

# Kenepuru & Central Sounds



Kenepuru & Central Sounds Residents Association Inc.

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30 January 2018

Dear Sir/Madam

**Kenepuru and Central Sounds Residents' Association  
Submission on Resource Consent Application U170941  
Aroma Aquaculture Limited**

I write in my capacity as Chair of the Kenepuru and Central Sounds Residents' Association Inc.

## 1. Introduction

- 1.1 The Association was established in 1991 and currently has approximately 240 household members who live full time or part time in the Kenepuru and Pelorus Sounds. The Association's objects include, among others, to coordinate dealings with central and local government and promote the interests of residents of Kenepuru Sound and adjacent areas and to promote and act in the best interests of residents, ratepayers and persons associated with the Kenepuru and Central Sounds area.
- 1.2 A few years ago members became concerned at the seemingly endless tide of marine farm applications in the Kenepuru and Pelorus Sounds without regard to the cumulative adverse impacts on what is often referred to as a unique and iconic New Zealand environment. We decided to make a principled evidence based stand. Consequently the Association has built up a sound knowledge and understanding of issues concerning the unsustainability of some marine farming in the Sounds. Most notably the Association has identified particularly egregious mussel farm applications and successfully opposed them at Commissioner led hearings. The Association has then participated in successfully opposing appeals to the Environment Court (and beyond) by those unsuccessful mussel farm applicants.
- 1.3 As noted the Association is concerned at the continuous push from mussel farmers to expand their activities through acquiring new public water space. Kenepuru Sound is,

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### Kenepuru & Central Sounds Residents Association Inc.

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with over 40 mussel farms, a low flush relatively shallow Sound, unfortunately a prime example of what some refer to as the **Tragedy of the Commons**. *“If I do not make a grab for extra area then someone else will, so I may as well and whilst yields will decline overall I will get a marginal increase”*. This approach cannot, we submit, be allowed to go on unchallenged..

- 1.5 To further illustrate the point above we refer to the saying that *“every drop of water into a full jug overflows”*. This application is such a drop.

## 2. Decline Application

- 2.1 The applied for farm extensions and renewal appear to extend more than 200 meters from shore and as such the application would appear to be for a non-complying activity. The Association is of the view for the reasons set out in this submission that the application cannot meet the statutory threshold for a non-complying activity under Section 104D of the Resource Management Act 1991 (RMA) and that the application should be declined.

## 3. Request to Appear

- 3.1 The Association confirms that it would like to present/talk to this submission at the public hearing and will be represented.

## 4. Some Background Points to this Application

- 4.1 Kenepuru Sound is a long, relatively narrow and shallow body of water with constrained “neck” at the channel end. Mussel farms line both sides of the entrance neck. It has long been regarded as an important spawning area for snapper. The applicant wishes to add a further 3.5 hectares to the current consented area of some 7 hectares area in question. This represents a **fifty (50) %** increase in area. As the applicant’s environmental assessment report makes clear the extended farm will be located in very shallow water with low tidal flows and in a particularly low flush area of what is, overall, a low flush Sound.

- 4.2 To further illustrate the relentless creep in mussel farm area over time in the Kenepuru Sound please refer to **Schedule A**.

- 4.2 Looking at the history of farm 8494 (0.75 ha) when the application for this 1 ha farm was lodged in 1994, concerns regarding snapper spawning and decreasing returns for the downstream farm (8495) in the area were expressed by several submitters, MDC declined the application on 13 June 1994, but it was appealed and in 1995 a smaller 0.75 ha farm was approved.

## 5. Ecological Cumulative Impact – Analysis

- 5.1 The Marlborough Regional Policy Statement (‘MRPS’)<sup>1</sup> acknowledges the potential for cumulative ecological impact at Section 3:

*“Marine farming competes with indigenous stock for nutrients and could therefore disrupt the marine ecosystem....The community relies on the quality of the marine ecosystem for cultural, social, and economic wellbeing. Many activities take place in the coastal marine area. ... As pressures for*

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<sup>1</sup> The notified MEP does not contain a separate chapter on Aquaculture as that was withdrawn prior to notification. MEP hearings have just commenced.

