

## **Appendix 1**

### **Tasmanian Abalone Council Ltd preliminary response to EIS to accompany draft Amendment No.1 to Storm Bay off Trumpeter Bay North Bruny Island MFD July 1998 (Huon Aquaculture)**

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The Abalone Industry supports Huon Aquaculture plans to move their operations out of the D'Entrecasteaux Channel to an off-shore/oceanic environment.

Continued expansion of the aquaculture industry must be built on the foundations of the Precautionary Principle and provide an undertaking that there will not be any adverse impact to other marine stakeholders.

Note: For the following paper the reference to 'in-shore' is considered to be within 4nm of the coast. The term 'off-shore' is considered as 4+nm off the coast.

### **Comments on Huon Aquaculture's EIS for Storm Bay extension**

#### **Legislated requirements.**

##### **Comment:**

Management Controls Section 24 of the Marine Farm Planning (MFP) Act states:

management controls must contain any measure necessary to manage and mitigate negative effects which marine farming operations may have *within the plan area.*

As stewards of a marine aquaculture lease the Lessee must also be responsible for negative effects specifically attributable to the industry, that are identified *outside the plan area.* This will require an amendment to the Act.

#### **Amendment to the Marine Farming Development Plan July 1998 Trumpeter Bay Section 2, 2.1 Location**

##### **Comment:**

The original surveyed site for the Trumpeter Bay lease allocates one zone of 2.2 km x 1.2 km totalling 264 hectares. The site extends 2.2 kilometres parallel to the coastline.

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The proposed amendment for the Storm Bay lease comprises 4 sites totalling 660.4 ha and located on a new site outside the existing lease in a South and East direction. The proposed site extends 7.5 kilometres parallel to the coastline from northern to southern boundary.

This trebles the length of coastline and reef habitat exposed to marine farm practices and impacted by reduced wave action.

There are sufficient differences between the Trumpeter Bay lease and the proposed Storm Bay lease to qualify as a **new** marine farm lease.

#### **Recommendation:**

That the proposed amendment be disallowed on the grounds that it is independent to and removed from the original Trumpeter Bay site.

That the existing Trumpeter Bay lease be used as a short-term trial site for testing off-shore equipment designs prior to moving their operations off-shore.

That the Marine Farm Planning Review Panel (MFPRP) support a proposal to create a new MFP lease 4nm+ off-shore. The proposal to include a draft plan for future expansion.

#### **Implications of a change to the Hydrology of the region:**

The Environmental Impact Statement for the Storm Bay, North Bruny Island notes a number of studies to assess current directions, wave action, phytoplankton biomass, nutrients, temperatures, etc. at and near the site of the proposed farm.

The vital piece of missing information is a prediction of the likely impact a 7.5km row of pens will have on the adjacent reef.

Wave action resulting from wind and swell, periodic storm events and deeper substrate up-wellings are factors supporting nutrient exchange, temperature variations, oxygenation and flushing on coastal reefs. Current work (Dr Craig

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Mundy, IMAS) linking productivity of abalone to wave exposure supports this fact.

The proposed site for expansion is rated as 'high wave exposure' (Parsons; State of the D'Entrecasteaux Channel and the lower Huon Estuary 2012 quoted Barrett et al 2001) indicating that variations to that action will have a major detrimental effect to the ecology of the adjacent reef. The impact to the onshore reef up to and including the intertidal zone has not been established. Further information is required as to the extent of the change and the consequences to the ecosystem of the adjacent reef.

The Acoustic Doppler Current Profiler (ADCP) work undertaken at the site of the proposed farm clearly shows an existing current flow from Site 2\* of the proposed farm in a West, Northwest and Southwest direction toward the adjacent reef at a depth range of 8 - 12 metres (EIS, Page 71, Fig 25, Polar plots of current velocity and direction T2, May 2014).

This will draw pollution (sediment particulate and dissolved nutrient) from the fish pens toward the coastal reef.

Accumulation of silt is known to have a detrimental effect on abalone by compromising gill function and reducing respiration. Premature spawning is a reaction to stress which will render the animal susceptible to disease and vulnerable to predation. For more vulnerable animals (juvenile etc) silt in their habitat diminishes the animal's ability to securely attach to and move around on the substrate - which is required for abalone to feed and avoid predation. If this stress related reaction occurs in abalone it is highly likely to impact other adjacent reef species with the end result of a rapid decline in an entire ecosystem of that reef.

