

11 September 2019

Environment Southland
Private Bag 90116
Invercargill 9348

Our ref: 18250
Council ref: APP-20191021

Attn: Alex Erceg

Dear Alex,

Re: Request for Further Information under Section 92(1) of the Resource Management Act 1991 – APP 20191021, application for a suite of consents relating to a dairy farming activity.

In reference to your request for further information dated 25 August 2019, please find outlined below our response to this request. Attachment A contains a conceptual plan which answers questions 2, 3, 7 and 8.

Wetland

- 1. An assessment of the total catchment area that will drain to the proposed Wetland;*
- 2. An aerial image indicating the total catchment area that will be serviced by the proposed wetland;*
- 3. A map indicating the direction of overland flow, surface water flow and artificial drainage into the proposed wetland and away from the wetland, including the identification of which surface waterway the subsequent flow will discharge into;*
- 4. An assessment of the proportion of artificial drainage networks that will discharge into the proposed wetland;*
- 5. An assessment of the effects (positive and/or adverse) on biodiversity values including any fish passage issues; and*
- 6. A description of what will happen with the buildup of sediment (and consequently other contaminants) within the proposed wetland and how this is maintained.*

As indicated on Attachment A, approximately 63 ha of the applicant's property will drain to the proposed wetland. Overall a greater area will drain to this wetland but has not been mapped given it is outside of the applicant's property boundary. The 63-ha captured by this wetland equates to 20% of the total proposed property area



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(315 ha). That entire catchment area on Aerodrome Farm is contained within the Oxidizing – artificial drainage variant Physiographic Zone. This zone correlates to Waiakiwi Soils. An exact proportion of tile drainage is not able to be accurately quantified, and the locations of **known** tile drains only are shown on the attached Map (as already identified in the application, and effluent disposal plan). The wetland will drain overland flow and subsurface flow in the direction of the arrows shown on the attached plan.

Presently, the tile drains terminate at the proposed head of the wetland, the area where the wetland is proposed is low lying and naturally collects runoff from surrounding paddocks and subsurface flow. Runoff and subsurface flow are ephemeral contributors to water flow in this area, and an impermanent water supply would be unlikely to support permanent fish habitat. The species found within the Waikiwi Stream are migratory (see Section 3.2 of original report). Whilst the proposed wetland will drain to a tributary as it leaves the applicants property, where it re-enters the applicants property it is tiled, therefore restricting natural fish passage from the Waikiwi Stream up-stream to the mid reach of the tributary and to the 'head waters' (being the proposed wetland). Further to this, the tile-drain as it discharges to the Waikiwi Stream is perched, and entrapment or passage of migratory fish through this tile drain is highly unlikely. Given the unlikely presence of migratory species, fish passage effects are not a relevant consideration in this instance. For completeness however, a pipe would likely be installed on the outlet from the wetland which would enable passage (if it is necessary) and to the appropriate fish passage guidelines. The specifics and detail to this level could be reasonably determined at a later date when the wetland is actually constructed, to ensure that it functions efficiently.

The creation of the wetland and planting will have positive effects on biodiversity, particularly as the applicant intends to only plant natives that are wetland compatible within this area, using appropriate reference material for technical support, such as consulting with the Land Sustainability officers at ES (or suitably qualified professional) and most likely aligning construction and planning of the wetland with the NZ constructed wetland planting guideline. The wetland will be maintained with efforts to remove pest species that can't otherwise be managed via grazing to ensure the survival and establishment of native terrestrial flora. Overall the effects on fish passage are anticipated to be nil, the effects on biodiversity: positive, and the effects on water quality: positive.



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From the applicants experience with their sediment ponds, 'build up' is not a significant concern. In the time the applicant has owned this property the sediment ponds have been deepened to enable settling out of sediment and to drop the base level below inlet pipes, clearing of sediment has not yet occurred and shows that the depended sediment ponds are sufficient at sediment attenuation by means of collection in the pond. Sediment build up can be removed mechanically by way of a digger, much like Environment Southlands current stream clearing programs for flood protection that are authorised to occur extensively throughout Southland. Any maintenance of the wetland will be in accordance with relevant regulations/Land Sus advice, as discussed further below.

Sediment Ponds/Traps

7. *An assessment of the total catchment area that will drain to the existing Sediment Ponds/Traps;*
8. *An aerial image indicating the total catchment area that will be serviced by the existing Sediment Ponds/Traps;*
9. *A map indicating the direction of overland flow, surface water flow and artificial drainage into the proposed wetland and away from the existing Sediment Ponds/Traps; including the identification of which surface waterway the subsequent flow will discharge into;*
10. *An assessment of the proportion of artificial drainage networks that will discharge into the existing Sediment Ponds/Traps; and*
11. *An assessment of the effects (positive and/or adverse) on biodiversity values including any fish passage issues;*
12. *A description of what will happen with the buildup of sediment (and consequently other contaminants) within the existing Sediment Ponds/Traps and how this is maintained.*

The total area that will drain exclusively to sediment ponds on this part of the property is hard to define, given the generally flatter topography of this part of the property, and location and distance between ponds across the property (see Attachment A).

