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| TO: | Andrew Allsopp-Smith, Andrew Fawcet<br>Vineway Limited | Date: | 1 July 2025 |
| COPY TO: | Madeleine Wright | Document No: | 10122-009-1 |
| FROM: | Mark Delaney | | |

# DELMORE FAST TRACK APPLICATION - RESPONSE TO AUCKLAND COUNCIL FRESHWATER ECOLOGY QUERIES

## Background

Vineway Limited (Vineway) has applied for approvals under the Fast-track Approvals Act 2024 to develop approximately 109 ha of land as part of the proposed residential development 'Delmore', in Upper Orewa, Auckland ("the Site"). As part of the application, Viridis Limited (Viridis) prepared an Ecological Impact Assessment (EcIA) assessing the potential effects of the proposal on the receiving environment (Viridis 2025). In accordance with the fast-track process, Auckland Council (AC) has been engaged to review and comment on the application. Initial feedback on the EcIA and the proposal's potential environmental effects was provided in two technical memorandums prepared by AC (2025a, 2025b). AC reviewed subsequently issued a formal technical memorandum with updated freshwater ecology comments (AC 2025c).

This memorandum has been prepared by Viridis in response to the majority of issues raised by AC's technical freshwater ecology review. Relevant freshwater ecology queries from AC have been labelled in accordance with the Applicant Response Table and reproduced in italics below for ease of reference. Responses to the issues raised by AC not addressed in this memo are provided either in the Applicant Response Table or by other technical experts.

## Response to Queries

Freshwater Ecology (Streams and Wetlands

*Item 2: Potential additional reasons for consent: Progressive encasement*

*Consent as a Permitted Activity under the AUP(OP) rule E3.4.1(A32) is sought for culverts 1, 2, 7, and 10. The applicant notes that these culverts meet the standards in E3.6.1.18. However, standard E3.6.1.18(1) requires that the activity complies with standards E3.6.1.14. Standard E3.6.1.14(1)(c) requires that a new structure must not be erected or placed in individual lengths of 30m or less where this would progressively encase or otherwise modify the bed of a river or stream. When applying this standard on a site basis, none of the culverts comply with this standard. In particular, culvert 1 and 12 are placed across the same reach and I interpret this as progressively encasement. I consider that all culverts require consent as a Discretionary activity under rule E3.4.1(A44).*

We understand that AC's interpretation of the progressive encasement standard considers the site as a whole, rather than assessing effects at the level of individual stream reaches, regardless of the number or length of streams present within the site. While the requirement for consent has been addressed in the addendum to the Assessment of Environmental Effects (AEE), an assessment of effects in relation to progressive encasement is provided below for completeness.

There are approximately 7,800 m of stream length within the site, and 24 existing culverts. A total of 17 culverts are proposed for removal[1]. The removal of these 17 culverts will restore a combined length of 133.12 m of stream.

A total of 13 new culverts are proposed. To minimise adverse effects, all new culverts have been designed to be less than 30 m in length. The combined length of these new culverts is 289.77 m, resulting in a net increase of 156.65 m of culvert length compared to the existing situation.

When expressed as a proportion of the total stream length within the site, the proposed total new culvert length represents just 3.5%, which is considered a low magnitude of effect.

To mitigate potential effects, all new culverts, except culverts 7, 9, and 10, have been designed to be less than 30 m long, 1.3 times the stream width, and embedded by 25%. These design features support natural stream bed conditions, maintain habitat continuity, and provide for fish passage. Although culverts 7, 9, and 10 meet the length and embedment standards, they have not been designed to span 1.3 times the stream width due to their location in wide, flat sections of the stream where such design is impractical. However, fish passage is still considered appropriate in these locations.

Importantly, the removal of existing farm culverts and the improved design of the new culverts are expected to enhance fish passage across the site. In addition, riparian revegetation planting is proposed along all stream reaches. This will improve water quality, stabilise stream banks, regulate water temperature through shading, enhance native habitat, increase biodiversity, and strengthen resilience to both floods and droughts.

Overall, the residual adverse effects associated with progressive encasement are considered to be low, given the proportion of stream affected, the removal of existing culverts, the fish-friendly culvert design, and the comprehensive riparian restoration proposed.

