Before the Independent Hearings Panel
at Waimakariri District Council

*under:* the Resource Management Act 1991

*in the matter of:* Proposed private plan change RCP31 to the Operative Waimakariri District Plan

*and:* **Rolleston Industrial Developments Limited**
*Applicant*

# Evidence of Laura Drummond

Dated: 7 July 2023

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## EVIDENCE OF LAURA DRUMMOND

1 My full name is Laura Rose Drummond.

2 I am a Technical Director – Ecology at the environmental consulting firm Pattle Delamore Partners Ltd (*PDP*). I have a Bachelor's degree in Science (2006) and a Master's degree in Ecology (2012) from the University of Canterbury. I am a member of the New Zealand Freshwater Sciences Society.

3 I have 15 years of experience in freshwater ecology consulting and research. I have been employed by PDP since April 2018, where I specialise in surface water quality and freshwater ecology projects. Internationally I have held positions as a Freshwater Ecologist, Fisheries Specialist and Environmental and Regulatory Specialist in Canada. Prior to this I was employed by the National Institute of Water and Atmospheric Research (*NIWA*) as a Freshwater Ecology Technician in Christchurch.

4 My evidence is supplementary to the statement of evidence by **Mr Mark Taylor** who prepared the Ecological Assessment that was submitted as part of the Plan Change RCP31 (*PC31*) application.

5 I am familiar with the plan change application by Rolleston Industrial Developments Limited (*the Applicant*) to rezone approximately 156 hectares of land on Whites Road, Ōhoka to enable approximately 850 residential sites and a small commercial zone. I have attended a site visit where I have seen the current condition of the waterways and springs on site.

## CODE OF CONDUCT

6 Although this is not an Environment Court hearing, I note that in preparing my evidence I have reviewed the Code of Conduct for Expert Witnesses contained in Part 9 of the Environment Court Practice Note 2023. I have complied with it in preparing my evidence. I confirm that the issues addressed in this statement of evidence are within my area of expertise, except where relying on the opinion or evidence of other witnesses. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

## SCOPE OF EVIDENCE

7 My evidence will deal with the following:

7.1 Comment on the potential mitigation that can be provided to minimise impacts of the proposed land use change to aquatic features on site.

7.2 Comment on potential enhancement and net ecological benefits at the site and downgradient of the site compared to current land use.

7.3 Comment on potential buffer distances for springs and waterways.

7.4 Response to the submissions of Waimakariri District Council, Environment Canterbury, Department of Conservation and Mr Lance Peters, as they relate to surface water quality and ecology.

7.5 Response to the S42a report, Section 6.10.

8 In preparing my evidence, I have reviewed and considered the following:

8.0 Land Use Change, 535 Mill Road, Ōhoka; Aquatic Ecology Report. Aquatic Ecology Limited. November 2021. AEL Report No. 192.

8.1 The site Outline Development Plan (*ODP*) - see **Figure 1**.

8.2 Relevant submissions.

8.3 S42a report, Section 6.10.

8.4 Mr **Mark Taylor's** Ecology evidence.

8.5 Mr **Eoghan O'Neill's** Stormwater and Wastewater evidence.

**SUMMARY**

9 The plan change has the potential to improve the ecological condition of spring-fed waterways and spring heads within the site. The site is currently a dairy farm, and historical land use has resulted in highly modified site conditions for drainage purposes, with no shading or bank protection present and little habitat of flow heterogeneity. With careful landscape design, there is potential for the site to contain highly naturalised and enhanced watercourse corridors. In particular, there is an opportunity to link Ōhoka Stream to the Ōhoka Bush, downstream of Whites Road, to increase in the length of the Ōhoka Stream ecological corridor and improve not only instream conditions, but overall biodiversity values in the area.

10 The provided minimum setback distances from waterways on the site (springheads and watercourses) and the requirement for an Ecological Management Plan will provide controls on potential ecological impacts to the site. The removal of dairy farming activities from this site will also result in a reduction in agricultural

contaminants in the waterways on site and downgradient (nitrogen, phosphorus, sediment and *Escherichia coli (E. coli)*), as required under Plan Change 7 (*PC7*) of the Canterbury Land and Water Regional Plan (*LWRP*).

11 Careful design and mitigation strategies will be required to provide ecological betterment to both the onsite waterways and those downstream. The amended ODP and ODP text now incorporates these measures and accordingly I support PC31 insofar as freshwater bodies and ecosystem values are concerned.

**ASSESSMENT**

12 I have been engaged by the Applicant to comment on potential mitigation and enhancement options that can be provided to minimise impacts of the proposed land use change to spring-fed waterways and spring heads within the site. Evidence on the ecological values of the waterways on site is provided by **Mr Taylor**.

13 The site is currently a dairy farm, and historical land use has resulted in highly modified site conditions typically associated with dairy farms. Streams and spring heads have been fenced to exclude stock (approximately 1 m setbacks), with water flow from spring heads channelized to drain the land and little to no remaining native riparian vegetation. The springheads and streams require a suitable buffer for ecological protection, as well as a mechanism for invertebrate dispersal (food source for fish), as outlined in the evidence of **Mr Taylor**.

