Draft Storm Bay North Marine Farming Development Plan, November 2017

Report of the Marine Farming Planning Review Panel

November 2018

Contents

1 INTRODUCTION

1.1 Purpose of Report

This report sets out the matters considered by the Marine Farming Planning Review Panel (the Panel) in making its determination, under section 29 of *the Marine Farming Planning Act 1995* (the Act) in relation to the *Draft Storm Bay North Marine Farming Development Plan, November 2017* (the Draft Plan).

The Panel rejected the Draft Plan in accordance with section 29(2)(b) of the Act and advised the Planning Authority (PA) accordingly under section 29(3A). The PA then submitted to the Panel a modification to the Draft Plan pursuant to section (30)(1)for consideration.

1.2 Structure of Report

Section 1 of this report provides background and contextual information.

Section 2 covers the legislative requirements relevant to the Panel's recommendation. In particular, the requirements of section 21 of the Act are examined.

Section 3 focuses on the key issues identified in the Draft Plan and Environmental Impact Statement (EIS) accompanying the Draft Plan, and sets out the conclusions drawn by the Panel.

Section 4 sets out the recommendations of the Panel, in relation to the Draft Plan.

Appendix A contains the Statement of Reasons, and suggested modifications to the Draft Plan.

Appendix B provides details of the Panel.

1.3 Background

A detailed chronology of the planning process is provided in the Panel's statement of reasons for its determination in Appendix A. The key elements were:

- On 22 September 2017, Petuna Aquaculture Pty Ltd (the applicant) requested approval, under section 16 of the Act, to prepare a Draft Plan (the initial Draft Plan).
- On 23 November 2017, the Panel met with representatives of the applicant to discuss the proposal.
- The Panel considered the (initial) Draft Plan and the Environmental Impact Statement (EIS) in accordance with Section 25(3) of the Act on 23 November 2017.
- The Draft Plan sought to create a new marine farming zone in the north central area of Storm Bay, southeast of Betsey Island. The proposed marine farming zone was 430ha with a maximum leasable area of 273.1ha.
- The applicant prepared the Draft Plan in consultation with the PA along with an environmental impact statement (EIS) prepared in accordance with approved guidelines issued by the PA. The EIS provided a description of the proposal. It contained a description of existing environmental conditions, an assessment of the potential effects on those conditions as a consequence of the (initial) Draft Plan and the proposed operations. It proposed mitigation measures and identified any likely residual effects after mitigation.
- On 3 December 2017, the Minister approved the public exhibition of the (initial) Draft Plan. The Planning Authority (PA) publicly exhibited a copy of the (initial) Draft Plan, together with the EIS, between 9 December 2017 and 9 February 2018.

- The PA forwarded a report to the Panel on 7 May 2018 in accordance with section 28 of the Act, Twenty-seven (27) written submissions were received in relation to the Draft Plan, including twenty-five (25) which met the requirements of a 'representation' under section 27 of the Act. Eleven (11) representors also requested a hearing pursuant to section 27(2)(c) of the Act.
- On the 15 May 2018, the Panel held public hearings pursuant to section 12 of the Act. Four representors presented at the hearing.
- Following the hearing the Panel met on 16 August 2018 and considered the Draft Plan, the section 28 report and information presented at the hearing.
- On 16 August 2018, in accordance with section 29(1) the Panel considered the Draft Plan and after its consideration, under section 29(2)(b), rejected the Draft Plan.
- In accordance with section 29(3A), on 24 August 2018 the Panel notified the PA in writing of its determination and the reasons for making it.
- On the 10 October, the PA submitted a modification to the Draft Plan to the Panel in accordance with section 30(1) of the Act.
- On the 15 October, the Panel, after consideration, determined to approve the Draft Plan as modified under 29(2)(d).

1.4 Legislative Changes – *Finfish Farming Environmental Regulation Act 2017*

After the (initial) Draft Plan had been approved for exhibition, the *Finfish Farming Environmental Regulation Act 2017* commenced. The *Finfish Farming Environmental Regulation Act 2017* amends several Acts relating to the management of finfish farming activities, including the *Marine Farming Planning Act 1995,* and establishes Tasmania's *Environmental Management and Pollution Control Act 1994* (EMPCA) as the primary piece of environmental regulation legislation for finfish farming. While the Secretary, DPIPWE retains a significant regulatory role in marine farming, the changes establish the legal structure that empowers the Director, EPA with an independent statutory role for the environmental regulation of the State's finfish farming industry. The new arrangements also include a new Environmental Licence under Tasmania's *Environmental Management and Pollution Control Act 1994* (EMPCA). Any individual marine farming operation will now be regulated by two licences, an Environmental Licence issued under the EMPCA, and a Marine Farming Licence issued under the *Living Marine Resources Management Act 1995*.

A number of changes to the management controls in the initial Draft Plan were required to reflect the new regulatory environment and responsibilities and are included in the Draft Plan as modified. This is discussed further in section 3.4.8 of this report.

1.5 Role of the Marine Farming Planning Review Panel

The Panel is a statutory body established by the Act.

In summary, the role of the Panel in relation to a draft marine farming development plan is to:

- consider a Draft Plan and environmental impact statement and determine whether it is suitable for public exhibition;
- where suitable, refer it to the Minister for approval for it to be publicly exhibited;
- consider the Draft Plan; the report of the PA, containing a copy of representations received in relation to the Draft Plan; a copy of any requests for hearings; a statement of the PA's opinion as to the merit of each representation; a statement regarding the need for any modification of the Draft Plan in the light of any representation, and the impact of any representation on the Draft Plan as a whole; and any appropriate recommendation in relation to the Draft Plan;

- make a determination to modify the Draft Plan; reject the Draft Plan; require the planning authority to modify a specified provision of the Draft Plan; or accept the Draft Plan without change;
- recommend to the Minister that the Draft Plan be approved if satisfied that the Draft Plan including any modification to the plan is acceptable; and the Draft Plan contains any matter relating to environmental management of finfish farming that the Director, EPA requires the Panel to include in the Draft Plan.

The Panel is also required to conduct a hearing if a request is made under section 27(2)(c) of the Act.

Members of the Panel are listed in Appendix B.

1.6 Context

The Panel noted several contextual issues in its consideration of the Draft Plan, the EIS prepared by Petuna Aquaculture Pty Ltd, the report prepared by the PA pursuant to section 28 of the Act and the representations made at the hearing. The Panel also sought and was provided with additional information from the EPA on:

- environmental monitoring;
- triggers and responses to on and off lease issues, and compliance with current regulatory conditions;
- the current Regulatory capacity to manage and respond to environmental performance issues.

The Draft Plan is one of three separate marine farming development proposals received for Storm Bay from each of Tassal Operations Pty Ltd, Petuna Aquaculture Pty Ltd and Huon Aquaculture Company Pty Ltd. In combination, the companies have aspirations to expand the salmonid production in Storm Bay to 80,000 tonnes/yr. However, in recognition that scientific information is not currently available to predict the environmental effects of this level of production, each proposal considers the potential environmental effects of a combined level of production of 40,000 tonnes/yr. This represents an increase of approximately 24,000 tonnes in annual production in Storm Bay. The Panel notes that the Director, EPA has advised that the staging of salmon farming development in Storm Bay will be capped at an initial 30,000 tonnes/yr. The Panel further noted that this cap will be reached progressively over a number of years from the date of any approval.

A Marine Farming Development Plan (MFDP) is a planning instrument which designates areas where marine farming may occur in State waters, and hence provides for the allocation of marine farming leases.

In setting out zones in which marine farming can take place, a MFDP also contains management controls considered necessary to satisfactorily manage and mitigate any effects of marine farming activities that may occur in those designated zones and the adjacent environment.

The approval of a development plan or an amendment to a plan is not an approval for a particular marine farming operation which may be subsequently licenced to occur within the zones approved by the plan.

On 4 December 2017, the *Finfish Farming Environmental Regulation Act 2017* took effect. The new arrangements include a new Environmental Licence under Tasmania's *Environmental Management and Pollution Control Act 1994* (EMPCA). Any individual marine farming operation will now be regulated by two licences, an Environmental Licence issued under the EMPCA, and a Marine Farming Licence issued under the *Living Marine Resources Management Act 1995*.

Regulatory controls stipulated by licence conditions are the primary instrument regulating allowable production levels and operational practices in the zones designated by the MFDP. Licence conditions provide for the regulators of the Industry (the Secretary, DPIPWE and the Director, EPA) to apply adaptive management principles to mitigate adverse environmental impacts. EMPCA provides the Director, EPA with a range of enforcement powers and tools in relation to compliance with any issued Environmental Licence.

However, whilst the licences are the primary tool for regulating a specific marine farming operation within an MFDP zone, the Panel must also consider whether the MFDP management controls are likely to be sufficient to mitigate potential adverse effects of marine farming operations in the approved zones. Under the Act, the Secretary of DPIPWE (the Secretary) has a range of enforcement powers in relation to compliance with management controls contained in the MFDP.

This Draft Plan allows for expansion of finfish farming within the Plan area and, by virtue of that, within Storm Bay. The Panel has noted limitations of the currently available science relating to nutrient inputs and biogeochemical processes in Storm Bay. These limitations have also been acknowledged by the PA and the EPA, who have proposed an adaptive management framework in recognition of the gaps in knowledge about how the environment will respond to increased levels of production. The proposed adaptive management approach would be underpinned by:

- Licence conditions imposed by the EPA through an environmental licence under EMPCA;
- Establishment by the EPA of environmental standards / guideline limit levels and performance indicators for water quality;
- A staged development approach overseen by the EPA;
- A comprehensive environmental monitoring program (including near-scale, intermediate and broad-scale monitoring) overseen by the EPA; and
- The development of a biogeochemical model, to help to understand the information provided by the environmental monitoring and the effects of any changes to farming operations in the region.

The Panel further noted the following:

- increased resourcing of the EPA to ensure regulatory capacity;
- the continued support by the DPIPWE Marine Farming Branch in transition to regulation under the *Finfish Farming Environmental Regulation Act 2017*; and
- the consultative development of the comprehensive environmental monitoring program, with engagement across the EPA, DPIPWE Marine Farming Branch, and industry representatives.

The Panel was satisfied that under the enhanced adaptive management framework and administrative arrangements, any environmental effects caused by marine farming operations undertaken in accordance with the MFDP can be effectively detected and mitigated to avoid serious or irreversible impacts on the environment.

The Panel highlighted the need for caution to be taken in expanding production towards the proposed cap, while further research is undertaken, particularly the development of the biogeochemical model and the benthic assimilative capacity of Storm Bay. This is discussed further in relevant sections of the report.

2 REQUIREMENTS OF THE ACT

2.1 Section 21 of the Marine Farming Planning Act 1995

A draft marine farming development plan for an area must comply with certain legislative requirements. Section 21 of the Act requires that the Draft Plan must:

a) further the objectives of resource management within the area covered by the Draft Plan; and
b) designate any area as a marine farming zone within the area covered by the Draft Plan; and
    i. specify the area to which the marine farming development plan relates; and
c) be co-ordinated with any marine farming development plan applying to any adjacent area; and
    i. if it relates to finfish farming, contain any matter relating to environmental management that is required by the Director, EPA, in a notice under section 17A(1), to be contained in the marine farming development plan or any marine farming development plan; and
d) have regard for the use and development of the region as an entity in environmental, economic, recreational and social terms; and
e) seek a co-ordinated approach with respect to any matter affecting adjacent land under the jurisdiction of the Marine and Safety Authority or council; and
f) have regard to the biological and physical requirements of fish species to be farmed in that area; and
g) provide for any other matter which this Act requires to be included in a marine farming development plan; and
    i. be consistent with State Policies made under section 11 of the State Policies and Projects Act 1993; and
h) contain any matter the Panel requires.

The Panel is satisfied that the Draft Plan complies with the relevant requirements of section 21 of the Act as discussed hereunder.

2.2 Resource Management Objectives

Section 21(1)(a) of the Act requires that the Draft Pan must further the objectives of resource management within the area covered by the plan.

The Act is part of the Resource Management and Planning System of Tasmania (RMPS), and as such, needs to further the objectives of the RMPS. The objectives of the RMPS are:

a) to promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity; and
b) to provide for the fair, orderly and sustainable use and development of air, land and water; and
c) to encourage public involvement in resource management and planning; and
d) to facilitate economic development in accordance with the objectives specified in paragraphs (a), (b) and (c); and
e) to promote the sharing of responsibility for resource management and planning between the different spheres of Government, the community and industry in Tasmania.

The Act also contains a set of objectives relating to resource management. The purpose of the Act is to achieve well-planned sustainable development of marine farming activities having regard to the need to:

a) integrate marine farming activities with other marine uses; and
b) minimise any adverse impact of marine farming activities; and
c) set aside areas for activities other than for marine farming activities; and
d) take account of land uses; and
e) take account of the community's right to have an interest in those activities.

The Panel's consideration of the Draft Plan, in regard to these objectives, is set out below.

Overall, the Panel concluded that the requirements of section 21(1)(a) of the Act have been satisfied.

2.2.1 Promote Sustainable Development

The Panel is satisfied that the Draft Plan provides for the sustainable development of natural and physical resources, and the maintenance of ecological processes and genetic diversity.

In making its determination, the Panel has considered both the Draft Plan, as well as two other proposals for marine farming activities within Storm Bay, including two draft amendments to existing marine farming development plans submitted by Huon Aquaculture and Tassal.

The Panel wrote to the previous Minister for Primary Industries and Water, Jeremy Rockliff, on the 27th April 2017 in regard to its preliminary consideration of the EIS submitted by Tassal Operations Pty Ltd. The Panel raised its concern that there appears to be limited science currently available to support the proposition that 40,000 tonnes of production within Storm Bay is sustainable and will not result in unacceptable environmental impacts. The Panel recommended that the PA engage with the EPA, industry proponents and scientific research organisations to develop a plan to integrate the following components into the planning process for all proposed salmonid farming developments within Storm Bay:

- Development of a full biogeochemical model for Storm Bay;
- Staged approach to reaching 40,000 tonnes of production (to be managed by way of Total Permissible Dissolved Nitrogen Output) within Storm Bay; and
- Development of a Broadscale Environmental Monitoring Program.

As set out in this report, the Panel considered a range of issues relating to the potential effects of the addition of the new marine farming zone and the concomitant additional leasable area for marine farming in Storm Bay. The Panel concluded that such an expansion is sustainable, conditional on it being supported by the adaptive management approach described in this report. In this regard, the Panel is of the view that the adaptive management approach provides a mechanism to enable farming to proceed in a precautionary manner. The Panel noted the co-ordinated approach that has been applied to the assessment and mitigation of environmental impacts through the use of co-ordinated nutrient dispersion modelling; the inclusion of a Total Permissible Dissolved Nitrogen Output limit for Storm Bay; and the proposed BEMP and Biogeochemical Modelling that will inform on-going adaptive management of salmonid production in Storm Bay.

2.2.2 Provide for Fair and Orderly Development

In general, the Panel is satisfied that the Draft Plan provides for the well-planned development of marine farming activities in Storm Bay, taking account of other uses and objectives. However, in consideration of other marine farming activities in Storm Bay, caution must be exercised given the absence of a biogeochemical model to inform the nutrient assimilation capacity of the system and the linkages between the Derwent Estuary and lower D'Entrecasteaux Channel.

In making its determination, the Panel has considered both the Draft Plan, as well as two other proposals for marine farming activities within Storm Bay, including two draft amendments to existing Marine Farming Development Plans.

