Ref RM210630 - RM210633

18 March 2022

planscapes (nz) ltd.
Surveying and Resource Management

Tasman District Council
By email:

Attn: Jenna Wolter
Jenna.Wolter@tasman.govt.nz

Dear Jenna

RE: Further Information Request for Resource Consent Application No. RM210630 - RM210633 – 35 Lot subdivision in the Residential Zone and associated land use, earthworks, and stormwater consents – 166 Mapua Drive, Mapua

I refer to your letter dated 6 September 2021 requesting further information in respect of the above application. Please find these requests listed below, with responses provided to each. Supporting information is also attached, referenced in the responses.

1. *Please provide the proposed formation details of Right of Way C.*

ROW C will be formed with a minimum 2.75m sealed carriageway, plus passing bays. Alternatively, two-way formation width can be provided if required.

2. *Please provide information on how Rights of Way A, C & D are proposed to be held.*

These rights of way will be held in joint ownership by the owners of the allotments served by them.

Reserves

3. *The application states that the reserve for the walkway within Lot 12 will be 6 metres wide and the walkway will be formed as part of the subdivision to meet Council standards. Please confirm that this can be achieved with the grade at the site following earthworks and the presence of the existing stormwater easement at the corner of the application site and Aranui Park. Please also clarify how it is proposed to form a walkway within the wetland area at the bottom of the site where it borders with Aranui Park and provide an assessment of whether this will require consent under the 2020 Freshwater NES.*

Please refer to additional detail on this provided in the landscape plan prepared by Rory Langbridge at Appendix A to this response. A 1.5m wide path is shown at an approximate gradient of 1:16. This will become a boardwalk where it crosses the wetland. The path and boardwalk are shown to be clear of the existing stormwater easement.

The proposed boardwalk within the wetland is a 'wetland utility structure' as defined in the NES:FW. The construction of this is a restricted discretionary activity under Regulation 42 of the NES:FW. Earthworks required to construct this will be minimal, limited only to the installation of pile foundations. Vegetation clearance, too, will be minimal for the installation of piles, noting that there is very little existing indigenous wetland vegetation existing on the site in this location. Replanting of the wetland area around the boardwalk will take place in accordance with the details of the Landscape Plans at Appendix A. This is a permitted activity under Regulation 38 of the NES:FW.

4. *Please provide a landscape planting plan for the proposed reserve and reserve boundary, including species and locations of replacement trees and plantings. This plan should be to scale and include number of plants proposed.*

Council's Reserves Officers have provided the following comments on the planting details provided with the application:

Planting above the wall – The cross sections included in Annexure H of the application show only 200mm of topsoil on a compacted, impermeable layer. Staff consider that this is going to be very restrictive for plant growth and it won't support any of the proposed plants beyond the first dry summer. Can the species list please be reviewed to take this into account – staff have suggested Poa cita (Silver tussock) or prostate Matagouri. However, they are mindful that these species are less desirable in a residential setting:

Road Plots - Please remove the Phormium cookianum (Mountain flax) and replace with a dwarf variety; Please remove the Coprosma kirkii and replace with less vigorous plant that requires less trimming.

Below the retaining wall - Please remove the Phormium cookianum (Mountain flax) and replace with Phormium tenax (Harakeke / NZ Flax); The tree species (Rata, beech and rewarewa) prefer drier conditions – can you please review their suitability with respect to this and the need to access the area in the future for wall maintenance. We recommend Cordyline australis (Cabbage tree) and Coprosma tenuicaulis (Swamp caprosma) as these grow quickly and can be easily replaced.

Wetland – Please replace the Typha orientalis (Bulrush) with an alternative or more of the other suggested species, although we can understand why this was chosen in terms of wetland biodiversity, it is likely to cause flood capacity issues in the future if it establishes within the watercourse.

Please refer to the Landscape Plans at Appendix A, which have been developed to take into account the comments and suggestions above. It is noted that additional soil depth has been proposed at the top of the retaining wall to support mitigation planting immediately above the wall. The Applicant is happy to volunteer that the planting list for future plantings within the containment cell area on Lots 1-10 (not mitigation planting) be amended to include Poa cita and prostrate Matagouri. It is noted that future lot owners would be free to add additional topsoil to their land to support plantings if they wished in order to provide better growing conditions. Equally, lot owners may wish to retain this area as lawn.

