

**Kenepuru and Central Sounds Residents' Association  
- New Zealand King Salmon Co. Limited -  
Resource Consent Application U190438 – North of Cape Lambert**

I present this submission as a Marine Committee member of the Kenepuru and Central Sounds Residents' Association ("Association").

Let me introduce myself.

My name is Hanneke Kroon and I live permanently in Elie Bay in the Pelorus Sound since February 2012.

I have completed a Master's of Science degree in Electrical Engineering at Twente University in the Netherlands, being the only female student in the Electrical engineering department during my study. I worked as a computer specialist in the field of Automation and Control of factory processes, travelling worldwide for my work. I am a scientist, but not in marine biology.

My husband Joop and I left the Netherlands in 1991 in our yacht Vaarwel and sailed half way around the world to New Zealand, where we arrived in 1995. We worked in Auckland as computer experts until we went sailing again in 2003, this time to Australia, South East Asia and returning to New Zealand via Papua New Guinea and the Solomon Islands. On my journeys I have become well aware of the many environmental challenges that our seas and oceans face.

I was a submitter in the Board of Inquiry process, when New Zealand King Salmon applied for nine new salmon farms. In 2016 I represented the Association in the Marlborough Salmon Relocation Working Group and was a liaison for MPI Biosecurity during the 2015 Response. I have also written extensively on NZKS farming efforts.

## **Introduction**

1. The Association was incorporated in 1991 and currently has over 300, mainly household members, whose residents live full time or part time in the Kenepuru or Central Pelorus Sounds. The Association's objectives include, among other things, to coordinate dealings with central and local government on matters of interest to the members.
2. The Association is active on a wide variety of issues. These range from: attempting to maintain the security and reliability of the rather stressed local roading network; advocating with Council for the installation and/or maintenance of essential public services; lobbying central government and advocating on conservation and environment matters concerning adverse impacts on our much valued and iconic marine space of the Sounds. For more detail see our web site ([www.kcsra.org.nz](http://www.kcsra.org.nz)).

## **Background**

3. **Board of Inquiry:** In 2012, New Zealand King Salmon (**NZKS**) sought to acquire space in the Sounds via a Board of inquiry process (**BOI**) for nine new salmon farms - supposedly in carefully selected high flow cool sites - most of these in the Pelorus Sound area. Once up to speed the Association (and many other community groups) quickly realised the significant adverse impacts of these proposals on the public space making up the iconic Marlborough Sounds marine environment. After due process – involving ground breaking litigation at the

Supreme Court - NZKS was granted three high flow sites. Two of these BOI sites were in the Pelorus Sound.

4. **Salmon farm relocation:** In 2016, with help from the Ministry of Primary Industries (**MPI**), NZKS almost immediately sought to make up the shortfall by initiating a “Salmon farm relocation proposal”. This time they sought up to six new farm sites inside the Marlborough Sounds, but carefully avoided any real scrutiny via a Board of Inquiry or Environment Court process and choosing instead the RMA Section 360 route. The relocation advisory panel suggested three new farms sites, two in the Waitata Reach of the Pelorus Sound and one in Tory Channel. That process is still ongoing. According to the latest MPI update - 30 November 2020 – Fisheries New Zealand is still waiting for a final complete proposal before it gives advice to the Minister for Oceans and Fisheries<sup>1</sup>.
5. Since then NZKS has had second thoughts about wanting more farms in the Pelorus Sound. The assurances given to the BOI back in 2012, that the Waitata Reach had the required year round low water temperatures, required for successful salmon farming, proved to be incorrect. Cue ongoing high mortality rates in the BOI Pelorus farms.
6. NZKS continued its drive for expansion of its salmon farming operations and has chosen to pursue one of the alternatives suggested during the salmon farm relocation meetings by going offshore. Initially, water column monitoring was undertaken at nine sites along the north and east coast of the South Island. Surprise, surprise the site in Cook Strait was chosen for their first offshore farm application.
7. **No Trade off:** Some members of the Association have expressed the view that if this so called “offshore” application is the price to pay for seeing NZKS exit its unsustainable Pelorus Sound sites, then that might not be such a bad trade off.
8. As we understand it from the amended 2021 Cape Lambert farm application, NZKS does not even want to relocate most of its worst performing salmon farms any more. Instead, a number of them may become an integral part of how the Cape Lambert site will be managed, with smolt growing sites and a dedicated harvesting site.<sup>2</sup>

