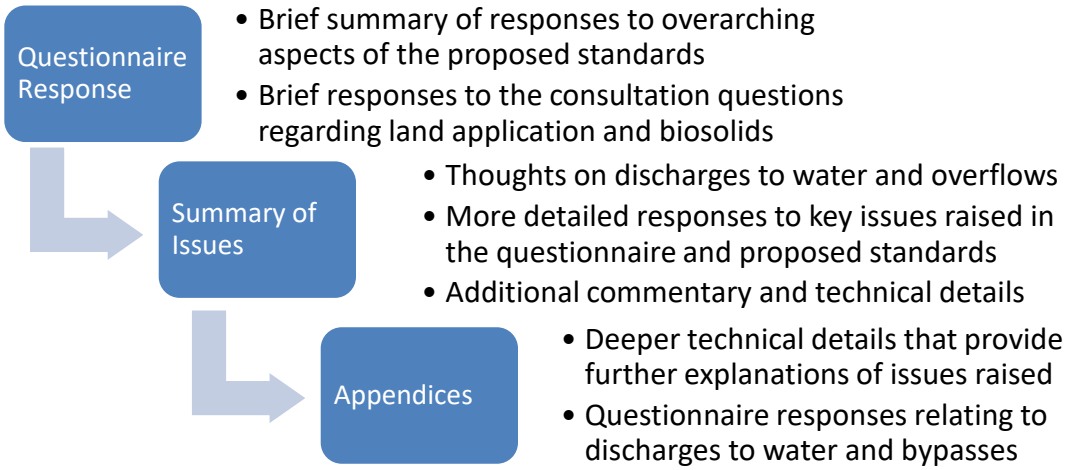
This document serves as the first in a series of papers that collectively provide a submission from Lowe Environmental Impact (LEI) regarding Taumata Arowai's proposals for national standards for wastewater discharges. This document in its current form is a DRAFT and will be updated prior to lodging. It is intended to contribute to and assist discussion and submissions being prepared by others.

LEI is a consultancy specialising in designing, consenting, and monitoring land discharge systems for wastewater treatment. Land treatment systems often involve discharges to water, and we comment on these where appropriate, but our main focus for this submission is on the proposed standards for wastewater land discharge and management of biosolids.

## INTRODUCTION

On 24 February 2025, Taumata Arowai initiated public consultation on its proposals for national standards for wastewater discharges which address four key aspects: discharges to water, discharges to land, overflow and bypass discharges of raw wastewater, and discharges of biosolids to land. Specific questions were included in the proposals to help focus submissions.

A number of LEI's responses to the questionnaire and commentary on elements of the proposals warrant more detailed information, which is technical in nature; so LEI are preparing a series of documents with different levels of detail, which all support this submission. The relationship between these documents is as follows:



The intention of this structure is to provide LEI's core views on the questionnaire topics and to refer readers to the linked documents for more in-depth information. This enables readers to choose to read the depth of technical detail that suits their level of interest.

The table below of LEI's responses to the proposal's questionnaire focuses on general matters, discharges to land, and biosolids – these being LEI's core areas of expertise.

LEI staff have been directly involved with developing the Biosolids Guidelines (including the 2003 Guidelines), so LEI's submission includes some responses to help clarify the incorporation of the Biosolids Guidelines into the Standards.

In relation to discharges to water, overflows, and bypasses, while not core areas of LEI's expertise, we have provided comment in the supporting documents.

Raw wastewater overflows are always an element of reticulated wastewater systems that LEI has needed to address as an integral part of discharge management, so LEI's submission includes some commentary on these.

## WHY SHARE INFORMATION

LEI support the standards. However, LEI want to inform and spark constructive discussion of the proposals across the relevant industries and stakeholders so they can be refined to be more relevant, accurate, and workable. The intention is for LEI's expertise and broad experience to assist with a greater understanding of the complexity of the standards and underlying issues. LEI is also keen to seek feedback on our ideas, issues, and opportunities to collaborate prior to final lodgement of our submission.

LEI is keen to link the experience of practitioners, particularly with land treatment, and identify opportunities for creating robust discharge standards and improve land treatment outcomes. These standards can help with implementing good practices and expand the appropriate development of land treatment systems for treated wastewater.

