

**BEFORE ENVIRONMENT SOUTHLAND  
AT INVERCARGILL**

**IN THE MATTER OF A HEARING UNDER S100A OF THE  
RESOURCE MANAGEMENT ACT 1991**

**BETWEEN           JIM MAASS-BARRETT & ZANE SMITH  
Applicants**

**AND                 TE RŪNANGA o AWARUA, DEPARTMENT  
OF CONSERVATION, MINISTRY FOR  
PRIMARY INDUSTRIES, SANFORD LTD,  
EEC LTD, and BLUFF OYSTER  
MANAGEMENT CO. LTD.  
Submitters**

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**REBUTTAL EVIDENCE OF JOHN FRANCIS ENGEL**

**2 SEPTEMBER 2019**

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## **EVIDENCE OF DR PHILIP MITCHELL**

- 1 I have reviewed the evidence of Dr Mitchell and have responded to the matters he raises below. Mr Maass-Barrett will also respond to some of the matters raised by Dr Mitchell that relate to his position as the applicant and to his expert knowledge of marine farming in Big Glory Bay.
- 2 Before proceeding, I wish to ensure that the correct site map is being referred to. I note that the map that is included as Figure 1 in Dr Mitchell's evidence is wrong. The original mistake was made by me but following notification, the mistake was rectified promptly. The correct version of the map was sent directly to Ms Alison Undorf-Lay, who made the submission on Sanford's behalf, on 18 March 2019. She acknowledged receipt of it on 20 March 2019. The only difference is in regard to the location of Site 1. The site was changed because Mr Maass-Barrett wanted to ensure that there was sufficient space for salmon cages to be taken through that area.

### **Scope of submission**

- 3 The submission lodged by Sanford Ltd (hereafter referred to as "Sanford") to this application was on two grounds, namely, that the proposal has the potential to:
  - a. adversely affect safe navigation into, around and out of Big Glory Bay; and
  - b. alter hydrodynamic processes, particularly water circulation patterns and phytoplankton distributions in Big Glory Bay. Those changes have the potential to adversely affect the performance of Sanford's existing aquaculture activities.
- 4 I set the scope out because Dr Mitchell makes repeated reference to carrying capacity and, in my view, it is stretching the scope of the submission to include this point. As I go through his evidence, I will comment as necessary where reference is made to carrying capacity.
- 5 In regard to para. 20 of Dr Mitchell's evidence, he notes that in regard to navigation, coastal processes and carrying capacity, the effects of this application are not trade competition effects. I agree with the first two matters but disagree with including carrying capacity. All marine farmers are competing for space in Big Glory Bay regardless of the type of farming. Effects on the existing environment are relevant and carrying capacity must be considered but it is also a matter of trade competition.

## Existing environment

- 6 In regard to the existing environment, Dr Mitchell's main concern appears to be that the application and Section 42A report do not address the environment as it exists following the recent granting of an amendment to the salmon farming consents held by Sanford. I believe that Dr Mitchell has been somewhat disingenuous with this submission, as the amendment was granted after the Maass-Barrett and Smith application had been notified, i.e. it was well down its processing track by that time.
- 7 Sanford did agree to its information lodged in support of its application for the amendments to be used for the Maass-Barrett and Smith application, and where it was, that use was referenced in the application and supporting information. I have reviewed some of those documents associated with the hearing of the amendment application, though not to the depth and extent of Mr Maass-Barrett, and saw nothing that flagged a potential issue for this proposal.
- 8 In fact, the converse is true in that the Sanford amendment application included supporting information that made numerous references to the removal of excess nitrogen from the water column by mussels being beneficial. Two reasonably typical references are as follows:
- a. application – Part B – Assessment of Environmental Effects:  
*“The effect of the proposed changes on the water quality of Big Glory Bay has been modelled by ADS, and while the proposed changes will result in increased TAN and chlorophyll-a, this is within the assimilative capacity of Big Glory Bay. Furthermore, it is anticipated that some of the increase will be consumed by mussel farms (Objective COAST.3 and Policy COAST.5).”*  
[Section 5.3.2.2 Chapter 7 – Coast, page 64]; and
  - b. Big Glory Bay Carrying Capacity Update, Stewart Island, New Zealand, Volume I – Summary of Findings – October 2017 – Aquadynamic Solutions Sdn Bhd (ADS):  
*“Based on the calculations of estimated Total N (without DON, **Figure 2**), there is evidence that N consumption occurs, and this is hypothesized to be a direct consequence of the large amount of mussels biomass in the bay, as filter feeders need to extract the food for their growth from their surrounding environment. Mussel farms act, albeit indirectly, as a mitigation measure limiting the impacts of extra loadings to the environment by consuming the algae as they grow from the*

*additional nutrient loadings from the fish farms.*" [Section 4.2 Summary of Conclusions, page 34].

- 9 From my review of the amendment application, there is no suggestion that Sanford relied on mussels to mitigate the effects of the salmon production increase, though the actual monitoring data used is affected by the mussels that are farmed there now. However, the ability of mussels to consume nitrogen is continuously referred to as something that makes the assessment of the effects of an increased level of salmon farming conservative. Reviewing those documents is as far as the Applicants could go in considering what the existing environment would look like following the granting of Sanford's amendment.

### **Effects on navigation**

- 10 At the time of preparing this rebuttal evidence, the evidence of Mr Eriksson was not available so I cannot respond to this matter in any detail. However, Mr Maass-Barrett, with his extensive experience of operating in this area, will respond to what ever is raised. He is also best place to respond to issues associated with moving salmon pens around the bay as it is something that has happened a number of times in the past. Mr Maass-Barrett is familiar with where and how that was done, and what space was required

- 11 What I would say in regard to the navigation effects, from a layman's perspective, when you look at a map of the bay showing all of the sites, it is difficult to see how the addition of the three proposed sites would make navigation in and around the marine farms any more difficult than what it is now. Care is obviously required and the addition of these new sites will not change that. There is ample space for vessels to move through the area.

