Submission from the Port Underwood Association in respect of:

Marine farm application U120642

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**Summary**

The Port Underwood Association submits that the application for the extension of three mussel farms into one large farm extending over 14 hectares should be rejected. The Association does not support this application.

The reasons for this are as follows:

* The proposal represents unacceptable expansion into the mid bay area of Port Underwood;
* The proposal will, by jutting out from Gorse Bay, be a hazard to navigation;
* The expansion of the farms will create marine farm structures extending 450 to 550 meters which is far in excess of the current discretionary distance of 200 meters in the current resource management plan;
* The analysis by the applicant omits the influence on phytoplankton of other neighbouring marine farms giving only a partial analysis of the depletion rates;
* It is not understood how any applications can be approved without research on the environmental impacts of marine farms. The Port Underwood Association submits that Marlborough District Council has an obligation to ensure the sustainable management of the costal marine area and this obligation cannot be met without understanding the environmental impact of marine farms;
* The Department of Conservation 2003 discussion paper on mussel farming noted several environmental impacts caused by mussel farming. These do not seem to have been taken into account in the application;
* The application has not undertaken any study into the impacts of sulphides or ammonia nor the level of oxygen depletion caused by mussel farms. The Association suggestion that the application cannot be approved without research into these matters;
* There is a lack of clarity regarding the species that are to be farmed. The Port Underwood Association submits that any application should make it clear what it is proposed to farm.
* The Port Underwood Association submits that further research is required on the impact upon red algae beds prior to approval of the application; and
* There are a number of errors in the maps showing the area to be farmed.

**Over expansion**

The Port Underwood Association has concerns with the further seaward expansion of mussel farms. The history of this area has been one of continual expansion further and further into the mid-bay area of the north-eastern arm of Port Underwood. Farms have been built to the seaward side of existing farms and then later extended further eastward. This is being followed by the currently proposed eastward expansions by adjacent farms, and as the past shows, will most likely be followed by applications by other farms to expand eastward yet again even further.

The current eastern boundaries of the marine farms in this area, the farms subject to this application and the farms to the south nominated as being in Gorse Bay, form a smooth navigation line as they now exist. This application, if approved, would form an abrupt jutting out corner on the southern edge that could be considered hazardous for navigation purposes. It would create more marine farm structures up to 450 to 550 metres from the coast when the discretionary distance is 200 metre in the current plan. The Port Underwood Association feels the limit of mid-bay expansion is currently at its maximum.

**Phytoplankton and interaction with other marine farms**

The study of phytoplankton depletion provided by Mr. Hadfield does not appear to offer any suggestion as to what effect this depletion would have on the surrounding environment. He goes to great lengths to justify the correlation of the model used with the real world. Unfortunately it was then applied without using a real world situation in that the model was run as if the proposed marine farms were isolated from any other effects. The influence of the other marine farms in close proximity has been ignored. They would compound the depletion effect. This will inevitably lead to a greater depletion than that suggested. The cumulative effects have not been addressed This omission seems strange in light of the fact that the applicant for U120642 has in the past claimed to have had depletion effects from the adjacent farms on his farms.

We are left knowing there are phytoplankton depletion effects but left questioning what the real values might be and what that effect would be on the surrounding environment.

In addition, it is noted from the study that there is little tidal flow in this part of Port Underwood. This will prevent the replenishment of phytoplankton.

**Lack of overarching research**

It is suggested that the expansion of the farms will reduce phytoplankton significantly. This is implicit in the submission made by the applicants. There is, however, a lack of overarching research on the marine environment in Port Underwood.

The application states that there will be significant depletion of phytoplankton. This will not only impact the growth of mussels, oysters and other aquaculture products but will also impact the growth of marine life in general in Port Underwood.

There is no overarching research on the impact of marine farms in Port Underwood. Before there is any further development it would be prudent for there to be the following research:

* What has been the impact on phytoplankton, other nutrients and suspended solids in the Port Underwood area?
* What has been the impact on marine life such as finfish, bivalves and shellfish in the Port Underwood area?
* Has there been a significant reduction in nitrogen levels caused by marine farm detritus?
* Has there been any other increase on pollutants to the detriment of the marine environment?
* Has there been any increase in parasitic marine life due to the marine farms?

Without this research it cannot be confidently stated what the capacity for marine farms is in the Port Underwood area. Nor can it be stated what the environmental impact of marine farms is.

As the Marlborough District Council has delegated responsibilities under the Resource Management Act 1991 and the NZ Costal Policy Statement 2010. This requires the Council to ensure the sustainable management of the costal marine area and to monitor the marine environment.

The application notes some adverse impacts but there is no overriding impact assessment when combined with other marine farms and activities within Port Underwood.

It is suggested Marlborough District Council will be failing in its responsibilities if it permits the proposed development without an understanding of the environmental impacts of the development within the context of the marine environment rather than in respect of the proposed expansion in isolation.

**Environmental impacts**

The application makes no comment on other impacts of the expanded marine farm. For example, what is the impact upon finfish? The Ministry of Primary Industry recognises that marine farms adversely impact fish stocks as filter feeders consume fish eggs and larvae. This will have a detrimental impact on fish levels and species. This in turn will adversely impact recreational and commercial fishing. This impact will range significantly further than the area study by the application.