These Standards and the underlying discussion are very important for involving as many parties as possible. The long-term implications are significant. A short window of opportunity is available for influencing the Standards and ensuring that they are fit for purpose, effective, and simple to understand.

## RESPONSES TO THE CONSULTATION QUESTIONNAIRE

| Consultation Question | LEI Response |
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| **Scope of Proposed Discharge Standards** | |
| Do you agree with the areas the first set of standards are proposed to cover? | Yes, all four types of wastewater discharges are appropriate and timely for national standardisation for consenting with 35-year terms or controlled activity status for discharges that comply with these standards and relevant criteria. LEI fully supports the development of nationally consistent wastewater discharge standards. |

| Consultation Question | LEI Response |
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| | Some of the exclusions could be reduced by including them in the standards. Non-potable beneficial reuse should be included in land discharge standards, as this is often a related outcome of discharges onto farmland and provides a significant future opportunity for the use of treated wastewater.<br><br>LEI supports the exclusion of emerging contaminants and other chemicals from limits and monitoring because this is appropriate until scientists become more confident of thresholds for adverse effects.<br><br>Small WWTP's should have different standards than larger WWTP's. However, future WWTP's for small communities should also be allowed to achieve the standards for existing small WWTP's. Scale and significance of the discharge is important to consider.<br><br>There appears to be a conflict where the standards impose discharge limits that determine the consent term and classification, but when a WWTP is unable to meet the discharge quality limits, the Regional Council is unable to specify different discharge quality limits in the granting of a resource consent. This looks to be a Catch 22 situation that will force WWTP's to be upgraded to achieve the discharge quality standards regardless of other factors. |
| What areas should we prioritise to introduce wastewater standards in future? | 1. Existing small community WWTP discharge standards.<br>2. Biosolids discharge to land standards.<br>3. Discharge standards for combined land and water systems, rapid infiltration systems, and treatment that includes wetlands.<br>4. Private systems that may be vested in public ownership or operation.<br>5. Future small community WWTP's. |
| What topics should we cover in the guidance material to support implementation of the standards? | Technical Manual of methodologies and scoring criteria for land suitability categorisation, risk mitigations, discharge design and management, and classification of overall suitability of a land discharge system for achieving the standards. |
| Are there particular groups we should work with to develop guidance and if so, who? | Yes. Water New Zealand, Local Government New Zealand, and New Zealand Land Treatment Collective (NZLTC). |
| How should factors such as climate change, population growth, or consumer complaints be addressed when considering a 35-year consent term? | Consent conditions often include regular (5- or 10-yearly) reviews that can be triggered by and consider all of these issues. This is related to the compliance function of Regional Councils and incurs some cost for the consent holder, but reviews are usually cheaper and more tightly focussed than consent renewals. Reviews can add or amend consent conditions, require changes to monitoring or management, modify limits, require infrastructure upgrades, or require more detailed investigations and action plans. |

| Consultation Question | LEI Response |
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| | There is scope for a specific review or optimisation condition to be developed that allows incorporation of new ideas and standards or requirements, while providing ongoing certainty that does not incur additional costs. Such a review condition could be used universally across all wastewater discharge consents.<br><br>Growth of communities' wastewater discharge to land can be partially managed by staged implementation of treatment infrastructure, using mass loading rates and capping nutrient discharge mass. This can be achieved by allowing for increased treatment as flows increase while maintaining catchment nutrient balances. This gives communities the flexibility to invest in combinations of land area and WWTP upgrades to improve discharge quality.<br><br>Alternatively, if the consent application, regardless of whether it is for new or renewed discharges, can be processed with certainty, such as a controlled activity with standard conditions, a shorter duration than 35 years could be appropriate. This is because it will no longer be expensive and uncertain to reconsent and update the system to deal with changes that have occurred in the interim. |
| How long should wastewater treatment plants be able to operate under section 124 of the RMA once wastewater standards have been set? | The reasons for s124 RMA continuing to allow WWTP's to discharge for many years after their consents expire are typically related to concerns about effects of reconsenting these discharges and/or stalled consultation. Environment Court appeals are also a common reason for long s124 RMA periods.<br><br>Whilst lengthy s124 RMA periods are undesirable, the only way to end these is to process the renewal consent application. Processing without sufficient information and/or inconclusive consultation will lead Regional Councils to decline those consents or grant them for short terms. This increases the risk of appeals to the Environment Court further extending s124 RMA times, and additional costs.<br><br>If s124 RMA continuations of expired consents are given a fixed timeframe, while this creates a consent processing endpoint, it may not change the overall duration. This may create situations where discharges continue but without any consent. This means that consent conditions will no longer apply, and Councils will face an on-going risk of enforcement action. Having national standards will help address the consent process uncertainty and overcome the obstacles that currently prevent consent renewals being processed and cause lengthy s124 periods.<br><br>There does not appear to be a practical way of minimising s124 RMA timeframes without causing other legal and consent processing issues. Therefore, LEI does not support a time restriction for s124. |
| **Discharge to Land Standards** | |
| Are the proposed parameters appropriate to manage the | <u>Overall</u><br>Adopting standards that provide clear minimum requirements are appropriate. The key is ensuring that minimum requirements are |