### **Effects on Hydrodynamic Processes and Phytoplankton**

- 12 This matter is obviously very technical. The most recent information available is that provided by ADS in support of Sanford's amendment application. Dr Mitchell takes issue with the fact that the Applicants have not addressed the concern raised in the submission about this matter. The difficulty in doing that is the submission does not provide any specific information to say why there is a concern and it is not one that the Applicants' could identify themselves.

- 13 As stated, the ADS reports were available to the Applicants and they were considered. In regard to the effect of marine farm structures on current direction, ADS stated:

*“The reason that the current directions are not well calibrated is that there are numerous mussel farm and fish farm structures within Big Glory Bay. A number of studies have observed that such structures can affect localised current flow and current direction (Hartstein 2003, Plew et al 2005, Stevens et al 2008). It is beyond the capabilities of the model to take into account hundreds of mussel lines and other associated structures that can be found within the Big Glory Bay water column, noting that this has minimal implications for the overall modelling results.”*

[From “Big Glory Bay Carrying Capacity Update, Stewart Island, New Zealand, Volume II – Hydrodynamic Modelling and Flushing – October 2017 – Aquadynamic Solutions Sdn Bhd (ADS)”- Section 3.2, page 18].

- 14 What the modelling does show is that the tidal current direction varies during each tidal cycle, and that there are differences between spring and neap tides, so phytoplankton movement within the bay will vary. No site is therefore always either upstream or downstream of another. As was noted in the ADS report, modelling currents with multiple structures with varying effects would be complex and, from what I know of modelling generally, would require a number of simplifications and assumptions. The Applicants have not seen or heard anything that would suggest that the results of such modelling would provide greater certainty than currently exists.
- 15 From what I understand, the sort of analysis that Sanford appears to be seeking is information that would be difficult and expensive to obtain, even if it could be done, and has not been provided by any other farmer in the bay. However, there is some basic information about currents around permeable obstacles like mussel lines that was provided in the further information response dated 17 August 2018, which can be summarised as follows:
  - a. mussels lines will not completely block water flow but they will slow it down as a passes through;
  - b. because the same amount of water still goes in and out of the bay over a tidal cycle, flow will compensate by speeding up around the farm. The Golden Bay study found that water tended to go around the structure rather than under it; and
  - c. flow moving past a structure will create eddies that will enhance mixing, and while the current flow is too low in Big Glory Bay to produce visible eddies, some will inevitable be occurring.

- 16 Because the tidal flow in Big Glory Bay is very slow even without structures in it, these effects will be correspondingly less. Wind effects in some conditions can have a greater impact, particularly at and near the surface. It is therefore difficult to understand how the proposed structures themselves will adversely affect phytoplankton distribution given the variability in current speed and direction.
- 17 Sanford's concern may be that mussels on the new farms will consume phytoplankton that would otherwise be available for mussels on existing farms. It is known the mussels take longer to mature in Big Glory Bay, probably for multiple reasons such as temperature and food supply. There is no evidence that this effect is likely if this application is granted but we now have consents granted to Sanford that will effectively allow a doubling of production that will result in a substantial increase in phytoplankton production, amongst other things. Again, it is difficult to see how the addition of more mussels will not be anything other than beneficial.
- 18 Dr Mitchell, in para. 36, believes information provided about a reduction in mussel farming by Sanford "... misrepresents the current environment ...". In para. 23(b), he makes the point that shellfish farming is authorised on Sanford's 10 salmon farming sites and there is no impediment to it doing so. Having seen the amended consents and the following plan, I agree with that point but I note that Dr Mitchell stops short of saying Sanford will farm shellfish on fallowed sites (at this time, Mr Culley's evidence is not available so I can only comment on Dr Mitchell's).
- 19 The information in the further information response relating to the decreased mussel production was based on the following statement given in para. 14 of Ms Undorf-Lay evidence to the hearing for the amendment application:
- "A key distinction between Sanford and other salmon farmers in New Zealand and Tasmania is that we fallow our sites. Sanford has been doing this since 2016. Before 2016 Sanford did not regularly move the farms around its sites, and we used to both 'in-fill' and farm areas 'in fallow' with mussels. Sanford does not do either now. Sites in fallow are not used for any farming, they are fully rested. This was a voluntary change made by Sanford as part of its commitment to sustainability, we imposed this condition on ourselves when we successfully changed a mussel farm site into a salmon farm site (MFL246, described in **Mr Culley's evidence**)."*
- 20 As noted, this practice started in 2016 and, given Sanford have had 3 years to assess its effectiveness, it does not appear to have any intention of stopping it. However, the

Applicants have not relied on this reduced production, simply noted it as something that is occurring now that adds a degree of conservatism to its own assessment of effects.

### **Provisions of the Relevant Planning Documents**

- 21 I note Dr Mitchell's review of the relevant planning documents but do not proposed to respond in any detail. Both the application and Section 42A report have a similar analysis but Dr Mitchell has, amongst other things, placed his emphasis differently and focussed on some of the caveats that apply to the objectives and policies in those documents. Such caveats can be found throughout resource management documents and to the extent they apply in this case, I consider them to have been addressed.

### **Conclusion**

- 22 Both my assessment, and that of the Processing Officer, which was reviewed by Environment Southland staff, agree that the potential adverse effects are no more than minor. We are also agreed that the proposal passes both gateway tests under section 104D. I therefore submit that the application can and should be granted.



John Engel

**Manager, Bonisch Environmental**

