13 August 2019

Southland Regional Council
Via email

Our ref: *18106*
Council ref: *APP 20191230*

Attn: Alex Erceg

Dear Alex

Re: Request for Further Information under Section 92 of the Resource Management Act 1991 – Cashmere Bay Dairy

In reference to your request for further information dated 5 August 2019, please find outlined below our updated further response.

1. **An explanation of the differences in the models relating to the "total farm area" and the "productive block area"**

The total farm area increased from 522.9ha (actual area) to 526.1ha was caused by the way our mapping software pulled through the overseer blocks, the area of the farm has not changed, and Brian Goodger has adjusted the total farm area in the updated model back to 522.9ha. The increase in the effective area of 0.3ha is insignificant and was due to how Brian Goodger/Fonterra's system mapped the new centre pivots to obtain the Overseer blocks

2. **An explanation of the increase in the proposed stocking rate**

The proposed stocking rate is not increasing, both OverseerFM models have 1000 cows peak milked with a replacement rate of around 22% each year, the change from the original proposed scenario at 2.0 peak cows/ha grazed up to 2.1 peak cows/ha grazed for the catch crop model was due to the way crops were modelled between the two years.

- Original proposed model had 38ha of crop entered as a fodder crop rotating through all blocks
- Catch crop model had 18ha entered as a fodder crop with 20ha entered as a crop block due to the modelling of the oats catch crop

This resulted in less effective area so an increase in peak cows/ha grazed.

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3. **An explanation as to why the proposed stocking rate is increasing but the Dairy Replacement revised stock units is decreasing;**

The replacement rate is also not changing. The replacement rate is unchanged at 22% and replacements are always on farm, the decrease from 1737 to 1638 revised stock units resulted from copying the existing file in OverseerFM and the age in months stock was pulled through i.e. R1 entered as 12 months of age compared to 11 months of age, Brian Goodger has changed this in the updated model to reflect the same as the original proposed budget. There was no decrease in replacement numbers.

4. **A response to the issues identified in the Overseer Budget Audit, specifically Point 41 in the report.**

The area of concern In the Catch Crop model is the difference in the farm area and the 40 ha of area not irrigated under pivot and resulting increase in N loss if it is.

This is a valid point raised by the Irricon report, the irrigated area has dropped overall from 186.41ha currently to proposed 143ha with the proposed introduction of the new pivots and removal of the small rotorainer irrigator. Brian Goodger has modelled crops in the catch crop nutrient budget with no irrigation as for last winter no crops were under irrigation but going forward, he agrees with Irricon the farm does not have VRI and some years there will be an area of crop under the irrigation area and be irrigated.

The irrigated area on the dairy platform is 143ha and represents ~34% of the effective dairy platform (510.8ha – 89.6ha (runoff) = 421ha = 34%). Going forward not all the 34ha (dairy platform beet) of crop will be under the irrigated area so we have assumed around 34% of the crop will be irrigated due to pasture renewal occurring across the whole dairy platform.

In the updated model Brian has included 41% of the crop area to be irrigated as one block (the 14ha of beet entered under fodder crop).

The added irrigation of crop area has increased total N loss from the new pivots and catch crop model from 17,874 kg N/yr to 18,043 kg N/yr, see tables below.

Table 3

	Proposed Dairy Unit/added crop irrigation
Peak Cows	1000 (2.1/ha)
Total N Loss (kg)	18,043
N Loss/ha (kg)	34
Total P Loss (kg)	297
P loss/ha (kg)	0.6
Pasture Grown Kg/DM/ha/yr	17,631 (irrigated) 13,223 (non-irrigated)

Table 1

	15/16	16/17	17/18	Average
Peak Cows	1000 (2.4/ha)	950 (2.2/ha)	960 (2.4/ha)	970 (2.3/ha)
Total N Loss (kg)	20101**	17473**	20916	19,496
N Loss/ha (kg)	45	39	40	41
Total P Loss (kg)	296***	289***	311	298
P Loss/ha (kg)	0.6	0.6	0.6	0.6
Pasture Grown Kg/DM/ha/yr (Dairy Platforms)	18,666 (irrigated) 14000 (non-irrigated)	17766 (irrigated) 13326 (non-irrigated)	18892 (irrigated) 14170(non-irrigated)	18441 13832

** Includes 982kg total N loss from sheep 17/18 added
*** Includes 14kg total P loss from sheep 17/18 added

The proposed scenario shows a decrease of total N loss from 19,496kg N (Table 1) down to 18,043kg N (Table 3) an 7.4% decrease or an average of 41kgN/ha/yr down to 34kgN/ha/yr.

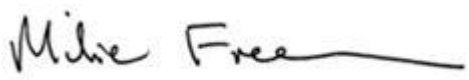
OverseerFM modelled total P decreased from 298kg P to 297kg P a 0.3% decrease with P loss /ha remaining the same at 0.6kgP/ha/yr.

The updated nutrient budget is in OverseerFM and can be published for review if requested from Environment Southland.

Could you let me know as soon as possible if you consider that the explanations outlined above satisfactorily address all the issues raised by Irricon.

Many thanks

Yours sincerely



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