| Consultation Question | LEI Response |
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| impact of wastewater discharges to land? | appropriate and relevant to the land characteristics and land use; which both influence potential offsite environmental effects and the long term viability of the land based system.<br><br>Our view is the selection of parameters and rationale for setting limits does not appear to be consistent with how the parameters for discharges to water have been selected. A consistent approach is a relevant consideration as there are often opportunities to have both water and land discharges for the same facility.<br><br><u>Nutrients</u><br>Using total land-based nitrogen and total phosphorus loading rates as the primary parameters to manage the impacts are appropriate. LEI fully endorses this approach because loads are easily measured, within the control of the consent holder, and directly manage adverse effects. The alternative approach of limiting nutrient losses based on Overseer modelling that many Regional Councils rely on is a more problematic way to assess and manage adverse effects. It is often subjective, open to interpretation and adds costs.<br><br>The use of the loading rates, however, should consider land type and land management. Both vary considerably around the country and the proposed standard limits are in some cases too high, and others potentially too low. The land loading limits would benefit from linkages with land management considerations.<br><br>Aside from the suitability of the methodology, the limits proposed for Class 1 locations are high, possibly too high and unsustainable. The hydraulic loads (annual water application depths) may also be unsustainably high for low-strength wastewater and nitrogen loads above 300 kg N/ha/y.<br><br>Soil's ability to retain phosphorus needs to be considered in the standards, as this is highly variable around the country. Further, having low Total Phosphorus limits, often associated with surface water discharges to minimise aquatic effects, will increase sludge volumes generated by WWTP's. Where a dual discharge system is used this could be an unnecessary cost for both the new infrastructure but also the need to eventually manage and discharge the sludge.<br><br><u>Pathogens</u><br>In many cases, using *E. coli* concentrations is not relevant. The proposed limits are very low and, in many agricultural settings, not needed. However, when considering amenity land uses near spray irrigation, they might warrant some restrictions if buffers and wind speed limits are insufficient to manage health risks.<br><br>Soils can tolerate higher pathogen concentrations than waterways. Buffers and wind speed restrictions for spray irrigation and driplines placing the wastewater either on the ground or subsurface readily |