*Item 5: Consent for the removal of constructed ponds (technically complying with the definition of a lake under the AUP(OP) is required under E3.4.1 (A49) New reclamation or drainage, is a Non Complying activity. Native fish capture and release as recommended in the conditions below will be sufficient to ensure that no residual adverse effect results from this activity. I further recommend that the location of ponds to be reclaimed be added to the plans.*

Auckland Council's interpretation of a lake under the RMA includes all constructed ponds, regardless of size, purpose, or history. Five constructed ponds have been identified on site (Figure 16 of the EcIA), all built for agricultural use. Four of these ponds, located in the upper ephemeral reaches of watercourses, are not considered natural inland wetlands under the National Policy Statement for Freshwater Management 2020 (NPS-FM). The northernmost pond, constructed within a permanent stream and wetland complex, is considered a natural modification.

Only two of the southwestern ponds are proposed for removal (Figures 35a and 36 of the EcIA). These ponds are of low ecological value due to their artificial nature, isolation, lack of native vegetation, poor water quality, small size, and limited habitat diversity, which restrict their ability to support diverse native aquatic species. Although they may support resilient native species such as shortfin eels (*Anguilla*

[1] The EcIA previously stated that 24 culverts would be removed, as it erroneously included culverts located outside of development area.

*australis*), mitigation measures, including a native fish capture and relocation plan and sediment controls, are proposed to address potential impacts.

Given their small size and shallow depth, these ponds do not function ecologically as lakes. Overall, their removal is expected to result in low ecological effects.

*Item 6: Consent for earthworks within 100m of natural inland wetlands that result in groundwater drawdown and consequently lead to hydrological changes to wetlands have not been discussed in this application. I note that significant groundwater drawdown is discussed in the Geotechnical assessment prepared by Riley Consultants Limited, dated 14/02/2025. This assessment has not been considered in the ecological assessment. I consider that consent may be required under the NES-F 45(c) (3) and (4) for earthworks, taking, use, damming, or diversion of water within, or within a 100 m setback from, a natural inland wetland as a restricted discretionary activity.*

Riley Consultants Limited (Riley) have provided an updated letter expanding their assessment of potential groundwater drawdown and its impact on wetland hydrology (Riley, 2025). They note that although groundwater drawdown will occur in the cut slopes above the wetlands, groundwater will continue to flow to the site's gullies throughout the year, ensuring no reduction in water reaching the wetlands. The development will not change the size of the water catchments, and all pre-development surface and groundwater will still be directed to the wetlands and gullies. Groundwater intercepted upslope by excavations and drainage systems will be discharged back into the wetlands at nearby points, using energy dissipation measures to minimise erosion. While some localised concentration of water may occur at these discharge points, the overall groundwater flow to the wetlands will be maintained.

Regarding surface water, the proposed stormwater management approach is designed to closely mimic existing catchment conditions (McKenzie & Co., 2025).

Based on the above, it is not expected that the wetlands will experience complete or partial drainage, nor changes to their water level range or hydrological function. Therefore, NES-F regulations 45(c)(3) and (4) do not apply.

*Item 8: The EcIA indicates thirty four natural inland wetlands, as per the NPS-FM definitions, identified within 100 m of the proposed activities. While earthworks will occur within the wetland catchments, earthworks are not expected to alter the size of the catchment significantly. Additionally, the wetlands within the Site are associated with the stream network, the stormwater approach for the Site mimics, as far as practicable, the existing catchments.*

*Based on the above, the EcIA notes that it is not expected that there will be complete or partial drainage of all or part of a wetland or that there will be a change to the water level range or hydrological function of the wetland. However, the Geotechnical report concludes that for Stage 1, a worst-case total drawdown of the groundwater table of 6m at cuts along the northern boundary, 5m in cuts in the northern portion of the eastern boundary and 2m-3m in the cuts along the southern portion of the eastern boundary and southern boundary will occur. For Stage 2, the worst case groundwater drawdown of 6m occurs along the southern boundary. Elsewhere, due to the proximity of rock to the ground surface the groundwater drawdown is limited to the top of the rock. The deepest being 5.2m (for approximately 3.2m of groundwater drawdown) along the southern part of the eastern boundary adjacent to Ara Hills. I further note that the geotechnical assessment lists various test sites which indicate shallow elevated soil moisture or shallow groundwater. I consider it important that the ecological assessment correlate with*

*the geotechnical data to confirm if hydrological changes to wetlands can be ruled out. I defer to Council's groundwater specialists for their assessment of groundwater matters.*

See response to Item 6 above.

