BEFORE THE FAST-TRACK EXPERT CONSENTING PANEL

IN THE MATTER of an application for approvals under section 42 of the Fast-track Approvals Act 2024 (the Act)

AND

IN THE MATTER of the application for approvals by Pukerua Property Group Limited Partnership for the Mt Welcome Project, Pukerua Bay, Porirua (FTAA-2603-1181)

JOINT STATEMENT OF EXPERTS IN THE FIELD OF ENGINEERING

(Stormwater, wastewater, earthworks management and water supply infrastructure)

Dated: 21st August 2026

INTRODUCTION

Expert conferencing on stormwater, wastewater, earthworks management and water supply infrastructure matters took place by Microsoft Teams videoconference on 20 August 2026, with a further session on 21 August 2026.

The conference was attended by:

- Kyle Dirse (Applicant)
- Katy Grant (Applicant) - 20 August 2026 session only
- James Blyth (Greater Wellington Regional Council)
- Andrés Roa (Greater Wellington Regional Council)
- Gregor McLean (Southern Skies Environmental Limited, engaged by Greater Wellington Regional Council - Minute 10 nominee, sediment matters)
- David Wilson (Tiaki Wai)
- Zeean Brydon (Tiaki Wai)

Darcy Brittliff (Orogen) acted as facilitator.

Darcy Brittliff (Orogen) assisted the experts to draft the Joint Witness Statement, as scribe.

CODE OF CONDUCT

The experts confirm that they have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023 and agree to comply with it.

The experts confirm that the issues addressed in this Joint Witness Statement are within their area of expertise, unless stated otherwise.

SCOPE OF STATEMENT

This Joint Witness Statement responds to the directions of the Expert Panel in Minute 9 (12 August 2026), paragraphs 7 to 10, and Minute 10 (13 August 2026), in relation to stormwater, wastewater, earthworks management and water supply infrastructure matters for the Mt Welcome Project.

Prior to attending the conference we each read the relevant parts of the Application, the evidence and independent reports prepared by the other expert(s) and circulated. The issues are set out in the List of Issues below.

In relation to each issue we discussed points of agreement and disagreement in relation to:

- Facts;
- Assumptions;
- Areas of uncertainty or lack of information; and
- Expert opinions / conclusions.

In this Joint Statement we report the outcome of our discussions in relation to each issue by reference to points of agreement and disagreement relating to facts, assumptions, uncertainties and expert opinions / conclusions. We have noted where each of us is relying on the opinion or advice of other experts. Where we are not agreed in relation to any issue, we have set out the nature and basis of that disagreement.

No Conditions of Consent were discussed in caucus.

LIST OF ISSUES

Consistent with the Panel's direction that experts prioritise agreement, or narrowing of disagreement, on the matters below (Minute 9, paragraph 9; Minute 10, paragraph 4), the issues are addressed in the following order:

- 1. Sediment source and yield from earthworks, subsequent house-building activity and open water courses between stormwater discharge headwalls and the “retention” wetlands (Minute 10, para 4; Minute 9, 9(e))
- 2. Sediment removal facilities at the retention devices (Minute 10, para 4; Minute 9, 9(g))
- 3. “Retention” wetland operation and maintenance access (Minute 10, para 4; Minute 9, 9(f))
- 4. Stormwater modelling and effect on downstream flood ponding (Minute 9, 9(a))
- 5. Achievability and scale of additional on-site retention to mitigate any downstream flooding effect (Minute 9, 9(b))
- 6. On-lot storage / recycle tanks (Minute 9, 9(c))
- 7. Rain garden design criteria (Minute 9, 9(d))
- 8. Wastewater modelling and risk of downstream reticulation overflows (Minute 9, 9(h))
- 9. Onsite wastewater detention operation and septicity risk (Minute 9, 9(i))

ISSUE 1: SEDIMENT SOURCE AND YIELD FROM EARTHWORKS, SUBSEQUENT HOUSE-BUILDING ACTIVITY, AND OPEN WATER COURSES BETWEEN STORMWATER DISCHARGE HEADWALLS AND THE "RETENTION" WETLANDS

Reference: Minute 10, para 4; Minute 9, 9(e)

Experts abstained: None

Panel's question: *The Panel has framed the specific issue for the scale of potential sediment load into the retention wetland systems, and potential continuation downstream to the Taupō Swamp environment and/or Pāuatahanui Inlet, after completion of earthworks, noting several sections of open stream between the stormwater piped system outlets and the retention wetland systems, and steep hillsides potentially prone to erosion, scour and/or slippage. Can the experts discuss the extent (if any) these additional potential sources of sediment could contribute to downstream sediment load, and whether this would impact on the operation and maintenance of the retention wetland systems.*

Facts

The following facts are agreed:

- Four sediment sources are agreed: (i) roads and roofs (developed impervious areas); (ii) erosion of open watercourse sections between the piped outfalls and the retention wetlands; (iii) existing hill slopes and catchments draining to the wetlands; and (iv) ongoing farming activity, including areas where land use is not changing.
- Two phases are distinct for assessment purposes: the post-bulk-earthworks/house-building phase, and the long-term post-development operational phase.
- Roads/roofs (source (i)): rain gardens are designed to intercept and treat road and roof runoff before it reaches the retention wetlands, targeting approximately 75% TSS removal where designed to Tiaki Wai / GWRC standards, with some residual sediment inevitably passing through. Approximately 95%of outlets route through rain gardens; 7 proprietary treatment devices are used where a rain garden was not feasible. In each case outlets maintain flow to mapped wetlands. This source is agreed to be mitigated as well as practicable, subject to confirmation of rain garden design adequacy (Issue 7).
- Outfalls to wetlands down steep gully slopes (source (ii)): agreed as a real and currently unresolved risk. The outlets are located partway up the gully slopes (rather than at the base) specifically to deliver flow to mapped wetlands without imposing on the footprint of these wetlands; standard riprap aprons are proposed at the outlets, with bubble-up structures considered as options with the aim to create diffuse flow at the outlet itself. But it is agreed that these flows could reconcentrate over the distance of the gully, potentially triggering erosion risks downstream of the discharge point. No hydrological control is proposed in the developed catchment upstream of these outlets.
- Existing hill slopes and ongoing farming (sources (iii) and (iv)): the sediment load from existing hill slopes is expected to reduce following removal of cattle/deer and revegetation, but the following gaps are agreed as relevant: areas shown as "Land Left to regenerate" ("grey") on the planting plan (Appendix 23 - Landscape Plan Part A & B, fig. L2.22) are to be left to naturally revegetate, with an agreed risk of gorse colonisation; Wetland B has several hundred metres of unplanted upstream watercourse; Wetland C's entire upstream grey area remains open pasture draining to the wetland; Wetland E receives minimal enrichment planting and continues to receive offsite load from the Muri block; and Lot 5003 will continue to be farmed (deer/wapiti), with potentially stock access continuing upstream of Wetland E, in a catchment where stream banks are already slumping under current deer farming.
- A Commissioning Plan for the build out phase setting out how the rain gardens/wetlands are protected during construction and allowing for an 80% build-out trigger point (discussed as a reference point, not yet formally agreed) at which requirements could be adjusted as the development matures will provide a management mechanism for sediment management during this phase of the development.

- It is agreed that the existing model is a water balance model to assess changes to the wetlands and downstream hydrology; it is not suitable for an assessment of short-term micro-scale scour effects on site to quantify sediment movement.

We do not agree on the following facts:

- What engineering response (if any) is appropriate at the outfalls remains unresolved - options raised (lowering outlets to the base of catchments/an ephemeral watercourse, relocating outlets, hydrological control measures) have not been agreed to mitigate erosion across the various events. The constraint against this agreement is that the current outlet locations were chosen to provide flow to serve the wetlands and remain outside of (uphill of) these footprints. Similarly, the concept of extending vegetation areas into the grey areas designated "Left to naturally revegetate".
- The engineering response is to achieve both water balance for wetlands and manage scour and erosion.
- The Applicant believes mitigation measures in place are fit for purpose.
- GWRC/Tiaki Wai believe sediment loading is a risk to the receiving environments (including wetlands) and the development would benefit from additional mitigation measures, including but not limited to hydrological control, and erosion controls downstream of the piped outfalls.

Assumptions

We agree on the following assumptions in relation to this issue:

- The assessment should distinguish the post-bulk-earthworks/house-building phase from the long-term post-development operational phase, as sediment generation mechanisms differ between the two.
- Rain gardens are not, and are not assumed to be, 100% effective at sediment removal; some residual sediment load from roads/roofs will reach the wetlands regardless of design standard achieved.

We do not agree on the following assumptions:

- None.

ISSUE 2: SEDIMENT REMOVAL FACILITIES AT THE RETENTION DEVICES

Reference: Minute 10, para 4; Minute 9, 9(g)

Experts abstained: None

Panel's question: *Some of the retention wetland systems receive inflow from different sub-catchments discharged in different locations into the basin containing the retention wetland structure. Can the experts discuss if pre-treatment and/or forebay provision is required on these systems and, if so, how that might work where there is more than one discharge location into a system.*

Facts

The following facts are agreed:

- It is our understanding that the development relies upon the "retention" wetlands being restored ecological offset wetlands.
- If stormwater maintenance and inspection activities were required these must be outside of ecological offset wetlands.
- A 4m all-weather access track to every individual gully-head outlet is not feasible, and that only the main primary outlets will have compliant access tracks.
- If a sediment forebay is required, the forebay and its access needs to be outside of the offset wetland area. James Blyth confirmed that once vested as an ecological offset wetland no digger work is permitted without consent.