2.2.3 Encourage Public Involvement in Resource Management and Planning and take account of the community's right to have an interest

The process prescribed in the Act for consideration of the Draft Plan encourages public involvement and takes account of the community's right to have an interest in the sustainable development of marine farming activities. The Panel is satisfied that public involvement in its consideration of the Draft Plan was encouraged through the representation and hearing process.

Additionally, the Panel noted that the applicant consulted with a range of stakeholders in the development of the Draft Plan and EIS. The Panel also noted that some representors raised concerns about the adequacy of public consultation and the planning process to encourage public involvement in the planning. These issues are discussed in sections 3.4.1 and 3.4.5 of this report. The Panel formed the view that the requirements of the Act were met in relation to the planning process and public consultation. The Panel does not, however, make comment on the effectiveness of the consultation undertaken by the applicant to address individual concerns.

2.2.4 Facilitate Economic Development

The proposal is likely to cause a direct increase in employment in the region as well as increased employment and economic productivity within supporting and downstream industries.

According to the EIS, the proposed development would employ 37 new full-time equivalent positions with the potential for 130 full-time equivalent positions to be indirectly employed within the local community and aquaculture service industry.

While the Panel has not evaluated these figures, it accepts the proposition that an increase in production will result in economic benefits for the region and the State.

2.2.5 Promote sharing of responsibility for Resource Management and Planning

The Panel is satisfied that the Draft Plan and the process prescribed in the Act for its consideration, promote the sharing of responsibility between the different spheres of government, the community and industry in Tasmania. By the nature of the provisions in the Act, the Draft Plan has been prepared in a collaborative fashion between the applicant and the planning authority, and the community has been provided with an opportunity to comment on the proposal (refer to sections 3.4.1 and 3.4.5 **Error! Reference source not found.**for discussion of issues raised).

2.2.6 Integrate marine farming activities with other marine uses

The Panel is satisfied that the Draft Plan provides for the well-planned, sustainable development of marine farming activities in Storm Bay, having regard to the need to integrate marine farming activities with other marine uses.

As discussed in section 3.3.2 of this report, navigational issues have been taken into consideration in the preparation of the Draft Plan. Other marine use aspects have been discussed in Sections 3.3.5 Commercial fishing, 3.3.6 Recreational fishing, and 3.3.7 Recreational activities.

2.3 Co-ordination with any marine farming development plan applying to an adjacent area

Section 21(1)(c) of the Act requires that a draft marine farming development plan for an area must be co-ordinated with any marine farming development plan applying to any adjacent area.

For the purposes of assessing this criterion, the Panel formed the view that the *Tasman Peninsula and Norfolk Bay Marine Farming Development Plan, November 2005* is a marine farming development plan applying to an adjacent area. The Panel noted the Draft Amendment to the *Tasman Peninsula and Norfolk Bay Marine Farming Development Plan, November 2005* to include the West of Wedge Zone within the plan area. Based on the information the Panel had at the time it initially formed the view that there was inadequate separation distance between the Draft Plan and the new West of Wedge Zone proposed in the Draft Amendment to provide for adequate avoidance or mitigation measures to manage biosecurity risks. The Panel raised a number of related concerns that hindered its support of the initial Draft Plan:

- The finalisation and implementation of an approved Biosecurity Plan, particularly as it relates to minimum separation distance between companies;
- A more complete understanding of circulation patterns in Storm Bay which will result from the FRDC Project 2017-215 which is developing a full biogeochemical model for Storm Bay; and
- The results from the FRDC Project 2017-182 on Pilchard Orthomyxovirus (POMV).

The latter two points would provide a better understanding of the acceptable separation distance between companies which would better inform an appropriate location of zone/s in the Draft Plan. While the Panel acknowledges that the above are in various stages of development, not having certainty of implementation or access to results has caused a heightened level of concern about biosecurity risks.

On other matters, aside from biosecurity and disease management, the Panel was of the view that the Draft Plan was coordinated with other marine farming development plans applying to adjacent areas.

In considering the Draft Plan as modified, it was acknowledged that separation distance between companies was a significant factor influencing the Panel's consideration, however it became apparent that separation distance was only one of a number of measures that could and did mitigate biosecurity risks across zones and between companies.

Based on the modifications made to the management controls and the further advice provided by the PA in relation to regulatory management of biosecurity and fish health, as well as the progress towards the development of Biosecurity Legislation, the Panel determined that it was satisfied that the requirements of section 21(1)(c) would be satisfied.

2.4 Use and development of the region as an entity

Section 21(1)(d) of the Act requires that a draft marine farming development plan has regard for the use and development of the region as an entity in environmental, economic, recreational and social terms.

The EIS identified a range of issues which were each taken into consideration by the Panel in making its determination (see Section 3). On this basis, the Panel is satisfied that the requirements of section 21(1)(d) of the Act have been satisfied.

2.5 Coordinated approach with the Marine and Safety Authority or Council

Section 21(1)(e) of the Act requires that a draft marine farming development plan must seek a coordinated approach with respect to any matter affecting adjacent land under the jurisdiction of the marine and safety authority or council.

The Panel noted that in preparing the Draft Plan and its EIS, the applicant consulted Marine and Safety Tasmania via the PA (MaST), and presented information about the proposal to the Tasman Council and Clarence City Council.

In its EIS, the applicant states that it received feedback from MaST, via the PA, on the locations of the commercial shipping lane and newly defined recreational boaters/fishers line of site transit lanes through Storm Bay. The applicant states that this feedback resulted in an adjustment to the proposed zone to prevent interaction with recreational transit lanes.

The Panel also noted that the PA, in making its recommendations to the Panel in its Section 28 Report, consulted with MaST and the Australian Maritime Safety Authority (AMSA).

On this basis, the Panel is satisfied that the requirements of section 21(1)(e) of the Act have been satisfied.

3 KEY ISSUES

This section of the report considers several key issues that arose in the EIS, through representations and the hearing process. Several issues were directly related to the Panel's consideration of the Draft Plan. Others related to the effects of farming operations as a consequence of the granting of marine farming leases within the designated zone within the development plan. Several other issues were raised which related to processes or other concerns that are outside the scope of the Act. Where this was the case, the Panel has included the issue in its report, as well as indicated that the matter is out of scope.

This section of the report focuses on key issues and does not seek to address every issue identified, or duplicate information or analyses contained in the EIS or the Section 28 Report, both of which are publicly available.

The key issues have been grouped into those relating to the proposed development description; the impacts on the natural environment; those relating to impacts on the human environment; and other matters.

This section provides background information on each key issue, a discussion of the relevant matters, and (where relevant) the conclusion of the Panel. In this section where the conclusion of the Panel is a recommendation for a modification, either by amending a management control or inserting an additional control, the PA in every instance has incorporated the change into the modification made to the Draft Plan.

In this section references to the Draft Plan may be a reference to the initial Draft Plan. All of the recommendations were addressed in the modification to the Draft Plan.

3.1 Issues relating to the proposed development description

3.1.1 Infrastructure and servicing

3.1.1.1 Background

Representors raised concerns relating to perceived infrastructure and servicing issues including: the potential for species escapes arising from infrastructure malfunction; marine debris originating from proposed operations; and the potential for infrastructure breakdown in the exposed location.

The Section 28 report of the Planning Authority recommended that the Draft Plan be modified to:

- Strengthen management controls to provide additional, specific management controls relating to marking and monitoring of marine farming equipment to assist in the management of marine debris; and
- Include requirements for verification that the lessee has appropriate systems, capabilities and equipment to both minimise the risk of infrastructure failures and ensure appropriate response capability in the event of a failure.

3.1.1.2 Discussion

Marine debris

The Panel acknowledged the potential risks to navigation arising from infrastructure that is lost from a marine farming zone.

Additionally, the Panel acknowledged the concerns of representors about marine debris causing environmental harm. Notwithstanding the recognised risk of micro-plastics to the biological environment, the Panel were of the view that larger marine debris originating from marine farms does not pose a significant threat to the marine environment. The Panel noted that industry had the capability to remove marine debris in the event of any loss of infrastructure.

The Panel noted the draft management controls contained within the draft Marine Farming Development Plan relating to marine debris (3.13.3, 3.13.5 and 3.13.6) and species escape (3.12.1 – 3.12.3). The Panel also noted the broad powers under draft control 3.01 contained in the Draft Plan requiring that lessees must comply with any written direction given by the Secretary. In addition, the Panel noted powers under Section 94 of the *Marine Farming Act* that allow for infringement notices and demerit points for failure to adhere to marine debris controls.

The Panel considers that the modifications recommended by the PA should be made in recognition of:

- The *Sustainable industry growth plan for the salmon industry* which includes an action to adopt a 'zero tolerance' approach to marine debris and related boating safety issues through the planned introduction of best practice tracking technologies and simple ways to identify the source of debris; and
- The proposed scale of the development, the level of exposure of the site and potential for serious environmental harm in the event of catastrophic failure of systems or equipment.
- The PA having consulted with MAST, AMSA and the EPA in forming its recommendations to the Panel.

While the issue of larger (markable) marine debris is adequately covered, the Panel noted that marine debris, particularly debris of a small nature, may constitute an environmental nuisance.

The Panel noted the Government's 'zero tolerance' approach to marine farming debris and the specific provisions of the *Marine Farming Planning Act* 1995 relating to requirements for the location of marine farming equipment (*s*94) and penalties associated with contravention of a marine farming development plan, or a condition of marine farming lease (*s*91). The PA has advised the Panel that enforcement of the 'zero tolerance' approach to marine farming debris will be undertaken by authorised officers (within DPIPWE and MaST) in accordance with these provisions.

The Panel also noted that industry has improved the traceability and marking of gear, undertaken to continue voluntary shoreline surveys and maintains a marine debris hotline.

Species escape

With regard to species escape, concerns have been expressed in terms of:

- Establishment of feral populations of Atlantic salmon;
- Impacts on native fish populations through either predation or competition for resources;
- Disease/parasite transfer from farmed fish to native populations; and
- Disease/ parasite transfer between escaped fish and farmed fish contained within marine farms.

The Panel noted that farming of salmonids in Tasmania commenced in the 1970s and that to date there has been no evidence of the establishment of feral populations of Atlantic salmon. This is despite the fact that there have been numerous attempts to establish self-supporting populations of both Atlantic and Pacific salmon for recreational fishing purposes[1].

The Panel noted research that had been conducted to understand the feeding habits of escaped salmon in Tasmania. While more research is required to better understand this, results to date suggest while some fish appear to survive, the majority of escapees do not appear to thrive in the wild[2]. Work to date has concluded that escapees are also subject to high levels of capture by recreational fishers and are thus unlikely to have a significant impact on the natural ecosystem.

The Panel noted the risk of disease transfer from farmed salmon to wild fish is very low, however there is the possibility that it may occur. There is also a risk that escaped salmon may be a cause of pathogen transfer to salmon contained within farms (Murray et al. 2010[3]). Therefore, adequate infrastructure design and servicing is also relevant from a biosecurity management perspective.

3.1.1.3 Conclusion

The Panel was of the view that modifications to the draft management controls were required in relation to the marking and monitoring of marine farming equipment, and engineering and infrastructure management systems, capabilities and equipment. The Panel recommended that any future modification of the Draft Plan by the PA, should include additional management controls 3.13.11, 3.13.12, 3.13.13, 3.13.16, 3.13.17, 3.13.18 and 3.13.19; editing of draft management control 3.13.5; and the replacement of management control 3.9.1.4, with management control 3.13.14. These have been included in the Draft Plan as modified.

3.1.2 Stock husbandry aspects

3.1.2.1 Background

Representors raised concerns about fish feeding and fish health, including the potential for fish feed components to impact on human health; the potential for uneaten feed to be consumed by wild fish (having effects on wild fish behaviour, health, reproduction or ecology); and use of antibiotics.

An issue raised at one of the hearings and not addressed in the applicant's EIS concerned the fate of wild fish that are trapped in fish pens during bathing and harvesting.

3.1.2.2 Discussion

Human health

Human health issues associated with the consumption of farmed seafood are beyond the scope of marine farming planning processes.

Wild fish health

[1] Clements (1998). Salmon in the Antipodes – A history and review of trout, salmon and char and introduced coarse fish in Australasia, pp.387, Self-published by John Clements

[2] Abrantes et al. (2011). Do exotic salmonids feed on native fauna after escaping from aquaculture cages in Tasmania, Australia? Canadian Journal of Fisheries and Aquatic Sciences, vol. 68: 1539-1551;

[3] Murray et al. (2010). Epidemiological investigation into the re-emergence and control of an outbreak of infectious salmon anaemia in the Shetland Islands, Scotland, Diseases of Aquatic Organisms, 91: 189-200.

With regard to wild fish health, feed inputs to the marine environment are regulated under draft management controls 3.2.1 – 3.2.8 which provide for regulatory limits to be imposed on feed/nutrient inputs, indirectly restricting the total amount of feed available for scavenging wild species. They also create a strong economic incentive for operators to minimise feed wastage. The management controls also provide for regulatory action where significant biological impacts are identified. Further, draft management control 3.01 (contained in the Draft Plan) requires an operator to comply with any direction given by the Secretary. This gives the Secretary a broad power to apply regulatory approaches as considered necessary.

The Panel notes that there has been a significant decrease in feed wastage as companies have adopted and innovated feed technology and systems. This includes a shift from previous best practice monitoring of feed losses through the bottom of the cage, to monitoring of fish behavioural cues, which results in timelier cessation of feeding. In its EIS, the applicant reports that feed wastage at the proposed leases are forecast to be approximately 1.5% of the total feed input. The applicant also referenced a study in their EIS[4] which the applicant states identified that the majority of white fish cannot synthesise pigments in fish feed and thus are not affected by ingestion of pigmented feed.

The Panel formed the view that current levels of food loss were unlikely to form a significant source of food to wild populations and was unlikely to affect the ecology of wild populations.

Trapped Wild Fish

Advice received by the Panel indicates that there are incidences of wild fish species being trapped in pens. The Department has advised that permits have been issued to companies to enable the collection of wild fish to verify the approximate numbers and which species of wild fish are being trapped in pens, as well as their fate. The Panel is not in a position to comment on the potential impact on wild populations in the absence of this information.

Farmed fish welfare

The Panel accepts that in Tasmania, salmon farming is conducted to a standard that conforms to International best practice in relation to farmed fish welfare.

With regard to concerns about overcrowding, the plan contains existing environmental controls relevant to carrying capacity and stocking density. Management controls 3.3.1 – 3.3.3 relate to management of stocking densities and potential environmental effects from proposed activities. These include the setting of maximum stocking densities (25kg/m^3) and a requirement for the lease holder to maintain records demonstrating that maximum stocking densities have not been exceeded (daily basis).

Section 42Z of the *Environmental Management and Pollution Control Act 1994* (EMPCA) provides the EPA with powers to direct a lessee in regard to the amount of finfish that may be produced and biomass held under an environmental licence.

The Panel noted that maximum stocking density set by management controls fell within international best management practice guidelines[5] and is supported by empirical research such as Turnbull et al. (2005)[6].

[4] Bjerkeng, B., Berge, G. (2000). Apparent digestibility coefficients and accumulation of astaxanthin E/Z isomers in Atlantic Salmon (Salmo salar). *Comparative Biochemistry and Physiology Part B Biochemistry and Molecular Biology.,* November 2000.

[5] Sim-Smith, C. & Forsythe, A. (2013). Comparison of the international regulations and best management practices for marine finfish farming MPI Technical Paper No: 2013/47, National Institute of Water & Atmospheric Research Ltd.

The use of antibiotics in marine farming is discussed in section 3.2.7 Chemicals of this report.