*community use and development increase these known areas must be restored and further degradation prevented...*

*Little is known about the cumulative or long term effects of some activities. For example, there is little known about the long term effects of farming filter feeding shellfish on the habitat of indigenous species.”*

- 5.2 Whilst there is still much to learn about the complex and intertwined marine ecosystem, particularly water column effects, our understanding has advanced significantly since that plan statement.
- 5.3 Mussels are filter feeders. It has been established that the average sized green-lipped mussel will filter around 200 litres of seawater per 24 hours. When this pumping rate is multiplied by the number of mussels present in intensively farmed areas low flush areas such as Kenepuru Sound their “scrubbing capacity” and thus cumulative and disruptive adverse impact on the water column should be quickly grasped<sup>1</sup>.
- 5.4 Dr Brian Stewart, a marine ecologist and expert witness for the Marlborough District Council (MDC) in a recent Environment Court hearing, under oath, noted that mussels non-selectively filter out particles from the water column in the five to 500 micrometer range and that includes plankton, phytoplankton, zooplankton, seston (palatable particles) and general silt and detritus in the water column<sup>2</sup>.
- 5.5 That which is palatable is food ingested into the mussels gut and consumed and that which is not is wrapped in mucus and ejected (pseudo-feces). Even a layperson can line up the dots as to the likely cumulative impacts on the ecosystem as hundreds of millions of mussels hungrily strip phytoplankton, zooplankton and fish eggs from the water column.
- 5.6 Further, the Association’s research reveals that the cumulative ecological impact of mussel farms within the Marlborough Sounds was considered in a 2009 report by the Cawthron Institute consolidating research and information on sustainable aquaculture in New Zealand<sup>3</sup>. This report acknowledges that even small scale developments will have an effect on ecological processes, species, population or communities in the growing environment<sup>4</sup>. It concludes<sup>5</sup>:

- *“that growth in the aquaculture industry as anticipated over the next 15 years (NZAS 2006) will in turn require **a better understanding of the wider ecosystem effects of shellfish aquaculture, particularly with regard to the cumulative effects of additional and aquaculture development (along side other anthropogenic stressors) within the context of ecological carrying capacity.** Research to address wider ecological issues where information is relatively sparse will require understanding of complex ecosystem processes, many of which occur beyond the immediate environment of the cultivation area (e.g. changes to food web pathways).”*

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1 See section 3 of the Resource Management Act 1991 for its interpretation of “effects” and “cumulative effects”.

2 Evidence of Dr B. Stewart in *Clearwater Mussels Limited & KJB Marine Farms Limited v Marlborough District Council* [2016] NZ EnvC 21, See Court Transcript (ENV-2014-CHC-36) at pages 439 to 484 – particularly pages 447-448 and 441.

3 “Acoustical and Sedimentological Characterization of Substrates in and around Sheltered and Open-Ocean Mussel Aquaculture Sites and its bearing on the dispersal of Mussel Debris.” Neil D. Hartstein. *Journal Of Oceanic Engineering* January 2005.

4 At subsection 2.4.4

5 At section 8

- “that there is little known about the effects of aquaculture and associated biodeposits on high value reef communities that can be found in close proximity to some farm areas. This study also identified a notable dearth of information surrounding the effects of marine farms on the wider food web and in particular, wild fish assemblages. However, we know little regarding the effects of bivalve aquaculture on the composition of plankton communities, which in turn may have wider ecological effects on the food web.”
- “Included in this information gap is the **general lack of research surrounding the potential consumption of larval zooplankton species (e.g. fish, crustaceans) and the subsequent ramifications for their recruitment success**”.