*Item 10: I note that wetlands currently occur immediately upstream of 5 culverts that are earmarked for removal. I consider it likely that these wetlands will be drained as a result of removing the culverts. This has not been included in the assessment of effects or offset calculations.*

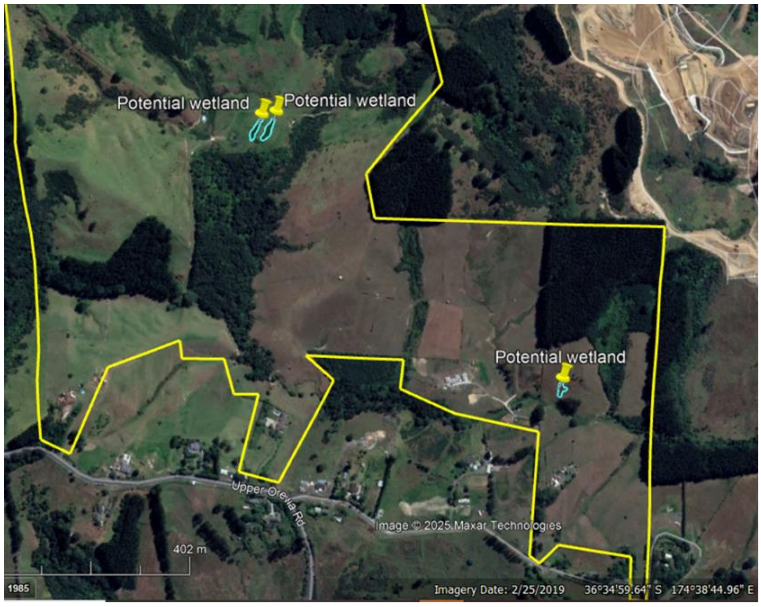
Wetland D is located upstream of proposed culvert 5, at the confluence of streams 38 and 39, within a low-lying floodplain area. This section of the site is relatively flat, with strong connectivity to both surface water and groundwater, supporting natural wetland formation. In contrast, the upstream channel is more confined, with steeper banks. Wetland D is considered to have formed through natural hydrological processes, primarily groundwater connectivity, rather than from water backing up behind culvert 5. Therefore, the removal of culvert 5 is not expected to affect the wetland's hydrology.

For completeness Williamson Water & Land Advisory (WWLA) has prepared a hydrological advice note addressing potential wetland dewatering during the construction and installation of five proposed culverts (1, 3, 7, 9, and 10) as well as the wetland dewatering during the removal of the related existing culverts (WWLA 2025a). The assessment concludes that the proposed culverts have been appropriately designed to avoid and minimise potential impacts on wetland hydrology, and that a natural bed is expected to establish over time.

*Item 10: Delineation and classification of freshwater features.*

*While I am in general agreement with the delineation and classification of wetlands and stream on the study site, I note that an area evidently saturated at the time of our site visit (13/05/2025), was not included in the wetland delineation. This feature is visible on the snip below indicates this area. I consider it likely that this area may meet the definition of natural inland wetland and an assessment as prescribed by the wetland delineation protocols set out by the MfE should be provided to confirm its status.*

*From Carly Hinde AC Principal Project Lead via email dated 28 May 2025: "please find enclosed the below mapping from Antoinette which indicates several areas where a high water table is visible, as discussed during the meeting. The Viridis assessment has satisfactorily addressed several of them, however, below are three areas that should be revisited."*



The two northernmost potential wetland areas are situated on top of a relatively steep hill. Both areas were dominated by kikuyu grass (*Cenchrus clandestinus*) and woolly nightshade (Solanum mauritianum), which are classified as facultative upland species (Figure 1). No facultative, facultative wetland, or obligate wetland species were observed, nor were any hydrological indicators present. Accordingly, these areas are not considered natural inland wetlands under NPS-FM.

***Figure 1. The two northern potential wetland areas on the left and right side of the phot. Photo taken facing southwest.***

The southeastern potential wetland is located in an area affected by recent slope instability. A site visit was undertaken on 6 June 2025 to carry out further assessments. In the three weeks preceding the visit, the area experienced significant rainfall, with more than 30 mm falling within a 24-hour period each week. April 2025 also saw several high rainfall events. Notably, over 50 mm of rain fell within 24 hours prior to the site visit, and an additional 2 mm fell on the day itself.

Given these conditions, the assessment was undertaken during abnormally wet conditions, following a prolonged period of elevated rainfall. As a result, the ground across the site was saturated. Due to this excessive surface water and ground saturation, hydrology was not considered a reliable wetland indicator for this site visit, and a formal hydrology assessment was not carried out.

Three vegetation and soil assessments were undertaken within the southeastern potential wetland area in accordance with the wetland delineation protocols (MfE 2022; Fraser 2018; MfE 2021) to assess the presence and extent of any potential natural inland wetland (Figure 2). The vegetation data for the three plots (Plots I, J, and K) are presented in Tables 1–3.

Plots I and J did not meet either the dominance test or the prevalence index test. In contrast, Plot K passed both tests.