### **Water Quality**

The work on dissolved nutrients in Storm Bay (Crawford et al 2011) in conjunction with known pollution outputs from fish farms highlights further concerns for our industry. eg.

- “Bottom water Ammonium concentrations were markedly higher in January....(Crawford et al 2011)” .

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- Phosphorus levels...”March when clear peaks in concentrations much higher than ANZECC guidelines...were evident” (Crawford et al 2011).
- November to December....”greater densities of phytoplankton are noted nearshore (Crawford et al. 2011).

Reduced wave action, changed current flows and increased nutrient levels will lead to increase levels of ammonia, phosphorus and blooms in phytoplankton, jellyfish and algae blooms. The level of change must be assessed in the context of impacting the ecology of the adjacent reefs.

#### **Recommendation:**

That a robust modelling program be developed to predict the hydrological changes between the 7.5km barrier and adjacent reefs including the intertidal zones.

That IMAS (funded by HAC) undertake a predictive assessment to quantify the impacts to the ecology of the adjacent reef.

That ongoing monitoring, including ADCP assessment at 4 metre depths, occur at regular sites on the reef adjacent to the proposed lease area.

That water quality and silt load monitoring occur monthly on the adjacent reef.

That Site 2\* be disallowed due to the impact it will have on the reef.

Modelling will need to extend to predications of seasonal flows, cold water uprisings, fresh water influxes, to distinguish the impact of La Nina and El Nino, etc Future monitoring can be used as an ongoing assessment of the modelling predictions.

CSIRO have noted that ongoing data collection is necessary to support the modelling.

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**Comment:**

Reference to sea floor scouring – Video reports describing conditions on the seafloor highlight the fact there are depressions and ridges on the ocean floor. This is likely a result of water movement at depth.

There has been no work to ascertain how organic carbon deposition under the pens will be influenced by these subsea water movements. Again, an understanding of direction, velocity and associated variations is critical to adjacent reefs.

**Use of Variety Bay**

**Comment:**

It is unclear as to how often and which HAC vessels will be accessing this Bay.

The bay is used by commercial divers and as a safe haven for recreational boaters. Commercial and recreational divers working with an umbilical air line up to 100m away from their dinghy operate underwater along the reefs from 2m to 25m depth.

The International Code Flag A (required by Maritime Law to alert vessels of a diver below) requires all vessels to reduce speed to under 5knts within 120m of the flag. Larger vessels find it difficult to steer at this speed. This will present an unacceptable risk for other stakeholders on a daily basis.

A vessel the size of the 75m Well Boat operating between the east shore of Bruny Island and the western boundary of the proposed lease poses an unacceptable danger to recreational and commercial fishing vessels.

**Recommendation:**

That, because of reduced manoeuvrability of the larger vessels between the western boundary of the lease and the east coast of Bruny Is and the possibility of a fatal interaction with a diver underwater the Well Boat must not encroach into that area.

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That no permanent moorings be established in Variety Bay. Larger commercial vessel to anchor/moor outside the 30m contour line.

#### **Servicing the Proposed Zones (pg 33)**

##### **Comment:**

The regular transfer of fuel and sewage in periods of high winds and large swell is a high risk operation. In poor weather conditions the immobilisation of a spill containment and removal process will be slow. In a situation where a spill occurs 1.5 km off the coast the chances of quick and effective containment before it reaches the inshore reef will be minimal. Onshore winds including South-easterly, North-easterly and Southerlies drawing up the shore will push minor leakages/major spillages/toxic substances floating near or on the surface directly on shore to contaminate the inshore reef system.

Undetected leaks or major spills in poor weather conditions have the capacity to devastate adjacent reefs. The impact will be long-term.

##### **Recommendation:**

That no transfer of toxic or waste product occur during any on-shore wind period or within 4km of the reef.