## Location, Location, Location

9. We noted in our September 2018 submission<sup>3</sup> concerning the original monitoring application for this site, that from a conceptual viewpoint it was good to see NZKS taking steps to investigate moving out of the Marlborough Sounds. Equally we made it clear that the Association would vastly prefer if NZKS was looking much further south. Instead NZKS is choosing a farming site so close inshore as to be partly within the Marlborough Sounds harbour limit and the Outer Sounds area. A fundamental disjunct is NZKS's selection of a massive salmon farm site in a highly sensitive and high value area from an environmental perspective. In other words, we have serious concerns about the suitability of this site in terms of significant adverse environmental impacts.

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<sup>1</sup> <https://www.mpi.govt.nz/consultations/marlborough-salmon-relocation/>

<sup>2</sup> Applicants Evidence - 022 - M Preece - NZKS operational matters.pdf

<https://eservices.marlborough.govt.nz/download/files/tQKu1h7wKmR76AiXtHKCIVLhQhwo5p6NOTkm5GS76UtQ>

<sup>3</sup> [https://www.marlborough.govt.nz/property-](https://www.marlborough.govt.nz/property-search/files?url=https%3A%2F%2Fdata.marlborough.govt.nz%2Ftrim%2Fapi%2Ftrim%2Fget%3Fid%3D18224198&name=Submissions.pdf)

[search/files?url=https%3A%2F%2Fdata.marlborough.govt.nz%2Ftrim%2Fapi%2Ftrim%2Fget%3Fid%3D18224198&name=Submissions.pdf](https://www.marlborough.govt.nz/property-search/files?url=https%3A%2F%2Fdata.marlborough.govt.nz%2Ftrim%2Fapi%2Ftrim%2Fget%3Fid%3D18224198&name=Submissions.pdf)

10. Other submitters and experts will delve deeper in the pristine nature of this part of the Cook Strait, the value of the high-energy waters for all matter of life, the recreational opportunities and the outstanding high natural character. The Association agrees that the Cape Lambert site is not a good location for a salmon farm, because of all these qualities.

## Sea temperature

11. From the onset of the BOI, it became apparent to the Association that salmon farming in the Pelorus Sound faced an intractable physical problem. Too often and for too long the water temperatures in the Pelorus Sound equal or exceed the critical 17 degrees threshold. At this point farmed King (Chinook) salmon become stressed, because they cannot regulate their body temperature. Eventually they stop eating and start to die in unacceptably large numbers.
12. **Pelorus Sound:** Sadly for NZKS (and its fish) their expectation that salmon farming would be successful here, has been proven wrong. For a NZKS farm extension consent application hearing (November 2018) involving one of the BOI high flow farms (**Waitata**) the Association, in the absence of farm specific mortality data being available, calculated the mortality in the 2018/2019 monitoring period for this farm as over 40% by biomass! This is not sustainable environmental management, nor is it acceptable for animal health, disease risk, biosecurity risk and other issues. Further, NZKS knew the risk as at the BOI they categorized the water temperatures in the main channel of the Pelorus Sound as marginal<sup>4</sup>.
13. **Sea Temperatures at the Cape Lambert Site:** Part of the NZKS story with this application is that this site will avoid the high summer sea temperature problem by being located in deeper open waters.<sup>5</sup> As far as we can ascertain the only actual sea temperature data from the Cape Lambert site provided by NZKS is from monitoring between begin October 2018 until 25 January 2019<sup>6</sup>. As can be seen from the graph, the surface temperature can even exceed 19°C at times in January, while at a depth of 10 meter, the temperature reaches 17°C. Due to the blue and green coloured dots used in the graph, it is hard to distinguish between the surface and the -10m measurements.
14. The January 2019 temperatures are hardly reassuring, but it must be noted that there was that summer a marine heatwave in the Tasman Sea, with elevated water temperatures 1.5°C above normal. This was the same year that 40% mortality was calculated for the Waitata farm in the Pelorus. According to the Cawthron report the temperatures shown were not representative of typical conditions for this region.
15. We compared the Cape Lambert site temperatures with three locations in the Marlborough Sounds. As can be seen, the Cape Lambert site is at least as warm as the entrance of the Pelorus or the Queen Charlotte Sound and much warmer than the Tory Channel entrance. The deeper water will not help the farmed salmon much, as the net pens have 15m long sides, followed by a cone shaped bottom. The graph shows the Marlborough Sounds locations for a few more months, but only Tory Channel remains below 17°C for the whole summer.
16. **Additional Temperature data:** The Marlborough District Council (**MDC**) monitors up to 23 sites from 2013 onwards, in reaction to the BOI, who noticed the complete lack of any