5. *Please provided an assessment of the likely effects of the earthworks and construction activities, including and driven posts or trenching, associated with the construction of the retaining wall and containment cell on existing vegetation within the wetland and Aranui Park.*

This is addressed in Section 2.4 of the revised wetland assessment prepared by Envirolink, included at Appendix B. This primarily addresses construction effects associated with sediment movement. There will be no construction works, including driven posts or trenching, undertaken within the wetland on site or within Aranui Park, or within 2m of these wetlands, therefore no vegetation in these wetlands will be affected. The only exception is piles for the construction of the boardwalk, which have been addressed above.

Contaminated Land

Please note that Council's Resource Scientist – Contaminants has yet to provide feedback on the Detailed Site Investigation and Remediation Action Plan provided. Any further information requirements in relation to this will be forwarded upon receipt.

It is assumed that as no further information requests have been made in respect of this matter, that the information provided in the Application is considered to be complete and there are no further information requests.

Contaminated Land Cell

6. *Please provide further detail about the design and expected design life of the proposed retaining wall, including how this structure may be impacted by rising groundwater levels and potential seawater inundation resulting from future sea level rise scenarios.*

Please refer to the letter from Ben Parry of Davis Ogilvie in relation to this matter, included as Appendix E to this response.

7. *The application states that the proposed retaining wall will be located as close as 0.5m to the boundary of wetland 2382 in some places. Please provide further information on how it is proposed the wall will be constructed, and maintained in future, without machinery and/or people being required to enter the wetland area - potentially damaging the wetland.*

This is a discrepancy in the version of the Wetland Assessment by Envirolink that was submitted with the application. This has been corrected in the amended assessment at Appendix B. The correct offset of the wall from the wetland or boundary (whichever is closer) is 2m. This is shown in the revised earthworks drawing 102 Rev D at Appendix C. This setback distance has been specifically set to allow for construction and maintenance of the wall to be undertaken entirely within the site and outside of the wetland, based on the recommendations of the Davis Ogilvie engineers. This is reconfirmed in the letter from Ben Parry of Davis Ogilvie at Appendix E.

8. *The Remediation Action Plan states that groundwater is estimated at 2.5m below ground level, and that 100mm of freeboard will be allowed above this before contaminated material is deposited. This 'freeboard'*

allowance is considered relatively small considering groundwater has been estimated, the likelihood of increasing variations in future groundwater levels as a result of sea level rise and inundation, and the ecotoxic nature of the material. It is also unclear where the 2.5m level has been taken from.

Please provide accurate measurements of current groundwater levels over the proposed containment cell location and provide an assessment of how this level may change in the future as a result of climate change. Please also provide evidence that the proposed freeboard depth is sufficient to ensure that groundwater will not interact with the contaminated material over the life of the cell.

This matter has been addressed in the letter from Ben Parry of Davis Ogilvie at Appendix E. Mr Parry notes that the base level of the containment cell will need to be raised above that detailed in the application as lodged. This has been done, and is reflected in the amended Remediation Action Plan (RAP) from Envirolink at Appendix F. It is noted that the reduction in capacity will result in an estimated 3000m^3 of excess contaminated soil from the Stage 1 works area that cannot be included in the containment cell. As detailed in the Envirolink report, this is proposed to be temporarily stockpiled in the Stage 2 earthworks area until such a time as it can be disposed of at an appropriate facility authorised to receive in. The plan prepared by Davis Ogilvie at Appendix G shows the proposed stockpile area and a typical cross-section of the fill relative to existing ground levels. The management of this stockpile area is addressed in the amended RAP.

9. *The Envirolink report provided states that the containment cell will ensure that the contaminated soil will not adversely affect wetland 2382, but this report does not assess the likely effect on the wetland should the cell fail for any reason and contaminated material enter the wetland. The proposed design relies on an engineered structure that will need to be maintained and may fail at some point. The proposed location of the cell means that the on-going management and maintenance of the cell structure will be the responsibility of 10 different lot owners who will be lay people and may not be relied upon to act in a co-ordinated and timely manner should work be required. It is considered that an assessment of the likely risk to the wetland should the cell fail is required to allow an assessment of the appropriateness of the proposal.*

   Please provide further information on the effect that the contaminated fill would have on the wetland if the cell were to be compromised.

