From: Liz Smith [redacted]
Sent: Sunday, 5 July 2026 2:04 PM
To: Tasmanian Salmon Study Secretariat
Cc: Liz Smith
Subject: Fwd: Response to Salmon Study topics
Attachments: Macquarie Harbour 2012 presentation copy for salmon study July 2026.docx

Salmon Industry Study response

As a former scientist with a strong interest in environmental sustainability, I have been concerned about the environmental effects of industrial salmon farming in southern Tasmania since the early 2000s, when the expansion was affecting the Huon River and D'Entrecasteaux Channel.

The following are brief comments on the topics listed for your salmon industry study, and I attach the presentation that I made to the Marine Farming Review Panel's consideration of the expansion of salmon farming in Macquarie Harbour in 2012.

Topic 1. Overview of the global salmon industry- the big picture for Australia, Norway, Chile, Scotland, Canada, New Zealand. Contributions to global and local demand for protein. Role in food security.

Although salmon is produced in huge amounts relative to other forms of protein in Tasmania, it is not produced to meet global need for protein and many people, especially locally, are now reducing or even eliminating their intake of salmon as they learn more about its production.

The protein yield of salmon flesh, in terms of protein inputs, is inefficient compared to protein in legumes, pulses and insects.

In wealthy countries most people consume more protein than they need and the excess is excreted to contribute to high nitrogen levels waste water treatment facilities.

The per-person weekly ration during the worst period of World War II was: 4 oz butter, 4 oz bacon or ham, 4 oz loose tea, 8 oz sugar, 1s worth of meat, 1 oz cheese, 8 oz preserves

Put in modern terms: 120g butter, 2 slices bacon, 25-50 cups tea, 250g sugar, 500g meat, 30g cheese, 250g preserves.

This was a minimal diet worked out by scientists and people survived and worked, though no doubt lost weight. I am not suggesting that people should live on such a diet today but this illustrates that the "need" for protein in western diets may be overstated.

Topic 2. Assessment of environmental values, impacts and benefits of salmon farming in Tasmania and lessons from beyond Australia.

For decades Tasmania has prided itself on being "clean and green" and visitors are attracted by this vision of a spectacular island that is relatively unspoilt. On my first visit to Tasmania, in 1987, I was fortunate to sail the D'Entrecasteaux Channel and was overwhelmed by the natural beauty of the waterways and surrounding landscapes.

Years later, in about 2005, I was on a small yacht sailing north through the Channel after dark, and was overwhelmed and confused by the lights surrounding salmon leases. It was no longer a pleasure to sail the Channel and I imagine the lights are now much more intensive.

The water is no longer clear and the salmon nets are constantly reminding us that the Channel has become an industrial site with the nets deep into the water.

In the early 2000s much of the salmon produced in the south was grown in the Huon Estuary resulting in the water quality degradation and high noise levels experienced by local residents. Later, as production increased, more salmon pens were moved out into the D'Entrecasteaux Channel and its not clear how much water quality in the Huon Estuary has improved.

Topic 3. Health impacts of salmon farming including public health ecosystem health, wildlife impacts compare with international regulations for compliance and effectiveness – best practice and salmon health.

The ecosystem of both the D'Entrecasteaux Channel and Macquarie Harbour have been seriously impacted by the intensity of industrial salmon farming.

In 2012 the Marine Farming Review Panel held consultation on the introduction of salmon framing in Macquarie Harbour. Having lived in the Huon Valley for 12 years at that time and been an elected member of the Huon Valley Council for about 10 years, I had been approached by residents concerned about the ecosystem damage done by the expansion of salmon farms, as well as the noise and light effects on their lives..

I read the report and made a submission on the proposed expansion of salmon farming in Macquarie Harbour and attended the Marine Farming Review Panel hearing in Strahan in 2012.

The presentation that I made is included as an attachment. I was not asked a single question by the Panel and no comment was made.

The Review Panel required that adaptive management would be the most effective way to develop salmon farming in Macquarie Harbour and the resulting rapid expansion was dramatic, until it became so clearly unsustainable that drastic reduction was required.

Topic 4. Detailed examination of Tasmania salmon industry regulation and compare with international regulations for compliance and effectiveness – best practice.

This is not an area with which I have maintained familiarity.