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<sup>4</sup> 2(c) Mark John Gillard - Map 3 Temperatures - all farms- v1.jpg

<sup>5</sup> See page 5 of the NZKS 2019 application.

<sup>6</sup> Newcombe E, Knight B, Smeaton M, Bennett H, Mackenzie L, Scheel M, Vennell R, Campos C 2020. Water column assessment for a proposed salmon farm offshore of the Marlborough Sounds. Prepared for The New Zealand King Salmon Co. Limited. Cawthron Report No. 3313. 79 p. plus appendices.

environmental monitoring with incredulity. Initially Port Gore was included in the monitoring, but dropped when the Supreme Court did not allow a salmon farm there. The monitoring location was in the middle of the entrance, between Cape Lambert and Cape Jackson. The graph shows that the temperature profile of Port Gore is more akin to the Pelorus or the Queen Charlotte Sound entrance, with summer temperatures exceeding the 17°C mark. It bears no resemblance to the Tory Channel temperature profile.

17. **Increasing Sea Temperatures?** According to MetOcean Solutions the sea temperatures in New Zealand are increasing<sup>7</sup>. NIWA has publically stated that the Tasman Sea is warming rapidly and is supplying warm sea currents in New Zealand's direction. Niall Broekhuizen and others from NIWA have done an in-depth analysis of the sea temperatures in the Pelorus Sound and how they have changed over time<sup>8</sup>. Multiple data series at different locations in the Pelorus Sound, spanning four decades, were analysed. The conclusion is that the sea temperatures are rising in the Pelorus and the main cause for this is the warming of the Tasman Sea. Higher than average sea temperatures in winter lead to marine heat waves during the summer. It is clear from the maps that the warming effect stretches far into Cook Strait and that the Cape Lambert site is also exposed to the warming Tasman Sea currents<sup>9</sup>. The satellite data indicate that warming has been more rapid in Cook Strait than inside the Sounds<sup>10</sup>.
18. Why all this emphasis on sea temperature? Due to the global warming of the earth<sup>11</sup>, marginal areas for growing salmon will only become warmer and at some stage unsuitable for salmon farming. From a Part Two RMA perspective we do not believe that the utilization of this site for an activity that is so marginal is an efficient use of this high value public space.