The Department of Conservations 2003 discussion paper Potential effects of mussel farming on New Zealand’s marine mammals and seabirds noted the following impacts of mussel farming:

* Phytoplankton depletion;
* Modification of the benthic environment and species assemblages;
* Altering local hydrodynamics;
* Increases in marine litter; and
* Facilitation of the spread of unwanted organisms.

It is noted that none of these issues are addressed in the application.

The discussion paper noted that phytoplankton depletion is dependent on numerous factors such as crop density, farm size, currents and season. It is suggested, therefore, that a significant expansion of a farm or farms in an enclosed area with little tidal flow should not be approved.

The application notes that maximum depletion is 30%. This is a high level of depletion in an area with low tidal flows and close to other existing farms. The Department of conservation’s discussion paper noted that there can be up to 50% depletion in a 50 hectare farm, yet there is already a 30% depletion rate in the much smaller existing farms. This would indicate that the application should be rejected.

The discussion paper also noted that there would be a consequent reduction on zooplankton due to the reduction of the phytoplankton upon which it depends and also the ingestion by the mussels and ejection as pseudo-faeces. This is a further indication that the large expansion of the farms should not be permitted.

In addition, the discussion paper notes that the “rain of faeces and pseudo-faeces” from mussel farms leads to organic enrichment of the sediments below the farm. Where there is little water flow (and the application states that water flow is a maximum of 0.09 meters per second) that organic enrichment of the benthos creates anaerobic and acidic conditions resulting to elevated levels of sulphides and ammonia. There is no mention in the application of the levels of sulphides or ammonia, nor the levels of oxygen or acidity. It is suggested that this is a significant omission form the application and one that needs to be addressed before the application can even be considered.

The 2002 paper by Peter Bondo Christensena, Ronnie N. Gludb, Tage Dalsgaarda and

Paul Gillespie, *Impacts of longline mussel farming on oxygen and nitrogen dynamics and biological communities of coastal sediments* demonstrates the impact of mussel farming on benthic microalgae and in fauna. It should be noted that this was a study in Tasman Bay, where there are strong currents and open water. The impact on enclosed waters with low flows and only weak tidal flows will be impacted far more severally than this study in open water. This report found “oxygen consumption increased in the organic-rich sediments, and ammonium effluxes were up to 14 times higher than those of unaffected sediments 250 m away from the farm.”

The application had no comments concerning ammonia nor oxygen consumption, yet these are of vital importance to microphytobenethic (MPB) production.

The report also found that “mussel production, however, also has a significant local impact on benthic microphyte and infauna composition as well as on oxygen and nitrogen cycling as demonstrated in this study. In particular, the mussel farm concentrates the sedimentation of C and N that was previously distributed to a wider area in a small local area.” Further, it found “the increased sedimentation can result in changed benthic community structure below the farms, giving fewer bioturbating macroinvertebrate species, and fewer benthic microalgae, reducing benthic primary production and increasing the nutrient efflux to the water column.” Furthermore, it noted that harvesting can significantly reduce the nitrogen removal from the area. This will be of significant importance to an area such as the North East of Port Underwood that benefits from only a small tidal flow.

The report concludes that these factors have to be taken into account when considering future development of mussel farms. The application does not take these factors into account at all and should, therefore, be rejected.

**Clarity required**

We are confused by the following statement from **Section 1.0 Introduction** of the application:

*“From a farm management perspective extension of the area will enable modification of farm operations, provide for widening of gaps between long lines when required, and produces a buffer zone to the east of site 8431 and south of 8432 that will ensure open water is not taken up by further long lines and thus creates a wider separation from recent farms installed to the south that have impacted on these existing farms.”*

We assume this refers to the rectangular area that forms the southeast corner of the proposed extensions. It would appear to us that rather than ensuring there is open water the plan is to install long lines in that area. The Port Underwood Association suggests that should part of the proposed extensions be granted this area should not be included thus creating an open water area that the applicants seek and preserving to some extent the continuity of a smooth navigation line from the south along the eastern side of all the marine farms in this area.

**Species farmed**

The application is to farm a variety of species. All the environmental work seems to concentrate on mussels or oysters. The application is, however, for a variety of species. It is possible that the farms could be used for 100% mussels, 100% oysters, or 100% for any other species. There is a lack of any environmental impact statement or research submitted on the other species that the application is made for.

The application, in its current form should be rejected as being too vague concerning what is to be farmed.

The application should also be rejected until there is appropriate research undertaken in respect of the species that it is proposed will be farmed.

**Red algae**

The Port Underwood Association further encourages the protection of the noted red algae bed area from development. Algae beds near marine farms do exist but there does not appear to be any information as to the effects of mussel farming on the inhabitants or users of those algae beds – only the fact that the algae beds exist.

**Map errors**

On the map titled Layout Details Marine Farm Sites at the beginning of the application the designated scale size does not match with what has been drawn for the line layout. The Layout Details Marine Farm Sites map in Appendix A has a different scale size which does not match either. While a minor point, it should be corrected to avoid any misunderstanding.

The large scale locality maps used by the applicants are out-dated and do not indicate the high density of consented farms in close proximity to this application. This may be an oversight on the part of the applicants but we believe the adjacent farms form an integral part of the existing conditions at this locality and are the basis of several issues, such as navigation and cumulative effects, which should be examined.

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