14 When comparing past and current agricultural land use at the site, a residential development has the potential to result in a net ecological benefit to aquatic ecological values. Currently, the stream channels have been highly modified for drainage purposes, with no shading or bank protection present and little habitat of flow heterogeneity. With careful landscape design, there is potential for the site to contain highly naturalised and enhanced watercourse corridors. In particular, there is an opportunity to link Ōhoka Stream to the Ōhoka Bush, downstream of Whites Road. This would provide an increase in the length of the Ōhoka Stream ecological corridor and improve not only instream conditions, but overall biodiversity values in the area.

15 The removal of dairy farming activities from this site will result in a reduction in agricultural contaminants in the waterways (nitrogen, phosphorus, sediment and *Escherichia coli (E. coli)*), which is required under PC7 of the LWRP. The closest downstream Environment Canterbury monitoring site - Ōhoka River at Island

Road[1] has high nutrient levels, in particular nitrate-nitrogen, which can be toxic at high levels, and dissolved inorganic nitrogen (*DIN*), which is the bioavailable form of nitrogen for plant growth. Five-year median nitrate-nitrogen concentration is 4 mg/L, which is above the LWRP PC7 target[2] of 3.8 mg/L and the National Policy Statement - Freshwater Management 2020 (*NPS-FM*) national bottom line of 2.6 mg/L. The faecal bacteria *E. coli* is also elevated above guideline levels, with the 5-year median count at 893.5 cfu/100 ml, compared to the PC7 freshwater outcome value[3] of 130 cfu/100 ml and NPS-FM national bottom line of 260 cfu/100ml.

16 Figure 1 of my evidence shows the updated ODP, with the location of the waterways and springs (as identified by AEL). Proposed minimum buffer distances for each waterway are provided in Appendix IV in the evidence of **Mr Taylor**. Further detail on the buffer distances and proposed realignment of streams is provided in the evidence of **Mr Taylor**. The proposed minimum buffer distances to waterbodies are considered suitable to protect and in fact lead to enhancement of the ecological values of the waterbodies on site.

17 To increase biodiversity values, and provide potential for increased filtration of contaminants to downgradient waterbodies (Kaiapoi Stream, Waimakariri River) in addition to the removal of agricultural activities, the ODP has been updated to provide the following:

17.1 Larger buffer distances (reserve space) to spring heads (30 m – central/southern spring; 20 m – northern spring), Ōhoka Stream (20 m), Ōhoka Branch South (15 m), and Southern spring channel (15 m), Groundwater seep origin (20m) and Groundwater seep channel (10m) as discussed in the evidence of **Mr Taylor** and shown in Figure 1.

17.2 Naturalisation of Ōhoka Stream, South Ōhoka Branch and the main spring complex, to improve instream values.

17.3 Vegetated swales are to be used where possible along roadsides instead of kerb and channel, to minimise the level of contaminants entering the stormwater treatment systems and ultimately the waterways. Vegetated swales are effective at removing metals and some sediment.

17.4 Stormwater treatment systems will be designed to meet the Christchurch City Council Waterways Wetlands and Drainage Guide (*WWDG*) and located an appropriate distance from streams and spring heads. Stormwater treatment areas will

[1] https://www.lawa.org.nz/explore-data/canterbury-region/river-quality/waimakariri-river-catchment/Ōhoka -river-at-island-road/

[2] Table 8-5: Water Quality Limits and Targets for Waimakariri Rivers.

[3] Table 8a Freshwater Outcomes for Waimakariri Sub-region Rivers.

be located outside of the 100-year flood zone and stormwater detention areas will be located outside of the 50-year flood zone, as discussed in the evidence of **Mr O'Neill**. The stormwater management system will be designed so that treatment areas fed by swales will be located furthest away from the stream to reduce the risk of contaminants entering waterways.

18 At the subdivision consent stage, the enhancement in the form of naturalisation of the springheads, spring-fed stream channels and the pond by the homestead, including native planting along the waterways and springs, would be relevant matters for consideration. These matters have been included in the ODP text.

19 To provide further controls on maintaining and enhancing the current ecological values of aquatic features on the site, an Ecological Management Plan is included as a requirement within the ODP text. This plan would require assessment by Council and would need to include plans for spring head restoration, waterway riparian management, aquatic buffer distances and adjacent land use. Ongoing maintenance and monitoring plans for riparian and stream management would also be required. With the proposed measures in place, my opinion is that ecological betterment can occur for the waterways in the ODP area.