## Salmon mortality, disease and biosecurity

19. Elevated sea temperatures for ongoing periods stresses salmon because they cannot regulate their body temperature. The farmed salmon cannot take evasive action either. Stressed fish are more susceptible to disease. Salmon diseases and diseased salmon has plagued NZKS for the last 10 years.
20. Coinciding with the BOI in early 2012, NZKS experienced such high mortality rates at its Waihinau farm in the Pelorus, that it was investigated by the Ministry for Primary Industries (MPI) Biosecurity section. No cause for the mortality spike was identified during its first investigation<sup>12</sup>.
21. The salmon mortalities continued in the years after<sup>13</sup> and lead to a second investigation in 2015. In 2017 the Ministry for Primary Industries (MPI) released an Intelligence report into the NZKS 2015 mortality spike, which confirmed that two hitherto unknown pathogens (to

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<sup>7</sup> <https://www.rnz.co.nz/news/on-the-inside/452728/marine-heatwaves-in-winter-could-have-dire-impacts-on-fisheries-and-herald-more-summer-storms>

<sup>8</sup> Niall Broekhuizen, David R. Plew, Matt. H. Pinkerton & Mark. G. Gall (2021). Sea temperature rise over the period 2002–2020 in Pelorus Sound, New Zealand – with possible implications for the aquaculture industry, *New Zealand Journal of Marine and Freshwater Research*, 55:1, 46-64, DOI: 10.1080/00288330.2020.1868539.

<sup>9</sup> Ibid 7, Figure 4 and 5.

<sup>10</sup> Ibid 7, page 15.

<sup>11</sup> NIWA – “It is the warmest winter on record – again”

<https://niwa.co.nz/news/its-the-warmest-winter-on-record-again>

<sup>12</sup> Salmon Mortality Investigation - REW-1017 Pelorus Sound. MPI Technical Paper 2013/19

<sup>13</sup> To review the KCSRA technical papers on this subject go to [www.kcsra.org.nz](http://www.kcsra.org.nz), click on “Documents” and then click on the folder “Salmon Farm Mortality” and select “Paper - Salmon Mortality in the Pelorus – Why”.pdf

New Zealand) had been isolated in the mortalities<sup>14</sup>. MPI Biosecurity has a webpage to report on the ongoing salmon response<sup>15</sup>, where all documents are listed.

22. **Controlled Area Notice:** In addition to the investigation, MPI then issued a Controlled Area Notice (CAN) in April 2016. To prevent the pathogens from spreading, MPI put legal controls on the movement of salmon and equipment from the salmon farming areas in the Marlborough Sounds. The controls are set out in a Controlled Area Notice<sup>16</sup>. Elimination of the NZ Rickettsia-like Organism (NZ-RLO) has not been attempted, despite it being listed as an unwanted organism under the Biosecurity Act 1993.
23. The CAN defines two separate areas of the Pelorus and Outer Sounds and the whole Queen Charlotte, including Tory Channel, where live or dead salmon and all equipment used for the salmon operations cannot be moved out of the Contained Area. Exceptions to these rules require a permit.
24. Harvested dead salmon is allowed to be moved without a permit to the Nelson processing plant. Dead salmon collected from the farms (morts), have to be transported in closed bins for rendering to fishmeal and fish oil in Fielding, or to Brightwater for composting, or dumped at any landfill. The composting facility has stopped accepting the morts<sup>17</sup> and transporting the salmon to Fielding in the North Island is deemed too expensive. All morts will be dumped at the (Blenheim) landfill until NZKS finds a biosecure alternative.
25. **NZKS and Controlled Area Notice:** NZKS is still in denial regarding the salmon diseases present in their farms. The salmon operations report (2016, updated in 2018) fails to mention that salmon diseases have been detected in the Marlborough Sounds and the Evidence of Mark Preece states at paragraph 58: *"It has also been conscious of the need to provide all year-round production and separate 'bio secure' areas, **not because disease is likely in the short term, but because that is the prudent way to plan for a long-term sustainable salmon farming future.**"* Because of this denial of the salmon diseases that are already present in the Marlborough Sounds, there is also no mention of the existence of a Controlled Area Notice for the Marlborough Sounds. A Controlled Area Notice (CAN) is a legal tool under the Biosecurity Act 1993, placing controls on the movement of certain risk goods out of a specified area. It puts limitations on moving live salmon out of the Contained Areas to the Cape Lambert Site.
26. Inshore salmon farms (such as Waihinau, Forsyth, East Bay) are planned to be used as a nursery for the smolt, which are very tiny salmon. The Cook Strait marine environment with its high current and large waves is too harsh an environment for smolt, who also need to transition from fresh water to sea water. Therefore the smolt will be grown to a size of 1.5 kg inside the more sheltered waters of the Sounds, then transported with a well boat to the Cape Lambert farm<sup>18</sup>. When ready for harvest, they will be transported back, to be killed at a dedicated harvesting farm. This live salmon transport contravenes the aim of the Controlled Area Notice, which is to contain the NZ-RLO within the Pelorus and Q.C. areas and prevent its spread outside these contained areas.
27. All NZKS salmon farms in the Sounds (except the never used farm in Crail Bay) are within the contained areas, because the NZ-RLO has been detected in nearly all of the farms that