Due to the recent slippage and the presence of early colonising species, the area is likely recently disturbed. As such, vegetation alone may not be a reliable indicator of wetland status under current conditions. Therefore, soils were assessed for hydric indicators in each plot.

Within Plot I, no peaty material was present. The soil throughout the top 400 mm was uniformly coloured 10YR 5/3 (Figure 4a), with no pale or dark low-chroma colours or mottling observed. The soil was therefore not considered hydric.

Within Plot J, no peaty material was observed. The top ~150 mm had a colour of 2.5YR 8/4, with the soil below (~150–400 mm) coloured 10YR 5/3 (Figure 4b). No pale or dark low-chroma colours or mottling were identified. These soils were also not considered hydric.

Within Plot K, no peaty material was present. The upper ~100 mm was 10YR 5/4, while the 100–400 mm layer was 10YR 5/2 when broken apart, showing pale low-chroma characteristics (Figure 4c). Extensive mottling was also observed (Figure 4d). These features are consistent with hydric soils.

The soil assessment results align with the vegetation assessments with Plots I and J are not being considered natural inland wetlands, while Plot K meets both vegetation and soil criteria for classification as a natural inland wetland. With the inclusion of Plot K, the total number of wetlands identified within the site is now 35.

Plot K is situated on a flatter area within the stream floodplain, unlike the other two plots. It is likely that hydrology in this location is primarily influenced by stream and groundwater connectivity, rather than surface runoff. Both Plot K and the area around Plot J are located outside of the proposed earthworks footprint (Figure 2).


***Figure 2. Location of the additional wetland assessments within the site (2025 aerial imagery).***

a)

b)

c)

d)

***Figure 3. Photos of a) the potential wetland area and assessment plots b).I, c) J and d) K.***

***Table 1. Vegetation Plot I Data***

| Binomial name | Common name | Rating | Biostatus | Cover (%) | Dominant |
|---|---|---|---|---|---|
| *Holcus lanatus* | Yorkshire fog | FAC | Exotic | 40 | Yes |
| *Ranunculus repens* | Creeping buttercup | FAC | Exotic | 15 | Yes |
| *Plantago lanceolata* | Narrow-leaved plantain | FACU | Exotic | 15 | Yes |
| *Cenchrus clandestinus* | Kikuyu | FACU | Exotic | 15 | Yes |
| *Lolium perenne* | Perennial ryegrass | FACU | Exotic | 10 | |
| *Paspalum dilatatum* | Paspalum | FACU | Exotic | 10 | |
| *Agrostis stolonifera* | Creeping bent | FACW | Exotic | 10 | |
| *Juncus effusus* | Soft rush | FACW | Exotic | 5 | |
| *Ulex europaeus* | Gorse | FACU | Exotic | 3 | |
| *Lotus pedunculatus* | Lotus | FAC | Exotic | 2 | |
| *Hypochaeris radicata* | Catsear | FACU | Exotic | 2 | |
| *Solanum nigrum* | Black nightshade | FACU | Exotic | 1 | |
| **% of dominant species that are FAC/FACW/OBL** | | | | | **50%** |
| **Prevalence value** | | | | | **3.3** |

***Table 2. Vegetation Plot J Data***

| Binomial name | Common name | Rating | Biostatus | Cover (%) | Dominant |
|---|---|---|---|---|---|
| *Holcus lanatus* | Yorkshire fog | FAC | Exotic | 45 | Yes |
| *Ranunculus repens* | Creeping buttercup | FAC | Exotic | 20 | Yes |
| *Plantago lanceolata* | Narrow-leaved plantain | FACU | Exotic | 10 | Yes |
| *Paspalum dilatatum* | Paspalum | FACU | Exotic | 10 | Yes |
| *Agrostis stolonifera* | Creeping bent | FACW | Exotic | 8 | |
| *Cenchrus clandestinus* | Kikuyu | FACU | Exotic | 3 | |
| *Lolium perenne* | Perennial ryegrass | FACU | Exotic | 3 | |
| *Juncus effusus* | Soft rush | FACW | Exotic | 3 | |
| *Lotus pedunculatus* | Lotus | FAC | Exotic | 3 | |
| *Juncus articulatus* | Jointed rush | FACW | Exotic | 2 | |
| *Cyperus eragrostis* | Umbrella sedge | FACW | Exotic | 2 | |
| **% of dominant species that are FAC/FACW/OBL** | | | | | **50%** |
| **Prevalence value** | | | | | **3.1** |