We do not agree on the following facts:

There are two positions on whether forebay are required or not:

- The Applicant's position (Katy Grant/Kyle Dirse) is that a forebay is not required, on the basis that the wetlands are designed to accommodate sediment inflow: a literature-based assessment (with caveats) indicates a minimum of 35 years, and more realistically 3-8 decades, before sediment meaningfully affects storage below the outlet (included in PDP response to reviewer comments dated 6 August 2026). Modelling of the wetlands showed that dense vegetation and sediment fill do not compromise pond functionality for peak flows and volumes. This assessment has not been provided for review at this stage.
- GWRC (Gregor, Andrés)/Tiaki Wai's position is that a forebay is a key element of any detention systems such as the wetlands proposed and is specifically required under Tiaki Wai's water sensitive design guidelines. Without one, sediment accumulates, capacity reduces over time, and there is a risk of contaminant resuspension in large events. A forebay is significantly easier to maintain than the full wetland body, providing a single accessible sediment-removal point.
- Tiaki Wai's position is that a forebay and its access is essential if Tiaki Wai is to vest and operate these as stormwater assets, but this is complicated by consent status: sediment cannot be excavated from an area designated as ecological offset without consent, so any forebay area would need to be legally excluded from the ecological offset calculation.
- Whether planting of currently unplanted grey/steep pasture areas is an adequate alternative or complement to a forebay (James's ~90% reduction figure) has not been tested or agreed by the other parties.
- The legal mechanism (if any) for excluding a forebay/stormwater maintenance area from the ecological offset calculation has not been agreed or resolved as it is beyond the scope of the Experts.

Assumptions

We agree on the following assumptions in relation to this issue:

- It is our understanding that the development relies upon the "retention" wetlands being restored ecological offset wetlands.

We do not agree on the following assumptions:

- None.

ISSUE 3: RETENTION WETLAND OPERATION AND MAINTENANCE ACCESS

Reference: Minute 10, para 4; Minute 9, 9(f)

Experts abstained: None

Panel's question: *The current concept designs for the retention wetlands appear to have limited facilities for access for future operation and maintenance, and less than that required by Tiaki Wai. Can the experts discuss to what extent the preliminary design can be improved to provide appropriate access.*

Facts

The following facts are agreed:

- A 4m compliant access track to the wetland outlets is feasible. Providing a 4m compliant access to every individual gully-head outlet is not feasible due to the topography.
- Stormwater management structures and their access tracks must be outside of ecological offset areas. We have identified that this is not reflected on the current the ecological planting plans (Appendix 23).

We do not agree on the following facts:

- Tiaki Wai's position is that it will not vest an ecological wetland. Tiaki Wai's role is limited to stormwater conveyance, treatment, and flood management, and Tiaki Wai has significant concerns about managing stormwater within an area subject to ecological covenants and monitoring conditions. Whether the wetlands should be classified and vested as stormwater management wetlands or offset (ecological) wetlands is not agreed and is treated by Tiaki Wai as a precondition to agreeing Operation &Maintenance access requirements.
- The Applicant's position is that the wetlands provide stormwater functions (peak-flow attenuation) and ecological offset functions. The wetlands have been designed to accept sediment without reliance on routine desilting or maintenance of the wetland body, and maintenance access has been provided to the key stormwater structures (the primary outlets controls).

Assumptions

We agree on the following assumptions in relation to this issue:

- Whatever the eventual classification, some form of legally defined and physically accessible maintenance zone, separate from the ecological offset area, will be required before Tiaki Wai can vest these assets – GWRC / Tiaki Wai confirm this would be consistent with the Plimmerton Farm precedent. The Applicant is not familiar with this precedent. The legal boundaries separating ecological offset land from stormwater engineering access have not yet been defined in the design.

We do not agree on the following assumptions:

- None.

Advise Note:

- The current ecological planting plans (Appendix 23) identify earth bunds of “retention” wetlands (to the culvert outlet) will have H6 FILL SLOPES + RESIDUAL LAND + STAGE 2 - ENRICHMENT planting. This has implications for dam stability (beyond our scope) and needs to be further assessed to ensure using these areas for offsetting is appropriate. There is also an unknown risk that 4m compliance access tracks to the “retention” wetlands may overlap with H6 planting (above) and ecological planting areas may need to be re-assessed (see Retention Wetland E, Appendix 23 Part B, L2.22).

ISSUE 4: STORMWATER MODELLING AND EFFECT ON DOWNSTREAM FLOOD PONDING

Reference: Minute 9, 9(a)

Experts abstained: Katy Grant, Gregor McLean, Andrés Roa

Panel's question: *The Applicant's stormwater modelling uses a "cut-off" model approach, calibrated at the hydraulic boundaries to reduce model complexity, used to confirm preliminary sizes of on-site detention systems and associated outlet control culverts to avoid an increase in instantaneous peak flow. The whole-of-catchment Awa model identifies significant downstream flood ponding in extreme events, which the Applicant's cut-off model does not consider. Can the experts discuss the extent (if any) to which the additional stormwater runoff volume generated within the Mt Welcome development, passing through the Applicant's proposed stormwater detention systems, might increase the depth, extent and/or behaviour of flooding in the lower catchment identified by the Awa model.*

Facts

The following facts are agreed:

- The Applicant's cut-off model (Info-Drainage plus an ICM flood risk model) was generally fit for its local flood risk purposes. But was not built to assess effects on the Taupo Swamp or further downstream.
- The additional development will generate increased runoff volume leaving the site in large events.
- The Awa model provided is built on 2013 Lidar and does not incorporate the most recent 2023 Lidar.
- Resolving whether downstream flooding will be materially affected requires an extended, whole-of-catchment model run, which is beyond the data available to this engineering caucus.