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<sup>14</sup> Intelligence Report – NZ-RLO & *T. Maritimum* 2015 response, MPI Technical Paper No. 2017/39

<sup>15</sup> <https://www.mpi.govt.nz/biosecurity/about-biosecurity-in-new-zealand/salmon-response/>

<sup>16</sup> <https://www.mpi.govt.nz/dmsdocument/12007-Controlled-area-notice-in-respect-of-NZ-Rickettsia-like-Organism-NZ-Rickettsiaceae-sp.>

<sup>17</sup> Applicants Evidence - 022 - M Preece - NZKS operational matters .pdf, paragraph 31.

<sup>18</sup> 20210901 NZKS blue endeavour Presentation - Sept 2021.pdf

contained fish<sup>19</sup>. It was also detected in the retested 2012 salmon from the Waihinau farm. From the moment the smolt are introduced into farms inside the contained areas they risk getting infected with the NZ-RLO pathogen. Yet there is no mention of this risk nor of the CAN impediment, not in the NZKS application nor in the evidence. From the evidence it does not appear that MPI Biosecurity has been consulted on this matter.

## **The Role of the MDC landfill**

28. Just what currently happens to the morts is worthy of a quick comment.
29. The Association has been provided with monthly dumped salmon waste data from the Blenheim tip. It gives the Association the most up to date indication of the scale of the salmon mortalities as they happen. This is in addition to the overall mortality percentage in NZKS yearly financial reports. The landfill data has been used to plot the seawater temperature in combination with the dumped salmon waste (in tonnes) per month and shows the correlation between the two. There is a clear increase in dumped salmon waste with increasing sea temperatures, but the salmon mortality increase happens some weeks after the sea temperature increase. This is to be expected, as the salmon mortality increases as a consequence of longer periods of seawater temperatures exceeding the 17°C mark.

## **Engineering and Mooring Design**

30. The engineering design information in the original 2019 application<sup>20</sup> was a brochure from huonaqua.com.au plus Appendix R – Engineering detail from OCEL. Both have been superseded by a single document in the amended application, namely document 15 – “Site diagram OCEL SK-051103-521, Rev 5”. That was all the information given regarding the engineering and mooring design. This site diagram was part of a ScaleAQ’s Grid Mooring Analysis report, dated 25 March 2020. This report was not made available during the submitter engagement process, despite the Association’s request for it.
31. The amended 2021 application was even more deficient than the original 2019 application in this respect. The whole engineering design is compressed in a single A2 drawing. Like you draw a salmon farm design on the back of an envelope!
32. Rather we had to wait for the late production of the Applicant’s evidence finally containing some of the engineering and mooring detail. This late production means we were unable to consult with an engineering expert. The Association was stunned to realise that the S42 report from the Council does not include the engineering and mooring design of the salmon farm. Again we understand this was because it was not provided in time. Bearing in mind my engineering background and with the support of the Association I decided to roll up my sleeves and in the short time available conducted a quick review of a couple of crucial aspects as I saw them.
33. ScaleAQ is a Norwegian firm who designs and builds salmon farms, as well as feed barges and well boats. The engineering design is based on a Norwegian Standard NS9145.E. There is no explanation of the standard from the applicant. Accordingly in the time available I reviewed

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<sup>19</sup> Ibid 13, Table 1.