In total however, the general overland and subsurface flow capture area that is within the applicant's property boundary is 33 ha which drains to the Waikiwi Stream. Part of that area contains sediment ponds, and thus a portion of the 33 ha is able to be



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'treated'. A subset of that plan is shown below, the plan in Attachment A gives an overview of general drainage direction, and the subset below is more specific.

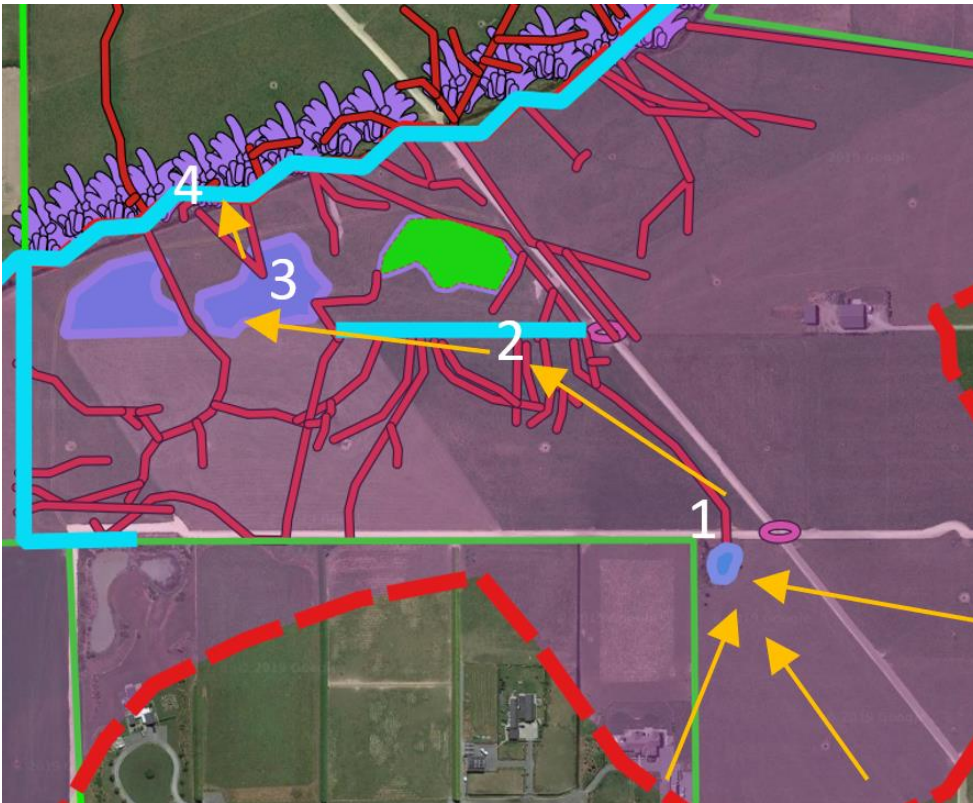


Figure 1: Sediment ponds direction of treatment

An area of the property drains to pond (1) (figure 10 in the original application), a tile drain then conveys water to an open channel drain (2) that was constructed on the property and is not a natural water body (i.e. an artificial water course). This drain collects other subsurface drainage, before discharging to the Sediment pond (3). Sediment pond (3) collects other subsurface drains. Water then drains from Sediment Pond (3) to the Waikiwi Stream (4).

The sediment pond and bush block either side of sediment pond (3) do not collect or discharge subsurface drainage, there are however natural drainage pathways which would collect overland flow from the catchment area and let sediment settle out prior to overland flow eventually finding its way to the Waikiwi Stream (following the direction of drainage).

As, stated above, these sediment ponds have never been 'emptied', but can in future be mechanically cleared by way of a digger. The continued use of these areas will have positive effects on biodiversity. As the applicant maintains these areas and endeavors to remove pest species, and the native flora will be able to further establish.



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The continuation of sediment ponds on this property and the bush blocks will benefit biodiversity overall as a variety of flora will then be present on the property, not exclusively improved pasture covers as is the case with many existing dairy farms in Southland. The continuation of these activities will maintain biodiversity within these blocks. Similarly, for fish passage, particularly for Sediment Pond (3), the same logic as discussed above for the constructed wetland would apply. It's highly unlikely that there are any fish species to be adversely affected by the continuation of these activities at this site, given the existing tile drain construction. Effects on fish passage will be nil, and the effects on biodiversity will be positive. Likewise, the effects on water quality will be positive.

There are also other sediment ponds downstream of the proposed constructed wetland, but these are located outside of the applicant's property boundary.

Further comments

The proposed wetland and existing sediment ponds have not been 'rewarded' under the proposed scenario as modelled by OVERSEER. Therefore any contribution these treatments will make in terms of reduced nutrient and sediment outputs will be over and above the already proposed quantified reductions; this proportion of reduction is unable to be accurately quantified, however it can be agreed that the effects of the sediment ponds and proposed wetland will be positive in terms of their effectiveness to further reduce nutrient losses, and increase biodiversity.