- 5.7 Of course the ecological impact from mussel farming is not uniform across a bay. The Association submits that areas close to mussel farms will be ecologically impacted far more and much earlier than the wider bay area in its entirety. More particularly, areas under and immediately adjacent to mussel farms are likely to be ecologically impacted through biodiversity changes and particulate feed and energy depletion far worse and far more quickly than the wider bay area in general.
- 5.8 Conceptually it is clear that where food depletion occurs, cultured mussels could theoretically out-compete other suspension-feeders (e.g. zooplankton and benthic shellfish) for particulate food, or exceed what is termed the ecological carrying capacity of a marine farmed area (see Cawthron Section 2.4.4). As can be seen from **Schedule A**, since 2004 the total mussel farm area in the Kenepuru has increased by **around 57%** from 166 to 260 ha.
- 5.9 A more recent (2015) MDC commissioned study from NIWA<sup>1</sup> strongly supports the Association’s concerns as to the likely disruptive biological effects of intensive mussel farming in low flush bays such as Beatrix Bay. In another appeal to the Environment Court by an unsuccessful applicant for a mussel farm in Beatrix Bay the appellant saw fit to subpoena one of the lead NIWA authors of this study in order to table the model before the Court and have the author answer questions. Naturally the Association took the opportunity to burrow into and analyse the model’s outcomes, notably the cumulative impact of existing mussel farms on key biological indicators in Beatrix Bay.
- 5.10 In the course of cross-examination the NIWA witness (Dr Niall Broekhuizen – one of the prime authors of the report) confirmed that our reading of the models outcomes **was correct**. Namely, that without the existing mussel farms there would be a six /seven fold increase in zooplankton over summer<sup>2</sup>. That is, the existing mussel farms are consuming or displacing 85% of zooplankton in the water column within Beatrix Bay. Dr Broekhuizen confirmed that the model showed that the existing mussel farms are also causing a doubling of ammonium levels in the water column on a year round basis. Further, Dr Broekhuizen also confirmed that the model showed that without the existing mussel farms, phytoplankton levels would increase by 125%, which means that mussel farms are causing a reduction of around 60% of phytoplankton in Beatrix Bay over the winter months.
- 5.11 Having had Dr Broekhuizen confirm, under oath, that the Association had calibrated the

1 E.“A Biophysical Model for the Marlborough Sounds – Part 2 Pelorus Sound” Prepared for the Marlborough District Council, March 2015 by NIWA scientists Dr N Broekhuizen, Mark Hadfield and David Plew.

2 Evidence of Dr N Broekhuizen in RJ Davidson Family Trust v Marlborough District Council [2016] NZ EnvC 81. See Court transcript (ENV– 2014- CHC- 36) at pages 253 to 276, particularly pages 254 to 266.

model's outcomes correctly naturally we have carried out the same exercise for Kenepuru Sound. The NIWA model shows similar disturbing results for the Kenepuru Sound. The NIWA model's outcomes show the same magnitude of cumulative impacts of existing mussel farms in the Kenepuru Sound as in Beatrix Bay<sup>1</sup>. With mussel farms present, the concentrations of mussel food (detritus, phytoplankton and zooplankton) decrease, while the ammonium and nitrate concentrations (part of mussel feces) increase. In winter there is a reduction of 60% of phytoplankton and up to 90% of zooplankton in the Kenepuru. **These are clearly not minor impacts.**

- 5.12 Anecdotally long term residents under oath also confirmed to the Court in the Beatrix Bay hearing that following the spread of intensive mussel farming in the Bay there have been noticeable declines in natural organic activity and dramatic changes in the clarity of the water column as the mussels vacuum up the phytoplankton etc in the water column<sup>2</sup>.
- 5.13 There is thus both recent scientific and anecdotal evidence of a more than minor cumulative and negative material impact on these highly valued inshore areas from existing levels of mussel farming activity.
- 5.14 The Association submits that a precautionary approach should be adopted. The appropriate response is to **decline the application.**