3.1.2.3 Conclusion

The Panel considered the issues raised by representors in relation to stock husbandry and considered that they would be adequately managed through the proposed management controls and the broader regulatory framework for finfish aquaculture. The Panel recommended that management control 3.3.1 be edited to reduce the maximum permissible stocking density from 25kg/m^3 to 15kg/m^3 in line with contemporary industry practice. This has been included in the Draft Plan as modified.

3.1.3 Decommissioning and rehabilitation

3.1.3.1 Background

A representor raised concerns that there are inadequate regulatory requirements for decommissioning and rehabilitation.

3.1.3.2 Discussion

The removal of marine farming equipment and fish from an area is required under section 71 of the *Marine Farming Planning Act 1995*. Under section 71, the person who is a holder of a lease (or permit under the *Living Marine Resources and Management Act 1995*) is required to remove, within a specified period, any equipment, debris and fish stock resulting from the occupation of that area by the holder or a sublessee. Furthermore, under section 72, if a person fails to comply with section 71, the Minister, without notice may seize any marine farming equipment, debris or fish stock within the area referred to and any reasonable costs incurred by the Minister in exercising power under section 72 are recoverable from the person who held the lease or permit.

The Draft Plan also contains proposed management controls (3.13.1 and 3.13.5) that require lessees or sub-lessees to comply with the *Marine Farming Planning Act 1995* and remove redundant, dilapidated or loose marine farming structures and equipment from lease area as directed by the Secretary, respectively.

With respect to environmental remediation after cessation of marine farming activities, the Panel notes the *Finfish Farming Environmental Regulation Act 2017* now leverages off Section 44 of EMPCA that can require the Director, EPA to impose a remediation and/or monitoring plan that allows for the completion of required works at the cost of the operator where that operator is not in a position to complete such. The Panel has proposed an additional management control (3.13.20) to ensure clarity on this point.

3.1.3.3 Conclusion

The Panel considered that there were adequate regulatory requirements for decommissioning and rehabilitation, however the Panel recommended that any future modification of the Draft Plan, by the PA, include additional management control 3.13.20 to provide greater clarity. This has been included in the Draft Plan as modified.

[6] Turnbull, J. et al. (2005). Stocking density and welfare of cage farmed Atlantic salmon: application of a multivariate analysis. Aquaculture 243: 121-132.

3.2 Impacts on the Natural Environment

3.2.1 Water Quality

3.2.1.1 Background

Representors were generally concerned about the potential for cumulative effects of all three Storm Bay proposals to impact on water quality in Storm Bay.

Representors raised concerns about potential impacts on water quality in Storm Bay as well as its connected embayments (e.g. Fredrick Henry Bay, Norfolk Bay and other small embayments fringing Storm Bay) and the Derwent Estuary. These concerns centred on the potential for increased nutrient loads to cause eutrophication leading to environmental harm including impacts to wild fish and shellfish habitats, in particular, reef habitat, and impacts to seagrass and macroalgae such as giant kelp. Concerns were also raised that increased nutrient levels and oxygen depletion caused by consequent algal blooms, could lead to mobilisation of heavy metal contaminated sediments in the Derwent Estuary; and that increased nutrient levels could cause an increase in the prevalence of harmful algal blooms causing impacts to wild fisheries.

Concerns were also raised about the availability and suitability of data and modelling to adequately characterise baseline conditions and predict changes resulting from increased nutrient loads in Storm Bay. Some representors were concerned that the use of steady-state model conditions did not allow for dynamic events such as storm events to be assessed, for example, modelling of the potential for resuspension of nutrient enriched sediments or bottom water during storm events.

Some representors emphasised their support for production levels to be regulated through a Total Permissible Dissolved Nitrogen Output (TPDNO) cap and for the establishment of an environmental monitoring program and biogeochemical model. Some representors also emphasised that proposed development stages should be tied to achievement of milestones indicating that the development is sustainable.

There was also a recommendation that environmental triggers be established with clear management responses, should the monitoring program demonstrate that these triggers have been exceeded.

3.2.1.2 Discussion

The Panel noted that the Draft Plan sets out draft management controls to manage and mitigate the potential impacts of marine farming on water quality. The relevant management controls are 3.1, 3.2.1-3.2.8, 3.3.1-3.3.8, 3.4.1, 3.4.5-3.4.10, 3.7.1-3.7.5. These management controls provide for regulatory controls to:

- limit nutrient inputs;
- adjust permissible stocking density;
- require environmental monitoring, assessment, audit and review; and
- regulate waste streams to the environment such as black and grey water.

The Panel noted that the proposed management controls are part of the adaptive management framework that has been adopted for both enabling and regulating the salmonid industry in Tasmania. Changes made to the regulatory framework in December 2017 include the provision of powers for the Director EPA to directly regulate finfish farming impacts to the environment, including the issuing of environmental licences under the EMPCA. The Panel noted that the transition to environmental licences is in the initial stages and the EPA has adopted the current licence conditions used by the DPIPWE Marine Farming Branch. These will be reviewed and updated over time. The DPIPWE Marine Farming Branch continues to support the EPA during the period of transition. The Panel noted the significant increase in environmental monitoring underpinning the adaptive management approach that will allow for timely identification of issues such that mitigations can be determined.

Nutrient inputs

An expansion in marine farming will involve an increase in nutrient inputs (nitrogen and phosphorus) to Storm Bay. Marine environments are generally taken to be nitrogen limited, and hence nitrogen is the more important nutrient with respect to eutrophication. This underpins the use of a Total Permissible Dissolved Nitrogen Output (TPDNO) limit to manage potential nutrient impacts to the environment.

Information presented in the EIS and by the PA makes reference to biomass production as a unit of reference in the context of limiting dissolved nitrogen output from marine farming activities. These values are indicative only and are used to illustrate relative levels of dissolved nitrogen output. This approach has been taken, in recognition that dissolved nitrogen is relatively abstract, to help readers by providing a more tangible unit of reference. This has led some representors to focus on the 'food conversion ratio' (FCR) used to equate dissolved nitrogen output with biomass production. However, aside from the purpose of illustration, this ratio is immaterial to the quantities of nitrogen that have been modelled. The existing (and proposed) management framework is that nitrogen output is limited, based on feed inputs.

The Institute for Marine and Antarctic Studies (IMAS) has used a dispersion model (CONNIE3) to investigate the fate of nutrients across Storm Bay at a combined interim target production level of 40,000 tonnes/yr (noting that an initial conservative cap on production in Storm Bay of 30,000 tonnes/yr will be imposed by the Director, EPA until such time that additional environmental monitoring and modelling studies confirm that finfish farming in Storm Bay at that level is sustainable and can potentially support a higher level of production). The results, included as an attachment to the applicant's EIS, showed the highly dispersive nature of Storm Bay and suggested that there are temporal differences in dispersion likely resulting from seasonal variations in hydrodynamics and temporal differences in farm inputs relating to feed input requirements across the production cycle. The modelling also suggested that dispersion is reduced with depth.

In relation to the assertion of some representors that there will be increased deep water nutrient loads to the lower reaches of the Derwent Estuary as a result of this and other proposals in Storm Bay, the Panel noted that the dispersion modelling presented in the EIS specifically considered bottom water nitrogen emissions across a depth range of 15-28m (indicative of bottom waters) that were equivalent to 10% of the total emissions. The modelled outputs did not predict a significant exchange of ammonia into the Derwent at this depth. Note that according to the South Eastern Tasmania Contour Map 1:25000 available on the The List, the very deepest part of the Derwent Estuary is 45m – just off Rosny Point Reserve, however the vast majority of the estuary has a maximum depth of 30m.

IMAS stated that the modelling is only indicative of the system conditions and as such, caution is required when interpreting the results. IMAS reports that the estimates of connectivity are likely to be fairly reliable as the hydrodynamic patterns in Storm Bay are reasonably well understood and well represented in the model, however a greater level of model validation is required, in particular, where predictions relate to biological outcomes or interactions.

The preliminary dispersion modelling contained in the EIS was parameterised using data from the literature and advice from local marine ecologists and modelling experts. However, limitations of the currently available data relating to biogeochemical processes in Storm Bay have been acknowledged by the PA and the EPA.

The PA and the EPA have proposed an adaptive management framework in recognition of the gaps in knowledge about how the environment will respond to increased levels of production. The proposed adaptive management approach would be underpinned by:

- Licence conditions imposed by the EPA through an environmental licence under EMPCA;

- Establishment by the EPA of environmental standards / guideline limit levels and performance indicators for water quality;
- A staged development approach overseen by the EPA;
- A comprehensive environmental monitoring program (including near-scale (lease-specific), intermediate and broad-scale monitoring) overseen by the EPA; and
- The development of a biogeochemical model, to help to understand the information provided by the environmental monitoring and the effects of any changes to farming operations in the region.

In relation to the TPDNO limit, the EPA sets this limit in accordance with responsibilities under EMPCA. The EPA has indicated that initial TPDNO limits will be conservative, recognising that scientific information is not currently available to predict the environmental effects of high levels of production.

Harmful Algal Blooms

IMAS have reported that the incidence of harmful algal blooms (HABs) in waters off the east coast of Tasmania have increased markedly as a result of rising sea temperatures in this region, driven by a southerly extension of the east Australian current. IMAS report that the increased prevalence of HABs poses a significant risk to salmonid aquaculture on the east coast of Tasmania[7]. However, there is no evidence to suggest that nutrients generated from marine farming has caused an increase in the prevalence of HABs on the east coast of Tasmania.

A study undertaken in Scotland which reviewed the interaction between fish farming and algal communities of the Scottish waters concluded that it is very unlikely that fish farming would have a large-scale impact on the occurrence of harmful algal blooms, particularly on toxic algae[8].

3.2.1.3 Conclusion

The Panel was not convinced that the evidence presented in the EIS was sufficient to demonstrate the extent of likely nutrient enhancement in Storm Bay from farming operations, or the nature and extent of the effects of such enhancement. The Panel accepted however, that uncertainties can, to a large extent, be dealt with through an adaptive management approach. However the Panel recommends conservative staging of the development to allow for development of both scientific knowledge and regulatory standards to ensure issues are identified and responded to in line with the objectives of the Act.

The Panel noted that the applicant will be required to participate in a BEMP, as well as compliance monitoring and highlighted the importance of including water quality and physico-chemical monitoring, commensurate with potential risks at various operational phases. Further discussion of this is provided below (section 3.2.2 Substrates and fauna).

[7] Macleod et al. (2016) Institute for Marine and Antarctic Studies University of Tasmania Submission to the Marine Farming Planning Review Panel Independent Assessment of salmon farming at Okehampton Bay.
[8] Rydberg et al. (2003) The Interaction between Fish Farming and Algal Communities of the Scottish Waters - a Review. Report to Scottish Executive. Environment Group Research Report 2003/04.

3.2.2 Substrates and fauna

3.2.2.1 Background

Representors were concerned that solid waste deposition (from food waste and fish faeces) could result in impacts to marine fauna through reduced dissolved oxygen concentrations, nutrient enrichment and potential effects on the benthic environment. Concern was raised about the potential effects of sustained nutrient loads on the balance of algae species in the environment, and in turn, potential changes to reef community and biodiversity. Some representors were concerned that there is insufficient data and information about rocky reefs and benthic habitats to determine baseline conditions for ongoing monitoring. Some representors considered that solid waste should be collected to be disposed of on land, rather than allowed to discharge to the marine environment.

The Tasmanian Abalone Council Ltd (TACL) made the following recommendations in light of their concerns about the potential for impacts to rocky reef habitat and the abalone fishery:

- That a comprehensive baseline environmental assessment is conducted on rocky reef systems that lie adjacent or proximate to the proposed 'Petuna "Storm Bay North"' finfish lease prior to any finfish lease being granted. In the event that a lease is then granted, comprehensive ongoing environmental monitoring should occur with the results being publically available via an independently managed web portal;
- The inclusion of two additional rocky reef monitoring sites - one at the southern end of Betsey Island and the other at Outer North Head on the Tasman Peninsula; and
- Seeks direct input into the design and implementation of the environmental monitoring system developed by the EPA for the Petuna Storm Bay lease.

3.2.2.2 Discussion

Established industry practices manage feed and faeces waste impacts to substrates through the following means as outlined in the applicant's EIS:

- site selection to avoid sensitive receptors being located below or immediately adjacent to the lease area, and to maximise waste dispersion;
- production and fallowing cycles tailored to the dispersive and assimilative characteristics of the lease area;
- feed system optimisation to minimise feed waste;
- stocking density management;
- optimised bio-fouling management to reduce waste discharge resulting from net cleaning activities, including avoidance of the use of anti-foulant paint on fish pens; and
- monitoring of visual, physico-chemical and biological indicators underneath and adjacent to the lease area in order to detect impacts and take appropriate actions if impacts are detected.

The Panel noted that the applicant moved the proposed zone from its initial location to provide a buffer of 1km between rock lobster habitat and the lease, in response to feedback from the Tasmanian Rock Lobster Fisherman's Association through the consultation process.

Finfish farming interacts with the ecosystem through water quality, the benthos and physical presence of equipment, nets, fish and feed. Proposed management controls contain measures to limit the extent of each of these interactions, as well as to monitor impacts and apply management responses. The relevant management controls are 3.1.1, 3.1.2, 3.3.1-3.3.8, 3.4.1-3.4.10, 3.7.1-3.7.5, 3.13.4. These management controls provide for regulatory controls to:

- limit significant visual, physio-chemical or biological impacts at or extending 35m from the boundary of the lease area;
- monitoring of environmental parameters within the lease area, 35m outside the lease area and at control sites;
- set maximum permissible stocking density, and provision for the regulator to alter it at any time should he/she consider it appropriate;
- require fallowing of farmed areas;
- set a minimum distance of 1m between the finfish cage net and the seabed (however the Panel noted that in the proposed zone the distance will be much greater);
- set baseline environmental survey requirements for lease areas prior to the commencement of marine farming operations in order to determine any licence conditions that may be required to manage environmental values;
- require the keeping of production records for each lease area, including stocking density, feed, chemical and therapeutant inputs and mandatory reporting when required by the regulator;
- require environmental monitoring, assessment, audit and review; and
- establish controls for managing waste from operations and harvesting; as well as removal of fouling organisms from marine farming infrastructure.

These management controls are part of the adaptive management framework that includes a BEMP and development of a biogeochemical model to inform management decisions about appropriate levels of farming in Storm Bay. The Panel noted, however, that much of the current understanding and management of marine farm impacts in Tasmania is based on research derived in estuarine or shallow water environments which are adapted to cope with variations in nutrients. Research is needed to confirm that this is applicable to Storm Bay, a relatively stable open water environment.

The importance of inshore and deep-water reefs is highlighted in a suite of research, existing and ongoing, that considers the potential effects of finfish farming on receiving ecosystems and/or target wild species. The outcomes of this work will be used to inform ongoing adaptive management. This work includes research as part of the Fisheries Research and Development Corporation (FRDC) project 2015-024 "Managing ecosystem interactions across differing environments: building flexibility and risk assurance into environmental strategies", to specifically consider the potential for interactions between salmon farming and local fringing reefs, risk appropriate monitoring strategies and to identify potential indicators of adverse impacts. This project is due for completion at the end of 2018 and it is the Panel's understanding that publications associated with the research as well as the final reports will be made publicly available. The Panel expects that the findings of this project will assist the design and implementation of reef monitoring for Storm Bay.