Topic 5. The direct and indirect contribution of the salmon industry to the Tasmanian economy including regional economies, employment opportunities and career pathways and the industry's role in developing skills and knowledge.

Clearly the salmon industry is the biggest employer in small towns such as Dover and Strahan where there is great dependence on salmon. Given that the future of the industry is uncertain in the light of climate change and increasing disease, residents and workers are living in a state of insecurity.

Decisions must be made about the future of the salmon industry so that people understand whether there is a future for the industry, and if so, how that future will evolve.

Topic 6. The social and cultural benefits and costs to Tasmanian community, including the effect of industry, amenity, and indigenous people's knowledge and perspectives for land and sea country.

The aquaculture companies (Huon and Tassal) consistently sponsor events and sports clubs, although the level of monetary support is very low compared to the huge profits they make. It is difficult to assess the cultural benefits of salmon farming though the loss of environmental values results in loss of amenity for everyone.

The tradition of fishing in southern Tasmania is being lost as limits are put on the size of flathead and other fish. Those who have been fishing here for years are now saying that there are far fewer fish, and it is not possible to imagine an event such as the Cygnet Fishing Carnival of the 1970s to 1990s being organised now. The decrease in fish may be a result of increased water temperatures and decreased pH due to increased levels of CO_2, as well as changes in the environment due to industrial scale aquaculture.

Thank you for the opportunity to respond to the topics contained in the Salmon Study.

Yours sincerely,

Elizabeth Smith BSc Ph D, Grad Dip Environmental Planning (UTas)

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Marine Farming Expansion in Macquarie Harbour - Hearing at Strahan 13th March 2012 - Dr Elizabeth Smith

Thank you for the opportunity to speak at this hearing. I am making this presentation as a private individual, not representing any organisation.
I want to briefly cover the following in this presentation:

- Introduce myself and explain why I have an interest
- I then want to concentrate on the potential impacts, in particular of additional nutrients in Macquarie Harbour, and the need for international accreditation.

First I'd like to give you a brief background about me and the reasons for my interest in this proposal.
I grew up on a wild and windswept coast near Aberdeen in the North East of Scotland, where my father was a scientist working in agricultural research.
I studied biochemistry at Aberdeen University and did a PhD at the Australian National University.
I then spent about 30 years in research in Canberra and the UK, and later in Sydney as a senior lecturer at Macquarie University in the School of Biological Sciences from 1984.
The following 13 years at Macquarie University broadened my understanding of biology because the research in biological sciences there ranged from biochemistry, virology and cell biology through soil science, botany and zoology to ecology.
It was a great way to develop an understanding of a broad of biological issues.
In 1997 I took voluntary early retirement from the university and moved to the Huon Valley in 1999 to follow a different path.
The Tasmania *Together* project in 2000 gave a great sense of hope that Tasmania would move into a genuinely clean, green and clever future, recognising and building on our unique position at the end of the world.
The response to **Tasmania *Together*** by Tasmanians was so positive, there was increasing economic activity, and it was a time of great hope for the future of Tasmania.
I volunteered to be involved, and was accepted as a member of the **Benchmarking Committee for the Natural Environment** for Tasmania *Together***.**
The process was, to me, disappointing, as little was achieved in protecting and supporting the amazing natural environment that still defines Tasmania, so that it is both valued and yields benefits to the population – the political will to make the necessary changes in the culture of Tasmania was not there.
In October 2002 I was elected as a Green to the Huon Valley Council and am still a councillor.
I would like to emphasise that I am speaking today as an individual, NOT representing the council.

By 2004 I had come to understand the complexity of the planning system that we, as councillors, are responsible for. So I did a Graduate Diploma in Environmental Planning at UTas.
I learned a lot about the meaning of sustainable land management in the context of planning for future generations and did my professional development at the Resource Planning and Development Commission.

Waterways
My connection with Tasmania's waterways goes back to my first visit to Tasmania in 1987, 25 years ago – sailing in the D'Entrecasteaux Channel.
The wildness of the waterways, the scenery and the rocks covered with lichen were reminders of my childhood in Scotland, and I decided then to make Tasmania my home.
I sailed the Channel again in 1991 and 1994 and again enjoyed the unspoilt waterways.
Since I came to live in Cygnet in 1999, the Huon Estuary and southern D'Entrecasteaux Channel have taken on the appearance of an industrial area on the water – the black circles remind me of gasometers – and I know that they extend 10 or 15 metres below the surface.
Navigation at night involves working out which lights belong to which fish farm – to be sure not to get on the wrong side of a boundary.
The wonderful wildness of the D'Entrecasteaux Channel that I was so fortunate to experience in the late 80s and early 90s is no longer.