We do not agree on the following facts:

- Whether the downstream ponding/flooding effect is, in fact, material: the Applicant's position is that no material effect is expected; Tiaki Wai position is that this is presently unknown, and the current model cannot answer the question either way.
- The flooding experienced in the James Street area is the result of localised issues or flooding in the Taupo swamp.
- Tiaki Wai's position is that the receiving environment is sensitive to flooding, and advice from the Tiaki Wai Principal stormwater modeller is that whilst the development provides peak flow attenuation it does not provide volume control resulting in increased volume reaching the Taupō Swamp with potential to impact on existing known flooding downstream of the Taupō Swamp, and that the storage volume and outlet controls are subject to further assessment and the Awa model is the best tool to assess the impact of the proposed development on the existing flooding in Plimmerton.
- The Applicant's position, based on its Senior Flood Modeller's advice, is that further modelling is not necessary to determine the application: post-development peak flows are attenuated to pre-development rates at the site outlets; the site discharges upstream, with flows passing through a series of streams and culverts before reaching Taupō Swamp; and the swamp itself provides further attenuation, its storage volume not being established in the Awa model build report.
- The Applicant’s position that no material downstream effect is expected is supported by the peak flow attenuation by the stormwater devices on site, and the extended catchment modelling referred to in the Advise Note below. This remains subject to review by GWRC and Tiaki Wai.

Assumptions

We agree on the following assumptions in relation to this issue:

- None.

We do not agree on the following assumptions:

- None.

Advise Note:

- Tiaki Wai has informed that their modeller can complete this initial model assessment (using current Awa model) in 2 weeks following receipt of data from the Applicant to confirm any impact on the downstream environment. The alternative is that the Applicant has this model and may choose to update and run it themselves.
- Following conferencing, the Applicant extended the flood model to include the full Taupo swamp catchment and ran pre- and post- development scenarios. Preliminary results show downstream flood levels have only minor changes, with no additional adverse effects from flooding. This information has not been provided or reviewed by GWRC or Tiaki Wai.

ISSUE 5: ACHIEVABILITY AND SCALE OF ADDITIONAL DETENTION TO MITIGATE ANY DOWNSTREAM FLOODING EFFECT

Reference: Minute 9, 9(b)

Experts abstained: Katy Grant, Gregor McLean, Andrés Roa

Panel's question: *If, as a result of their consideration of stormwater volume having an increased effect on downstream flooding, can the experts consider if it is likely to be achievable to mitigate that effect by increased retention within the site, and if so, what might be the indicative scale of the increase in retention wetland volume and footprint required to avoid increased flooding in the downstream catchment.*

Facts

The following facts are agreed:

- The engineering response to provide more detention is by increasing the height of outlet controls (bunds, outlets etc) or by earthworks. There is some scope for this within the centralised areas in the development. However, the extent of detention increase is unknown.

We do not agree on the following facts:

- As discussed above in Issue 4 the Tiaki Wai Awa model is necessary to confirm the volume of additional detention required in the development that would mitigate any downstream effect.
- The Applicant's position is that peak flows are attenuated to pre-development rates within the proposed stormwater management ponds, that the increased runoff volume is not expected to have a material downstream effect (see Issue 4)
- Tiaki Wai's position is that the applicant has not provide flood modelling to support their position regarding the effect of the increased runoff volume on the sensitive receiving environment.

Assumptions

We agree on the following assumptions in relation to this issue:

- That the current information does not allow confidence either way about whether the downstream, flood-sensitive area is protected.
- A permanent water level is proposed for ecological offsetting. The impact of changing detention volumes on ecological requirements has not been discussed.

We do not agree on the following assumptions:

- None.

ISSUE 6: ON-LOT STORAGE / RECYCLE TANKS

Reference: Minute 9, 9(c)

Experts abstained: Gregor McLean

Panel's question: *The Applicant has provided additional assessment of the potential effectiveness of on-lot storage/recycle tanks in its response (PDP, 4 August 2026). Can the experts discuss the additional information and confirm the extent of agreement (if any) on that information, and update their position on the potential use of this element of stormwater management (and potential reduction in water demand) for the site.*

Facts

The following facts are agreed:

- Rainwater tanks provide water conservation benefits and resilience.
- The Applicant's PDP assessment models only the Taupo catchment, not the Kakaho stream. The report does not present water conservation benefit across the full development. The PDP assessment only focuses on rainwater harvesting and volume mitigation (retention) but does not cover extended detention.
- Appropriately designed rainwater tanks can, in principle, fully achieve hydrological control objectives by providing rainwater harvesting (retention) and/or extended detention functions.
- No rainwater tanks, or any other means of achieving extended detention or retention are included in the proposed scheme.
- Sediment sources are stated and agreed in Issue 1.
- We discussed sediment mobilisation and scour within the development. But we have not discussed the ecological impacts of changes in hydrology, or ecological benefits that can result from providing hydrological control.
- The rain gardens are proposed as treatment devices only, and the “retention” wetlands provide peak-flow attenuation only. Neither of these devices reduce runoff volume or provide a hydrological-control function.