| Consultation Question | LEI Response |
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| | manage pathogens and protect public health. Soils will usually filter out pathogens, and most pathogens will die in soil. Sunlight and drying will kill pathogens. Exclusion periods for stock and people accessing the discharge area can readily manage health risks.<br><br>Limiting *E. coli* in its current form is not supported and is not considered necessary. We note that such a limit may significantly encourage preference for water discharges. WWTP's discharging to land and water will likely need to achieve the more restrictive limits all the time. This will in many cases, incur cost by requiring additional treatment technology.<br><br><u>Hydraulic Rates</u><br>Adopting daily discharge rates and application event limits are appropriate parameters for managing discharges to land. However, limiting <u>all</u> discharges to 5 mm/h and 15 mm/event is not necessary in some instances. The standards need to clarify that the 15 mm/event is appropriate, or whether it should be 15 mm/day. Minimum return periods and/or maximum weekly limits could be specified. There should ideally clear limits for deficit, non-deficit, and perhaps rapid infiltration discharge regimes. These would be more appropriate and more flexible than the proposed fixed limits of 5 mm/h and 15 mm/event. Currently these limits would exclude a number of currently consented systems that have acceptable effects on the environment and potentially require significant upgrades if they were to be reconsented to meet these limits.<br><br>The proposed limits provide no linkage with the soil properties nor with limiting soil moisture and drainage to groundwater. Specifying deficit and non-deficit limits for different soil types would help to address this. Sandy sites are better able to cope with higher applications and year-round than heavier clay soils which potentially should have a lesser application rate limit.<br><br>See LEI's Summary of Issues for more details on the proposed parameters. |
| What benefits and challenges do you anticipate in implementing the proposed approach? Are there other particular matters that could be addressed through guidance material? | <u>Benefits</u><br>Standardised discharge parameters and consent conditions with 35-year terms are highly beneficial. This avoids debate about site suitability and land discharge limits.<br><br>Existing publicly accessible online GIS data layers support the initial desktop site selection and assessment processes proposed. GIS data is commonly used by land discharge designers for initial assessments of site suitability. Attributes typically include soil properties, terrain (slope, elevation, and waterways), current land uses, flood hazard risks, geology, groundwater, and heritage sites. Climate and soil moisture deficit variations are also included in initial assessments. The S-map soil categories can be combined with terrain data to categorise the land according to the soil and landscape classifications |

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| | prescribed by the Dairy NZ Code of Practice for Farm Dairy Effluent or other guidelines. These may be more appropriate than the risk categories proposed in Taumata Arowai's standards. This initial assessment process and sources of data could be incorporated into the information made available, and/or used to refine the category criteria that have been used.<br><br>Standardised buffers and other risk management measures will be beneficial for designing and consenting land discharge systems. It will be helpful to develop a standardised methodology for assessing the effectiveness of mitigation measures for reducing risks and to classify the suitability of the site and proposed land discharge system.<br><br><u>Challenges</u><br>*Site Selection and Discharge Design*<br>The standards have an incomplete process for selecting sites, developing designs, incorporating mitigation measures, and minimising adverse effects.<br><br>The land suitability assessments and risk management process are not consistent with best practice, Dairy NZ Code of Practice, or LTC Guidelines (which are referenced in the Standards). It is unclear how mitigations (especially design mitigations) reduce the risks and enable systems. This is an iterative process, which the current flow chart in the draft standards does not clearly show. There is also confusion about the various types of categories used for different attributes or parameters in the draft standards' tables and flow chart.<br><br>The land selection and discharge management proposal is unclear. Guidelines ideally need to be developed and robustly reviewed before confirming the standards. We note that it would be challenging to do this before August 2025.<br><br>Points of note: we do not consider natural hazards to be fatal to land discharges. Flooding can be accommodated. Volcanic eruptions are rare. Faults rarely rupture the land surface, and shaking can be destructive across very large areas and long distances from the earthquake's epicentre. While we anticipate the iterative implementation of the risk, mitigation, and site characterisation process would incorporate a scale and significance assessment, this detail appears still to be developed. Therefore, care is needed to not overstate the risks of natural hazards.<br><br>Good practice with developing land discharge systems involves an iterative process of adjusting design and mitigation measures to reduce adverse effects until an integrated system and acceptable effects are achieved. Storage and discharge management, including to surface water, can be adjusted to reduce effects. The current proposal does not appear to provide for this.<br><br>*Efficiency of Funding Environmental Improvements* |