***Table 3. Vegetation Plot K Data***

| Binomial name | Common name | Rating | Biostatus | Cover (%) | Dominant |
|---|---|---|---|---|---|
| *Agrostis stolonifera* | Creeping bent | FACW | Exotic | 40 | Yes |
| *Holcus lanatus* | Yorkshire fog | FAC | Exotic | 20 | Yes |
| *Ranunculus repens* | Creeping buttercup | FAC | Exotic | 15 | |
| *Isolepis prolifera* | N/A | OBL | Native | 15 | |
| *Plantago lanceolata* | Narrow-leaved plantain | FACU | Exotic | 5 | |
| *Juncus articulatus* | Jointed rush | FACW | Exotic | 3 | |
| *Paspalum dilatatum* | Paspalum | FACU | Exotic | 2 | |
| *Cenchrus clandestinus* | Kikuyu | FACU | Native | 2 | |
| *Juncus effusus* | Soft rush | FACW | Exotic | 2 | |
| *Cyperus eragrostis* | Umbrella sedge | FACW | Exotic | 2 | |
| **% of dominant species that are FAC/FACW/OBL** | | | | | **100%** |
| **Prevalence value** | | | | | **2.4** |

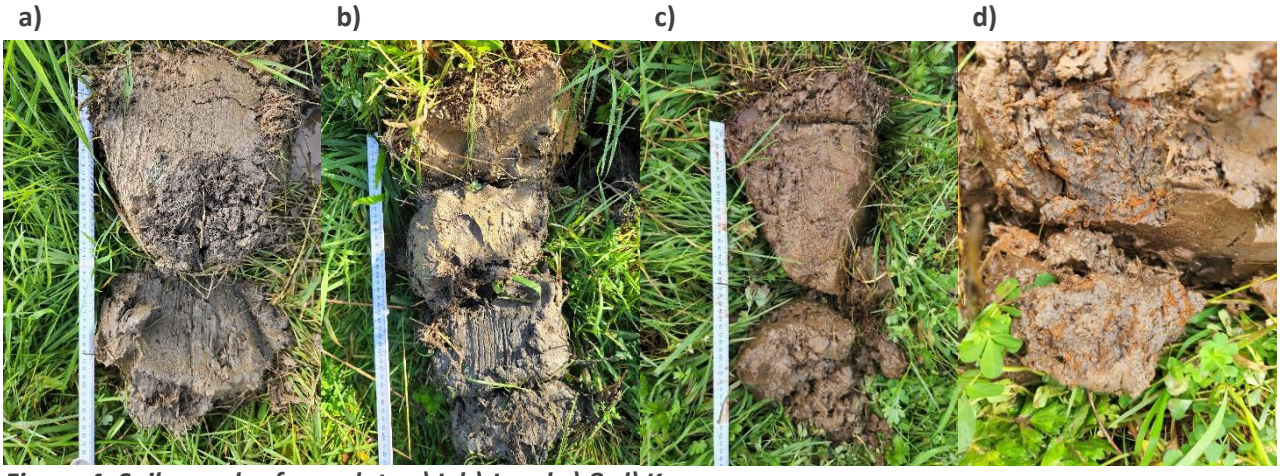



***Figure 4. Soil samples from plots a) I, b) J and c) & d) K.***

*Item 10: Offset for wetland loss*

*The application proposes to defer the wetland assessment to conditions of consent. No motivation is provided for the proposed 3:1 offset ratio as opposed to the more rigorous BOAM offset calculation which is based on site specific calculations. I further note that delivery of part of the NoR 6 arterial road is specifically relevant to offsetting of freshwater habitats proposed in this application. However, the application documents do not provide any information about how the proposed offsetting is integrated with NOR requirements. Essentially, the assessment of offset provided in this application is not able to be shown to be aligned with Appendix 6 of the NPS-FM, principles for aquatic offsetting.*

The EcIA provide details on the proposed impact on wetlands and are summarised below.

Earthworks are required within wetlands for the installation of five of the thirteen proposed culverts (culverts 1, 5, 7, 9, and 10). All culverts are designed to be less than 30 m wide and embedded to reinstate a natural bed. Wetland modification will generally be temporary, except for culvert 7 (associated with NoR6) and culvert 9, where permanent alteration is needed to retain upstream wetland habitat. While wetland soils are expected to establish within the culverts and wetland hydrology function preserved, wetland vegetation is not expected to persist within the culverts. Culvert 7 will result in permanent wetland removal.

WWLA has prepared a hydrological advice note (WWLA 2025a) assessing the potential for wetland dewatering during the construction of the five proposed culverts, as well as the likely formation of a natural bed within the embedded culverts. The assessment concludes that the culverts have been appropriately designed to avoid and minimise potential impacts on wetland hydrology, and that a natural bed is expected to establish over time.