We do not agree on the following facts:

- Tiaki Wai/GWRC do not consider a catchment scale volume reduction assessment to be an appropriate tool for assessing a benefit of rainwater harvesting tanks in terms of mitigating increased scour and erosion.
- The Applicant considers that the modelling provides an assessment of potential downstream effects of the use of rainwater harvesting tanks, which indicates that the reduction in discharge from the Taupo Swamp site catchment will be limited (approximately 3%). It also assesses the impacts to the onsite subcatchments, albeit with the focus on the wetland hydrology.
- Whether the receiving environment's sensitivity to hydrological change has been properly assessed: the Applicant considers this adequately assessed via existing modelling; Tiaki Wai and GWRC consider it has not been assessed at all, only catchment-scale volume having been considered rather than sub-catchments within the development.
- Rainwater tanks provide benefit for stormwater volume/erosion mitigation but the scale of the benefit has not been agreed.
- The Applicant's PDP assessment does not consider the issue of cumulative effects i.e. if every development in the catchment were to follow the same approach, then unacceptable adverse effects may result.

Assumptions

We agree on the following assumptions in relation to this issue:

- None.

We do not agree on the following assumptions:

- Whether tanks should be required to provide extended detention as a hydrological control function (per GWRC's 2025 practice note), rather than reuse/water-conservation only, is not agreed.

ISSUE 7: RAIN GARDEN DESIGN CRITERIA

Reference: Minute 9, 9(d)

Experts abstained: Katy Grant, James Blyth, Gregor McLean

Panel's question: *Can the experts discuss appropriate rain garden design criteria for the site and confirm the extent of agreement on this matter.*

Facts

The following facts are agreed:

- Rain gardens have been designed as treatment-only devices, not for hydrological control/retention, given current geotechnical siting constraints.
- If roof runoff were diverted to appropriately sized rainwater tanks, designed to fully meet hydrological control objectives, the resulting rain garden sizing would come close to meeting the Tiaki Wai 2% criterion applied to the full contributing catchment.
- The current rain garden design has very limited flexibility to be increased in size later; sizing decisions need to be locked in now given site constraints.
- The Applicant, Tiaki Wai, GWRC agree that Darcy's Law is an acceptable design approach.

We do not agree on the following facts:

- The Tiaki Wai water sensitive design guideline refers to a 2% raingarden design criterion by untreated impervious area. The Applicant has sized the raingardens from by routing the water quality volume from each device's full contributing catchment through the device, verified independently using Darcy's Law.
- Tiaki Wai's position is that the Guideline (section 2.3.2 and Table 5) defines a device's "contributing untreated catchment" as the area not already treated by an upstream treatment device. As the proposed rain gardens receive both roof and road runoff, with no upstream treatment device, both surfaces contribute untreated impervious area. Tiaki Wai's position is that the 2% sizing requirement must be applied to the combined roof and road impervious area.
- Tiaki Wai and GWRC both agree with using a Darcy's Law approach. The area of disagreement is the infiltration rate to be used in the design; the Applicant proposes 87.5mm/hr, whereas GWRC and Tiaki Wai both consider 30mm/hr as an appropriate design infiltration rate.
- Tiaki Wai and GWRC's view that a 30mm/hr infiltration rate can be used, as recommended in other guidance documents in New Zealand (Christchurch, Bay of Plenty, Waka Kotahi). The 30mm/hr infiltration rate provides for a factor of safety to allow for long-term deterioration in performance, gradual reduction in filter-media infiltration capacity due to sediment and organic-matter accumulation, clogging, compaction, and maintenance considerations.
- The Applicant can agree to adopt Darcy's Law for sizing, conditional on using a design infiltration rate of 87.5 mm/hr (this would replace the current design criteria). The Tiaki Wai WSUD guideline specifies a bioretention media range of 100–250mm/hr; the midpoint of 175mm/hr has therefore been adopted. As the guideline provides no clogging or safety factor, a factor of 0.5 has been applied in accordance with Auckland Council GD01 for water quality bioretention devices, resulting in a design rate of 87.5mm/hr, however this assessment has not been shared to Tiaki Wai/GWRC for assessment.
- Whether rain garden sizing should be based on the Applicant's assumed 236 m^2 per-lot impervious allowance or the 75% permitted site imperviousness. The Applicant considers 236m^2 more representative, as extensive earthwork batters reduce the buildable area of most lots. GWRC considers that a maximum permitted site imperviousness of 75% (excluding batters) should be used in the design, as it provides a more robust approach while recognising buildable area reductions due to batters.