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| | Land discharges can be expensive ways to improve waterway health. Investment into rural catchments to reduce nutrient loads from other diffuse sources can be much more financially efficient than WWTP upgrades to reduce discharge effects when adopting a holistic approach. Acknowledgement of this potential offset mitigation is needed.<br><br>Discharging to land can achieve direct benefits for waterways, as it removes a source of contamination from the waterway. However, the cost of accessing land (lease or purchase), constructing discharge systems, and operating them is high and needs to be weighed alongside WWTP upgrades and continued surface water discharges. There are no incentives to develop land discharge systems when it is cheaper to upgrade WWTP's and obtain consents for discharges to water.<br><br>It is unclear where the standards consider tangata whenua/awa values, which typically prefer land discharges over water discharges. It is also unclear how consideration is given to Regional Council policy which in most regional plans is directive to adopting land application systems.<br><br>*Combined Land and Water Discharge Systems*<br>The standards do not integrate water and land systems at all, yet combined systems are commonplace. Reference is given to mix and match, but it is unclear how water and land discharges regulated by different standards work together. A standard for combined land and water discharge systems would be very helpful, or at least a linkage between water and land discharges.<br><br>*Exclusions*<br>The focus of the standards is very narrow. There are other land discharge systems, and a much broader range of mix and match options, that provide for beneficial reuse that could be included. The standard to too narrow in its scope or at least does not set up the development of other complementary standards.<br><br>The exclusions lead themselves to being covered in their own standard. This includes rapid infiltration and beneficial reuse; albeit beneficial use needs closer attention to its definition to identify current and future opportunities for New Zealand.<br><br>This standard needs to be clearly defined as a discharge to land by irrigation standard, and there should be acknowledgment that other standards, such as high rate systems, need to be developed. |
| Are the monitoring and reporting requirements proportionate to the potential impacts of the different discharge scenarios? | Groundwater monitoring can be onerous for large sites and terrain or groundwater with diverse downstream directions. The prescriptive approach is good but questionable if it is appropriate for varying land use and site conditions. |

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| Other feedback | It is unclear how these standards will be implemented:<br>• Will they be Regulations, NES/NPS, and/or Guidelines?<br>• How will these interact with Regional Plan Policies and Rules?<br>• Will the Regional Plan provisions be replaced, or only overridden in specific circumstances?<br><br>The example WWTP's described in the supporting material have errors which provide incorrect details of the schemes. This has the scope to led to conclusions and recommendations that are incorrect. Details provided require correction.<br><br>A number of WWTP's have been successfully consented in the last 10 years based on good or best practice that meet Regional Council Policies and RMA principles, yet they may not fully comply with the proposed standard. In particular, the hydraulic, pathogen, and nitrogen limits are different for these recently consented systems. It is unclear how these systems will be managed in the future, including expectations with modifications. This might be a rough ride for the community, given considerable investment has already been made. |
| **Biosolids Discharge to Land Standards** | |
| General comments | Relying on the draft Beneficial Use of Biosolids and other Organic Materials on Land (Good Practice Guide) 2024 is sensible and fully supported. This will rapidly implement the Guidelines instead of waiting until each Regional Council decides to prioritise Plan Changes to incorporate the Biosolids Guidelines. It will also ensure that all Regional Councils implement these Guidelines in the same way.<br><br>Our understanding is that sludge is not intended to be included in the Biosolids Guidelines, so in our view, it would be appropriate for opportunities to be created for sludge management. It would be beneficial if materials that did not meet the definition of biosolids, as set out in the Standards, are not precluded from opportunities for alternative management and consenting pathways i.e. application of fresh or unstabilised sludge into land. |
| What matters of control or restricted discretion should sit with consenting authorities to manage the reuse of biosolids? | Matters of control must be based on the Guidelines and may include other matters that relate to the management of potential effects on neighbours.<br><br>For lower grade biosolids and sludges, a similar land application site selection process to the land application process should be followed. Factors of control could be specified, including nutrient and contaminant loading rates (kg/ha/yr), buffer distances, application methods, vector reduction techniques, post application land use, and stock exclusion periods. |
| What should the permitted activity standards include? | Grade A1 biosolids applied to land in accordance with the Guidelines. The definition for "biosolids" needs to be nationally consistent and to match the Biosolids Guidelines' descriptions and exclusions. Some |

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| | Regional Plans exclude all human waste from their definitions of biosolids and/or their related land discharge rules. |
| How should contaminants of emerging concern in biosolids be addressed in the short-term? | Contaminants to be considered should match the approach suggested in the Biosolids Guidelines. The approach suggested is that, as evidence of adverse effects of emerging contaminants in soils and groundwater is generated, the Guidelines and Standards can be amended. The small portion of WWTP sludge that is discharged to land as biosolids instead of landfill means that this research and implementation is not urgent. Research is also likely to require years to complete robust risk assessments.<br><br>This most closely aligns with Option 1 in the consultation document. |