The Panel noted FRDC 2017-215, "Storm Bay Biogeochemical modelling & information system: Supporting sustainable aquaculture expansion in Tasmania", will develop a full biogeochemical model for Storm Bay and undertake data collection and observational research that will inform the nutrient assimilation capacity of Storm Bay. The Panel has confirmed via discussions with the EPA and operators that, should the results of this project indicate that the proposed production levels exceed the assimilation capacity of the Storm Bay system, then this will be managed via the draft management controls and the Environmental Licences to ensure appropriate production limits are applied. The Panel further noted the intention to establish a BEMP for Storm Bay.

The Panel noted concerns that the stocking density of 25kg/m^3 was too high and should be changed to 12kg/m^3 (reflecting the stocking density proposed by the applicant in its EIS) as a way of managing potential effects on substrates and fauna. The Panel noted that the primary tool for regulating nutrient inputs was to manage biomass limits through the TPDNO limit. Stocking density has also been discussed in section 3.1.2 Stock husbandry aspects of this report.

Baseline information

Baseline information on benthic habitats and rocky reefs in Storm Bay and adjacent embayments includes comprehensive habitat mapping to 40m depth and extensive sampling on the Bruny coast under FRDC 2015-024. Lease-specific baseline information will be collected and analysed prior to the commencement of marine farming operations on any proposed marine farming lease areas.

Ongoing monitoring

The Panel noted the consultative approach between the Planning Authority and EPA taken to develop an integrated monitoring program that includes broad, intermediate and near (lease-specific) scales. Proponents will be required to participate in this monitoring program.

The proposed Storm Bay environmental monitoring program will be designed to achieve a comprehensive spatial and temporal assessment of the broadscale effects on the marine environment as well as lease specific baseline surveys and ongoing compliance monitoring. Throughout the operation of the lease, benthic conditions are monitored after fallowing and prior to re-stocking pens to maintain acceptable environmental standards. The lease-specific monitoring will be aligned to operational cycles, in particular, year class grow out and fallowing, and includes pre-stocking video surveys and peak-biomass benthic surveys (biological, physico-chemical and video). Peak-biomass monitoring will also include assessment of water quality within and outside the lease area. The environmental monitoring requirements are overseen by the EPA.

This monitoring program represents a significant intensification and broadening of environmental monitoring obligations and a progression from escalation of monitoring based on identified issues to a more pro-active program. The Panel considers this a critical element for sustainable industry growth.

Transparency is an important aspect of environmental monitoring and the Panel has noted the adoption by operators of *inter alia* a sustainability scorecard to inform interested stakeholders. The EPA has also provided significant information on their website, including determinations and reports. There has also been a recent update to the public planning and land information website 'The List' to include a map layer of EPA Regulated Premises which includes information about finfish farming including the operator and the associated Environmental Licence[9].

The Panel supports all endeavours by operators and the Regulator to increase transparency in the salmon industry as endeavours that will improve community acceptance of marine farming in Tasmania.

[9] ListMap data layer 'EPA Regulated Premises', Metadata ID: 427c061e-3b80-4d01-b17e-73b70591884b

Waste Capture Systems

Regardless of the efficacy or otherwise of waste capture systems, the Panel noted that these were not applicable to a high energy site. The Panel further noted that environmental emissions were not only in solid form but in dissolved form and these would be managed via the TPDNO limit.

3.2.2.3 Conclusion

The Panel noted the environmental licence conditions relating to the maintenance of on and off lease standards in relation to benthic impacts. Appropriate head of power exists under the management controls for the Director EPA to act in response to identified issues.

The Panel formed the view that the direct effects of solid waste deposition on the benthic environment and fauna will be limited in spatial extent and can be sustainably managed through fallowing. The Panel was satisfied that the adaptive management framework underpinned by the BEMP, provided an ability to detect and address adverse environmental effects in a timely manner so as to avoid serious environmental harm. See also section 3.3.5 Commercial fishing and section 3.3.6 Recreational fishing of this report.

3.2.3 Marine Vegetation

3.2.3.1 Background

Representors raised concerns about the potential for increased nutrient loads to lead to algal overgrowth/biofouling and shading which leads to loss of seagrasses and macrophyte communities, and impacts to reef habitat.

3.2.3.2 Discussion

Marine farming operations have the potential to impact on marine vegetation depending on the siting of those operations. Impacts are identified as both the physical growth of algae on infrastructure (pen netting) and the resulting shading effects on the underlying substrates; and algal growth being promoted by dissolved nitrogen and phosphorous released into the receiving environment from salmonid farming operations, causing degradation of existing macroalgal communities (e.g. through reduced light penetration).

The applicant's EIS describes the substrates as hard-compacted course sand with some shell grit with no significant evidence for the presence of marine vegetation in any part of the survey area. .

Anthropogenic eutrophication has been shown to change the structure and diversity of marine benthic communities (Pearson & Rosenberg 1978[10], Lotze & Schramm 2000[11], Kraufvelin et al. 2010[12]) with opportunistic fast-growing macroalgal species frequently occurring in eutrophic coastal waters (Cederwall & Elmgren 1990[13]). Such macroalgal blooms are generally explained by increased nutrient loads which selectively favour filamentous and foliose macroalgae.

[10] Pearson, TH. & Rosenberg, R. (1978) Macrobenthic succession in relation to organic enrichment and pollution of the marine environment. Oceanogr. Mar. Biol. Ann. Rev. 16:229-311.

[11] Lotze, H.K. & Schramm, W. (2000) Ecophysiological traits explain species dominance patterns in macroalgal blooms. Journal of Phycology 36: 287-295.

[12] Kraufvelin, P. et al. (2010). Biomass, diversity and production of rocky shore macroalgae at two nutrient enrichment and wave action levels. Marine Biology 157: 29-47.

[13] Cederwall, H. et al. (1990). Biological effects of eutrophication in the Baltic Sea, particularly the coastal zone. Ambio 19(3): 109-111.

In a study of the macroalgal composition in the Huon River and D'Entrecasteaux Channel, Oh (2009)[14], showed that macroalgal composition at sites located 100m from farms were different from reference sites 5000m away in both exposed and sheltered areas. Sites situated 400m away from fish farms were, however, not significantly different from sites 5000m away (Oh 2009). Analogous to the results of other studies on macroalgal composition and nutrient enrichment from other anthropogenic sources, Oh (2009) found the effect of fish farms was characterised by increases in the cover of epiphytes and total opportunistic algae (which included opportunistic green algae, filamentous algae and algal turf). In particular, opportunistic green algae of the genera Chaetomorpha, Ulva and Cladophora (the main constituent of filamentous green algae in this region) were collectively responsive to the proximity of fish farms.

Oh (2009) also found that there was no apparent decline of canopy algae close to fish farms, as has been reported for other cases of eutrophication. The study suggested that while variations in the detectable effects of fish farms could be anticipated at scales of hundreds of metres, they rarely reached distances of several kilometres away from farming areas. Similarly, Crawford et al. (2006)[15] undertook an analysis of a 10 year dataset from two small marine protected areas (Ninepin Point at the mouth of the Huon estuary and Tinderbox near North West Bay) for changes in abundance of the seven most abundant macroalgal species. This study was aimed at assessing whether broadscale impacts of effluent from marine farming activities could be detected at rocky reef communities and found no apparent patterns of change in macroalgal community composition over the 10 year time period.

More recently, Valentine et al. (2016)[16] characterised reef community health at sites spanning the southeastern coast of Tasmania. This included analysis of patterns of change in macroalgal communities in southeastern Tasmania between 1992 and 2015, including sites at Tinderbox, Ninepin Point and Maria Island. The study found no consistent patterns of broad-scale change in macroalgal community structure over time. The Panel formed the view that while nutrient impacts have been detected some distance from salmon farms in Tasmania, nutrient loads have not been shown to cause significant changes to macroalgal communities on adjacent rocky reef habitats. In the relatively high energy environment in Storm Bay, nutrient dilution and dispersion was expected to be greater, and consequently the risk of eutrophication was likely to be low.

The Draft Plan sets out management controls to manage and mitigate the potential impacts of marine farming on marine plants. These include 3.1.1, 3.1.2, 3.2.1, 3.4.1, 3.4.5, 3.4.6, 3.4.9, 3.7.1, 3.7.3, 3.13.1, 3.13.4 and 3.13.8. These management controls enable management of physio-chemical and biological impacts, recording and monitoring of any impacts and controls on waste (including fouling organisms) in relation to marine plants.

3.2.3.3 Conclusion

Based on the information available, the Panel is satisfied that there are unlikely to be near-scale effects on marine vegetation as a result of the Draft Plan.

[14] Oh, E. (2009). Macroalgal assemblages as indicators of the broad-scale impacts of fish farms on temperate reef habitats. Honours thesis, School of Geography and Environmental Studies, University of Tasmania. 91pp.
[15] Crawford, C. et al. (2006). Development of broad scale environmental monitoring and baseline surveys in relation to sustainable salmon aquaculture in the D'Entrecasteaux Channel region. Final Report to Aquafin CRC Project 4.41, Published by Tasmanian Aquaculture and Fisheries Institute, University of Tasmania. 115pp.
[16] Valentine, J.P. et al. (2016) Understanding broad scale impacts of salmonid farming on rocky reef communities, FRDC Project No 2014/024.

With regard to potential broadscale effects, the Panel was not convinced that the evidence presented in the EIS is sufficient to demonstrate the extent of likely nutrient enhancement in Storm Bay from farming operations, or the nature and extent of the effects of such enhancement. Without this information, it is not possible for the Panel to form a view on the likely effects on marine vegetation, however, the Panel is satisfied that the uncertainties can be dealt with through the adaptive management approach as discussed in section 3.2.1 Water quality of this report. The Panel notes that current and proposed research is specifically targeting uncertainty in this area.

3.2.4 Birds

3.2.4.1 Background

Representors raised concerns about potential impacts to bird life, including migratory birds, caused by entanglement, marine debris and disorientation from lighting.

3.2.4.2 Discussion

Potential impacts to birds could result from disorientation caused by night-time lighting, entanglement in marine debris or marine farming infrastructure, or physical disturbance of roosting and nesting sites.

The Panel has had regard to the information provided by the applicant in its EIS. The EIS included information about bird life roosting, nesting and feeding sites as well as information on bird entanglement risk, including measures to avoid and mitigate risks of bird entanglement in marine debris and marine farming infrastructure, and monitor the effectiveness of these measures (section 5.1.4 of the EIS). The applicant has also provided information and risk mitigation strategies for listed bird species in section 5.1.6 (threatened species) of its EIS.

The Panel noted that the applicant has not yet decided on a shore base. The EIS does not include an assessment of the potential impacts to bird life resulting from a shore base. Without this information, the Panel cannot comment on the potential for bird life to be directly impacted at the shore base location.

The plan contains draft management controls that manage and mitigate the potential impacts of marine farming on birds. These include: 3.1.1, 3.1.2, 3.4.1, 3.4.6, 3.4.9, 3.7.1, 3.9.1.5, 3.6.1.7, 3.13.1, 3.13.5, 3.13.8, 3.13.10, 3.13.11, 3.13.12 and 3.13.15. These management controls provide for regulatory controls to enable management of physico-chemical and biological impacts, recording and monitoring of any impacts, controls on waste and controls on minimising physical impacts on birds.

In its section 40 report, the PA recommended changes to management controls relating to wildlife interactions reflecting the PA's observation that the relevant existing draft management controls were no longer up to date with DPIPWE wildlife management protocols and procedures. This is discussed in section 3.4.8 of this report. The PA recommended replacing existing controls 3.13.9 through 3.13.15 with two controls; one prohibiting deliberate interactions with wildlife; and the second requiring compliance with operational requirements issued by the Secretary. The two new controls are 3.13.9 and 3.13.10 in the Draft Plan as modified.

Management control 3.9.1.5, whilst designed to mitigate light pollution on the human environment, would also be appropriate in reducing impact on migratory birds. Further, lighting, to the extent that it constitutes a pollutant under EMPCA, may be managed through conditions on an environmental licence. Lighting on navigational aids is required to conform to certain legislative standards and are further discussed in 3.3.2 Navigation.

3.2.4.3 Conclusion

As detailed in section 3.1.1.3 of this report, the Panel recommended that any future modification of the Draft Plan by the PA, should include modifications relating to marine debris. As recommended the modifications are to include additional management controls 3.13.11, 3.13.12 and 3.13.13; editing draft management control 3.13.5; and replacing management control 3.9.1.4 with management control 3.13.14. These modifications relate to the marking and monitoring of marine farming equipment, and engineering and infrastructure management systems, capabilities and equipment and have been included in the Draft Plan as modified.

As detailed in section 3.4.8 of this report, the Panel also recommended edits to draft management controls 3.13.9 and 3.13.10, and deletion of draft management controls 3.13.11, 3.13.12, 3.13.13, 3.13.14 and 3.13.15 in the initial Draft Plan relating to interactions with wildlife (implemented in Draft Plan as modified).

The Panel is satisfied that the management framework provides adequate protections for bird life.

3.2.5 Marine mammals

3.2.5.1 Background

Representors raised concerns that the proposed location of marine farming operations may result in more interactions with marine mammals with increased potential for entanglements in marine farming equipment or marine debris; or through the concentration of seal populations in the area of the proposed farming zone. Concern about the potential impacts to whales was raised with reference to a perceived potential increase in risk of entanglement as well as perceived potential for industrial marine noise to impact on the migration of threatened whales.

3.2.5.2 Discussion

There is sufficient anecdotal evidence to indicate that the existence of fish farms does lead to a concentration of seals and consequent interactions. It is possible that increased marine farming activity could result in local increases in seal numbers into the future. Section 5.1.5 (marine mammals) of the applicant's EIS addresses potential impacts and mitigation measures related to seals. The applicant's EIS references the DPIPWE Seal Management Protocols. The PA has advised that the DPIPWE Seal Management Framework 2014 is currently under review. The Panel noted that relocation of seals as a tool for managing interactions with marine finfish farms was ended in December 2017.

Southern Right Whales and Humpback Whales periodically enter Storm Bay as part of traditional migratory routes and for shelter. Potential impacts to whales may arise from entanglement, vessel and/or infrastructure strike or noise. The applicant summarises its proposed mitigation measures in the EIS (section 5.1.5 of the EIS).

The Draft Plan includes management controls that prescribe operational requirements relating to a range of wildlife, including marine mammals. These are intended to implement measures to avoid, manage and mitigate interactions with wildlife, pursuant to relevant legislation such as the *Threatened Species Protection Act 1995* and *Nature Conservation Act 2002*.

In its Section 28 report, the PA recommended changes to management controls relating to wildlife interactions reflecting the PA's observation that the relevant draft management controls were no longer up to date with DPIPWE wildlife management protocols and procedures. The PA's recommendation, along with the Panel's recommended modifications to the Draft Plan are discussed in section 3.4.8 of this report.

3.2.5.3 Conclusion

As detailed in section 3.1.1.3 of this report, the Panel recommends that any future modification of the Draft Plan should include modifications relating to marine debris. The recommended modifications are to include additional management controls 3.13.11, 3.13.12 and 3.13.13; editing draft management control 3.13.5; and replacing management control 3.9.1.4 with management control 3.13.14. These modifications relate to the marking and monitoring of marine farming equipment, and engineering and infrastructure management systems, capabilities and equipment and have been included in the Draft Plan as modified.

As detailed in section 3.4.8 of this report, the Panel also recommended edits to draft management controls 3.13.9 and 3.13.10, and deletion of draft management controls 3.13.11, 3.13.12, 3.13.13, 3.13.14 and 3.13.15, in the initial Draft Plan relating to interactions with wildlife.

The Panel is satisfied that the management framework provides adequate protections for marine mammals.