- What legal or consenting mechanism, if any, will reliably constrain future lot imperviousness to the design assumption relied on.
- Whether unlined, "online" rain gardens capable of also achieving hydrological control are geotechnically achievable given batter proximity.

Assumptions

We agree on the following assumptions in relation to this issue:

- If the raingardens were redesigned to only accept road runoff, then a stormwater redesign will be required.

We do not agree on the following assumptions:

- The applicant considers that the 2% raingarden design criterion in Tiaki Wai's water sensitive design guideline relates to untreated surfaces only (TK WSUD 4.3.2.1). Tiaki Wai and GWRC's interpretation is that the 2% criterion relates to total impervious surface contributing flow to the raingarden.

ISSUE 8: WASTEWATER MODELLING AND RISK OF DOWNSTREAM RETICULATION OVERFLOWS

Reference: Minute 9, 9(h)

Experts abstained: Katy Grant, Gregor McLean, James Blyth, Andrés Roa

Panel's question: *The wastewater modelling presented by the Applicant does not consider the full downstream system. Can the experts discuss the potential extent (if any) to which the additional wastewater volume generated within the Mt Welcome development, passing through the Applicant's proposed wastewater detention tank, might increase the risk of additional overflows in the downstream wastewater reticulation system. Consideration should include allowance for other developments currently under construction, as the experts see fit.*

Facts

The following facts are agreed:

- Tiaki Wai's wastewater network model needs to be updated with the Applicant's development data before the overflow risk question can be answered with confidence as this is the right tool to answer these questions.
- The current design defers dedicated wastewater modelling until "stage 10" of the development, which does not provide confidence that the intervening stages can be developed without effect on the receiving environment.
- By reserving additional land area available during Stage 1 for potential wastewater storage provides time to model and agree the wastewater solution including its timing. Please refer to the appended Sketch Plan illustrating this concept.
- There is a process for staged development assessment in the wastewater model to confirm there is no effect for the initial stages.
- The actual scale of overflow risk and required mitigation (tank size, network upgrades) cannot be determined until the extended modelling exercise is completed.
- A Wastewater mitigation plan is recommended to be prepared that considers the rate of development in the NGA to support the development detail and programme for Mt Welcome. This document is a live document with periodic review through the development delivery.

We do not agree on the following facts:

- None.

Assumptions

We agree on the following assumptions in relation to this issue:

- Reserving additional, flexible land area and adopting a modular/progressive tank arrangement is an appropriate interim design response pending completion of updated wastewater modelling.

We do not agree on the following assumptions:

- None.

Advise Note:

- An initial model is agreed to be prepared over the next 4 weeks. The purpose of this model is to confirm that the initial stages can be delivered without mitigation.
- Tiaki Wai have informed that their modeller can complete this initial model assessment in the next 4 weeks following receipt of data from the Applicant to confirm the initial stages of development. Alternatively, the applicant can re-run the model received on 19 August 2026 and provide an updated assessment.
- Two engineered overflow points (upstream of pump stations 13 and 7), identified by Tiaki Wai's modeller as not addressed in the Applicant's assessment, are new information to the caucus and were

not resolved in this session. Note. The engineering overflow points were only added into the model that the Applicant received on 19 August 2026. The previous two version the applicant was provided with, did not include these overflows.

ISSUE 9: ONSITE WASTEWATER DETENTION OPERATION AND SEPTICITY RISK

Reference: Minute 9, 9(i)

Experts abstained: Katy Grant, Gregor McLean, James Blyth, Andrés Roa

Panel's question: *If the solution for wastewater relies on significant onsite storage to buffer wastewater flows, what is the likely period the detention tank would be expected to operate in a large event, and would that period be such that potential adverse septicity issues could be triggered. If so, could those issues be managed via reasonable engineering infrastructure.*

Facts

The following facts are agreed:

- A solution exists however we do not understand the detail of that until the long term modelling is complete. If extended on-site wastewater detention is required, there is a recognised septicity risk, and dosing is an accepted, standard engineering mitigation used at wastewater pump stations and detention systems generally.
- Reserving additional physical space for the detention tank, as agreed under Issue 8, would allow both the sizing and the septicity/dosing design response to be resolved later, once modelling is complete.
- The actual required detention period, and therefore the severity of septicity risk and the specific dosing infrastructure required, cannot yet be determined until the long-term modelling is complete.

We do not agree on the following facts:

- None.

Assumptions

We agree on the following assumptions in relation to this issue:

- None.

We do not agree on the following assumptions:

- None.