Support for sustainable fish farming
Having said that, I am not opposed to farming salmon in Tasmania's waterways.
Salmon farming has become a major employer in the Huon Valley, and I would not like to see the industry collapse because it becomes unsustainable due to water temperature rises, disease and so on, as has happened to aquaculture industries around the world.
In Chile the salmon industry developed in the 1980s collapsed between 2007 and 2009 because of a viral infection causing severe anaemia in Atlantic salmon. Before 2009 the salmon industry had 550 farms and employed 50,000 people with profits in 2006 of $2.5bn. In 2008-2009 15,000 workers lost their jobs. Disease is a threat to all salmon farming and the bigger the venture the more disastrous is the impact.

- High-value, low-impact marine farming could and should be a wonderful industry for Tasmania, and could be sustainable far into the future.
- It could also be the basis of high-value salmon-tourism – but only if it expands slowly, is done on a smaller scale and with sustainability as its primary goal, not as an afterthought.
- Tasmania's brand, or promise, is all-important.
- This was highlighted last week by Gerard Castles at the EDO conference "Managing Marine Farming have we achieved best practice". Gerard Castles talked about "the

wild amazing place that is Tasmania" and said that the product, in this case Atlantic salmon, "must be what it says it is." (So must our World Heritage Area)

- If the image is not the reality, over time consumers will come realise that the product is not what it claims to be, and it will become unacceptable.
- And, as we've seen recently with the campaign against Apple computers, word can spread very quickly through social media.
- **Tasmania bases its marketing on a clean, green image, so that image must be a reality**.

Visual impacts and effect on the brand – or promise - of wilderness at Macquarie Harbour

- The greatest tourism drawcard of the town of Strahan is the wilderness atmosphere provided by the vast expanse of Macquarie Harbour.
- It is the base for the cruises to Sarah Island and the Gordon River with its primeval forests that entrance visitors from all over the world.
- **Do these visitors anticipate that the route through Macquarie Harbour to Tasmania's last wild river will be lined with industrial scale fish farms?**

Expansion

- I have been concerned because the expansion of aquaculture has been so fast in the Huon/D'Entrecasteaux
- It has been difficult to get information about the environmental impacts of the industry, and it has taken over 25 years to get the first sustainability report from Tassal.
- I don't think such reports have been made public by the two other proponents of the Macquarie Harbour expansion.
- This lack of transparency is not a feature of an industry that has been built on open and sustainable practices from the beginning, so there is a lot of catching-up to do.
- In Macquarie Harbour, unlike the southern D'Entrecasteaux Channel, there will be constant surveillance of the farming. Fish escapes, mortality of fish in the pens and any other events will be visible to visitors and locals.
- Also, informed residents may know better what to look for, because the environmental changes that have taken place in Port Esperance over the past decade – increased algal growth, changed water flows etc, will provide a guide for them to know what to look out for.
- **The environmental credentials of any expansion must be internationally recognised as world class if the brand or promise is to be the reality.**

Bathurst Harbour and Macquarie Harbour – low nutrient estuaries

A couple of years ago I was lucky enough to have the chance to fly in to Bathurst Harbour and sail back to Hobart on the "Enterprize".

This opened my eyes to the unique qualities of the South West Wilderness World Heritage Area and the Bathurst Harbour and Port Davey waterways in particular.

Information provided by PWS added enormously to the experience by highlighting the underwater wonders and the unique values of the harbour in particular.

It was the experience of Bathurst Harbour that prompted me to make a submission on the expansion of marine farming in Macquarie Harbour.

Like Bathurst Harbour, Macquarie Harbour is a stratified water system, and thus a very fragile environment.

Surely the two sites must be similar in their qualities and environmental values?

In Bathurst Harbour the booklet tells us of the **"unusual water features – dark, layered water"**

"When freshwater meets saltwater, layering occurs because freshwater is lighter than dense saltwater. Within the marine reserve, this causes the dark band of tannin-rich freshwater to sit on top of the clear saltwater. The phenomenon is known as stratification. In Bathurst Harbour and Bathurst Channel the freshwater layer is at its deepest – about 4m – in winter when rainfall is highest. The narrow zone where freshwater meets saltwater is called the halocline, or salt gradient. Mixing of the halocline disturbs marine life as some species have adapted to live in either fresh or saltwater.

