

19 August 2022

**Environment Canterbury**  
200 Tuam Street,  
Christchurch City

Attention: Nicola Duke

Dear Nicola,

**SUBJECT – REQUEST FOR FURTHER INFORMATION – WONGAN HILLS LIMITED  
RESOURCE CONSENT APPLICATIONS CRC224237 AND CRC224238**

This letter is a response to your email requesting for further information dated the 2 August 2022.

In your email, you confirmed the following items had been satisfied:

Item 1: General operation of the barn – request satisfied

Item 4: Medication – request satisfied

Item 5: Removal of compost – request satisfied

Item 6: Rule 5.29 assessment – request satisfied

Information was requested to further address the potential entry of flood water into the barns and that this possibly has links to the sealing of the base area and contingency measures. This relates to the following items of the original request:

**Item 2: Sealing of base area**

**Item 3: Entry of water into the barns**

**Item 7: Contingency measures**

We have provided a response to these items before under each heading.

**Item 2 – Sealing of the Base Area of Barns**

*The RFI response states that the base area will be lined with approximately 12 m wide heavy duty plastic liners which are overlapped by 0.3 to 1 m and tapped to seal. Can you please provide additional information on how you will ensure these are not damaged during removal of compost material and how the 'intactness' of the liners will be monitored over time to ensure they are still functioning as required (i.e. not ripped, fractured, broken down over time etc). Should the barn be inundated with flood water, will these liners ensure that the barn remains impermeable to discharge of water via ground? I acknowledge that during flood events the ground can become saturated so thinking in reverse, during flood events would there be any risk of water entering the barn from the ground up*



The plastic liner is proposed to extend up the timber wall along each side of the barn in addition to across the base. The liner is tape sealed to prevent moisture entering or exiting the barns. This would avoid the potential for inflow from groundwater. The potential for high groundwater to also cause uplift of the liner is avoided due to the weight of the compost acting as ballast. Furthermore, groundwater at the site was not intercepted in any test pits undertaken as part of the barn geotechnical design.

The liner along the walls is protected from damage during the regular daily cultivation by an overlay of marine-grade plywood. While the base of the liner is protected from damage when the compost is removed by retaining a layer of compost 100 to 200 mm above the base. This level is achieved using laser level for guidance. From the experience of other barn operators, the compost at the base of the barns is not degraded and removed.

### **Item 3 - Entry of Water into Barns**

#### **Flooding risk**

Wongan Hills has engaged NIWA to undertake a review of the two methods used by ECan in relation to flood modelling.

NIWA has advised that:

- Use of the 200-year ARI (0.5% AEP) is a reasonable (but conservative) flood statistic to assess flood hazard potential within an indefinite building lifespan exceeding 50 years. On that basis, the using the 2011 flood frequency ECan estimated the 200 year ARI flow for the Kaituna and then added 35% to that flow to account for climate change, with resultant flood flow of **175 m<sup>3</sup>/s**
- In terms of the assumptions used by ECan, NIWA has similarly advised that the inputs into modelling used are reasonable (but conservative) assumptions including:
  - A historic 200 year flood estimate.
  - Allowing for climate change induced flow alteration of 30% (correspondence from M. Wild, 6 May 2022) and 35% (correspondence from M. Wild (ECan), 26 April 2022).
  - A saturated landscape for the higher flood flow predictions.
- Overall, given both the above and the fact the tested model was not produced using a hydrograph profile means that the modelled approach can be considered conservative (correspondence from M. Wild to C. Margetts and N. Griffiths, 26 April 2022). The inundation maps show that for a 10-year ARI flood, inundation is not modelled to reach the proposed structures. Under the 200-year ARI flood, it is possible to generate a **water depth of up to 0.2 m** at the proposed building sites (consistent with correspondence from C. Margetts to N. Duke, 6 May 2022).



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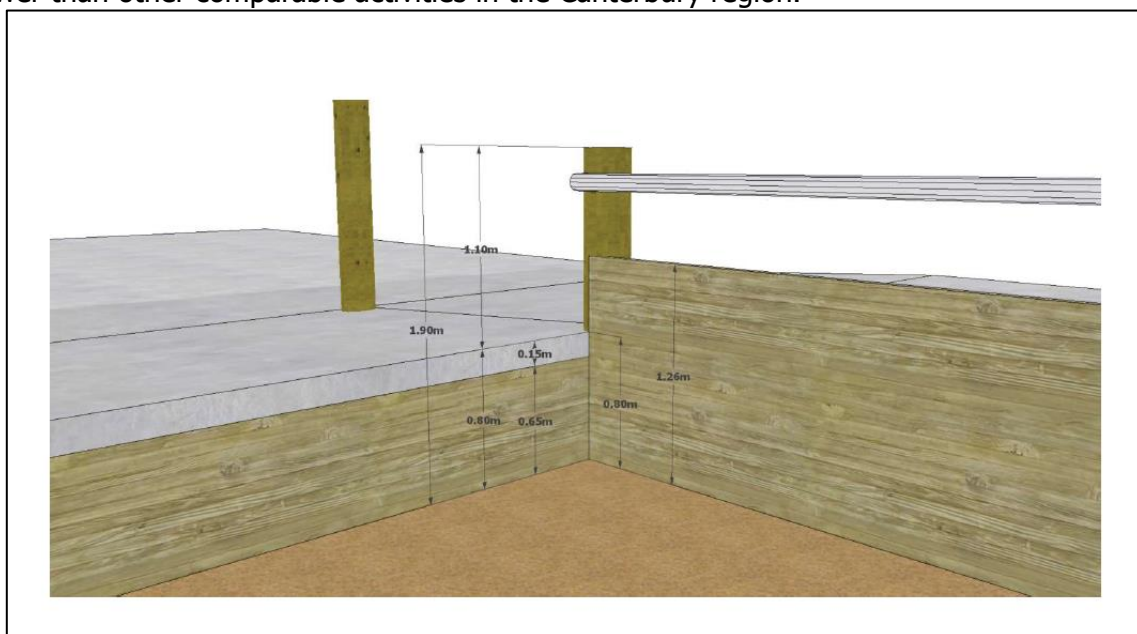
Given the above, the flood risk is completely avoided (even in a 200-year ARI flood event) by the elevated height of the barns. The lowest level of the barns is at the southern entrance apron of Barn four. The concrete level is 5.785 m and rises by 0.5 % over the 240 m length to 6.785 at the northern end. The other barns are progressively higher in elevation, with Barn one having the lowest level of 6.235 m.