#### **Wildlife Interactions**

##### **Comment:**

Seals, and their natural predator the shark, are known to frequent fish farms. Abalone divers, who frequently spend 5 hours per day underwater, have noted growing numbers of both species in the waters of southern Tasmania. Most abalone divers choose not to operate in areas of high seal populations because of the high possibility of seal or shark attack. However expansion of the aquaculture industry is forcing divers to work near these high risk areas. The fish farm industry recognises the increased risk of shark and seal attack to their staff operating in this environment but must also address its responsibility for other users.

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#### **Recommendation:**

That in an attempt to mitigate this safety factor for both the commercial abalone industry and the recreational diving sector the Marine Farm Planning Review Panel (MFPRP) support a HAC application to establish a marine farm zone 4nm off-shore in Storm Bay. The application to meet all requirements of the revised base-line study and monitoring parameters.

#### **Waste Management**

This is a primary concern of all primary producers because of its undeniable toxic effect on the farm animal and environment as a whole.

In the marine environment the issues surrounding concentrations of heavy metals (copper, etc), chemical accumulation, antibiotics etc have not been sufficiently addressed .

Technology has made great advances in treatment of waste including human and industrial waste. Why isn't fish farm waste treated accordingly?

The practise of moving pens from a contaminated site to a clean site is costly and creates greater stress on the marine environment by spreading the waste to alternate sites. Whilst sites remain fallow some of the toxic silt under the leases dissipates into the adjacent environment but much of the waste remains in the general vicinity. The issue of continued degradation of inshore reefs and other marine habitat continues. Settlement containing heavy metals, antibiotics, and persistent chemicals continues to impact the associated flora and fauna for generations.

#### **Recommendation:**

That all reefs within 3nm of a fish farm be regularly monitored for silt loading including lipid level assessment, heavy metal, chemical and antibiotic contamination.

That all fish farms in in-shore or Channel waters be required to suction waste for a removal program or instigate a containment program.

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#### Net Cleaning

##### **Comment:**

The proposed establishment of the new lease will result in an extensive mass of in-water infrastructure. The infrastructure will need to be substantially stronger and heavier to cope with increased weather conditions. Constant cleaning will be required to maintain the water flow for the fish and maintain the buoyancy of the pens and equipment. In-water net blasting results in large amounts of organic debris (see further papers relating to impacts of hydroid and spicules on marine species) in the water column and settling on the substrate. As indicated by the Polar plots for Site 2 this debris is likely to impact the adjacent reef.

It is unclear from the EIS if any chemicals (eg copper based antifoulants) are released into the environment during the in-water net blasting process.

##### **Recommendation:**

That if in-water net cleaning processes are to be done within 4nm of the shore that the suction method be used so that the waste material is retained, rendered inert and disposed of on land.

That net cleaning takes place only when conditions throughout the water column expel the waste in a southerly direction.

#### Antibiotic usage

##### **Comment:**

The use of antibiotics may have been considered to '**pose no significant ecological risk** (*EIS page 168, Point 6.1.8.3*)' in the past but that is not the case now.

A scientific paper (*CASANDRA ANGUIANO-BELTRA AND RICARDO SEARCY-BERNAL Journal of Shellfish Research Vol. 26, No. 3, 795–799, 2007*) notes antibiotic exposure (streptomycin /penicillin) can cause bacterial

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resistance in farmed juvenile black abalone with recommendation that exposure to antibiotics be limited.

Note: Bacterial resistance to antibiotics occurs in farmed fish in the same way it occurs in humans, so the turnover or mixture of antibiotics used would likely be change over time.

Quote from Abstract:

In the experiment with antibiotic mixtures, bacterial abundance was reduced 99% at the highest concentration (150/150) in the first 48 h, and remained significantly lower than the control for 2–3 wk. During this period, postlarval growth in this antibiotic treatment was also slower, as well as final survival, suggesting an important role of bacteria in the nutrition and/or digestion of abalone postlarvae. Results of this study also suggest that bacterial resistance to these antibiotics develops fast, discouraging their long-term use in abalone culture.

The scientific literature also documents antibiotics and antibiotic resistant bacteria in bottom sediments associated with salmon farms in Norway, recording persistence (ie. presence) up to 400+ days in deoxygenated sediments, and shorter durations when sediment is well oxygenated. Similarly, antibiotics can also be found adhered to smaller particles floating throughout the water column.