In the first instance, it is relevant to understand the likelihood and type of failure that could occur to a structure of this nature. In this respect, Ben Parry of Davis Ogilvie comments that:

> *'The proposed retaining wall will be subject to specific engineering design (SED) and certification. The wall will be designed not exceed predetermined deflections under static and seismic conditions. It is important to discuss what "wall failure" would look like. From a design perspective 100 mm deflection for example would likely be a significant failure. From an environmental perspective this level of deflection may be well within the tolerable limits. Excluding durability, the risk of wall failure which will result is contaminated material entering the wetland is very low.*
>
> *Durability is a separate issue. The life for the wall is something that needs to be worked through in the design. It is likely standard retaining wall construction using H5 poles and H4 lagging will need to be upgraded to H6 and H5 respectively.'*

Based on this advice, it can be concluded that there is an very low likelihood of failure of the wall provided it is properly maintained, which will be ensured through easement obligations as detailed in the application. With that said, Ms Tiernan of Envirolink has commented on the potential effects on the wetland that might occur if a failure did occur, at Section 2.4.1 of her updated report at Appendix B. In summary, the covering of vegetation and wet areas with fill, and any disturbance associated with removing this would create a greater effect than the contaminated nature of the fill would. Any physical damage would require restoration of the wetland. Given the very low chance of such disturbance occurring (particularly given the 2m buffer zone provided, which is equal to the height of the wall itself, this risk should not be of great concern.

10. *The proposed cell location is adjacent to the most ecologically sensitive area on the subject site and puts the responsibility for the future management and maintenance of the cell (which would be a costly and hazardous liability should it fail) onto 10 different lot owners. It is considered that this location is not ideal from both ecological and on-going management perspectives, and that the proposed ownership and management structure for the cell is unlikely to be the most effective option.*

    Please provide information on whether any alternative locations for the cell and alternative management and maintenance scenarios have been considered.

Please find at Appendix D to this response a letter from Martyn O'Cain of Envirolink detailing the alternatives that were considered for management of contaminated soil prior to deciding on the management methods detailed in the application. Given that the proposed management approach is able to effectively avoid adverse effects on the ecological effects on the adjacent wetland area, there is no need to consider these alternatives in any further detail.

Stormwater

11. *Please provide an assessment of how the proposed changes to stormwater run-off from the subject site following the proposed development may affect the hydrology of wetland 2382. Currently run-off is discharged in a diffuse manner across the site, but the proposed stormwater management will change this to a point source discharge from one point on the property. Please also include calculations for the likely increase in total stormwater volume likely to be discharged as a result of the proposed development during Q10 and Q100 events and provide an assessment of any effect this increase in total volume may have on the wetland.*

Fleur Tiernan of Envirolink responds to this as follows:

'Run-off from the site currently is diffusely directed towards the drain along the western boundary of the wetland, which feeds the wetland, essentially demarcating it's boundary. Post-development, run-off will be directed to this drain at a rate which will not be dissimilar to what currently happens; therefore, it is considered that the 'diffuse manner' in which runoff is directed to the wetland will not substantially change. However, total run-off volumes will change.

Water volumes increase due to the added imperviousness associated with the development according to the table below (Table 1).

***Table 1:** Pre and post development volumes from the development*

Event	***Pre-development Volume (m^3)***	***Post development Volume (m^3)***	***Difference (m^3)***
Water quality event (10 mm/hr 2.5 hour duration ≈ 0.75 year ARI)	*158*	*353*	*195*
2-year 2 hour	*246*	*549*	*303*
10-year 2 hour	*454*	*598*	*144*
100-year 2 hour	*843*	*1355*	*512*

In a 2-year ARI 2-hour event the peak flow is significantly different for the pre-development situation (Figure 1). So, although the post development case (Table 1) releases more total volume it does so at a low flow rate, less than 10 L/s, which will not increase flow in the receiving watercourse enough for it to start eroding and cutting down.

