

To: Brittany Watson

From: Elizabeth Morrison

Company: Otago Regional Council

SLR Consulting New Zealand

cc:

Date: 11 July 2025

Project No. 875.V13600.00002

**RE: RM24.098 – WM New Zealand, Fairfield Closed Landfill
Ecology Technical Peer Review**

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1.0 Introduction

SLR Consulting NZ (SLR) has been engaged by Otago Regional Council (ORC) to conduct a technical review of the resource consent application (including subsequent attachments and request for information (RFI) responses) submitted by WM New Zealand (the applicant, WM) for the continued operation of activities associated with the aftercare period for Fairfield closed landfill (referred to herein as the site).

SLR completed an initial review of the application in April 2024 and identified a number of items requiring further clarification (Section 92). A response to the request for further information was provided by the applicant in June 2025.

I have reviewed ecological aspects of the application as outlined in the 'Technical Assessment of Effects on Groundwater, Surface Water and Ecology' prepared by PDP (dated February 2024), and relevant proposed conditions of consent. I have also reviewed the 'Fairfield Landfill Ecological Assessment' report (dated March 2025) provided as part of the S92 response.

2.0 Response

ORC posed the following questions which I respond to in turn in the table below:

Q44: Has the Technical Assessment of Effects on Groundwater, Surface Water and Ecology prepared by PDP identified all ecological values relevant to the site?
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The 'Technical Assessment of Effects on Groundwater, Surface Water and Ecology' clearly identified all receiving waterbodies adjacent to the site potentially impacted by the landfill. It provided descriptions of macrofauna, vegetation, fish and birds in these habitats but with strong emphasis on the Kaikorai stream and wetland-estuary complex. However, as it was based off a desktop assessment there was a lack of information on the Christies and Coal Creeks such that they were unable to ascertain the ecological values of these. The 'Fairfield Landfill Ecological Assessment' received as part of the S92 response provides a more thorough assessment and description of the site's ecological values including all waterbodies with field investigations completed.

Q45: Do you agree with the assessment of the overall ecological values for the Kaikorai Wetland-Estuary complex and the Kaikorai Stream and Christies Creek, and Coal Creek? Why/why not?

I agree with the assessment of the ecological values of the Kaikorai wetland-estuary complex and stream tributaries as very high and high respectively. As outlined in the PDP assessment this is due to the presence of threatened species in the case of the stream and wetland, in addition to the swamp being classified as a regionally significant wetland. The ecological assessment acknowledges the modification within these areas has reduced its representativeness. The rapid habitat assessments (RHA), macroinvertebrates (MCI), infauna, sediment and other assessments undertaken in late 2024 as part of the Ecological Assessment provide a detailed assessment of the freshwater and marine waterbodies surrounding the landfill. This gives a good understanding of current baseline conditions.

Q46: Do you agree with the assessment of the overall ecological values for the Kaikorai Wetland-Estuary complex and the Kaikorai Stream and Christies Creek, and Coal Creek? Why/why not?

No. Cumulative effects have not been discussed in the ecological assessment. Given the stage of the development with the landfill now at closure stage with no new direct ecological impacts cumulative effects are not a significant consideration for flora or fauna. Continued monitoring is proposed and recommended to determine any cumulative impacts on sediments and surface water quality (refer to the surface water quality technical review).

Q47: The Applicant has not concluded what the effects will be on ecology. In your opinion, is there any further investigations/ testing that could be completed to be able to conclude the actual and potential effects on ecology? Please be specific with your answer.

Ecological effects will mostly be associated with leachate discharge to the receiving freshwater and environments, namely the Christies/Coals Creeks and Kaikorai Stream and Lagoon. The ecological assessment indicates that leachate is likely impacting the receiving water bodies, as evidenced by high TAN concentrations, low pH and dominance of tolerant aquatic fauna communities closer to the site in comparison to higher diversity in the central estuary. They state that the dominance of pollution tolerant species is likely linked to environmental stress from sediment bound contamination.

The assessment in the Ecological Assessment provides suitable baseline data to assess flora and fauna in the receiving environment to track any changes over time and whether leachate is having ongoing impact on the species present. This monitoring programme has been expanded to include not just surface water monitoring sites in Kaikorai Stream and Lagoon but also to include the Coal and Christies Creek sites.

Q48: Is the proposed monitoring programme appropriate for establishing baseline conditions for Ecology? Please include reference to the appropriateness of the location, parameters and frequency. (Groundwater, Surface Water and Landfill Gas Monitoring Plan-Appendix 1).

Baseline ecology monitoring was undertaken in late 2024 which included habitat assessment, macroinvertebrates, fish survey, bird count and vegetation surveys. While initially ongoing monitoring was proposed annually for the first three years and 5 yearly thereafter this is no longer proposed. Ongoing monitoring focuses on surface sediment sampling for various nutrient and metal parameters, benthic infauna (in estuarine areas) and macroinvertebrate sampling (in the nearby streams).