Reducing boat speed helps avoid mixing the fresh and saltwater layers."

Effects of increased boat movements in Macquarie Harbour

- Boat speed and the consequent noise has been a major issue in the Huon River where the aquaculture vessels often travel at high speeds. Yesterday evening at about 7.30pm two fish farm boats arrived in Strahan disturbing the peace of the twilight and causing considerable noise.
- In the Huon D'Entrecasteaux region, pens are towed around by fairly substantial boats with large engines that churn up the water. The boat such as the "Sea Hauler" and the one that came in yesterday evening could well disturb the stratification of water in Macquarie Harbour.
- If pens are moved around in Macquarie Harbour it could significantly disturb the stratification.
- **What restrictions have been included to minimise impacts of boats on the stratification of the waters by boats with powerful engines, and to prevent coastal erosion due to wakes of fast motor boats, such as people movers, used in aquaculture?**

Disturbance of stratification by pens

- The bottoms of the 15 metres deep pens will penetrate well into the saltwater layer. Fallowing requires pens to be moved around, thus further disturbing the stratification of the waterway.
- Even the continuous movement of fish within the deep pens may set up local currents that affect the layering of the water – I don't know if this has been studied.
- The proximity of the furthest south lease closest to the WHA must mean that there is a risk of change to the waters across that imaginary line.

A report from Lenfest Ocean Program (www.lenfestocean.org) in April 2011 "Dilution cannot be assumed the Solution for Aquaculture Pollution" on a scientific study in the journal *Environmental Fluid Mechanics* was the first detailed look at how real-world factors influence the flow of wastewater from fish farms. It provides a basis for understanding the impact of aquaculture on coastal water quality. I would like to come back later to this study with regard to the issue of the low levels of nutrients naturally present in the waters of Macquarie Harbour.

Low nutrients

In their response to my submission the PA state that one of my concerns is ***"increased nutrient levels resulting from salmonid farming into what is considered by the representer to be low nutrient waters".***

This response from the PA implies that there is no evidence that the waters of Macquarie Harbour have low nutrient levels.

In the EIS here are two references to low nutrient levels in Macquarie Harbour – based on these references and the Bathurst Harbour booklet I believe that there is justification for my "considering" that the waters are low in nutrients.

In the Executive Summary p xxi

"The fish community in Macquarie Harbour is very similar to that found in Bathurst Harbour. There is low diversity, possibly reflecting the low nutrient waters of the West Coast."

On p.59 under the heading **Fish**

The fish community in Macquarie Harbour is very similar to that found in Bathurst Harbour. There is a low diversity, possibly reflecting the low nutrient waters of the West Coast, resulting in drainage from poor soils and inert metamorphosed Precambrian rock types (Edgar et al. 1998).

The beautiful booklet prepared by the Parks and Wildlife Service for visitors to Bathurst Harbour states that ***"it is highly unusual for an estuary to have low nutrient levels as the waters that drain into them usually contain sediments rich in nutrients. In the south west, however, the waters have drained through the nutrient-poor shallow soils of eroded quartzites.***

The low nutrient levels affect the entire food chain, with less plankton, less fish and less filter-feeding invertebrates, other than at locations with rapidly flowing currents. The marine invertebrates in Bathurst Channel and Bathurst Harbour exist in – and rely on – this low nutrient environment. Any increase in nutrients can poison the animals and encourage invasive species.

Discharging boat sewage and sullage increases nutrient levels. Boat owners are encouraged to discharge outside the marine reserve."

- Bathurst Harbour is a highly protected waterway – a national treasure - and is treated with the greatest respect by the limited number of visitors who are lucky enough to be able to travel to this remote location.
- Even the relatively minor amount of effluent that might be discharged from marine toilets is tightly regulated and policed.
- In contrast, the equally special and wild Macquarie Harbour has already been adversely affected by human activities, especially mining and residential, but also by some aquaculture.

Any expansion of aquaculture into the more southerly area of Macquarie Harbour only 400m from the boundary with the World Heritage area has the potential to irreversibly damage this iconic waterway through the effluent from fish farms changing the fragile natural balance of the waterway.