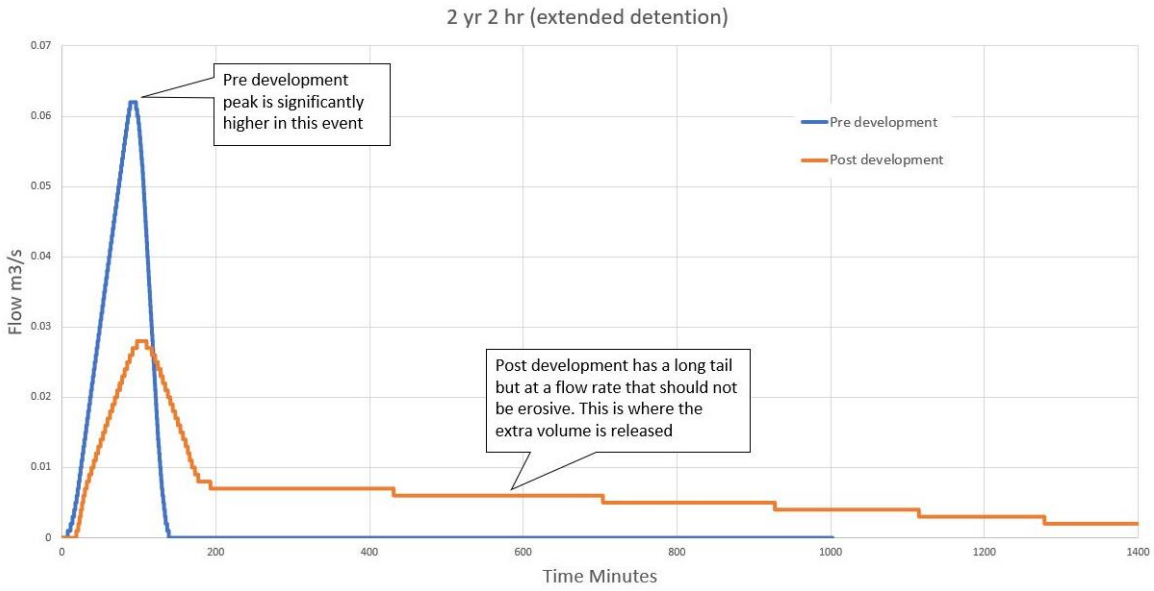

Figure 1: Pre and post development 2-year ARI 2-hour event

In a 10-year ARI 2-hour event the peak flow rate is roughly maintained, and the duration of potentially high erosive flows is also roughly maintained. Similarly, the rate at which water is released is unlikely to lead to erosion or down cutting of the stream (Figure 2).