3.2.6 Threatened species

3.2.6.1 Background

Representors were concerned that increased nutrient loads may lead to impacts on spotted and red handfish or on threatened marine vegetation such as Giant Kelp; threatened whales (humpback whale and southern right whale) may be impacted by industrial marine noise, marine debris or marine farming infrastructure.

The Panel noted that the applicant has referred the Draft Plan for assessment under the *Environmental Protection and Biodiversity Conservation Act, 1999*.

3.2.6.2 Discussion

The applicant has provided detailed information on threatened species in section 5.1.6 of its EIS. This information provides an overview of species occurrence, threats arising from the Draft Plan and mitigation actions to avoid significant impacts.

Handfish

The Panel noted that red and spotted handfish are listed as critically endangered under the EPBC Act and currently occupy highly localised areas in the Fredrick Henry Bay and Derwent Estuary. Impacts from pollution, dredging and introduced species (North Pacific Seastar) and coastal development have been identified as being the key threats to this species. However, there are no known populations of handfish in Storm Bay and the impacts that arise from localised effects from the proposed development will not impact on the known distributions of red or spotted handfish.

Giant Kelp

Giant Kelp Marine Forests of South East Australia are listed as Endangered under the EPBC Act. This ecological community is defined as giant kelp growing typically at depths greater than eight metres below sea level and forming a closed or semi-closed surface or sub-surface canopy. The applicant's EIS states that Giant Kelp may occur within a 5000m radius of the proposed farming zone. The applicant states that its zone survey did not detect any Giant Kelp within the proposed farming zone. The applicant does not provide any detailed information about Giant Kelp distribution in the area surrounding the proposed farming zone. The key threats to this ecological community include threats posed by climate change such as increasing sea surface temperatures, changes in nutrient availability in warmer waters, changes in weather patterns and large scale oceanographic conditions, and associated range expansion of invasive species; and impacts on water quality from land-based activities and aquaculture.

Marine farming emissions contribute to nutrient loads that may impact upon water quality parameters. Water quality management has been discussed in section 3.2.1 of this report.

Whales

Southern Right Whales and Humpback Whales periodically enter Storm Bay as part of traditional migratory routes and for shelter.

The Southern Right Whale is listed as endangered under the EPBC Act. Southern Right Whales typically calve in sheltered coastal waters of southern Australia in the winter months, occupying nursery grounds in shallow coastal waters from May to October. The Humpback Whale is listed as vulnerable under the EPBC Act. Humpback Whales generally migrate north from feeding grounds in the Southern Ocean to calving grounds along the mid and northern parts of the east and west coasts of Australia from June to August, and south from September to November.

The Panel noted that key potential threats from activities associated with the Draft Plan may include entanglement, vessel disturbance including noise pollution, and habitat modification. These threats and their mitigation have been discussed in section 3.2.5 of this report – Marine mammals.

3.2.6.3 Conclusion

As detailed in section 3.1.1.3 of this report, the Panel recommended that any future modification of the Draft Plan should include modifications relating to marine debris. The recommended modifications are to include additional management controls 3.13.11, 3.13.12 and 3.13.13; editing draft management control 3.13.5; and replacing management control 3.9.1.4 with management control 3.13.14. These modifications relate to the marking and monitoring of marine farming equipment, and engineering and infrastructure management systems, capabilities and equipment and have been included in the Draft Plan as modified.

As detailed in section 3.4.8 of this report, the Panel also recommended edits to draft management controls 3.13.9 and 3.13.10, and deletion of draft management controls 3.13.11, 3.13.12, 3.13.13, 3.13.14 and 3.13.15, in the initial Draft Plan relating to interactions with wildlife.

3.2.7 Chemicals

3.2.7.1 Background

Representors raised concerns about the use of therapeutants (such as antibiotics) and a perceived potential link to 'superbugs'. Representors also raised concerns about the use of the chemical pigment astaxanthin in fish feed.

3.2.7.2 Discussion

The Panel noted that the plan contains draft management controls relating to the use of antibiotics and other chemicals. Specifically, management control 3.4.2.3 requires operators of a marine farming licence to maintain records of all chemicals used (including but not limited to antibiotics) for a period of 5 years. Furthermore, management control 3.4.3 provides for the Secretary to request that the lease holder provide this information. Management controls under 3.4.4 provide for reporting the details of any antibiotics used to the Manager, Marine Farming Branch within 48 hours. The use of chemicals is further regulated by management control 3.6 which requires the use of all chemicals to comply with the requirements of the *Agriculture and Veterinary Chemicals (Control of Use) Act 1995*. Disease controls are also provided in section 3.8 of the management controls.

Reported antibiotic use in salmon farming in Tasmania has decreased substantially over the past decade. No antibiotics use was reported in marine farming operations in 2017.

Fish feed components and potential impacts to consumers are outside the scope of the Marine Farming Planning process.

3.2.7.3 Conclusion

The Panel concludes that there is adequate regulatory control of chemicals used in the production of salmon.

3.2.8 Disease and Biosecurity

3.2.8.1 Background

Representors raised the following concerns:

In situ waste accumulation could contribute to disease proliferation;

- The biosecurity regulatory framework for the Tasmanian salmonid industry does not provide assurance that biosecurity risks are adequately managed;
- Freshwater bathing for AGD is not sufficiently detailed in the applicant's EIS.
- The proximity of the proposed site to existing and proposed salmonid farming operations in Storm Bay.
- Disease impacts on other marine farming areas within and outside the plan area.
- Potential for transfer of disease between year classes at the proposed site.
- Concern about potential fish health, disease management and biosecurity issues in combination with other existing and proposed marine farms in the region.

One representor specifically commented that:

- The proposed Storm Bay North MFDP is too close to existing and proposed operations in Storm bay. Distances between leases in Storm Bay should be two tidal excursions (i.e. 10km).
- Only one year class of fish should be allowed to be stocked on the proposed Storm Bay North MFDP at any given time and there should be at least 2 months fallow period between vacating the zone and restocking.
- Different year classes within Storm Bay should be separated by 5km and the dimensions of the current proposal does not facilitate this recommendation.

3.2.8.2 Discussion

The Panel noted that the Draft Plan contains existing draft management controls to manage and mitigate the potential introduction and impacts of disease. Relevant management controls include 3.01, 3.7.1-3.7.5 and 3.8.1-3.8.3. These management controls provide for regulatory controls to notify relevant authorities of disease and minimise the spread of disease in accordance with the *Animal Health Act 1995* and to limit production waste entering the marine environment which may harbor pathogens. Further, management control 3.3 ensures that minimum benthic standards are maintained, helping to ensure healthy ecosystem function and limit disease proliferation.

The controls are part of a much broader framework for the management of fish health and biosecurity matters. Powers relating to biosecurity and fish health also exist under several other statutes, including the *Living Marine Resources Management Act 1995*, which provides for the Minister to make orders to deal with marine pests and diseases, including disease control areas.

However, while the existing draft management controls provide a level of protection, the Panel agrees that management of biosecurity risk within Storm Bay should be strengthened by modifying the management controls relating to disease control.

The Panel noted the relative disease free status of the Tasmanian industry, but recognised the increasing impact of Pilchard Orthomyxovirus (POMV) in the sector and the devastating impact that major disease outbreaks have had elsewhere (e.g. Infectious Salmon Anaemia (ISA) in Faroe Islands and Chile). The Panel noted that while there is no occurrence of ISAV in Tasmania, the virus is the closest relative of POMV (Morrison et al. 2013[17]; Godwin et al. 2016[18]), and lessons learned in relation to ISA internationally are generally applicable to disease management in Tasmania.

The Panel noted the importance of a biosecurity management plan that considers world best practice in terms of off-farm and on-farm management of disease. With respect to the latter, the Panel noted that physical separation of companies; single year class stocking into specified sites; adequate fallowing regimes; closed transport; and on-farm hygiene have proven to be effective measures for mitigating disease outbreaks.

In the context of Storm Bay, where multiple companies are operating in close proximity, the importance of closed transport becomes of particular relevance for disease management.

The Panel noted the importance of a shore base facility capable of servicing the needs of any farming operation located within the proposed plan area, that meets contemporary biosecurity requirements or as required in an approved Biosecurity Plan.

For biosecurity purposes 'year class' means those fish first placed into State waters within a calendar year. However, within a year class there may be two or more cohorts of fish which go to sea.

The crucial consideration for biosecurity purposes is physical separation between groups of fish put to sea at significantly different times so as to reduce risk of exposure of naive fish to fish that may have been previously exposed to disease (eg POMV) and which have developed carrier status (Mardones et al. 2014[19], Aldrin et al. 2011[20], Murray et al. 2010[21]).

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[17] Morrison, R.N. et al. (2013). Assessment of orthomyxo-like virus pathogenicity in Atlantic salmon, FRDC Project No. 2012/053.

[18] Godwin, S. et al. (2016). Establishing viral diagnostics for salmonid aquaculture in Tasmania, FRDC Project No. 2013/033.

[19] Mardones, F.O. et al. (2014). The role of fish movements and the spread of infectious salmon anemia virus (ISAV) in Chile, 2007-2009, Preventative Veterinary Medicine, 114: 37-46.

[20] Aldrin, M. et al. (2011). Modelling the spread of infectious salmon anaemia among salmon farms based on seaway distances between farms and genetic relationships between infectious salmon anaemia virus isolates, the Journal of the Royal Society Interface, 8(62): 1346-56

Hence it is important to introduce smolt to a site over a limited "window period" to avoid disease transfer from the first smolt introduced to the site to those transferred last to the site.

Therefore the Panel has recommended that the Draft Plan include an additional management control to be applied to stocking of Atlantic salmon under the Draft Plan (management control 3.8.6).

Modelling of water movement in Storm Bay has illustrated the connectivity of the proposed farming Zones and for this reason the CVO has flagged that Storm Bay will be considered a single region in terms of disease management.

The Panel accepted that two tidal cycles in Storm Bay, a distance of 5-10km, would reduce the risk of pathogen transfer and disease outbreak. However, in the case of POMV, which has been one of the most significant diseases to impact on the Tasmanian salmon industry, the Panel noted that the risk could not be eliminated because of the highly dispersive environment of Storm Bay, its physical connection to other farming regions such as D'Entrecasteaux Channel and the fact that wild fish can be a cause of pathogen transfer.

The Panel formed the view that due to the spatial constraints particular to Storm Bay, a 4km separation between year classes would be a pragmatic compromise. This minimum is of particular importance in the physical separation between the farming operations of companies.

The Panel noted the recommendation of the PA that in light of international practices and the proposed expansions into a relatively new farming area, and following consultation with the Chief Veterinary Officer and EPA, that it would be appropriate to more explicitly state how the Secretary may exercise powers to require stocking management of an area for biosecurity purposes by modifying the Draft Plan management controls relating to disease.

The Panel noted that there has been a renewed commitment from industry and government towards better management of biosecurity risks, as articulated in the *Sustainable industry growth plan for the salmon industry*. The Panel considers that biosecurity risk poses the greatest single threat to marine farming operations in Tasmania and emphasises that an update of the *Biosecurity Program* is critically important and needs to be completed prior to commencement of activities under the Draft Plan.

Minimum separation distance between companies

The Panel raised a number of related concerns that hindered its support of the initial Draft Plan:

- The finalisation and implementation of an approved Biosecurity Plan, particularly as it relates to minimum separation distance between companies;
- A more complete understanding of circulation patters in Storm Bay which will result from the FRDC Project 2017-215 which is developing a full biogeochemical model for Storm Bay; and
- The results from the FRDC Project (2017-182) on POMV.

The latter two points would provide a better understanding of the acceptable separation distance between companies which would better inform an appropriate location of zone/s in a draft Storm Bay North Marine Farming Development Plan. While the Panel acknowledges that the above are in various stages of development, not having certainty of implementation or access to results has caused a heightened level of concern about biosecurity risks.

Species of salmonid to be farmed in Storm Bay

[21] Murray, A.G. et al. (2010). Epidemiological investigation into the re-emergence and control of an outbreak of infectious salmon anaemia in the Shetland Islands, Scotland, Diseases of Aquatic Organisms, 91: 189-200.

The Panel recommends that of the salmonids, only Atlantic salmon should be allowed to be farmed in Storm Bay.

Between 2006 and 2015 there were 14 cases of POMV infection in farmed Atlantic salmon in Tasmania, however the disease has never been reported in rainbow trout (Godwin et al 2016). In Atlantic salmon the disease causes mortalities of 300 fish/cage/day, sometimes up to 5000 fish/cage/day (Godwin et al. 2016). As there have been no clinical outbreaks in trout it is possible that this species can become an asymptomatic carrier and a reservoir of POMV. Similarly, ISA does not cause mortalities in trout which are carriers of ISAV (Nylund et al. 1997[22]; Devold et al. 2000[23]; Plarre et al. 2005[24])

Amoebic Gill Disease

The Panel considers that the frequency of freshwater bathing and requirements to support an appropriate bathing regime at the proposed site is primarily an operational matter for a lessee to consider. Freshwater Resources are discussed in section 3.3.9 – Land use and development.

Planning for mass-mortality events

While the management of single or minor multiple mortalities is well embedded, there is a need to plan for waste management in the event of mass mortalities, which could occur due to a disease outbreak. There are adequate requirements under Environmental Licence conditions and general provisions of EMPCA to deal with mass mortality events however the Panel recommends that the Biosecurity Plan should explicitly address how operators will deal with disposal of mortalities following a mass mortality event. This should include *inter alia* the method of containment, extraction, transport, waste treatment, waste disposal, and biosecurity measures that would be applied throughout these steps. While it is accepted that the circumstances for an actual mass mortality may alter this plan it is reasonable to expect due consideration of the basic process for waste management and the options for final entombment.

3.2.8.3 Conclusion

The Panel recommended modifications to the initial Draft Plan to strengthen biosecurity management arrangements to reduce biosecurity risks, including:

- mandating separation distances between fish of a different year class and fallowing periods, refer management controls 3.0.1, 3.0.2 and 3.8.1 to 3.8.14;
- specifying how the Secretary may declare an area to be a single year class area and the consequent obligations of lease-holders refer management controls 3.01, 3.02 and 3.8.1 to 3.8.14; and
- strengthening planning arrangements through a requirement for licence applicants to provide evidence of a biosecurity and fish health plan and once granted, licence holders to operate in accordance with that Plan, refer management control 3.8.4.

[22] Nylund, A. et al. (1997). Replication of the infectious salmon anaemia virus (ISAV) in rainbow trout, *Oncorhynchus mykiss* (Walbaum), Journal of Fish Diseases, 20:275-279.

[23] Devold, M. et al. (2000). Use of RT-PCR for diagnosis of infectious salmon anaemia virus (ISAV) in carrier sea trout *Salmo trutta* after experimental infection, Diseases of Aquatic Organisms, 40:9-18.

[24] Plarre, H. et al. (2005). Prevalence of infectious salmon anaemia virus (ISAV) in wild salmonids in western Norway, Diseases of Aquatic Organisms, 66:71-79.

The Panel recommended that any future modification of the initial Draft Plan by the PA should include additional management controls 3.8.4 to 3.8.13. These have been included in the Draft Plan as modified.