Increasing nutrients are likely to spread over wider areas as the years progress, simply by diffusion and wind.

The report from Lenfest "Dilution cannot be assumed the solution for aquaculture pollution" in 2011 on a research paper in the journal *Environmental Fluid Mechanics*, states

Marine aquaculture or fish farming is viewed as a means to supplement declined wild fisheries and to help meet the rising global demand for seafood; however, it can cause environmental degradation. For example water quality can be significantly impacted because farmed fish excrete much of the nutrients contained in their feed, including nitrogen and phosphorus. In excess these nutrients can trigger eutrophication and depleted oxygen levels.

Nutrients discharges are a particular concern when fish are grown in open net pens because nutrient-laden faeces, undigested feed and other fish wastes flow freely into the

surrounding environment, some settling to the bottom and other wastes dissolving into the water column.
The concentrations of dissolved waste from net pens are often assumed to decline continuously in all directions as the discharge moves further from the pens, diluting the environmental impacts as the distance from the pens increases.
The scientists created a modelling tool that predicts a site's ability to meet water quality standards, taking into account local factors such as tidal flows, river outflows, wind-induced currents, shape of embayments, the earth's rotation and other properties of the locality influence the concentration and spread of dissolved wastewater plumes.

This study is consistent with a 2005 paper from the Aquafin CRC on the D'Entrecasteaux Channel in which tracers were used and it was found that ***"a continuous release of tracer from the cage results in a plume emanating from the cage in the form of a long narrow ribbon. The position and concentration of the plume is dependent on the in situ flow conditions and possesses large variability in space and time. It is possible for a plume having concentration of 10% (ie 10:1 dilution) of the source concentration to exist up to 0.5km from the cage on occasion".***

Note that Zone 9 is only **400m** from the boundary of the World Heritage Area.

The CRC report on the D'Entrecasteaux Channel goes on to say that ***"for settling rates typical of feed pellets or faecal material eg of the order of 10cm/sec, the footprint is restricted to the cage site. However, settling rates an order of magnitude less than this result in footprints in the form of an elongated plume with typical length 0.5km and width 200m emanating from the cage site. The direction of this plume is controlled by subsurface currents, and may be in the opposite direction to surface currents."***

The data in the EIS give the impression that there will be no pollution outside the lease areas.

I am not a hydrologist - but these data from the two papers referred to suggest to me that pollution is very likely to spread at least from Zone 9 into the waters of the World Heritage Area and its coastline – and possibly from other zones.

In the EIS (p.252- 3) the conclusion is that ***"aside from localised effects, there will most likely be a small elevation of nutrients within the central harbour area. It is possible that such an increase could create indirect impacts like macro-algal growth in more remote and shallow locations. While it is thought unlikely due to dilution of the nutrients with***

distance from the farms in the central harbour region and light limitation similarly affecting plankton development."

The greater effects may be in shallow waters, where the threatened Maugean Skate has been found.

Total Permissible Dissolved Nitrogen Output – TPDNO

The issue of the TPDNO was raised in relation to the proposed expansion of the lease at Soldier's Point in the D'Entrecasteaux Channel.

The Panel's report stated that: ***"Both the EIS and the section 40 report suggest that because the total feed input to the Channel is within the Total Permissible Dissolved Nitrogen Output (TPDNO), there is a low risk of dissolved nutrients having a deleterious environmental impact on the regional environment."***

- I have searched the EIS for the TPDNO for Macquarie Harbour and have not been able to find any reference to it.
- **It is essential that the TPDNO for Macquarie Harbour is defined before any expansion of aquaculture is permitted, and that it is consistent with the low nutrient conditions present in Macquarie Harbour in its natural state.**

Antibiotics

- The use of antibiotics is of concern. If a bacterial disease occurs, aquaculture companies have no choice but to use antibiotics, so there is no guarantee that antibiotics will not be used if and when diseases occur.
- According to Dr John Volpe who spoke at the EDO conference last week, there has never been an instance where disease was not a significant problem for finfish aquaculture.
- His view was that it is not whether antibiotics will be used but when and how much.

Climate Change

In my submission I referred to the potential effects of climate change, and in particular, rising CO2 levels that are lowering the pH of waterways, and how this might affect aquaculture in Macquarie Harbour. There was no response on this from the PA.