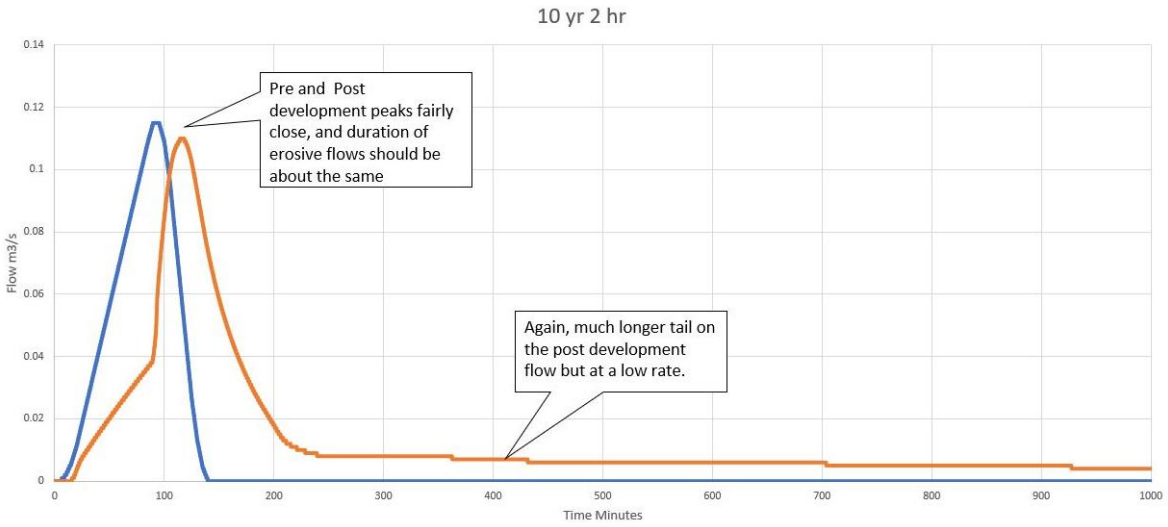

Figure 2: *Pre and post development 10-year ARI 2-hour event*

Minimising any potential for erosion and downcutting of the drain will ensure that flows are not diverted from the wetland and that water will continue to flow northwards along the drain to ensure water supply to the northern extent of the wetland.

Assuming a wetland area of 4,500 m2, the increased volumes anticipated from the wetland range from 3 to 10 cm, depending on the rainfall event. This increase is temporary (days (at most) rather than weeks) and as the wetland is adapted to changes in water levels, daily due to tidal influences and seasonally, any temporary increase in water levels is unlikely to have any adverse effect on the wetland vegetation. Furthermore, any increase will likely be insignificant in relation to the wider increase in water level from runoff from the wetland catchment as a whole.

The DO report concludes with 'Stormwater will be attenuated both with extended detention to protect stream morphology and peak flow attenuation to protect downstream areas from increased flooding'.'

12. *The Preliminary Servicing report provided with the application states that infiltration could be included in the design if infiltration is available on site in accordance with NTLDM standards. The availability or otherwise of infiltration is required to allow a full assessment of the proposal and inform conditions of consent. Please provide the results of infiltration testing.*

Infiltration testing will be undertaken as part of detailed design. The stormwater calculations and basin sizing have been carried out assuming no infiltration. So, any infiltration which is available will mean an improved result, i.e. there is no risk the system is undersized so the assessment shouldn't be a problem. Furthermore, any proposed infiltration will need to be carefully considered to ensure that it does not result in local ground water levels mounding up under the site and pushing groundwater up into the containment cell. For this reason, even if infiltration it is available it may not be the preferred option and it is therefore preferable for Council to consider the proposal based on no infiltration at resource consent stage.

13. *The application states that the applicant wishes to maintain ownership of Lot 11 as the detention basin in this lot may eventually become redundant after downstream upgrade works and could be decommissioned. Council's Development Engineer has stated that there are currently no such works programmed and would rely on Council obtaining land that is currently in private ownership. This lot will be required to be vested with Council to ensure appropriate on-going access and maintenance.*

    It is also unclear whether this basin could be decommissioned without adverse effects on wetland 2382. If the basin cannot be decommissioned without adverse effects on the wetland occurring, then this would not be considered a feasible outcome.

The Applicant is satisfied to progress on the basis that the detention basin be vested to Council as drainage reserve, on the proviso that this is either compensated for by Council or an appropriate mechanism is established to enable the land to be offered back to the Applicants in the future should other stormwater mitigation works elsewhere render the detention pond redundant. The amended scheme plan at Appendix H shows Lot 11 to vest as drainage reserve.

14. *The Envirolink report provided states that stormwater contaminants are likely to be minimal but provides little evidence to support this claim. Given the sensitivity of the receiving environment Council's Resource Scientist – Freshwater Ecology considers that further assessment of likely stormwater contaminants and potential effects on wetland 2382 is required.*

Fleur Tiernan of Envirolink responds to this as follows:

'The assessment that stormwater contaminants are likely to be minimal is based on the nature of the proposal i.e. low intensity residential. The nature of any development helps inform the potential for contaminants to be present in stormwater, with high intensity residential, commercial and industrial developments producing an increase in the type and concentration of contaminants being mobilised in stormwater runoff. Furthermore, the DO report Stormwater and Service report (V2 February 2021) states 'The NTLDM sets out the surfaces from which runoff must be treated. This development will have less than 5000 vehicle movements per day hence does not need treatment. However should housing in the development propose to use unpainted or treated building materials such as copper or zinc roofing then treatment would be required for those buildings. This would be dealt with at house construction stage', which provides confidence that any contaminants (and in particular copper and zinc) generated, which could enter stormwater, are likely to be minimal.