Storm Bay is an area that has not been subjected to disinfectants, therapeutants, anaesthetic, antibiotics and other chemical pollution derived from fish farming practices. Tasmania prides itself on its 'clean green status' and to knowingly endorse pollution practices into pristine waters is irresponsible.

#### **Recommendation:**

That as part of an ongoing monitoring program regular tissue samples of a range of benthic animals be taken and assessed for chemicals.

That tissue samples be retained by IMAS for future comparisons for both disease and made available for new testing processes developed in the future.

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#### Community Consultation

##### **Comment:**

The statement quoted from *Tarbath* 2012 (Environmental Impact Statement...page 60) states “stock levels very low, and many (divers) were concerned about the future of this part of the fishery” must be taken in context. In this case a short term view and anecdotal evidence has been quoted as fact. There is over 20 years data available for inspection but this has obviously been overlooked. The abalone fishery is managed sustainably and was the first Tasmanian fishery to be labelled as such.

##### **Recommendation:**

That scientific data from the Abalone fishery be assessed in its entirety and acknowledged in further enquiries.

#### Baseline survey

##### **Comment:**

The IMAS Baseline survey: AN ENVIRONMENTAL ASSESSMENT OF A PROPOSED MARINE FARMING ZONE EXTENSION AT TRUMPETER BAY, SOUTH EASTERN TASMANIA *V. Lucieer and A. Pender May 2014* **does not** include a detailed survey of the neighbouring reef. During the consultation period the commercial abalone industry (and others) have continually expressed deep concern about the impacts of fish farms on reef habitats, the lack of baseline surveys and ongoing monitoring.

It is noted in the EIS that the HAC will commit to a baseline survey in Variety Bay and further surveys '**if survey results from the Huon and D'Entrecasteaux Channel region studies indicate the potential for an effect in Storm Bay**'.

The intention to use results from surveys conducted in the Channel region as an indicator or predictor of conditions on the east coast of Bruny Island is flawed. The parameters for baseline surveys and monitoring requirements were designed to suit conditions in the Channel region. Evidence now shows those

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parameters to be deficient due to the lack of data from adjacent reefs. The extremities experienced on an exposed coastline demand a more robust process extended over a period to allow for seasonal changes. A review of the parameters of baseline and monitoring surveys is required as a matter of urgency. Ongoing monitoring needs to be considered in conjunction with the review.

**Recommendation**

That a project be established in conjunction with other stakeholders to identify and design a specific baseline survey that is inclusive of inshore reef habitats and the intertidal zone. This is required to support an ongoing in-shore and off-shore monitoring program.

That the baseline study be conducted by an independent body.

That the baseline survey of the reef be conducted prior to any marine farming in the area.

**Monitoring Program**

**Comment:**

The Marine Farm Planning Act was enacted in 1995. At that time environmental monitoring was considerably less sophisticated in comparison to current capabilities and impacts to the marine environment less well understood. Insufficient monitoring requirements and techniques of the past have given rise to accusations of poor farming practices, questions of responsibility for disease outbreaks and viral conditions, lack of baseline data, impact of farming on adjacent reefs, etc.

The BEMP was originally designed in collaboration with CSIRO as a monitoring program which suited marine farms located in the D'Entrecasteaux Channel but failed to include a monitoring regime for adjacent reefs. More current data obtained from a variety of sources indicates the waste from fish farms is more widely distributed than readily acknowledged (eg Ross & MacLeod, 2012) states 'environmental changes directly attributable to Salmon farming have been detected over 400m away from a lease'. The Ross &

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MacLeod paper goes on to highlight deficiencies in the monitoring method (...fail to consider direction and scale of changes, ...analysis done at Family rather than species level, etc).

There is strong evidence from divers with 30 years diving experience in the Abalone Industry that reefs adjacent to old and current fish farms have gone through significant degradation with a corresponding depletion in abalone (and possibly many other reef species). This correlates with the catch rate decline documented for over 30 years. The BEMP has been deficient in areas of monitoring reef ecology and diversity, diversity of macro algae species and percentage of coverage, volume and composition of silt, biochemical sampling over adjacent reefs, etc. The current BEMP sampling is useful as a tool for the farm to advise good farm husbandry practices but is a long way short of a thorough monitoring program.