**RESPONSE TO SUBMITTERS**

20 Waimakariri District Council's submission on PC31 includes a section on protection of indigenous fauna including longfin eels:

20.1 I consider longfin eel habitat can be enhanced by PC31, with no loss of habitat expected. The proposed stream buffers discussed in paragraph 17 along with native riparian buffers, will result in not only the protection of stream habitat, but its enhancement, with increased shading, overhanging vegetation and instream enhancement in the form of increased flow heterogeneity and instream habitat features (boulders, logs, riffles). Existing mature trees will also be retained, where able, to provide shade to waterways and preserve existing biodiversity values in the site. This will be confirmed with input from a terrestrial ecologist at subdivision consent stage.

20.2 The Ecological Management Plan required by the ODP text will ensure the habitat of the longfin eel is enhanced as a result of PC31.

21 Environment Canterbury's submission on PC31 includes a section on waterbodies and freshwater ecosystems:

21.1 The Environment Canterbury submission discusses wetlands, with a comment that the PC31 site is located 'within a much greater historic wetland area with many seasonal and permanent springs that support a large ecosystem'.

21.2 My review of the AEL (2021) report, historical Canterbury Maps layers, the site's Farm Environment Plan and a site walkover has only identified one area of natural inland wetland, at the central/southern spring pond. This area will be enhanced, as outlined above, with a buffer distance around the spring of 30 m.

21.3 To ensure no natural inland wetlands are missed, an additional survey can be completed using the Ministry for the Environment (*MfE*) wetland delineation protocols, in accordance with the NPS-FM requirements. This can be done at subdivision stage.

22 The Department of Conservation (*DOC*) submission on PC31 supports the proposed setbacks for Ōhoka Stream (20 m) and the Southern Spring (30 m). It is understood that the Southern Spring DOC are referring to is the Central Spring:

22.1 As outlined above, the updated ODP proposes large setback distances (reserve space) to the Central Spring (30 m), Northern Spring (20 m), small Groundwater Seep origin (20 m), and substantial stream setbacks for the Ōhoka Stream (20 m), Ōhoka Branch South (15 m) and Southern Spring channel (15 m).

23 Mr Lance Peters has opposed PC31 due to the potential for damage to the local fishery. Mr Peters considers the stormwater overflow will impact the Ōhoka Stream, Kaiapoi River and Waimakariri River (the downstream receiving environments). Mr Peters considers that more nitrates and other pollutants will enter the waterways, which will impact fisheries values:

23.1 The ODP text proposes that stormwater will be treated to a high standard, as further discussed in Paragraph 17. Runoff of agricultural contaminants, including nitrogen, phosphorus, sediment and bacteria associated with dairy farms (*E. coli*) are expected to be reduced, as the source of these contaminants (dairy stock) and associated direct overland flow of water will be avoided. However, it is recognized that urban contaminants may increase compared to current land use. These contaminants (in particular metals) can have

chronic effects on aquatic fauna, therefore consent limits will be required to be achieved through on-site treatment.

23.2 It is recognised that the wider catchment needs to be considered when assessing effects, as sensitive receiving environments are located downstream including the Ōhoka Stream, Kaiapoi Stream and Waimakariri River. When comparing the closest downstream Environment Canterbury water quality site data for 'Ōhoka River at Island Road' (see Paragraph 15), water quality conditions are required to improve to meet targets and outcomes. Land use change away from dairy farming will provide a reduction in nutrients and *E. coli* entering the waterway within the site.

**RESPONSE TO SECTION 42A**

24 I agree with the authors conclusion in Section 6.10.1 that "*the potential adverse aquatic ecological effects of the proposal can be adequately avoided or mitigated*". I consider that there is an opportunity to provide more than just avoidance and mitigation of adverse ecological effects and that betterment of the site can occur if the ODP text is followed.

25 Section 6.10.5 discussed setback distances and recommends that a "*15-20m setback is applied for Ōhoka Stream Tributary, South Ōhoka Branch and Groundwater Steep*". I agree with the 20 m setback for Ōhoka Stream Tributary, a 15 m setback for South Ōhoka Branch, and a 20 m setback for the Groundwater Seep origin. It is noted that the Groundwater Seep has limited flow to support aquatic communities, therefore the setback for the downstream channel is proposed at 10 m, which is considered suitable for its limited extent.

**CONCLUSIONS**

26 It is my opinion that the provided minimum setback distances from waterways on the site (springheads and watercourses) and the requirement for an Ecological Management Plan will provide controls on potential ecological impacts to the site.

27 PC31 has the potential to improve the current ecological values of aquatic features within the site (which are degraded by current land use) and increase the naturalized corridor of Ōhoka Stream. PC31 also has the opportunity to provide a reduction in agricultural contaminants entering the waterways on site, which will assist in reducing levels of nitrogen and *E. coli* in downstream waterways required under PC7.

28 Careful design and mitigation strategies will be required to provide ecological betterment to both the onsite waterways and those

downstream. The amended ODP and ODP text now incorporates these measures and accordingly I support PC31 insofar as freshwater bodies and ecosystem values are concerned.

Dated: 6 July 2023

**Laura Rose Drummond**

**Figure 1**. Outline Development Plan for the land use change proposed at 535 Mill Road (PC31).