## 6. **King Shag Matters**

- 6.1 The Association was very interested to see a reference in the Davidson Environment Limited (**DEL**) report to several King Shag sightings in the Kenepuru<sup>3</sup>. We were most disappointed that the DEL report never attempted to place this in context.
- 6.2 The King Shag is unique and iconic to the Sounds. It is an officially recognized as an endangered species. The relevance of the King Shag in terms of this classification, in particular the adverse cumulative effects of loss of habitat, were recently hammered out in the RJ Davidson case by the Environment Court<sup>4</sup>. The mussel farmer applicant (the RJ Davidson Family Trust) challenged these findings. The appellant went to the High Court arguing these findings were wrong at law<sup>5</sup>. **The appeal was rejected.**
- 6.2 **We respectfully request that the hearing panel** ask DEL/Mr. Davidson for a copy of his records around his sightings of the King Shag. At the hearing we can discuss this this information and also canvas the legal relevance of the likes of Policy 11 of the New Zealand Coastal Policy Statement (**NZCPS**) further as required.

## 7. **The Association's Concerns – Cumulative Impacts Generally**

- 7.1 The Association is concerned at the continuing flow of applications for additional marine farming space within the Marlborough Sounds without any assessment of cumulative environmental impact. This is most concerning in intensively farmed areas such as the shallow, low flush intensively farmed Kenepuru Sound. We refer to the Ministry for the Environment commissioned paper on cumulative effects<sup>6</sup> in the context of the RMA and make the following observations by way of summary:

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1 See section 5.4.1 of "A Biophysical Model for the Marlborough Sounds – Part 2 Pelorus Sound".

2 Evidence of Mr W. Scholefield in *RJ Davidson Family Trust v Marlborough District Council* [2016] NZ EnvC 81. See Court transcript (ENV-2014 –CHC-36). at pages 347 to 352- particularly page 349.

3 Paragraph 5.2 of the DEL report.

4 *RJ Davidson Family Trust v Marlborough District Council* [2016] NZ EnvC 81

5 *R J Davidson Family Trust v Marlborough District Council* [2017] NZHC 52, at para 150.

6 "When is Enough, Enough- Dealing with Cumulative Effects under the RMA" By Phillip Milne, Partner, Simpson Grierson (2008). A paper commissioned by the Ministry for the Environment.

- Cumulative effects include the known and potential effects of the activity in question added to the known and potential effects of other consented activity (page 6).
- Cumulative effects can and must be considered when determining a resource consent application (page 6).
- There are cumulative effect limits on all natural character and landscape values whether or not they are considered outstanding or features (page 11).
- “*One only need visit the Marlborough Sounds...to wonder whether we have....exceeded the sustainable limit of some landscape resources...*” (Page 14).

7.2 The Association submits that, unfortunately, this application highlights in a very negative way these and related issues.

7.4 The Association is concerned at the seemingly limitless expansion of mussel farms that this application and others like it represent. **This can only be addressed by reference to the cumulative environmental impact of all existing mussel farm activity - aesthetically, recreationally, navigationally, and ecologically.** If the cumulative impact of existing activity is already at or above acceptable thresholds then all of the impact of an addition to the area of an existing farm will be of an unacceptable level, irrespective of how it stands relative to the level of existing activity.

7.5 The Association is of the view that the cumulative impact of marine farming in the Kenepuru Sound is clearly already at or above acceptable levels from an aesthetic, recreational, navigational and ecological perspective. As such any further mussel farm applications for the this area, including this application, should it is submitted be declined.

## 8. Other Ecological Cumulative Impact Examples

8.1 The Association notes the comments in the DEL report at paragraph 5.3.2 (Productivity). It is submitted, that the DEL report completely misses what the Zeldis report is actually revealing. In short, Zeldis reports a small correlation between crop yields and weather patterns. It does not address average crop yields over time. These have (anecdotally) declined as farming intensity has increased. Moreover, Zeldis demonstrates nutrient limitation in the Sounds – a factor strongly suggesting that nutrient depletion by mussels can significantly suppress indigenous activity. This outcome is particularly so in La Nina weather patterns.