In addition to the identified required modifications, the Panel, also recommended that a modified plan should include management controls to reflect the following:

- Mandating that separation distances between 'moored marine farming structures that contain fish' as managed by different operators (companies), be maximised wherever possible. Refer management controls 3.8.6.1to 3.8.6.4.
- Mandating that any fish transported to/from the proposed Storm Bay North MFDP area is via closed transport (well vessel or similar), that has the capacity to wholly contain the transported fish and all accompanying waters. Refer management control 3.8.13.
- The requirement for the proponent to provide evidence of a suitable shore based facility capable of servicing the needs of any farming operation located within the proposed plan area, that meets contemporary biosecurity requirements or as required in an approved Biosecurity Plan. Whilst shore based operations are outside the scope of a Marine Farm Development Plan, management control 3.8.4 requires a satisfactory site-specific biosecurity and fish health plan to the satisfaction of the Secretary. The PA's advice is that such a plan would be expected to demonstrate that an operator has appropriate biosecurity measures in place to manage risks as they relate to movements of fish, equipment and marine farming inputs (such as feed) between the leases and a shore base.

3.2.9 Introduced marine pests

3.2.9.1 Background

Representors raised concerns about the potential for the introduction or spread of marine pests through proposed marine farming operations.

3.2.9.2 Discussion

Risks of transmission of marine pests through marine farming activities generally relate to biofouling and translocation of equipment. The Panel noted that the plan contains draft management controls to manage and mitigate the potential introduction of marine pests. Management control 3.13.4 provides for the removal of fouling organisms from marine farming equipment. These controls operate to ensure that marine farming equipment is appropriately maintained, reducing the risks associated with excessive biofouling and dilapidated equipment.

In addition to the regulatory controls provided through the Plan, marine farming licences issued under the *Living Marine Resources Management Act 1995* include conditions relating to management of introduced marine pests.

3.2.9.3 Conclusion

The Panel is satisfied that there are adequate measures proposed in the Draft Plan to limit the introduction and spread of introduced marine pests from marine farming operations.

3.2.10 Climate change

3.2.10.1 Background

Representors raised concerns that there has not been adequate consideration of climate change effects on the area's suitability for salmon farming. Specific concerns related to the potential for rising sea temperatures to cause greater fish stress and impacts on fish welfare and that the effects of climate change may make farming operations in the proposed area increasingly challenging, leading to decline in production and / or failure to achieve sustained production increases or environmental harm (e.g. during storm events).

3.2.10.2 Discussion

The effects of climate change may impact on environmental responses to farming activity. Specific measures to monitor, mitigate and manage environmental effects (whether or not more pronounced as a result of climate change) are described in 3.2.1 Water quality, 3.2.2 Substrates and fauna and 3.2.3 Marine vegetation.

In relation to engineering challenges arising from climate change, such as potential increased frequency or severity of storm events, see section 3.1.1 for discussion and recommendations in relation to infrastructure and servicing.

In relation to climate change impacts on the viability of marine farming in the proposed zone, the plan includes a declaration that the Crown in right of the State of Tasmania gives no warranty, either express or implied, that marine farming zones identified are suitable for marine farming activities. Investment in marine farming activities by a lease holder is subject to risk borne by the lease holder. The panel noted that the waters of Storm Bay are currently suitable for the farming of salmonid.

3.2.10.3 Conclusion

The Panel acknowledges that the effects of climate change may exacerbate the risks associated with marine farming but considers that the hazards can be managed under the draft management controls and therefore does not consider that any further modifications are required at this time.

3.2.11 Greenhouse gases and ozone depleting substances

3.2.11.1 Background

One representor raised concern that the applicant has mooted the use of a reverse osmosis plant for the supply of freshwater, however the resulting greenhouse gas emissions have not been accounted for in the applicant's EIS.

3.2.11.2 Discussion

The Panel notes that EMPCA applies generally to regulation of greenhouse gas emissions. It is an offence under EMPCA to cause environmental harm, for example, through emission of greenhouse gases.

The Panel also notes that the applicant has stated, in its response to representations, reported in the PA's Section 28 report, that the calculations in the EIS did include emissions from an operating RO plant.

3.2.11.3 Conclusion

The Panel considers that there are appropriate regulatory controls on greenhouse gases and ozone depleting substances.

3.2.12 Environmental management

3.2.12.1 Background

Representors raised the following issues in relation to environmental management:

- Concern about the transparency of environmental performance standards;
- Concern about the enforceability of regulatory controls, namely nitrogen controls;
- Request for information to be provided about the process that will be applied by the EPA to determine whether permissible nitrogen inputs will be increased;
- Concern about the adequacy of baseline information, particularly with regard to rocky reefs;
- Concern about the ability of the environmental monitoring program to detect early stage ecosystem changes; and
- Publication of environmental monitoring and production information.

3.2.12.2 Discussion

The plan contains draft management controls to monitor and manage the environmental effects of proposed salmon farming including regulatory controls to:

- require lessees to provide a baseline environmental survey to the satisfaction of the Director EPA prior to the commencement of marine farming operations;
- fallow or comply with limits on the use of a lease area if unacceptable benthic impacts are identified through routine monitoring;
- require an independent auditor to examine record keeping; and
- require lessees to comply with any environmental monitoring requirement.

Environmental compliance standards have historically been set through conditions on a marine farming licence. As a consequence of the recent regulatory changes, in future, compliance standards will be set through environmental licences issued by the EPA under EMPCA. Licence conditions are used to describe the impacts that may be considered significant for the purposes of the relevant management controls.

The Panel noted that the monitoring programs proposed for Storm Bay provided an ability to actively gather data relevant to the operational phase and respond to identified issues prior to these presenting off lease or broader impacts on the marine environment. Most notably this included: pre-stocking benthic surveys to ensure characterisation of the specific site prior to the introduction of fish; monthly water sampling during the peak biomass use period to ensure close monitoring during the highest impact time in the growth cycle; and post-lease stocking to ensure return to a reasonable state prior to re-stocking. This constitutes a significant intensification of monitoring effort.

Concerns that a 35m lease boundary compliance distance may not befit for purpose in the more exposed Storm Bay environment were acknowledged by the Panel. This was the standard distance that has been used for finfish farming environmental management across Tasmania for approximately twenty years. For Storm Bay it represents a starting point for new sites and provides a consistent means of managing existing sites. The EPA, through environmental licences issued under EMPCA, has the ability to amend this distance if it was found not to suit farming conditions in Storm Bay. The Panel understands that Government is developing an environmental standard for environmental management of finfish farming in Tasmania, for implementation in 2019. The Panel formed the view that while this standard is being developed, close scrutiny of intensive lease specific data is an appropriate mitigation.

Management controls relating to nitrogen outputs from finfish farming are provided by management controls 3.2.1 and 3.2.3 – 3.2.7. These controls and the planned development of a biogeochemical model and the broadscale monitoring program are discussed in sections 3.2.1 Water quality; 3.2.3 Marine vegetation and 3.4.2 Holistic impact assessment. Section 91 of the Act creates offences for obstruction of execution of plans, and these provisions would apply to a failure to comply with a TPDNO determination made under the plan. Section 91 includes special penalty provisions that apply to exceeding a TPDNO determination, as prescribed by the *Marine Farming Planning Regulations 2016*.

The process for an operator to pursue an increase in nitrogen input limits beyond those modelled for this proposal may take one of two paths:

- a process under the Act, seeking an amendment to the plan to enable their operations to expand – the potential effects of such expansion, including any additional nitrogen inputs, would be duly considered through this process; or
- if no change to the plan was required, a process under EMPCA, seeking a variation to the relevant environmental licence under Part 3 of EMPCA.

Discussion of environmental management issues relating to rocky reefs is presented in section 3.2.2 Substrates and fauna and section 3.2.3 Marine vegetation. The Panel recommended that adequate baseline information on sensitive habitat such as rocky reefs be collected prior to the commencement of farming.

In relation to decommissioning and rehabilitation, the Draft Plan contains management controls (3.13.1 and 3.13.5) that require lessees or sub-lessees to comply with the *Marine Farming Planning Act 1995* and remove redundant, dilapidated or loose marine farming structures and equipment from the lease area as directed by the Secretary. The Act contains provisions relating to removal of equipment and fish by a lessee and for recovery of costs by the Crown if the lessee does not remove equipment and fish as required. Further, EMPCA provides that an environmental licence may include conditions requiring a site to be decommissioned or rehabilitated as required.

In relation to comments about the public availability of relevant environmental data, the Panel noted that improving the transparency of information on the industry's environmental performance through the establishment of an independent web portal hosted by IMAS is identified as a priority action within the *Sustainable industry growth plan for the salmon industry*.

In addition to the powers under EMPCA relating to environmental licences, the provisions of EMPCA apply generally in relation to avoiding environmental harm. It is an offence under EMPCA to cause environmental harm, for example, through noise, water quality, odour or light pollution.

3.2.12.3 Conclusion

The Panel considers that there are adequate environmental management systems in place to avoid serious environmental harm and that lease holders are required to provide a range of environmental management and performance information to the Regulator on an ongoing basis. Further, the Panel noted the increased resourcing of the EPA Division to ensure capacity to regulate and work collaboratively with lease holders.

3.3 Impacts on the Human Environment

3.3.1 Visual

3.3.1.1 Background

Representors raised concerns about the potential visual impact of marine farming infrastructure in Storm Bay. Concerns were raised about the potential visual impacts of farm infrastructure and lighting to residential amenity and property values as well as potential impacts to visitor experience on the Tasman Peninsula, impacting on tourism values. Representors were also concerned about the visual impacts on residential and tourism amenity of marine debris originating from marine farms and support vessels.

3.3.1.2 Discussion

Marine debris is discussed in section 3.1.1 of this report, including a description of modifications made to the Draft Plan to strengthen management controls relating to marine debris. Issues relating to tourism and socio-economic related impacts are discussed in sections 3.3.8 Tourism and 3.3.10 Socio-economic aspects of this report.

The Panel noted that the Draft Plan includes the following visual controls relating to infrastructure and operations: 3.9.1.1-3.9.1.4. These controls provide for the Secretary to:

- direct the colour, profile, size and shape of marine farming equipment;
- regulate the equipment that may be located within the lease area; and
- require that light generated from marine farming operations does not create a nuisance.

3.3.1.3 Conclusion

The Panel considers that the Draft Plan contains management controls that mitigate visual impacts to reasonable levels. Whilst the Draft Plan contains management controls for limiting visual impacts, the Panel acknowledges that the proposed development may have a residual visual impact for some individuals.

3.3.2 Navigation

3.3.2.1 Background

Representors raised concerns about potential impacts to navigation enjoyment and safety resulting from the Draft Plan as well as the potential effects of the Draft Plan in combination with other marine farming proposals in Storm Bay:

- Concern that marine debris originating from marine farms and vessels poses safety hazards to vessels.

- Concern that navigation safety may be reduced due to farms being located such that access to safer waters (e.g. a lee shore) is reduced.
- Concern that navigation safety may be reduced because of poor visibility of farms (considering day and night conditions as well as in large swells) leading to increased risk of collisions.
- Concern that navigation safety may be reduced if lease boundary beacon's become inoperable or are off-station.
- Concern that navigation enjoyment may be reduced because farms limit the waters that may be freely sailed in.
- Concern that the proposed location will cause navigation difficulties for Tasmanian yacht races and potentially impact on Storm Bay as a 'last hurdle' in the Sydney to Hobart.

Some representors also made recommendations to mitigate perceived risks.

At the hearing conducted on 10 May 2018, the Panel heard from the Cruising Yacht Club of Tasmania Inc (the Club) in relation to the Draft Amendment No. 5 to the Tasman Peninsula and Norfolk Bay Marine Farming Development Plan November 2005. The Club's statements were also relevant to the other proposals in Storm Bay, including the Draft Plan. The Club made the following key recommendations in regard to navigation safety and marine farming in Storm Bay:

- Official nautical charts should be updated more regularly and with more accuracy and consistency;
- The Club's preference is that leases are shown on nautical charts (not just zones);
- Nautical charts should show the different types of marks being used;
- Remote telemetry of equipment should be required and reporting of off-station, lost or malfunctioning equipment should be mandatory;
- Notices should be issued both when there is a hazard, as well as when the hazard has been removed.

In the Club's written representation, the Club also preferenced that lights around an individual lease should be synchronised, and lights on adjacent leases should use unique sequences or timeslots. The Club also supported the use of virtual AIS marks in addition to physical marks.

3.3.2.2 Discussion

The Panel noted that the applicant has consulted with Tasports and MaST via the PA, and has consulted directly with Australian Sailing, as outlined in Sections 4.5 and 5.2.2 of the applicant's EIS. The applicant states that the main commercial shipping channel is approximately 4km west of the proposed zone and that the main recreational boating corridors are not within the proposed zone area.

The Panel noted that the PA consulted with MaST in preparing its Section 28 report.

Marine Farming Infrastructure

The physical presence of marine farming infrastructure necessitates the exclusion of other activities from marine farming areas. As such, the proposed development would impact on navigation in Storm Bay.

The Draft Plan contains the following management controls relating to navigation, 3.10.1-3.10.3, 3.13.1-3.13.3, 3.13.5 and 3.13.6. These management controls:

- require that lessees must mark the external boundary of the lease area in whatever manner is required by the Secretary and MAST;
- require anchors and mooring lines that extend outside the lease area to be at least 5m below the surface at the boundary of the lease area and not extend outside a marine farming zone;
- require lessees to maintain marine farming structures and equipment in a serviceable condition;
- empower the Secretary to require redundant, dilapidated or loose marine farming structures and equipment must be removed from the lease area; and
- require a lessee to take action to recover any part of marine farming structures or equipment that break away from the lease area, and dispose of them in an appropriate manner.

Marine Debris

In its Section 28 report, the PA advised that as a matter of common practice, marine farm operators notify MaST of navigational hazards (such as lost or off-station equipment), such that a notice to mariners may be issued. However, there may not be any direct regulation requiring marine farm operators to take this action and it is not presently required within the plan, lease or licence conditions. In light of this, the PA recommended the addition of a management control to require lessees who become aware of a potential navigation hazard, to notify MaST of the hazard and take any other action directed by MaST, or considered necessary by the lessee. The Panel considers that the additional management control is required.

Discussion in section 3.1.1 Infrastructure and servicing of this report includes a description of modifications made to the Draft Plan to strengthen management controls to reduce marine debris hazards.

Navigation markers and charts

In its section 28 report, the PA advised that it understands that Australian Hydrological Survey charts commonly show zone boundaries. The PA and MAST consider that marking the zone boundaries is the most appropriate means of marking charts. Use of technology (such as lighting and AIS) to assist skippers in keeping a fit and proper lookout will provide a practical solution to on-water navigational safety. This may be particularly important in the deeper and more exposed Storm Bay environment, as lease corner marks may move substantially within their moored radius. The Panel noted that the PA takes advice from MAST in relation to navigational marks and lighting requirements.

3.3.2.3 Conclusion

The Panel, noting the recommendations of the PA in relation to marine debris and as discussed in section 3.1.1 of this report, recommended modification of the initial Draft Plan to improve environmental performance with regard to marine debris.

The Panel recommended that the initial Draft Plan be modified by adding management control 3.13.15 to strengthen reporting requirements. This control has been included in the Draft Plan.

3.3.3 Reservations

3.3.3.1 Background

One representor submitted that any expansion of marine farming to oceanic areas should be balanced by the appropriate protection of important marine areas. The representor referred to the Resource Planning and Development Commission (2008) Inquiry into the establishment of marine protected areas within the Bruny Bioregion which the representor states undertook a comprehensive review of the proposed Bruny Bioregion and made a series of recommendations about marine protected areas (MPA)[25]. The representor also stated that the Government is yet to implement all of the Commission's MPA recommendations and urged the Panel to consider these outstanding recommendations in relation to the proposed Storm Bay expansion.

3.3.3.2 Discussion

The Panel noted that no marine reserves have been identified within the proposed MFDP area or surrounding areas other conservation areas identified in the vicinity of the proposed development.

