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To:	Tasmanian Salmon Study Secretariat
Subject:	Submission to the Study
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Attachments:	Submission to the Independent Study of the Tasmanian Salmon Industry.docx

Dear Sir/Madam

Please see attached my submission to the study.

Thank you for your attention to my concerns.

And best wishes for your work.

Michael

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Submission to the Independent Study of the Tasmanian Salmon Industry.

Michael Rowan
2 July 2026

Introduction

Before responding directly to the Study's stakeholder engagement and study plans I wish to make a few observations on the philosophical, economic and historical context of the Study.

The first sentence of the Introduction to the Independent Study of the Tasmanian Salmon Industry on the Tasmanian government website reads

> The salmon industry independent study will examine whether Tasmania's regulatory arrangements are effective in achieving sustainable development while protecting the state's marine and freshwater environments.

Left unchallenged, that single sentence predicts that the Study will fail to achieve what many if not all in the community hope for it: that the salmon industry can be re-engineered to provide jobs and economic wealth for the community indefinitely into the future. The problem is the concept of sustainable development. This supposedly reconciles the fundamental conflict between the development of industry as we have known it, on the one hand, and the protection of the environment on the other. The notion of sustainable development has come to be a mythical shock absorber that prevents the economy and the environment coming into a calamitous collision.

That hope is in vain. Put simply, for every economic activity which has any effect on the environment at all, either that activity improves the state of the environment, or it harms the environment. And any activity which harms the environment is not sustainable in the same way that a modest net withdrawal from your bank balance is not sustainable. If you are withdrawing without at least equally depositing, the only question is how long your funds will last. Perhaps we could call that 'sustainable bankruptcy'.

The best model for sustainable development as it is now understood is not a healthy farm, but a mine which extracts the ore at a steady pace, and with innovation finds ways to make it economically viable to extract material with lower and lower concentrations of the target mineral. Perhaps even working over the tailings left from previous mining to extract further minerals from what was previously discarded as waste. All of which extends the life of the mine and increases the profits of the owners – but in the end leaves the community with no jobs and often, as the many abandoned mining towns attest, no future.

The community will not accept a technology of salmon farming which is in fact a practice of mining the environment to produce fish. It will not accept sustainable development of the salmon industry which produces profits for the owners but in the end leaves the community with no industry and no employment.

Rather, the community hopes for a salmon industry – if it be possible – that is even more viable next year than it was in the last. An industry which improves the environment in which it operates – both the natural and the human - such that the industry can be more

productive and socially supported for an indefinite future. That requires an industry which is nature positive, and socially positive. It requires discarding the idea of sustainable development and embracing the idea of a circular economy or more fundamentally an economy which is built on the premiss that industry owes a duty of care to the environment and the community just as it owes a duty of care to its employees.

No doubt there are some in the community who simply wish the salmon industry to go away. While my AI research says the industry contributes relatively little to the state budget, and if it closed down it would be the commonwealth budget that would be most affected (loss of income tax; increase in social support payments) the loss of the industry would be a substantial blow to the Tasmanian economy and a disaster for the areas where it is a major employer. My 'AI assisted back of the envelope' calculations suggest that the entire Tasmanian economy is around $45bn/year, to which salmon farming contributes as much as $900m/yr, or 2% in very round figures. Assuming that workers in the salmon industry are about as productive as the Tasmanian average, that suggests the industry provides around 2% of the jobs in Tasmania – though the industry claims many more.

Whatever the true figure, it is clear that if the industry goes extinct in Tasmania it will cause a great deal of unemployment. It is also clear that the near future will not be a good time to be looking for new employment in Tasmania, with the budget in deficit and the government proposing to return to surplus partly by cutting expenditures – mainly by removing 1,700 full time positions from the public service.

Clearly, if it is possible to develop a survival plan for the industry, that would be preferable to shutting it down.

Finally, for historical context, it needs to be recalled that Tasmania has suffered badly in the relatively recent past from the collapse of large sections of the economy concentrated in the same area as the salmon industry. In the early 1970s the ending of the apple export industry following the UK joining the common market took around 1,000 jobs out of the economy, and the collapse of the scallop industry in the D'Entrecasteaux Channel a little later added around another 500 to that. The risks to both were evident years before their collapse. Both of these industries should have worked with the government and the community to develop a survival plan. They did not, and in its absence both failed.