<sup>20</sup> Appendix C: Open Ocean Farm Structures Examples – available on the Portal

<https://eservices.marlborough.govt.nz/download/files/ArRgFV0PWKTDHWjrD2uNDQ0n5qbQZiuh47JzKlkcArRg>

other sources. Below is an extract<sup>21</sup> concerning how the standard categorises certain aspects of the operating environment.

**Table 1.2:** Environmental classification given in terms of significant wave height Hs, peak period Tp and current velocity U1 according to **Norwegian Standard NS9415 (2009)**. It is assumed irregular waves for each wave class.

Wave	Hs(m)	Tp(s)	Exposure	Current	U1(m/s)	Exposure
A	0.0 - 0.5	0.0 - 2.0	Small	a	0.0 - 0.3	Small
B	0.5 - 1.0	1.6 - 3.2	Moderate	b	0.3 - 0.5	Moderate
C	1.0 - 2.0	2.5 - 5.1	Heavy	c	0.5 - 1.0	Heavy
D	2.0 - 3.0	4.0 - 6.7	High	d	1.0 - 1.5	High
E	>3.0	5.3 - 18.0	Extreme	e	>1.5	Extreme

34. As can be seen from the table above, the NS9415 standard has several classes, based on significant wave height and the current.
35. The 2019 Engineering detail from OCEL puts the significant wave height at the Cape Lambert site as 5.5 m and the maximum wave height as less than 11 m. The Hindcast Wave Summary Report - September 2021.pdf reaches similar conclusions. Thus the Cook Strait site has **Extreme** size wave heights while the currents in Cook Strait are high, but not extreme at the site. Accordingly, the NS9415.E standard applies. In other words in terms of the standard the site is extreme. We **recommend** that the hearing panel must be satisfied that the design accommodates this extreme environment and that what is proposed is not an untested design.
36. The mooring design is for circular pens with a 168 m circumference. It is unclear why NZKS wants to be able to switch to the larger pens with a 240 m circumference. At the same depth of the net it has double the volume of the smaller pens. It is also unclear if the mooring design will have to be redone, but it seems unlikely that it will be adequate for both sizes of circular pens.
37. We note the reservations of Maritime NZ back in 2019 (see appendix 8 of the MDC section 42A report). In the absence of anything further **we recommend** that the application be declined given the lack of review by independent NZ based experts and Maritime NZ on this fundamentally important aspect.

## The Site – Outstanding Landscape and Natural Character Values

38. As we understand it the site sits in an area of outstanding landscape and seascape values. In terms of natural character the sites' benthic area contains vibrant biological communities that appear to have long gone from the Inner Sounds. There are at least three areas labeled as ecologically significant marine areas in close proximity. The nearest at about 1.5 km distance is the renowned McManaway Rock area. The site is close to the entrance of the Pelorus Sound and Queen Charlotte Sounds. It straddles or is close to significant navigation routes for all manner of sea going vessels and recreational craft. The site is a very high current site with the possibility of extreme wave action. In short it has many attributes, which suggest this is not an ideal site. However after only a few months of monitoring the applicant seems supremely confident these values can be suitably discounted to further its economic aspiration.

<sup>21</sup> Yugao Shen; Thesis - Operational limits for floating-collar fish farms in waves and current.pdf (2018) Norwegian University of Science and Technology. DOI:[10.13140/RG.2.2.17501.13288](https://doi.org/10.13140/RG.2.2.17501.13288)

39. We also point to the evidence put forward by experts B. Miller of e3S and Mr R. Schuckard as they clearly set out the values of the area and why the application should be declined under these headings.

## **Conclusion**

40. Our review of the revised application, despite being relatively brief given our limited resources, suggests it is deficient in many areas and is a far from compelling argument that the economic benefits hoped for by the applicant outweigh the possible and reasonably obvious adverse environmental effects from the proposed activity. We also submit that the expert evidence referred to above supports the conclusion that this application should be declined.