8.2 We also note the DEL statement that there has been no data presented to show that the ecological carrying capacity of the Sounds has been reached. Ecological Carrying Capacity **cannot** be measured at a Sounds wide level. Ecological carrying capacity is measured by reference to ‘areas of influence’. That is, by reference to discrete areas of the Sounds that are actually effected by the activity. There is ample data and tools available, such as the **Aquaculture Stewardship Council (ASC)** standards and the NIWA Biophysical Model for the Pelorus Sound, showing that parts of the Pelorus and Kenepuru Sounds are being farmed beyond ecological carrying capacity. We look forward to discussing these and other productivity issues at the hearing. If the hearing panel requires copies of either report/paper we suggest that MDC will be able to supply the same, otherwise we would be pleased to assist.

8.3 Mussel farming has material adverse benthic impacts. Mussel farms can deposit between 250 and 400 tonnes of material onto the seafloor per hectare per annum<sup>1</sup> and much of

<sup>1</sup> “Sustainable Aquaculture in New Zealand: Review of the Ecological Effects of Farming Shellfish and Other Non-fish Species” April 2009 Cawthron Institute.

the Kenepuru Sound's more productive photic zone is now impacted in this way. Bearing in mind that it has been established that depositions from mussel farms can be found up to 50m from the edge of a farm (dependent on flow rates) then we estimate that a significant part of the Kenepuru area benthos is now adversely impacted by mussel farm fouling and biodiversity changes. Any additional development imposing yet further effects on the area in this manner is not, it is submitted, appropriate development.

- 8.4 For another example we refer to research on the impact of mussel farming can have on populations of the mobile benthic predator the sea star *Coscinasterias muricata*, often colloquially referred to as 11 armed sea stars. A scientific study has found that the incidence of these creatures in areas with mussel farms is up to **39 times** that compared to areas without mussel farms<sup>2</sup>. This is, it is submitted, a significant and adverse biodiversity change.
- 8.5 There is thus both recent scientific and anecdotal evidence of a more than minor cumulative and negative material ecological impact on these highly valued inshore areas from existing levels of mussel farming activity.
- 8.6 A precautionary approach should be adopted. The appropriate response is to decline the application entirely.

## 9. Legal Relevance of Cumulative Impacts

- 9.1 The Association submits that the RMA requires regard to be had to cumulative impacts when assessing marine farm applications<sup>3</sup>. When assessing a resource consent application Section 104 of the RMA requires a consent authority to, among other things, to have regard to environmental standards, regulations, national policy statements, the New Zealand Coastal Policy Statement ( **NZCPS** ), the Marlborough Policy Statement (MPS), as well as the Marlborough Sounds Resource Management Plan (MSRMP).
- 9.2 The first part of Objective 1 of the New Zealand Coastal Policy Statement ('NZCPS') states:

**"To safeguard the integrity, form, functioning and resilience of the coastal environment and sustain its ecosystems, including marine and intertidal areas, estuaries, dunes and land, by:**

- *maintaining or enhancing natural biological and physical processes in the coastal environment and recognising their dynamic, complex and interdependent nature.."*

- 9.3 Policy 3 of the NZCPS requires the adoption of a ***precautionary approach*** towards proposed activities whose effects on the coastal environment are uncertain, unknown, or little understood, but potentially significantly adverse.

## 10. Recreational and Amenity Impacts

- 10.1 Kenepuru Sound is a relatively heavily populated and popular recreational area. The general area is a popular recreational area for water sports. The applicant notes there are 3 mooring sites inshore of the extended farm. The applicant suggests the extended farm

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2 Inglis, G.T.; Gust, N. 2003. Potential indirect effects of shellfish culture on the reproductive success of benthic predators. *Journal of Applied Ecology* 40: 1077–1089.

3 "When is Enough, Enough- Dealing with Cumulative Effects under the RMA" By Phillip Milne, Partner, Simpson Grierson (2008). A paper commissioned by the Ministry for the Environment.

will have no impact on users of these moorings. We beg to differ. The extended area will significantly impede access. There is no suggestion from the applicant that it has consulted with the owners of these sites. Further we submit the proposal will seriously impede access to the beach and foreshore. We also note that back in 1994 there were no residences around Bells Point, but since then the land adjacent to it has been subdivided and several residences established. Even back in 1994 the MDC expressed the view that the impact on amenity values would be more than minor. We submit that this is even more so today.