The total wetland disturbance is 1,086 m², comprising 277 m² of permanent and 809 m² of temporary disturbance. Within Stage 1, 748 m² will be disturbed (including all permanent loss), and 338 m² will be disturbed in Stage 2. This equates to approximately 5% of the total 22,166 m² of wetland habitat within the site. The magnitude of effect prior to mitigation is considered moderate.

All affected wetlands are similar in type, composed primarily of common exotic rushes, sedges, and grasses, and associated with seepage or stream margins. The wetlands also had similar habitat features, generally lacking indigenous flora biodiversity, structural tiers, and aquatic habitat. They are located within the same catchment (Ōrewa River) and have low to moderate ecological value due to limited biodiversity and structural complexity.

Stormwater and groundwater management will mitigate the functional loss (e.g., attenuation, nutrient capture), but the residual loss of extent and ecological value is considered significant residual effect. To offset this, new wetlands are proposed to be created at a 3:1 ratio, with 2,244 m² established in Stage 1 and 1,014 m² in Stage 2. All new wetlands will include a minimum 10 m wide buffer of planted vegetation, will be located in the same catchment, and will aim to reconnect historic wetland areas to enhance ecological function connectivity and resilience.

WWLA undertook hydric soil and wetland hydrology tool assessments at the proposed wetland offset sites to evaluate the feasibility of wetland creation from a hydrological perspective. The assessment concluded that, with minor interventions such as the construction of bunds where needed, all proposed offset areas are capable of supporting wetland hydrology, enabling the establishment of wetland vegetation, and promoting the development of hydric soils.

A 3:1 offset ratio was proposed as a conservative measure. Based on previous experience, creating new wetlands at this ratio (rather than enhancing existing ones) is more than sufficient to achieve a net ecological gain. However, to ensure completeness and transparency, a Biodiversity Offset Accounting Model (BOAM) was also used to demonstrate the expected ecological benefits.

The Wetland Ecological Valuation (WEV) method was used for the BOAM. WEV is a simplified equivalent of the Stream Ecological Valuation (SEV) tool and was developed by RMA Ecology in collaboration with Auckland Council. It provides a framework for quantifying the ecological value of wetlands and allows for comparisons between wetland sites within a region.

The WEV assesses 29 components across 20 wetland attributes, grouped into three main categories: catchment, wetland, and buffer. These components are processed using a series of formulas to produce a score ranging from 0 (severely degraded with no ecological value) to 1 (pristine wetland with very high ecological value).

This methodology has previously been applied to a project in Drury West involving wetland reclamation of a similar scale and condition, and was also accepted by Auckland Council for two other Milldale stages in 2021 (BUN60366520) and 2024 (BUN60427756). Based on this precedent, the WEV method was considered appropriate and applicable for this project. Summarised WEV scores are attached to this memorandum.

**Impact Sites**

Due to their similar characteristics, all affected wetlands were treated collectively for offsetting purposes and are hereafter referred to as the 'impact wetland'. When assigning values to components within the WEV for this collective area, a conservative approach was taken by either using the highest value recorded among the individual wetlands. Although 809 m² of the disturbance is considered temporary and only 277 m² permanent, a conservative approach was adopted and the total disturbed area of 1,085 m² was treated as reclamation to account for and potential loss of wetland value and extent.

The impacted wetland had a current WEV score of 0.543 and a potential score of 0.708. The potential score was also calculated, assuming current wetland enhancement and protection best practice measures which includes a 10 m planted riparian buffer, stock fencing and pest plant control. The development proposes to reclaim the wetland areas, therefore the impact WEV score for the impacted wetlands is 0.

**Offset Sites**

The offset sites are located in the same catchment as the impact sites; the Ōrewa river catchment. The proposed offset wetlands will be created within low lying areas or within ephemeral overland flow paths and adjacent to existing degraded wetlands and a stream network. Similar to the impact wetland, the adjacent wetlands have been highly modified through agricultural practices, there is a lack of structural tiers, a very high dominance of exotic species and lack of aquatic habitat. Historical agricultural practices have severely impacted these wetlands through pugging and grazing.

The locations of the offset areas were selected because they lie within the same catchment as the impact site, avoids streamworks, and utilises the natural overland flow paths or natural low points as a collection point for surface runoff. Additionally, they will contribute to a broader catchment-focused enhancement plan and offer wetland habitat and functions comparable to those of the impact site.

Due to their similar characteristics, all offset wetlands were treated collectively for offsetting purposes and are hereafter referred to as the 'offset wetland'. When assigning values to components within the WEV for this collective area, a conservative approach was taken by using the lowest value considered among the individual wetlands.