Median copper concentrations in stormwater generated from low density residential areas are approximately 5 µg/L (Figure 5). The freshwater DGV for copper to protect 95% of species is 1.4 µg/L i.e. approximately 3.5 times lower than the presumed copper concentration from the stormwater quality. The catchment size for the wetland is approximately 18 ha, versus 3.15 ha for the development catchment size, i.e. the wetland catchment size is nearly 6 times the size of the development catchment size. The anticipated dilution factor would ensure that copper concentrations discharged to the wetland from stormwater from the development would be reduced to below the freshwater DGV.

The first flush event (a 10 mm/hr rainfall with a total depth of rainfall of 25 mm as specified in the NTLDM) will be released over about 20 hours. Figure 3 shows the water stored in this event in the basin and the time it takes to drain out. This will allow for some settlement of sediment, where it would be anticipated to remove down to about a 0.01 mm particle but more likely a 0.015 mm particle i.e. medium silts. Contaminants associated with urban development, such as copper and zinc are predominately attached to the sediment fraction, therefore removal of sediments, particularly during first flush events will reduce the contaminant load to the wetland. Therefore, a combination of a low risk of contaminants being generated, reducing the source of contaminants (such as dealing with using unpainted or treated building materials such as copper or zinc roofing materials at the construction phase), and attenuating the first flush fraction of medium silts within the stormwater detention pond indicate that any adverse effects from stormwater contaminants on the wetland are likely to be minimal.

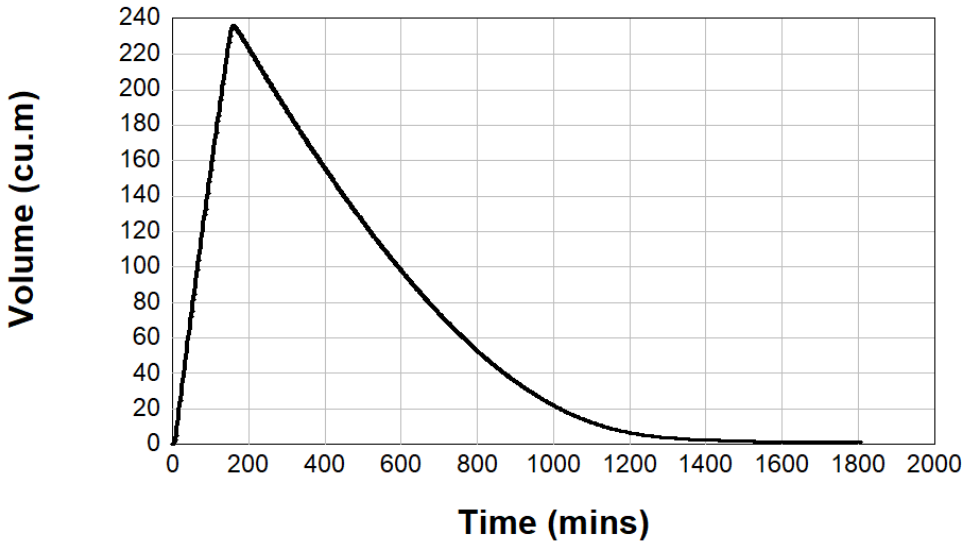

Figure 1: The first flush event (a 10 mm/hr rainfall with a total depth of rainfall of 25 mm) released from the stormwater pond