Climate change is a long term issue that will need to be dealt with under adaptive management strategies by the proponents.

Water temperature

- In the Huon D'Entrecasteaux region, the rising water temperatures that were predicted as part of the effects of climate change have been considerably greater than expected, and have had serious effects on the aquaculture industry.
- Fish pens now need to be venturated and flushed with fresh water in order to minimise disease.

- I don't know whether potential sea temperature rises were taken into consideration in previous marine farming plans- but it should be considered in detail in this one.
- If the water temperature in Macquarie Harbour were to rise significantly so that venturation was needed this could significantly disturb the stratification of the water in the harbour.

pH changes

In the TAFI paper "Scoping Study into adaptation of the Tasmanian Salmonid Aquaculture Industry to Potential Impacts of Climate Change" the authors refer to pH changes as a threat.

"The oceans are becoming more acidic due to absorption of increasing atmospheric carbon dioxide. Surface ocean pH decreased by 0.1 pH unit since 1750, and is expected to decline by an additional 0.2 to 0.3 units by 2100 (Hobday et al 2007). While this change may not have direct effect on salmon health it is possible that it can contribute to disease outbreaks".

- The greater understanding that climate change is happening now – in particular rising temperatures and falling pH – means that it **must** be taken into account.
- It should be a substantial part of the modelling for any long term development – and needs to be done before any expansion of aquaculture in Macquarie Harbour is approved.

Rate of development

It seems that the proposed expansion of marine farming in Macquarie Harbour is going to take place over the next five years, with expenditure of something like $88 million. The PA claims that this is **"gradual development".**

- I regard this as rapid expansion and question whether it will allow for the adaptive management processes that are part of this proposal.
- How can the **cumulative effects** on areas at a distance from the leases be determined within one or two years of the pens being put on the lease?
- The water monitoring so far has been once or twice a year – how often will it be done as the farms are established and the process of growing the fish proceeds?
- How are the **cumulative impacts** of the ten expanded leases going to be assessed?

The expansion of aquaculture in the Huon D'Entrecasteaux Channel over the past 10 years has been dramatic.

Anecdotally, the decreases in wild fish numbers in Port Esperance have been quite significant. The changes are noticed by members of Coastcare groups, people who walk on the beach and especially those who visit shacks at regularly at longer intervals. The increases in algal growth, especially sea lettuce in the inter-tidal zone has been very noticeable.

Accreditation for environmental credibility

Earlier I talked about the Tasmanian brand – the promise that Gerard Castles referred to last week. If aquaculture is to continue, it must have consumer acceptance – and consumers are becoming more discerning.

- Tasmanian Atlantic salmon is marketed as a clean green product grown in pristine waters without environmental damage.
- This must also be the reality.
- The "promise" of the World Heritage Area must be protected.

In 2010 an international accreditation system was introduced for the first time.
The Global Aquaculture Performance Index - GAPI – is internationally recognised (www.seafoodsource.com October 2010, and www.lenfestocean.org)

GAPI has two functions
It evaluates and compares the environmental impacts, and simplifies the results for key marine finfish species such as Atlantic salmon.

- Firstly, it provides a measure of the intensity of environmental impacts per unit of production.
- Secondly it provides a ***"cumulative score which encapsulates the overall impact of aquaculture production across a region or within a country, allowing policy makers to assess proper scale and carrying capacity for a given area".***
- Dr John Volpe who was involved in developing the accreditation system said:
- ***"Even within species we found dramatic difference from country to country across the board.***
  Scale matters. Efficiency on a farm-by-farm basis is good but one must keep an eye on the cumulative effect. GAPI is the first initiative to take a global snapshot of aggregate impacts".

If Tasmanian farmed salmon industry is to be recognised as environmentally responsible it needs to embrace the standards set out in the Global Aquaculture Performance Index.
The 2010 media release says that GAPI should also be used by the governments ***"to inform policies and regulations to minimise the environmental footprint of fish farming. Farmers can it to improve production practices. And buyers can use it to compare and select better, more environmentally friendly seafood options".***
The tools are available – if Tasmania is to achieve the best possible production methods and minimise environmental impacts, as well as improving market acceptance – or at least not losing market acceptance – then it is critical that GAPI is used to assess any expansion of aquaculture in Macquarie Harbour – **before the expansion takes place** – not afterwards when it may be too late to make the necessary adjustments.
Thank you