## **11. The Association's Position**

- 11.1 The Association submits that where the cumulative impact on indigenous ecological systems of existing marine farms in an area is already at unacceptable levels then cumulative impact principles dictate that any further such activity cannot be permitted. This outcome follows it is submitted from the requirements of the NZCPS, the MSRMP and the MRPS.
- 11.2 The Association also submits that the same applies for aesthetic, recreational, navigational and other negative amenity impacts from further marine farm activity in already heavily farmed areas. As we hope to be making clear, the Association believes that Kenepuru Sound has passed this point.
- 11.3 The Association believes it is unfortunate that the mussel farming industry has been enabled to evolve without consideration of cumulative impact. The Association submits that this is not a basis on which the mussel farming industry within the Marlborough Sounds should continue to evolve. Nor is it a basis upon which this application can be properly considered. In other words, the Association submits that the Applicant has to demonstrate that the existing cumulative effects are minimal. The Applicant has not done so and, we submit, nor can it do so.

## **12. Other Specifics of the Subject Application**

- 12.1 With regard to other specifics of the subject application the Association also makes the following submissions.
- 12.2 **Limitless Spawl:** The Association does not accept the applicant's propositions that existing marine farms mean that further marine farms or extensions to existing ones will have only a minor marginal impact. The logical extension of such propositions is limitless sprawl (See Schedule A). As noted, the Association's position is that a proper assessment of environmental impacts is a cumulative one. If already at or above acceptable levels then no further activity can be permitted. In other words, each extra drop of water into a full jug overflows.
- 12.3 **The Applicants Production Claim?:** The Association views the applicant's claims as to mussel yield with some scepticism. The applicant asserts that the yearly production of the existing two farms is 400 tonne. The average farm production per ha is 21 tonnes per year according to the Marine Farming Association, based on a 3 ha farm with 8 x 110m longlines, 20m longline spacing and 3750m dropper length per longline. For the 6.25 ha farm of the applicant that would amount to only 131.2 tonne if the MFA production figure is used. This is only 30% of the 400 tonne yearly production claimed.
- 12.4 However a moment's thought suggests that the situation is quite different here given the shallow water of the proposed site. As we understand it the 3750m dropper length per long line of the MFA average farm is based on 15m long droppers, spaced at 0.88 m intervals, or 125 droppers per 110 m long line. The droppers on the applicant's farms can only be 5

metres long on average as the water depth varies between 3.8 and 6 metres. In this case the MFA long line would only have 1250 m of dropper rope suspended as 125 droppers from the 110 m long line, reducing the MFA average farm production to 7 tonnes per ha per year. The applicant's total yearly production would we submit only be 43.7 tone. **We urge the hearing panel to have the applicant provide a substantiated** account (backed up by past yield data) of how it arrives at the 400 tone yearly production figure.

- 12.5 **Biofouling Issues:** Placing mussel farm structures into the water attracts large numbers of other species – bio- fouling. The most well documented being the presence of the indigenous blue mussel (*Mytilus galloprovincialis*). However in the DEL report we note a reference (plate 4 page 15) to a filamentous algae. We are concerned that this could be a mat-forming green filamentous macroalga, belonging to the Cladophora sp. We can discuss this further at the hearing.

### 13. Conclusion

The Association is of the view that the application fails the discretionary activity criteria of the Marlborough Sounds Resource Management Plan. It also offends against the objectives and policies of the New Zealand Coastal Policy Statement and the Marlborough Regional Policy Statement. It stands to have a more than minor environmental impact and fails the tough legislative policy threshold as prescribed by sections 104D of the RMA.

As such the Association submits the application **should be declined**.

We understand that the MDC should have ready access to all the references cited but if that is not the case please let us know and we can provide the same.

Yours faithfully

Ross Withell



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# SCHEDULE A