Government should have learned from these failures, and ensured that industries which face existential threats are supported with a survival plan, or if this is not possible, a plan for an orderly retreat and transition to new opportunities. I look to the Study to provide both the evidential basis and the political impetus for the development of such a plan or plans.

The draft study plan

I do not profess general expertise in this area, and can say only that the draft study plan looks appropriate to me. There is, however, one issue which I think needs to be given much greater emphasis - topic 3, question 2:

> What are the trends in antibiotic and chemical use in the Tasmanian industry, and, in addition to the environment risks in topic 1, what are the associated risks to public health and the environment?

This question needs to be placed in an historical context, recognising that the major cause of fish mortality – the bacterium Piscirickettsia Salmonis – is now established in the environment where fish pens are located. This bacterium was previously killed by oxytetracycline, but has evolved to become resistant to this antibiotic, and the salmon industry has moved on to florfenicol for treating Piscirickettsia Salmonis infections.

While florfenicol is delivered to the fish in the pens in their food, not all of this food is consumed by the salmon and therefore the antibiotic is effectively delivered to all living things in the environment near the pens – and indeed in lesser concentrations up to kilometres away. Thus while the fish in the pens are receiving a dose scientifically calculated to effectively kill the bacterium, fish and other organisms outside the pens are receiving a dose which is sub-lethal for Piscirickettsia Salmonis and indeed other bacteria and other pathogens. This will lead to the development of strains of Piscirickettsia Salmonis resistant to florfenicol, as happened with the earlier antibiotic used, oxytetracycline. At that point if no other solution to mass fish deaths has been found, a third antibiotic will be sought, and so on.

Distributing sub-lethal doses of antibiotics in the environment is not a practice which complies with rules for the safe use of medicines. It creates a risk of pathogens evolving which are both harmful to humans, and other species, and resistant to antibiotics which might be used to treat resulting infections. That risk increases with every new class of antibiotics which is used in open pen salmon farming.

The World Health Organisation already considers the development of antimicrobial resistance (AMR) to be a major threat to human health. Open pen salmon farming by its nature contributes to the development of AMR, since the very feature of the process that ensures waste is removed from the immediate environment of the fish as is required for their health – the natural flow of sea water through the pens – also removes antibiotics from the pens and distributes it into the environment, where both the target pathogen and countless others develop AMR with respect to the antibiotic used – one antibiotic after another.

The development of an antibiotic resistant pathogen which caused harm to humans, especially one which was easily transmissible between people, would risk widespread infection and potentially a global pandemic. While the risk might be considered low, the UN's Food and Agriculture Organisation is clear that it needs to be taken very seriously and tightly managed. The emergence of a novel disease linked to aquaculture should be considered a black swan event made more likely by every turn of the evolutionary wheel in the battle between pathogens and antibiotics in salmon farming.

In relation to the above I note that the Tasmanian Environmental Protection Agency Environmental risk assessment of florfenicol use in marine salmonid aquaculture in SE Tasmania 2025-2026 states that

> The EPA recognises that antibiotics in the environment are complex and can affect bacterial communities in different ways.
> This assessment did not examine:
>
> - impacts on bacteria
> - the potential for antimicrobial resistance

It is vital that the Study does thoroughly investigate these two areas and assesses the risk to the health of humans and other species – including other seafoods – from the development of AMR caused by the use of antibiotics in open pen salmon farms.

While the plan for the relevant area of the Study (Topic 3) does refer to international experts and the FAO as sources of information, in the light of the cavalier attitude of the EPA I believe it is of the utmost importance that the topic is considered as a serious issue in its own right rather than just in the context of salmon farming in Tasmania, by consulting experts on AMR to establish the public health risk of AMR. Once the scale of the cost of AMR is established, then it is appropriate to consider the probability of worrisome pathogens emerging from the use of antibiotics in salmon farming, and the cost to the industry of limiting or prohibiting the use of antibiotics in open pens.

I surmise that the EPA did not do this, with the consequence that they focused on the high probability that not allowing the use of florfenicol would lead to readily quantifiable loss by the salmon industry and did not consider at all the lower probability that the use of florfenicol might lead to a major public health impact, which would explain their apparent discounting of the importance of considering the 'impacts on bacterial' and 'the potential for antimicrobial resistance'.

We might call this the Huanan Seafood Wholesale Market miscalculation – or perhaps the Wuhan fallacy. We should learn from Wuhan and Covid 19 that black swans are ignored at our peril.