UNCERTAINTIES

We agree that the following material matters are uncertain, and where that uncertainty lies (e.g. due to inadequate baseline knowledge, unproven research methodology etc):

- Whether the existing water balance model is fit to assess channel-forming flows and micro-scale scour at individual outfalls which is outside its design criteria (Katy Grant, Issue 1) - a new or supplementary model may be required.
- The vesting trigger and staging/handover timing for the “retention” wetlands to Tiaki Wai (suggested at approximately 80% lot build-out, not yet formally agreed) (Issue 3).
- The legal boundary between ecological offset land and stormwater engineering access/maintenance zones has not yet been defined by design iteration, affecting forebay location, access track provision and offset area calculations (Issues 2 and 3).
- Whether the site's ongoing farming and stock exclusion arrangements at Wetland E (Lot 5003) are consistent with the sediment and ecology assumptions relied on elsewhere in the application - this had not previously been raised in the parallel ecology caucus (Issue 1).
- Whether the whole-of-catchment Awa model needs to be re-run on an extended basis to assess effects on the Taupo Swamp and downstream areas below St Teresa's, and if so, whether this requires a further dedicated modelling-experts' conference (Issue 4).
- Whether smaller-scale, distributed on-site retention and/or extended detention (e.g., tanks, unlined rain gardens) is achievable and would materially reduce downstream erosion effects - not addressed as a discrete item in the 20 August session (Issue 5).
- The legal or consenting mechanism, if any, that will reliably constrain future lot imperviousness to the rain garden design assumptions (Issue 7).
- Wastewater modelling is required to provide certainty for wastewater mitigation to support the development programme. This will confirm the stages that can be delivered before mitigation is required, and the nature, the scale, and the timing of the mitigation required (Issue 8 & 9).

The following matters relating to uncertainty are not agreed:

- None.

We agree that addressing the following matters would assist in improving the certainty and knowledge gaps discussed:

- Confirming the vesting trigger and staging/handover timing with the Applicant.
- Completing the design iteration defining legal boundaries between the ecological offset area and stormwater engineering access zones, before forebay locations, access tracks and offset calculations are finalised.
- Raising the Wetland E stock exclusion / ongoing farming with the ecology caucus track for consideration alongside the ecological offset assessment.
- Determining whether a supplementary hydrological/geomorphological model is required to assess channel-forming flows and micro-scale scour between the outfalls and the wetlands.
- Bringing forward the wastewater network modelling programme referred to in Issue 8 from stage 10 to an earlier stage, and updating Tiaki Wai's model with the Applicant's development data.
- Completing the Tiaki Wai catchment wide stormwater model extended to below St Teresa's, Plimmerton, using the Applicant's development data.

REFERENCES

We have referred to the following documents in our discussions:

- Minute 9 of the Expert Panel, 12 August 2026
- Minute 10 of the Expert Panel, 13 August 2026
- Minute 12 of the Expert Panel (Suspension), 14 August 2026
- PDP memorandum on on-lot storage/recycle tanks, 4 August 2026
- Engineering Caucus Agenda, prepared by D Brittliff (Orogen), 17 August 2026
- GWRC Appendix 7 - Technical Comments, Erosion and Sediment Control, Gregor McLean (Southern Skies Environmental Limited), 25 June 2026
- Meeting transcript and recording by Darcy Brittliff, Engineering Caucus session 1, 20 August 2026
- Applicant Proposed drainage storage tank concept – Plan 1753-02-4101-R# (appended)
- Applicant response to comments and panel Minutes - Appendix F -PDP hydrology and contaminated land memorandum, 6 August 2026.

SIGNATURES

Each expert confirms their agreement to the contents of this Joint Witness Statement, subject to the matters of disagreement recorded above.

Kyle Dirse (Applicant)

Signature: Kyle Dirse Digitally signed by Kyle Dirse DN: E=kyle.dirse@envelope-eng.co.nz, O=Envelope Engineering, CN=Kyle Dirse Date: 2026.08.24 12:31:23+12'00'

Date: 24th August 2026

Katy Grant (Applicant)

Signature: 

Date: 24th August 2026

James Blyth (Greater Wellington Regional Council)

Signature: James Blyth Digitally signed by James Blyth DN: cn=James Blyth, c=NZ, o=Collaborations, ou=Director, email=James@Collaborations.co.nz Date: 2026.08.24 13:49:23 +12'00'

Date: 24th August 2026

Andrés Roa (Greater Wellington Regional Council)

Signature: Andrés Roa Concha Digitally signed by Andrés Roa Concha DN: cn=Andrés Roa Concha, c=NZ, o=Woods, ou=Woods LG, email=andres.roa@woods.co.nz Date: 2026.08.24 12:15:25 +12'00'

Date: 24th August 2026

Gregor McLean (Southern Skies Environmental Limited, engaged by Greater Wellington Regional Council)

Signature: 

Date: 24th August 2026

David Wilson (Tiaki Wai)