The proposed offset wetland will be formed to create 3,258 $m^2$ of new wetland habitat. There are no natural wetlands in these areas at present, and the plant community is dominated by pasture and weed species. As such, the current WEV score for this area was 0 (i.e., no wetland values currently present).

The new offset wetland has a potential WEV score of 0.670. The potential score was calculated, assuming the proposed enhancement actions are undertaken. These enhancement actions include extending/joining the adjacent wetlands, planting of the wetlands with appropriate native species, planting a 10 m buffer with appropriate native species, weed and pest control, fencing and legal protection (e.g., covenant).

**Extent offset**

A total of 1,085 $m^2$ of wetland is proposed to be reclaimed at the impact site, while 3,258 $m^2$ of new wetland is proposed to be created at the offset site. To support the growth of native hydrophytic vegetation, the offset wetlands have been designed to establish or enhance wetland hydrology, either through minor interventions such as bund construction, or by situating them in areas where natural wetland hydrology already exists (WWLA 2025b).

The newly created wetland will offset for the loss of wetland area at the impact site, ensuring at least no net loss of wetland extent. Moreover, it will result in a net gain of 2,173 $m^2$ of wetland habitat.

**Value Offset**

As part of the BOAM, the Auckland Council's technical report TR009 guidelines for calculating an Environmental Compensation Ratio (ECR) were incorporated using the WEV scores. This ensures that adverse effects are mitigated, achieving a 'no-net-loss' of biodiversity values.

The ECR calculation = [(WEVi-P – WEVi-I)/(WEVm-P – WEVm-C)] x 1.5, where:

WEVi-P = Impact wetland potential WEV Score (0.708);

WEVi-I = Impact wetland impact WEV Score (0);

WEVm-P = Offset wetland potential WEV Score (0.670);

WEVm-C = Offset wetland current WEV Score (0); and

The x '1.5' is the multiplier to account for delay and uncertainty.

The creation and planting of the new wetland at the offset site will offset the loss in ecological value at the impact site. The WEV/ECR calculations regarding the impact site and the created offset wetlands are provided below in

Table ***4***.

***Table 4. WEV/ECR calculations for the impact wetland and the created offset wetland.***

| Variable/calculation | Impact wetland | Offset wetland |
|---|---|---|
| Wetland area ($m^2$) | 1,085 | 3,258 |
| Wetland perimeter (m) | 406* | 557† |
| Existing WEV state | 0.543 | 0 |
| Potential WEV state | 0.708 | 0.670 |
| State after impact | 0 | N/A |
| | | |
| WEV ECR (multiplier) | 1.59 | |
| **Wetland area required ($m^2$)** | **1,719.85** | |

* Perimeter based on the highest (i.e., best) perimeter to area ratio for all individual impacted wetlands.
† Perimeter based on the lowest (i.e., worst) perimeter to area ratio for all individual offset wetlands.

Based on the ECR calculations, 1,719.85 $m^2$ of new wetland habitat would be required to be created to appropriately offset the ecological values lost at the impact site, ensuring at least no net loss of wetland value. Since a total of 3,258 $m^2$ of new wetland habitat is proposed, a net gain of 1,538.15 $m^2$ of wetland habitat will be achieved regarding ecological value. Further, once established, the native wetland vegetation will provide higher ecological value to native fauna than the exotic-dominant wetlands being lost.

**Biodiversity Offsetting Principles**

Regarding the key biodiversity offsetting principles which are incorporated into Appendix 8 of the AUP-OP, the following comments are provided:

- **Mitigation Hierarchy** – As a result of the proposed scheme plan and bulk earthworks proposal, there are unavoidable impacts on the existing low value wetlands. Adverse effects have been mitigated in part by mitigating the loss of the wetlands' functional roles of flood attenuation and nutrient capture through stormwater and groundwater management. However, there will still be a significant residual loss of wetland extent and ecological value as a result of the reclamation, which the proposed offset addresses to a minimum no-net loss level.
- **Additionality** – Outside of this proposal to create a new wetland for offsetting, there are no requirements or other plans to create new wetland within the offset site. Therefore, the proposed offset site and the work within it to provide the necessary enhancements, satisfies the additionality test.
- **Landscape Context (Proximity)** – Offset actions are located within the application site and within the same catchment as the impact site.
- **"Like for Like"** – Once the offset wetland is established, both the impact and offset wetlands will be of a similar nature. Both wetland areas will be within the Ōrewa River catchment, will have similar structural tiers, will be associated with stream habitat and have a comparable hydrological regime.