In recognition of the industry's interest to move off-shore, the development of a tailored monitoring program is considered a priority.

#### **Recommendation:**

That a research project be established to look at the impact of fish farms on adjacent reefs. It may be possible to utilise the work undertaken by Craig Mundy assessing stress levels of abalone by tissue sampling as the basis for an ongoing study to detect possible impacts of fish farming on abalone.

That a review of the monitoring program be instigated with a view to establishing a system specifically for fish farms in off-shore and open water areas. Consideration must be given to reef ecology, silting, oxygenation, seasonal variations, macrofaunal communities, micro and macro algae species and percentage cover, nutrients, etc. A monitoring program should specifically address in-shore and off-shore reefs in order to identify negative effects and implement a remedial program.

That long-term storage of the tissue samples for future testing as and when testing procedures improve into the future and provide a baseline for perpetuity.

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**Critically Endangered Species**

**Comment:** The Southern Bluefin Tuna, as well as other tuna species, are noted along the eastern side of Bruny Island.

**Recommendation:** That the EIS assess the impact of the proposed lease on the movements of the Southern Bluefin Tuna.

**Summary**

The current proposal is viewed as being so distant from the lease agreements of the Trumpeter Bay as to constitute an application for a new lease.

Evidence quoted in the EIS states conclusively states current flow will move water from the proposed lease towards reef that has not been previously exposed to effluent from fish farming practices.

That the instillation of a fish farm at the proposed site will produce hydrological changes that will impact the adjacent reefs.

That current baseline surveying and monitoring requirements are insufficient to address the possible impacts on a virgin reef environment. A review of baseline surveys and monitoring requirements is required.

Proposes the option to make the Storm Bay lease (excluding Site 2) temporary for a period of 2 years only to assess the viability of farming off-shore (>4nm from coastal reefs).. (A baseline study specifically tailored to conditions on and adjacent to the lease area must be conducted by an independent consultant prior to the establishment of any lease agreement.)

This would provide the opportunity to undertake trials to determine the effectiveness of rearing varying year classes in an inshore habitat prior to moving off-shore and provide lead time to construct off-shore pens.

The temporary licence would need to **exclude any increase in size or amendments to the Storm Bay lease in any direction.**

The Abalone Industry raises concerns that further expansion of the Salmonoid Aquaculture Industry has the potential to impact a proven sustainable, low

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environmental impact fishery that supports the Tasmanian economy by \$300m per annum and over 800 regional jobs unless the expansion is handled in a responsible manner.

#### References

An Environmental Assessment of a Proposed Marine Farming Zone Extension at Trumpeter Bay, South Eastern Tasmania *V. Lucieer and A. Pender May 2014*  
The IMAS Baseline survey:

*Buchanan et al (2014)* New evidence links changing shelf phytoplankton communities to boundary currents in Southeast Tasmania.

*Crawford et al (2011)*. Nutrient and Phytoplankton data from Storm Bay to support sustainable resource planning.

Environmental Impact Statement to accompany the Draft amendment No. to the Storm Bay off Trumpeter Bay North Bruny Island Marine Farming Development Plan July 1998

*Herzfeld (2008)*. Connectivity in Storm Bay. CSIRO Technical Report, as quoted in the EIS.

Marine Farming development Plan: Storm Bay off Trumpeter Bay: Section 2, 2.1 Location,

*Ross & MacLeod (2012)*. Evaluation of Broadscale Environmental Monitoring Program (BEMP) fro 2009 - 2012. IMAS Technical Report

*CASANDRA ANGUIANO-BELTRA AND RICARDO SEARCY-BERNAL* Journal of Shellfish Research *Vol. 26, No. 3, 795–799, 2007*

2009 report for the Nordic Council of Ministers. Chemicals from marine fish farms.

*Rosie Coyne, Maura Hiney, Peter Smith 2006* Transient presence of oxytetracycline in blue mussels following its therapeutic use at a marine atlantic

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salmon farm. (Evidence of uptake of antibiotics in mussels adjacent to salmon farm)

ICES J. Mar Sci - 2006 *Buschmann* 1338 - 45 Review of salmon farming impacts of salmonid farming on marine coastal ecosystems in the southeast Pacific.