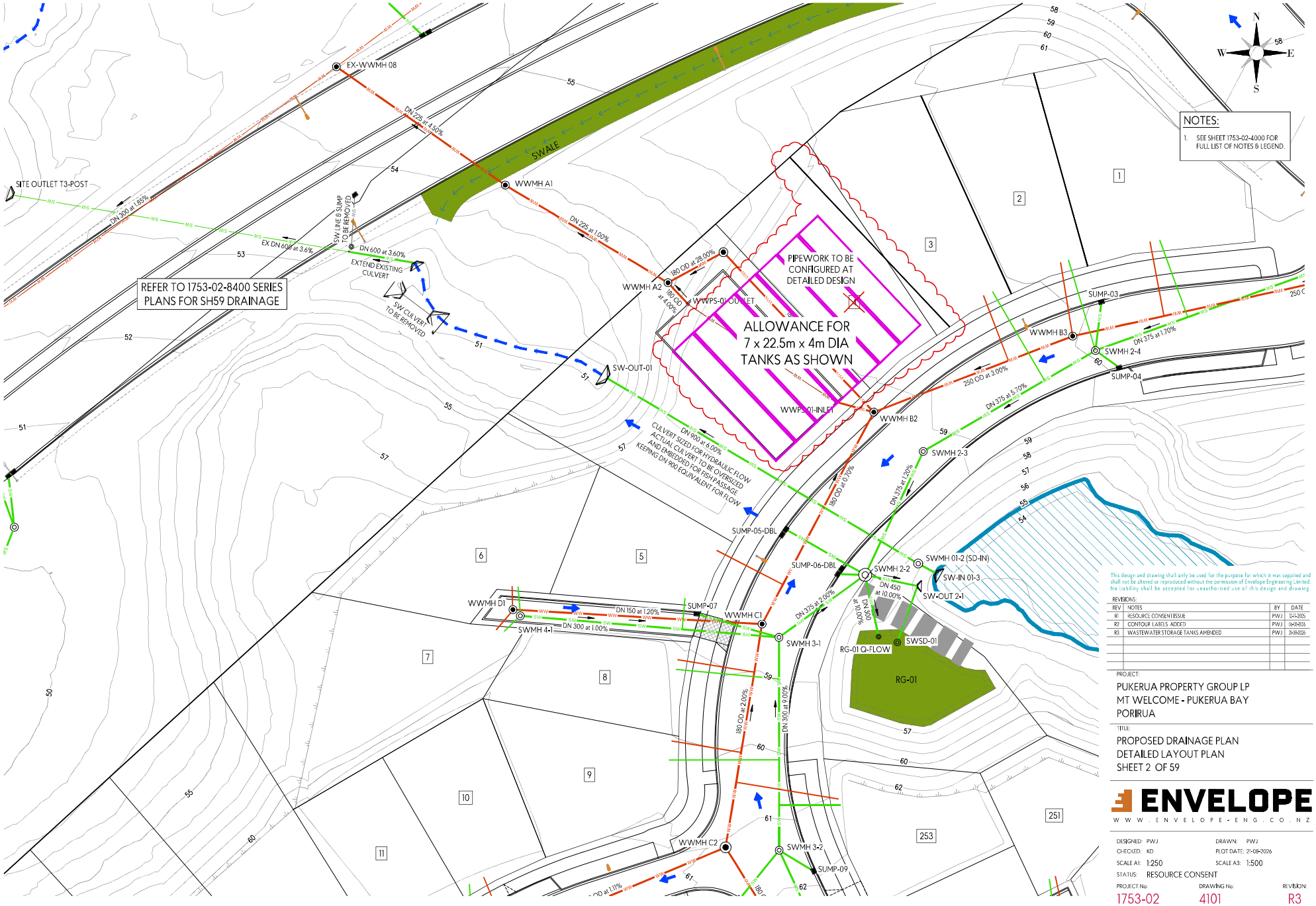
Signature: _____

Date: 24th August 2026

Zeean Brydon (Tiaki Wai)

Signature: Zeean Brydon Digitally signed by Zeean Brydon DN: cn=Zeean Brydon, c=NZ, email=zeean.brydon@foxenviro.co.nz Date: 2026.08.24 14:09:01 +12'00'

Date: 24th August 2026



REVISIONS:

REV	NOTES	BY	DATE
R1	RESOURCE CONSENT ISSUE	PWJ	12-11-2025
R2	CONTOUR LABELS ADDED	PWJ	06-03-2026
R3	WASTEWATER STORAGE TANKS AMENDED	PWJ	24-03-2026

PROJECT:
PUKERUA PROPERTY GROUP LP
MT WELCOME - PUKERUA BAY
PORIRUA

TITLE:
PROPOSED DRAINAGE PLAN
DETAILED LAYOUT PLAN
SHEET 2 OF 59

ENVELOPE
WWW.ENVELOPE-ENG.CO.NZ

DESIGNED: PWJ
DRAWN: PWJ
CHECKED: KD
PLOT DATE: 27-08-2026
SCALE A1: 1:250
SCALE A3: 1:500
STATUS: RESOURCE CONSENT
PROJECT No: 1753-02
DRAWING No: 4101
REVISION: R3