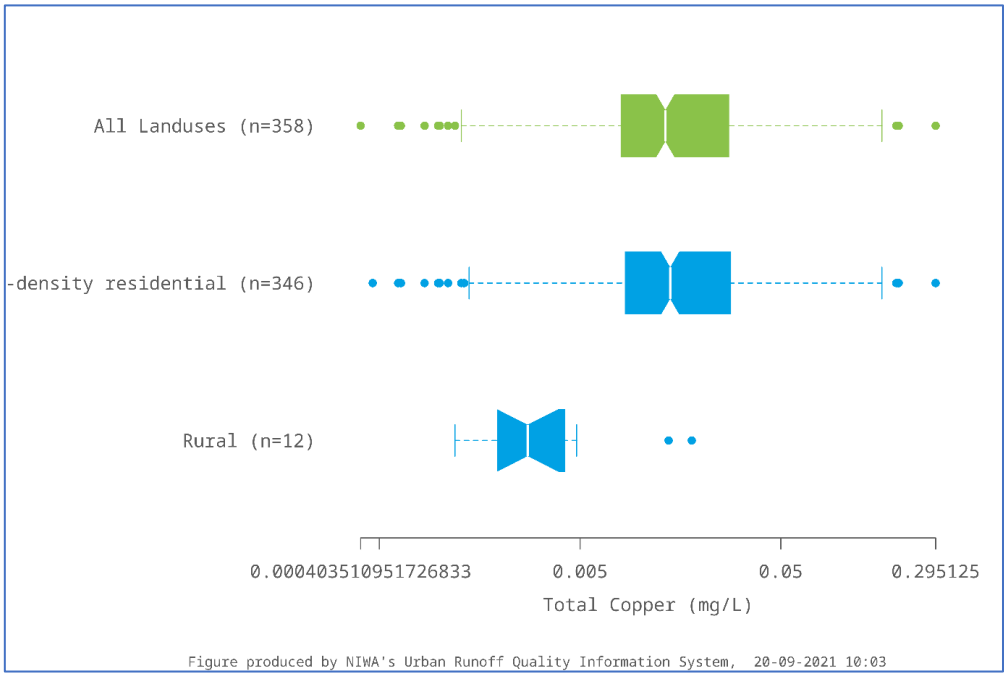

Figure 2: Stormwater quality from low density residential developments (from: https://urqis.niwa.co.nz/)

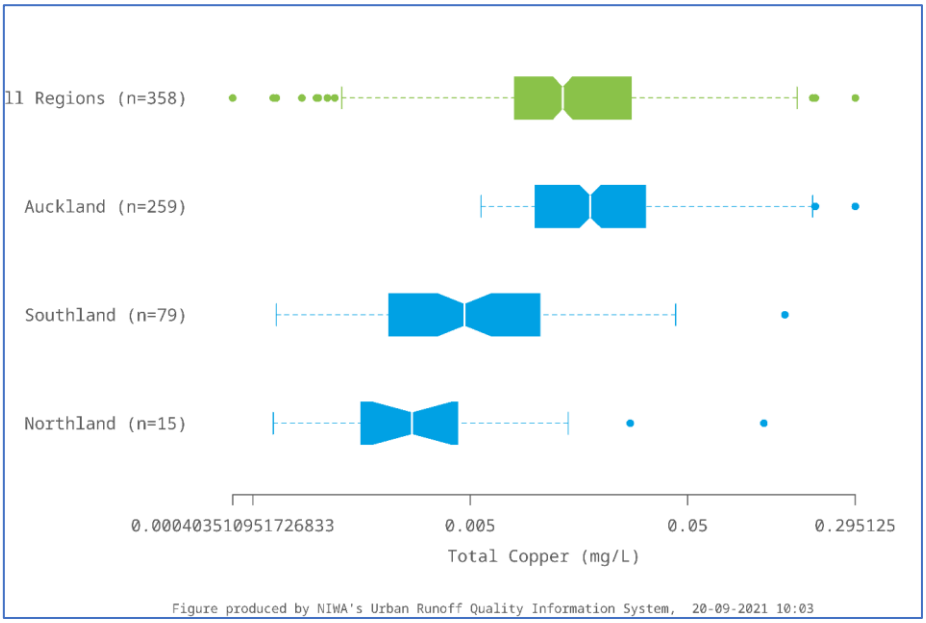

Figure 3: Stormwater quality from low density residential developments by region (from: https://urqis.niwa.co.nz/)

Wetland Boundary

Please note that Council's Wetland Ecologist has yet to provide comments on the proposed revised wetland boundary.

It is assumed that as no further information requests have been made in respect of this matter, that the information provided in the Application is considered to be complete and there are no further information requests.

I trust that this satisfied your requests, however if you require further clarification please do not hesitate to contact me.

Yours sincerely
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