In relation to the comment on marine protected areas, any future changes to marine protected areas that are not currently proposed by Government is a matter outside of the Marine Farming Development Planning process.

3.3.3.3 Conclusion

The Panel is satisfied that the Draft Plan will not impact on reservations.

3.3.4 Noise

3.3.4.1 Background

Representors raised concerns about noise impacts to residential amenity resulting from increased service vessel traffic past Dennes Point and Tinderbox. Some representors were concerned that they are already experiencing noise impacts from marine farming service vessels transiting past Dennes Point and that the proposed developments could increase these impacts. Comments were concerned with the potential for cumulative noise impacts of increased traffic movements from both the Storm Bay North and the Trumpeter Bay proposals. Representors were also concerned that stationed marine farming equipment could create a noise nuisance, impacting on residential amenity.

Representors made the following recommendations:

- There should be an overall assessment of the environmental impact of vessels servicing fish farms in Storm Bay from North West Bay and further south in the Channel.
- Consideration should be given to controls on hours of operation of vessels travelling to the proposed leases and ongoing monitoring of vessel noise.
- Specific noise limits should be imposed, extending both to equipment within the farmed area and vessel traffic.

Some representors raised concerns that increased vehicle (truck) movements and land-based infrastructure requirements may increase road traffic and noise impacts in residential, tourism and holiday areas, impacting on lifestyle/ tourism and residential amenity.

[25] Resource Planning and Development Commission (2008) *Inquiry into the establishment of marine protected areas within the Bruny Bioregion: Final Recommendations Report*

3.3.4.2 Discussion

The plan includes management control 3.13.2 which requires lessees to comply with guidelines on noise emissions made pursuant to EMPCA for marine farming operations.

Management control 3.9.1.4 in the Draft Plan requires that floating storage huts and other facilities located in the lease area must be authorised in the relevant marine farming licence. As a matter of policy, the Minister requires a noise assessment for such vessels to accompany any application for such an authorisation and this forms part of the information on which a determination made. Together, these controls provide effective means to avoid marine farming operations within the plan area from having excessive noise impact.

Notwithstanding that these controls are effectively applied for existing marine farming operations, in its Section 28 report, the PA recommended that management control 3.13.2 could be improved by minor re-wording, recommending that the words 'made pursuant to the *Environmental Management and Pollution Control Act 1994*' be deleted and replaced with 'issued by the EPA'. This change would mean that guidelines issued by the EPA could be applied, regardless of their status as a statutory instrument made under EMPCA.

Additionally the PA recommended that management control 3.9.1.4 in the Initial Draft Plan should be moved from 3.9 'Visual controls' to 3.13 'Other controls' in order to give it broader effect (see recommendation in relation to management control 3.9.1.4 in section 3.1.1 of this report - Infrastructure and servicing).

Changes were made to the regulatory framework for finfish farming in December 2017. These changes gave direct powers to the EPA to regulate the environmental management of finfish farming activities, including the issuing of environmental licences. The EMPCA defines a pollutant to include noise, and under Section 42Z of that Act, an environmental licence can include any condition or restriction requiring the holder of the environmental licence to undertake such measures as are specified in the licence to limit the environmental effects of traffic movements, or vessel movements, to and from the area of land, or area of State waters, to which the licence applies. As such, regulatory powers in relation to environmental effects of noise associated with finfish farming now sit primarily with the EPA.

Any member of the community who considers that marine farming operations may be causing a noise nuisance should report their concerns to the EPA.

3.3.4.3 Conclusion

The Panel recommended that any future modification of the Draft Plan by the PA should edit management control 3.13.2 and move management control 3.9.1.4 from 3.9 'Visual Controls' to 3.13 'Other controls'. These have been included in the Draft Plan as modified.

3.3.5 Commercial fishing

3.3.5.1 Background

Representors raised concerns that fish habitat and fish stocks could be impacted such that commercial fishing is impacted. These concerns related to both local and cumulative effects. Key species listed in representations and targeted by commercial fishers were rock lobster, abalone, tiger flathead, and school whiting. Key habitat listed in representations was rocky reef.

The potential for harmful algal blooms to increase as a result of increased nutrient inputs was also raised as a concern. See section 3.2.1 Water quality of this report for discussion of harmful algal blooms.

The Tasmanian Abalone Council Ltd (TACL) made a representation in relation to the Draft Plan including the following recommendations:

- A comprehensive baseline environmental assessment is conducted on rocky reef systems that lie adjacent or proximate to the proposed Petuna "Storm Bay North" finfish lease prior to any lease being granted and that in the event that a lease is granted, comprehensive ongoing environmental monitoring should occur.
- The TACL is also seeking additional rocky reef monitoring sites at the two closest rocky reef locations that currently support the commercial harvest of abalone.
- The TACL also seeks direct input into the design and implementation of the environmental monitoring system developed by the Tasmanian Environment Protection Authority (EPA) for the Petuna Storm Bay lease.
- Results should be publically available via an independently managed web portal.

The Tasmanian Seafood Industry Council made a representation in regard to the two draft amendments for Storm Bay. The recommendations made by TSIC, whilst not having been made in regard to the Draft Plan, are also relevant to the Draft Plan as they apply more generally to marine farming within Storm Bay:

- No farming activity should overlap current wild catch/ other marine farming activities in order to maintain current wild catch/ marine farm access rights.
- If a new salmon farm development impacts current wildcatch fishery catches / farming operations, compensation must be considered.
- A 1.5nM buffer between any new salmon farm development and hard reef habitat must be formalised within Government policy.
- That the Government commit to funding IMAS to conduct a side scan 'swath' mapping project to update or create habitat maps within each of the potential salmon farming 'green zones' identified in the Salmon Growth Plan.
- Establishment of a TSIC member forum to better explain salmon farm operations and future expansion plans.

The Tasmanian Seafood Industry Council also noted that consultation over Storm Bay proposals had progressed under a 1km buffer distance between marine farming zones and rocky reef, but stated that it would show considerable good will if the 1.5nM (approximately 2.8km) distance could be achieved.

3.3.5.2 Discussion

Fishery Access

The development proposed to be enabled through the Draft Plan would reduce the area available for some commercial fishing activity in Storm Bay and this may have an impact on some commercial fishing operators, in particular, Danish Seine operators.

Ecosystems and wild fish stocks

Finfish farming interacts with the ecosystem through water quality, the benthos and physical presence of equipment, nets, fish and feed. The draft management controls contain measures to limit the extent of each of these interactions, as well as to monitor impacts and apply management responses. Management controls 3.1, 3.2, 3.3.1-3.3.8, 3.4.1-3.4.10, 3.7.1-3.7.5 and 3.13.4 provide for regulatory controls to:

- limit significant visual, physio-chemical or biological impacts to 35m beyond the boundary of the lease area;
- monitoring of environmental parameters within the lease area, 35m outside the lease area and at control sites;
- limit nutrient inputs through a TPDNO cap;
- set a maximum permissible stocking density and the ability for the regulator to alter it at any time should he/she consider it appropriate;
- require fallowing of farmed areas;
- set a minimum distance of 1m between the finfish cage net and the seabed;
- specify baseline environmental survey requirements for lease areas prior to the commencement of marine farming operations in order to determine any licence conditions that may be required to manage environmental values;
- require the keeping of production records for each lease area, including stocking density, feed, chemical and therapeutant inputs and mandatory reporting when required by the regulator;
- require environmental monitoring, assessment, audit and review; and
- establish controls for managing waste from operations and harvesting; as well as removal of fouling organisms from marine farming infrastructure.

These issues are further discussed in section 3.2.1 Water quality and section 3.2.2 Substrates and fauna of this report.

The Panel noted that the applicant states in section 4.5.3 of its EIS, that following consultation with the Tasmanian Rock Lobster Fisherman's Association (TRLFA), it subsequently revised the zone plan size and location to provide a mutually agreed 1 km buffer between the lease and known rock lobster habitat. The Panel noted that the TRLFA did not make a representation in relation to the Draft Plan, however the TACL did make a representation and raised concern about the potential impacts to algae upon which abalone, lobster and other marine fauna depend.

The Panel also noted that the applicant reports that it was advised by TACL of important fishing grounds to the north of the proposed zone on the coast line in proximity to Betsy Island. The applicant highlighted that a number of the proposed BEMP inshore reef monitoring sites are located around Betsey Island and on the coast to the north of the proposed zone, ensuring that there will be ongoing monitoring of reef biodiversity and species survey in proximity to known abalone fishing grounds. The applicant's consultation with Danish Seine fishers did not identify any direct impact from the proposal.

The Tasmanian Government is working with IMAS and CSIRO to establish a program of work to develop the biogeochemical model and BEMP. This project has recently been granted FRDC approval. This work, together with results from FRDC project 2015-024 "*Managing ecosystem interactions across differing environments: building flexibility and risk assurance into environmental strategies*" and previous habitat mapping will provide a body of data relating to the Storm Bay environment that will help to inform regulatory management. The proposed broadscale environmental monitoring will help to inform regulators about ecosystem responses to increased marine farming in Storm Bay. Together with the biogeochemical model, staged development and targeted future research, adverse impacts on wild fish species may be avoided, mitigated or managed through proposed management controls and other elements of the regulatory framework, such as environmental licences under EMPCA. (See section 3.2.2 Substrates and fauna for further discussion of FRDC project 2015-024).

In addition, catch and effort data collected for Tasmanian commercial fish and shellfish fisheries is reported annually by IMAS, to provide information about the status of fish stocks and trends. Reporting includes scalefish (e.g. Tiger Flathead and School Whiting), rock lobster and abalone. Data for the Storm Bay region is available and should trends in commercial fisheries stocks (which is scientifically attributable to salmonid farm development) become evident, appropriate management responses would be investigated.

Recommendations that are out of scope

The panel noted the recommendations made by the Tasmanian Seafood Industry Council in relation to marine farming policy such as the question of compensation and a buffer distance formalised in Government policy. The Panel considers that these issues are outside the scope of its consideration of the Draft Plan. The Panel also considers the recommendation on the establishment of a member forum to be outside the scope of its consideration of the Draft Plan but would encourage the salmon industry to consider such a forum as part of its on-going community and stakeholder engagement work.

3.3.5.3 Conclusion

The Panel does not consider that the Draft Plan will have a significant impact on commercial fishing in Storm Bay.

3.3.6 Recreational fishing

3.3.6.1 Background

Representors raised concerns that fish habitat and fish stocks could be impacted such that recreational fishing is impacted. These concerns related to both local and cumulative effects. Key species listed in representations and targeted by recreational fishers were rock lobster, abalone and flathead and whiting. Key habitat listed in representations was rocky reef. Some representors raised concerns that recreational fishers would lose access to fishing grounds.

The potential for harmful algal blooms to increase as a result of increased nutrient inputs was also raised as a concern. See section 3.2.1 Water quality of this report for discussion of harmful algal blooms.

3.3.6.2 Discussion

Management controls relating to water quality and substrates and fauna have been described in the relevant sections of this document and should be referred to. No other management controls are relevant to the issues raised.

In relation to comments asserting that recreationally targeted species have declined in response to increased finfish farming, the Panel noted that these assertions conflict with findings of recent research. For example, Moore et al. 2018[26], reported that 'a Sand Flathead fishery-independent survey commenced in 2012 to support classification of this species' and highlighted fishing pressure, population dynamics and management arrangements as influencing the availability of legal size fish in the D'Entrecasteaux Channel and Frederick Henry-Norfolk Bay. They found that standardised catch rates from the fishery-independent survey increased in 2017 at all locations relative to previous years and concluded that this finding suggests that the management measures introduced in late 2015 may be having a positive effect on the stock. In relation to flounder, they observed that the declining commercial catch rate was likely related to market demand and management changes.

Lyle and Tracey (2017)[27] estimated that 12% of recreational rock lobster and 38% of recreational abalone harvest came from the D'Entrecasteaux Channel. In relation to rock lobster (statewide), they found that amongst those respondents to the survey conducted for the assessment of the 2016-17 recreational fishing season who had fished for rock lobster, 'more than twice as many suggested that the quality of the fishery in 2016-17 was better (34%) rather than worse (15%) compared with the previous season' and that 'almost half of the active fishers…suggested that the overall quality was about the same as in the previous year'. Further, they found that 62% of respondents disagreed with the proposition that legal size rock lobster were less abundant or more difficult to catch in 2016-17. They concluded that (statewide) 'recreational abalone catch rates have fluctuated without obvious trend through time, reflecting the fact that many divers regularly attain the bag limit' and that the average daily harvest rate was within the range of that reported in previous years.

3.3.6.3 Conclusion

The Panel recognises that the development proposed to be enabled through the Draft Plan would reduce the area available for recreational fishing activity in Storm Bay and that this may have an impact on some individual recreational fishers.

3.3.7 Recreational activities

3.3.7.1 Background

Representors raised the following perceived visual, water quality, and safety impacts on recreational activities resulting from the Draft Plan:

- Marine debris originating from marine farms and vessels wash up on beaches or pollute coastal waters leading to reduced recreational amenity (see section 3.1.1 Infrastructure and servicing of this report for discussion).
- Access to the waterway for recreation is limited, impacting on recreational enjoyment (see 3.3.2 Navigation and 3.3.6 Recreational fishing of this report for discussion).
- Visual impacts of the fish farms reduce recreational amenity (see 3.3.1 Visual of this report for discussion)

[26] Moore et al. (2018). Tasmanian scalefish fishery assessment 2016/17, Institute for Marine and Antarctic Studies.

[27] Lyle, J.M., and Tracey, S.R. (2017). Tasmanian Recreational Rock Lobster and Abalone Fisheries: 2016-17 fishing season, Institute for Marine and Antarctic Studies.

3.3.7.2 Discussion

See sections 3.1.1 Infrastructure and servicing, 3.2.1 Water quality, 3.2.2 Substrates and fauna, 3.3.2 Navigation, 3.3.6 Recreational fishing and 3.3.1 Visual for discussion of potential impacts relating to these aspects. Related issues are also considered in 3.3.8 Tourism of this report.

3.3.7.3 Conclusion

The Panel recognises that public access to the lease area would be lost, however, overall, the Panel does not consider that recreational activities will be excluded as a result of the Draft Plan.

3.3.8 Tourism

3.3.8.1 Background

Representors raised concerns that the Draft Plan, in isolation and in combination with other proposed marine farming developments in Storm Bay, could impact on tourism to the Tasman Peninsula and Bruny Island areas. Concerns about direct impacts principally related to visual impacts from marine debris and marine farming infrastructure impacting on views, vistas and amenity. Concerns were also raised that the Tasmanian Brand or Bruny Island brand could be impacted which could flow on to reduced tourism interest in the region.

3.3.8.2 Discussion

Management Controls relating to visual impacts and marine debris are discussed in section 3.3.1 Visual and 3.1.1 Infrastructure and servicing of this report.

The Tasmanian Brand is discussed in section 3.4.7 of this report.

The Panel noted that no representations were received from tourism operators or tourism representatives, although one representor stated that tourism operators have raised concerns about impacts to their businesses. In section 5.2.11.1 of its EIS, the applicant stated that it had consulted with Pennicott Wilderness Journeys who operate a cruise that circumnavigates Betsey Island. The applicant states that there were no objections to the proposal, however they have had further discussions regarding waste management and seal interactions.

3.3.8.3 Conclusion

The Panel does not consider that there is evidence that tourism to the Storm Bay region, Tasman Peninsula or Bruny Island will be significantly impacted by the Draft Plan. However the Panel does acknowledge that the proposed development may have a residual visual impact for some individual businesses catering to tourism.