- **No net loss and preferably a net gain** – Through the creation of new wetland habitat there will be a no net loss in wetland extent, in fact there will be net gain (2,173 $m^2$). The previously accepted WEV/ECR methodology was applied as part of the calculation process to offset lost ecological value. The WEV/ECR includes consideration of the current and future states of the impact and offset site, including accounting for risk, uncertainty and time lag (i.e., through a 1.5 x multiplier). The overall result will be at a minimum a no-net-loss to redress the potential ecological values lost at the impact site. In fact, the additional creation of 1,538.15 $m^2$ (above the required 1,719.85 $m^2$) will provide for a net biodiversity gain.

**Recommendations**

It is recommended that a detailed wetland offset plan is to be prepared as a condition of consent to ensure successful establishment of a native wetland ecosystem. This wetland offset plan should be prepared in collaboration with a suitably qualified ecologist, hydrologist and engineer, in general accordance with this report, the Final Landscape Plans prepared by Greenwood Associates and the hydrological assessment prepared by WWLA (2025b), and include the following minimum details:

- Area proposed for wetland creation at a minimum 3:1 ratio
- Works to ensure a wetland hydrology is created and maintained
- Planting schedule, including species, density and grade
- Legal protection (e.g., consent notice)
- A five-year maintenance and monitoring plan to ensure the wetland and it's planting is successfully established
- Measure to undertake if the wetland or plantings is not successful

**Attachments:** Summarised WEV scores

## References

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WWLA 2025a. Delmore Subdivision: Response to Council's Questions Regarding Wetland Hydrology. An advice note prepared for Vineway Limited by Williamson Water & Land Advisory. 30 June 2025. Document No: WWLA1147.

WWLA 2025b. Wainui Subdivision Wetland Assessment - Hydric Soil & Hydrology Tool Assessments. 1 July 2025. Document No: WWLA1147.

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***Wetland Ecological Valuation summary data for project site.***

| Component | Attribute | WEVi-C Average Score | WEVi-P Average Score | WEVi-I Average Score | WEVm-C Average Score | WEVm-P Average Score |
|---|---|---|---|---|---|---|
| Catchment | Land use affecting catchment hydrology | 3.00 | 3.10 | 0.00 | 0.00 | 0.80 |
| Catchment | Diversion of flows | 5.00 | 5.00 | 0.00 | 0.00 | 5.00 |
| Catchment | Water quality in catchment | 2.00 | 4.00 | 0.00 | 0.00 | 4.00 |
| Catchment | Mammalian predators in catchment | 1.00 | 2.00 | 0.00 | 0.00 | 2.00 |
| Catchment | Key undesirable plants in catchment | 1.00 | 4.00 | 0.00 | 0.00 | 4.00 |
| Catchment | % impervious surfaces in catchment | 5.00 | 4.00 | 0.00 | 0.00 | 2.00 |
| Catchment | % catchment in vegetation of any sort | 5.00 | 3.00 | 0.00 | 0.00 | 1.00 |
| Catchment | Degree of runoff control – flood and first flush | 0.00 | 4.00 | 0.00 | 0.00 | 4.00 |
| Catchment | Wetland connections | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 |
| Wetland | Size and shape | 1.00 | 1.00 | 0.00 | 0.00 | 0.50 |
| Wetland | Change in hydrology | 3.67 | 3.67 | 0.00 | 0.00 | 3.67 |
| Wetland | Change in water/ soil quality or state (physico chemical parameters) | 3.50 | 4.50 | 0.00 | 0.00 | 4.50 |
| Wetland | Change in ecosystem intactness | 4.33 | 4.33 | 0.00 | 0.00 | 4.33 |
| Wetland | Change in amount of animal damage and harvest by humans | 2.33 | 3.67 | 0.00 | 0.00 | 3.67 |
| Buffer | Change in dominance of native plants | 0.00 | 2.00 | 0.00 | 0.00 | 3.00 |
| Buffer | Animal damage | 2.50 | 5.00 | 0.00 | 0.00 | 5.00 |
| Buffer | Weeds | 2.50 | 5.00 | 0.00 | 0.00 | 5.00 |
| Buffer | Canopy dieback | 5.00 | 5.00 | 0.00 | 0.00 | 5.00 |
| Buffer | Buffer | 2.50 | 2.50 | 0.00 | 0.00 | 2.50 |
| Overall Mean Score | | 2.72 | 3.54 | 0.00 | 0.00 | 3.35 |
| Maximum attainable Score | | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| **Wetland Condition (WEV score)** | | **0.543** | **0.708** | **0.000** | **0.000** | **0.670** |