In the interest of giving the Consent Authority certainty, a condition may be imposed on the Land Use Consent for farming that requires the construction of the wetland to be completed in consultation with Land Sus, and/or a suitably qualified representative. It is important that the wording is sufficiently flexible so that the applicant can adapt their management and maintenance as new research is developed, and construction techniques refined over time. It would be prudent to ensure that fish passage (if it is even applicable) be provided for in accordance with some regulations or standardized guidelines (such as the NZ constructed wetland guidelines).

Investment in improving water quality and biodiversity on farm is paramount to the applicant. Although not specifically part of this application, the sediment ponds have been noted as suitable for trialing de-nitrification beds in future, further research will



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determine if this project is able to proceed, and for that reason the applicant cannot commit to it as part of this application.

I trust that the information set out above satisfies the request for further information. However, if you have any further queries, please do not hesitate to contact me.

Yours sincerely,



Zoe McCormack
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ATTACHMENT A – Scheme Plan



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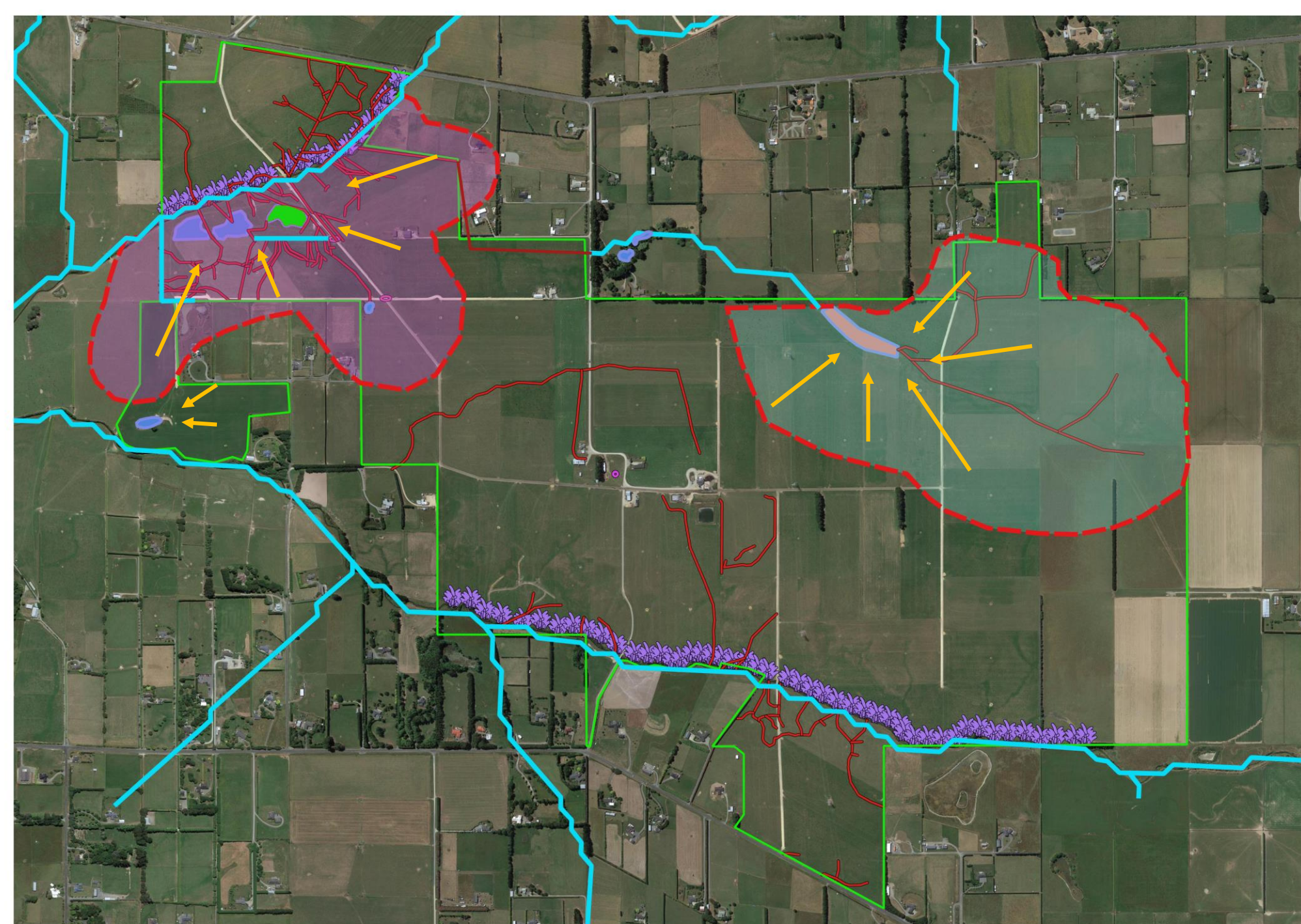
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- Proposed property Boundary
- Waterway
- Sub-surface drains
- Direction of flow
- Riparian margin
- Catchment area within property: 63ha
- Catchment area within property: 33ha
- Wetland
- Sediment pond with bush
- Bush only block