The number of sites to be monitored does not include all of those initially surveyed. Including sites upstream of, or at the upstream extent of the landfill, including ongoing monitoring for all the baseline survey locations will aid in determining and separating out influences from the wider catchment and those that can be attributed to the landfill.

The parameters indicated above are to be monitored yearly. The draft conditions propose that ecological, surface water and groundwater monitoring continue until two years of environmental monitoring data shows that the risk of adverse effects from leachate is minimal. At this time the monitoring period will reduce or cease accordingly over time. This is appropriate as part of landfill management operations after closure provided that extended weather events/conditions in the two-yearly period (i.e. drought/floods that may otherwise influence any improvement) are taken into account before any reduction is considered.

The appropriateness of the groundwater and surface water monitoring is reviewed in the respective technical reviews. It is noted they recommend additional monitoring to better understand impacts on the landfill on the receiving environment.

Q49: Does the monitoring program or after-care plan have clear thresholds for when correction actions are required? If so, are these thresholds appropriate?

Sediment and water quality results were compared against ANZECC and ANZG (2018) guideline values in the Ecological Assessment, although comparison of results against similar threshold levels for contaminants has not been recommended or referred to in the proposed monitoring conditions.

Corrective action is proposed for any noted adverse change to groundwater, surface water and leachate. 'Adverse change' is not defined. It is appropriate that corrective action is undertaken should any degradation in monitored parameters be recorded. However, while the aftercare management plan mentions corrective actions it does not indicate what these may include, should they be required.

Refer to the groundwater and surface water technical specialists' review memos for the appropriateness of any monitoring thresholds and potential corrective actions proposed or recommended.

Q50: Should adverse effects on ecology be observed through the monitoring programme, are the proposed correction actions appropriate to address adverse effects? (Aftercare Management Plan, Appendix 2).

No. Corrective actions to remedy any adverse changes to groundwater, surface water and leachate will in turn be effective in addressing potential ecological effects on flora and fauna in the receiving environments. The monitoring of groundwater and surface water will allow actions to be undertaken before any further ecological impact is caused. However, while the aftercare management plan mentions corrective actions it does not indicate what these may include should they be required.

Q51: Has the Applicant proposed appropriate adaptive management and remedial measures to enable adverse effects identified through monitoring to be addressed?

The consent is related to aftercare activities associated with the landfill closure. Adaptive management is in the form of eventual decreases in monitoring as a decrease in discharge of contaminants is recorded over time. The aim is to eventually move from active to passive management as any discharges reduce to levels that can be considered innocuous. This is considered appropriate as the need for potential corrective actions (if any adverse changes are noted in groundwater surface water and leachate) should also reduce to the point that further management actions should not be required in the long term. If a reduction in contaminants is not observed corrective measures (to be determined) should also be integrated into aftercare management. Corrective actions have not been outlined in the proposal.

In the case of sea level rise, that has the potential to impact the landfill, additional monitoring and management may be required and should be integrated into the aftercare management plan accordingly.



Q52: Is the technical information provided in support of the application robust, including being clear about uncertainties and any assumptions? Yes, or no. If not, what are the flaws?

A thorough assessment has been provided based on a desktop assessment of the Kaikorai Stream, wetland and estuary receiving environment as there is a wealth of information and monitoring data available for these areas, as summarised in the initial technical report. The additional site monitoring undertaken in late 2024 as part of the ecological assessment provides a more detailed assessment of current status of the environment using industry recognised metrics. The ecological assessment clearly indicates the methods used, where data was collected from and how it was analysed. This has been used to better understand the current ecological values, has considered wider catchment influences and those impacts that are more likely to be attributed to the landfill. The scope and scale of the ecological assessment is considered appropriate for the size and scale of the proposal.

Q53: Are there any other matters that appear relevant to you that have not been included? Please specify what additional info you require and why? please explain.

No. All areas relevant to ecological impacts have been assessed based the results of both desktop and onsite assessments.

Q54: Is the proposed consent conditions appropriate (updated Appendix 8)? If not, please state why.

The conditions as proposed for ecology are sufficient to ensure that potential impacts on these are monitored.

Monitoring related to groundwater and surface water quality should be as outlined in other technical specialists' review memos.

It is important to ensure that should impacts be observed as part of monitoring that appropriate actions are undertaken to manage any observed adverse effects on the receiving environment. Thresholds to protect aquatic fauna (i.e. ANZ Guidelines - refer to recommendations in the groundwater and surface water technical review memos), need to be incorporated into the aftercare management plan. It is also suggested that a feedback loop is incorporated into the aftercare management plan and that potential corrective actions are outlined should these be required.

Regards,

SLR Consulting New Zealand



Elizabeth Morrison
Principal Ecologist