The concrete entrance is lower than the side walls, which are a further 460 mm above the compost and entrance apron level. **The barns are above a 200 yr. flood level by 185 mm, 335 mm, 485 mm and 635 mm at the finished entrance levels above for the barns.** The height of the barns above the existing ground surface is the first mitigating factor to avoid inundation of the barns. The external walls are 460 mm higher (Figure 1).

The design of the barn mitigates the potential for flooding from the Kaituna River to enter the buildings and compost.

In terms of reference to a 200-year ARI flood event Wongan Hills considers this is overly conservative and not consistent with the planning framework. By way of comparison, the storage and application of animal effluent is controlled by the LWRP. The LWRP controls the use of land for the storage of animal effluent under rules 5.33, 5.34 and the discharge 5.35 and 5.36 and 5.37. These rules reference a number of conditions that need to be considered. The animal effluent collection and discharge rules do not reference flooding and ECan do not apply consideration of flood at a 200 year ARI when granting these activities. For example, there are many dairy land use and discharge consents to store and apply effluent to land within the Lake Te Waihora catchment. Good examples of the farming activities authorised and currently occurring in the 200 yr. flood risk zone are near Gammacks Road or Greenpark.

The design of the barns, the proposed earthworks to manage site runoff and drainage means that the nutrient discharge risk is effectively avoided at the proposed location and significantly lower than other comparable activities in the Canterbury region.



**Figure 1: Internal Dimensions of the Barn Compost Pit**



### **Item 7 - Contingency Measures**

In our response dated 11 July we provide a description of the contingency measure to manage barns. With any farming system there will be a number of situations that occur that are not planned for. This consenting work has identified that flooding events could cause flood water to surround the barns (but not enter the barns). The farm system and standard operating procedures will document the potential for flooding surrounding the site, the design mitigates these, but additional measures will be incorporated to respond to adverse events with the scale and intensity of these responses being varied proportionally to the event being mitigated.

The scale of the Wongan Hills property and wider farming businesses means there is space and capacity with staff and equipment to respond as needed should an adverse event occur.

### **Other matters;**

#### **Activity Status:**

*My assessment is that the drains/swales nearby to the proposed barns fall under the definition of 'drain' in the NES-F. If the barns are located within 50 metres of these drains then the activity status will be non-complying under Regulation 11 of the NES-F.*

Wongan Hills considers the swale is most likely not a "water body, any water abstraction bore, any drain, and the coastal marine area." that is caught by Regulation 10(3)(c). For example, the definition of "drain" under the NES in turn refers to the National Planning Standards that references any artificial water course used for drainage of surface water and subsurface water. In this case the swale would have the character of a 'modified natural flow path' that drains the gully behind the shed site. Conversely, classifying the swale as a river or stream (which would be necessary for the swale to be considered a "water body" for the purposes of the NES) would be a stretch.

However, on the basis of being overly conservative, this letter assumes the swale is in fact, a water course caught by Regulation 11.

The assessment of effects has already demonstrated that given the design, location and mitigation measures incorporated into the proposal, the potential effects are less than minor and not inconsistent with the objective and policy framework. The proposal will therefore meet the requirements of either limb of Section 104D of the RMA allowing the grant of consent.

The conservativeness of this approach can be further demonstrated by the fact that were Wongan Hills to pipe the part of the swale within 50 metres of the site then it would not fall within the definition of water (or any aspect of the other definitions).

### **Construction stormwater:**

*I have also discussed construction phase stormwater consent requirements with Principal Consent Planner Tracey Gray. She has advised the 2 ha limit for a permitted activity is the*



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*total area disturbed at any one time. Therefore if the buildings are staged and the other conditions of the PA can be met it is unlikely that consent will be required for construction phase stormwater discharge.*

The applicant has confirmed that the area of disturbance associated with the barn construction will be limited to less than 2 ha at any one time.

We trust this further response allow application to continue to be processed on a non-notified basis and we look forward to hearing from you.

Yours sincerely

**Low Environmental Impact**

Brian Ellwood

**Copy to**

» **Brent Thomas, at Wongan Hills Limited**