3.3.9 Land use and development

3.3.9.1 Background

Representors raised concerns about the potential for heavy vehicle movements, noise, light and visual pollution will increase around Storm Bay as a result of the cumulative expansion of salmonid farming. One representor was also concerned that the Storm Bay North EIS proposes that freshwater will be sourced from reverse osmosis and that the EIS does not detail the likely impacts of disposal of reverse osmosis concentrate on the marine environment or the methods of mitigating these impacts. The representor stated that the EIS does not detail what, if any, other permits or approvals would be required to operate the plant, and if it is to be based on shore, what opportunities there will be for members of the affected community to voice any concerns they may have as to potential noise or other impacts.

3.3.9.2 Discussion

The Panel noted that the Draft Plan does not seek to alter land-based planning schemes and does not propose any changes to land use or development. Any land use and development changes would be assessed under separate legislation. The Panel also noted that the applicant is yet to nominate a shore-base for its proposed development.

Management controls relating to noise, light and visual impacts arising from on-water infrastructure have been discussed in the relevant sections of this report.

In relation to freshwater supply, the siting and operation of a reverse osmosis plant as referred to by the applicant would be subject to its own approval process, for example, through an environmental licence under EMPCA. If the plant is located on land it would be subject to land-based planning processes.

3.3.9.3 Conclusion

The Panel does not consider that additional regulatory controls are required as a result of the issues raised in representations.

3.3.10 Socio-economic aspects

3.3.10.1 Background

Representors raised concerns that the existence of finfish farms in Storm Bay could impact on the Tasmanian Brand which relies on a 'clean, green, natural image' for example, through visual impacts of marine farming infrastructure, or through industry reputation of poor environmental performance.

Representors were also concerned that commercial fishing, tourism and local producers may be negatively impacted by the expansion of marine farming in Storm Bay. Concerns relating to commercial fishing and tourism have been discussed in the relevant sections of this report (3.3.5 Commercial fishing and 3.3.8 Tourism).

Representors raised concerns that environmental, social and economic costs and benefits that may result from the Draft Plan and the other developments proposed for Storm Bay, have not been adequately assessed. One representor recommended that a single consolidated marine farming development plan for the Bruny Island Storm Bay Bioregion should be developed to consider potential environmental, social and economic costs and benefits which might result from the proposed developments. This is discussed further in sections 3.4.1 and 3.4.2 of this report.

3.3.10.2 Discussion

The Panel noted that many of the issues raised by representors in relation to socio-economic impacts and the Draft Plan pertained to perceived effects of all three current Storm Bay marine farming planning proposals. All management controls in the MFDP are relevant to the concerns raised by representors. Strong industry environmental performance and compliance is key to maintaining the Tasmanian Brand, underpinning a strong tourism economy, as well as minimising impacts to environmental and social values and existing businesses in the region.

Based on the relative economic value of commercial fisheries that may be impacted by the proposal, some individual fishers may be locally displaced from areas they have historically fished. Any effects of this are unlikely to have substantial socio-economic impact at the regional level.

3.3.10.3 Conclusion

The Panel concluded that the socio-economic benefits of marine farming expansion in Storm Bay are potentially widespread through both the local economy and the Tasmanian economy. The Panel acknowledges that some individuals will be impacted by reduced amenity caused by visual or noise impacts from marine farming infrastructure or service vessels.

3.4 Other matters

3.4.1 Marine farming planning process

3.4.1.1 Background

Representors raised the following concerns relating to the marine farming planning process:

- Dissatisfaction with the planning framework.
- Concern that the exhibition period coincided with Christmas.
- Concern that the planning process, including EIS preparation, lacked independence, scientific rigour or appropriate oversight.
- Concern that the EIS did not address, or provide sufficient independent information on potential socioeconomic, recreational, tourism and public amenity effects.

3.4.1.2 Discussion

The Act sets out the statutory process for the preparation of marine farming development plans. This is one component of the planning and approval framework that applies to sea-based marine farming developments. The framework is described on pp10-11 of the *Sustainable industry growth plan for the salmon industry*.

In relation to the Draft Plan, the Act specifies timeframes for various steps in the planning process, including that the period of exhibition of a Draft Plan is to be two months. The Panel noted that the PA exhibited the Draft Plan for the maximum allowed period.

Comments in relation to the coincidence of Christmas and the summer holiday period with the exhibition period are noted. Given the two month exhibition period, there are several periods in any year that would likely overlap with holiday periods.

The Draft Plan is accompanied by an EIS, which was substantially prepared by the applicant. The EIS is prepared in accordance with guidelines issued by the PA specific to the proposal and which have input from the Panel. The EIS contains information from a range of scientific and independent sources, as well as information from the applicant in relation to their proposal to develop and operate a marine farm in the proposed zone.

The Panel is a statutory body established by the Act with the functions described by section 9(1). It comprises nine persons who are appointed by the Governor based on their ability, expertise and experience in certain matters. Panel members have scientific and professional expertise, which they apply to these functions. As such, there is considerable independent review and consideration of matters through the planning process.

3.4.1.3 Conclusion

The Panel noted the comments that have been made on the planning process, however, they are outside the scope of the Draft Plan.

3.4.2 Holistic impact assessment

3.4.2.1 Background

Representors raised the following issues relating to the potential combined effects of all current marine farming planning proposals in Storm Bay:

- Suggestions about bioregional and ecosystem approaches to marine resource management, including marine farming planning.
- Concerns that combined effects of the three separate planning proposals on the natural or human environment may be greater than identified and described through any one process.
- Suggestions that the proposals should be progressed through a single, holistic planning process.
- Potential impacts on amenity for residents in and around North West Bay, Tinderbox and Dennes Point arising from combined effects of vessels servicing fish farms in Storm Bay from North West Bay and further south in the Channel (see also discussion under 2.3.4 Noise).

3.4.2.2 Discussion

The marine farming planning process is discussed under section 3.4.1 of this report and is relevant to discussion of the approach taken in relation to the three current planning processes.

The Act sets out the process for development and amendment of marine farming development plans and these processes are currently being progressed in respect of three separate applications, each relating to Storm Bay. The processes are:

- Amendment of two existing MFDPs
- Development of one new MFDP.

Each process proceeds on its merits, as assessed under the relevant provisions of the Act.

Section 2 of this report sets out the requirements under the Act, including the requirements of Section 21 of the Act which set out the things that a draft MFDP must and may do.

This provides for the objectives of resource management, coordination with adjacent MFDP areas, and use and development of the region as an entity in environmental, economic, recreational and social terms to be considered in the assessment of a Draft Plan or amendment. In the Panel's view, each of these provisions is relevant to the issues raised in relation to holistic impact assessment.

The Panel recognises that both additive and synergistic cumulative effects may arise from the three proposed developments, as well as other existing and future anthropogenic activities. Synergistic cumulative effects may occur in relation to water quality, substrates and fauna and marine vegetation, as well as disease and biosecurity. Additive effects may occur also in relation to birds, marine mammals and threatened species and impacts on the human environment such as visual, navigation, noise, commercial and recreational fishing and other recreational activities.

Of the potential synergistic effects, the Panel considers water quality changes to be the primary means through which synergistic ecosystem impacts might occur. As detailed in 3.2.1 Water quality, 3.2.2 Substrates and fauna and 3.2.3 Marine vegetation of this report, monitoring and research at the regional level will help to inform the regulator of any changes that occur. The Draft Plan relevant to this proposal, as well as the existing plans and draft amendments relating to the other two proposals, provide for water quality impacts to be limited through limits on dissolved nitrogen emissions, as detailed in 3.2.1 Water quality. In the context of the adaptive management framework that relates to the Storm Bay region and includes means to consider impacts in adjacent waterways, the Panel considers that appropriate mechanisms exist to manage any negative impacts, whether relating to a single proposed development or regional issues.

Representors raised concerns about regional biosecurity and disease management, questioning whether the biosecurity framework was adequate to minimise disease risks and avoid biosecurity issues such as have been encountered overseas. For discussion of disease and biosecurity issues in the regional context, see section 3.2.8 Disease and biosecurity.

Additive cumulative effects on other values in the natural environment, such as birds, marine mammals and threatened species are managed through application of best practice measures to minimise and mitigate interactions with and impacts on these species. These measures can be mandated directly through relevant legislation (such as the State *Nature Conservation Act 2002* and *Threatened Species Protection Act 1995* and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, or through marine farming regulation, such as relevant management controls under the applicable MFDP or conditions on environmental licences.

In terms of additive cumulative effects on the human environment, these impacts are likely to be transient with the presence of marine farming infrastructure in the region; once activities are decommissioned and remediated, these effects would disappear. Additive visual effects are unlikely to be significant, given the visual controls that exist, the distances between sites and the elevation required to view more than one proposed development. The visual impact assessments included within each of the relevant EIS's demonstrates additive visual impacts are likely to be minimal.

Similarly, given the distance between sites and the exposed environment, noise generated within lease areas would be unlikely to have an additive impact on any human environments. Additive noise effects have been raised in relation to marine mammals (see 3.2.5 Marine mammals and 3.3.4 Noise), with a recommendation that baseline survey requirements should include a marine noise assessment (representation from Environmental Defenders Office Tasmania). The Panel noted that as the EPA is responsible for determining baseline survey requirements and may regulate noise through environmental licences, the PA provided this recommendation to the EPA.

Noise generated outside lease areas, for example, by vessel movements, is a matter for the EPA and may also be regulated through an environmental licence.

Additive effects on navigation, commercial and recreational fishing and other recreational activities arise from the area that is occupied by marine farming infrastructure. Issues relevant to this proposal are considered in the relevant sections of this report, along with relevant recommendations in relation to management controls. The Panel expects that the recommended management control modifications would also have benefits in the context of the combined effects of the three current marine farming proposals and the use and development of the region.

3.4.2.3 Conclusion

The Panel has recommends that any future modification of the Draft Plan by the PA, includes management controls to provide explicit description of an action the Secretary may choose to take in relation to single year-class stock management (see section 3.2.8 Disease and biosecurity of this report).

3.4.3 Application of the Precautionary Principle

3.4.3.1 Background

Representors emphasised the need to apply the precautionary principle in making a recommendation about the Draft Plan.

3.4.3.2 Discussion

Section 21(1)(ga) of the Act requires the Draft Plan to be consistent with State Policies made under section 11 of the *State Policies and Projects Act 1993*. Two State Policies are relevant to the determination. These are the State Coastal Policy 1996 and the State Policy on Water Quality Management 1997.

The State Coastal Policy 1996 requires that where a development may pose serious or irreversible environmental damage, then the precautionary principle will be applied to ensure that environmental degradation can be avoided, remedied or mitigated. The State Policy on Water Quality Management 1997 requires that the precautionary principle is applied to the management of pollutant discharges to surface waters, including coastal waters.

The precautionary principle means that where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

i. careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and
ii. an assessment of the risk-weighted consequences of various options.

The Precautionary Principle rose to prominence following its inclusion in the Rio Declaration on Environmental Development (Principle 15) which describes the precautionary approach and its use in the context of environmental conservation as, "*In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation"*. Recent reviews confirm that identification of a threat, and determination that that threat is significant, should be key prerequisite steps in accepting the application of the Principle [28].

[28] Kearney, R. et al. (2012). Questionable interpretation of the Precautionary Principle in Australia's implementation of 'no-take' marine protected areas. Marine Policy 36: 592–597

A major characteristic of the precautionary principle is that it specifies that measures must be taken if there are threats of serious or irreversible environmental damage and these measures should be relaxed only if research demonstrates that they are not needed.

It is not consistent with the Principle to allow scientific uncertainty to negate the necessity to assess whether any particular action or event is a threat. Nor is it appropriate to assume that a threat, once identified, is sufficiently significant to uncritically trigger precautionary action. The need for precaution should not be used to provoke or justify an assumption that something is a threat without sufficient evidence. UNESCO 2005 states, *"Some form of scientific analysis is mandatory; a mere fantasy or crude speculation is not enough to trigger the Precautionary Principle"*

The National Strategy for Ecologically Sustainable Development (ESD) has three core objectives: to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations; to provide for equity within and between generations; and to protect biological diversity and maintain ecological processes and life support systems.

The strategy is implemented under the guidance of a number of ecological and development principles. The ecological principles are:

- Decision making processes should effectively integrate both long and short-term economic, environmental, social and equity considerations
- Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation, and
- The global dimension of environmental impacts of actions and policies should be recognised and considered.

The developmental principles are:

- The need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised
- The need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised
- Cost effective and flexible policy instruments should be adopted, such as improved valuation, pricing, and incentive mechanisms, and decisions and actions should provide for broad community involvement on issues which affect them.

The strategy emphasises that a balanced approach is required for ESD and these guiding principles and core objectives need to be considered as a package. No objective or principle should predominate over the others.

Management judgements have to be based on the available scientific evidence of the risk being undertaken, and the levels of short and long-term impacts that are acceptable in the socio-economic as well as ecological areas.

The Panel considered the various pathways in which the Draft Plan may impact on the environment. The Panel also considered the various pathways in which the Draft Plan, in concert with the other proposed finfish developments in Storm Bay may impact on the environment. Additionally, the Panel considered the management protocols of the applicant as detailed in their EIS, the management controls applying in the existing Marine Farming Development Plan, and those proposed by the Draft Plan; as well as the applicant's commitment to adaptive management. The Panel also considered the broader regulatory regime that will apply. The Panel recommended that the Draft Plan be modified to strengthen management of potential impacts to the environment. Having considered these pathways and available information on potential impacts, the Panel considers that the proposed expansion of salmon farming in Storm Bay is unlikely to cause serious environmental or irreversible environmental damage.

3.4.3.3 Conclusion

The Panel has assessed that the risk of significant or irreversible environmental damage as a result of the Draft Plan, or in combination with the other marine farming proposals in Storm Bay is low in light of the management controls that are proposed in the recommended modifications to the Draft Plan, the internal management protocols of the companies, as well as the broader regulatory arrangements for finfish farming in Tasmania.

3.4.4 Moratorium

3.4.4.1 Background

Five (5) representors expressed a desire for, or requested, a moratorium on one or more marine farming development and planning matters. Representors cited various reasons for desiring a moratorium, including:

- To see evidence the industry can be sustainably managed.
- For independent assessment of the impact of marine farming on marine and human environments.
- To allow for consultation with key stakeholders.

These comments relate to regulation frameworks, the effectiveness of regulation, and planning process and impact assessment. Some of these issues are also discussed under 3.4.1 Marine farming planning process.

3.4.4.2 Discussion

The Panel noted that the Government released the *Sustainable industry growth plan for the salmon industry* (the Salmon Plan) in December 2017, which sets out the Government's vision for Tasmania's salmon industry. The Salmon Plan outlines the regulatory framework, which has recently been changed to give direct regulatory responsibility for environmental management of finfish farming to the EPA and legislating a process to create finfish marine farming exclusion zones. The Salmon Plan also outlines the marine farming planning process and opportunities for stakeholder engagement in planning processes. The Salmon Plan identifies the Storm Bay area as a proposed 'Grow zone'.

In relation to the Draft Plan, the Panel noted that the applicant undertook consultation with key stakeholders in developing its proposal. Information on consultation undertaken is contained in section 3 of the applicant's EIS. The EIS is prepared in accordance with Act and proposal specific guidelines issued by the PA, in consultation with the Panel.

3.4.4.3 Conclusion

The Panel considers that a moratorium is a question for Government and is outside the scope of the current planning process.

3.4.5 Stakeholder consultation

3.4.5.1 Background

Representors raised the following concerns that there has not been adequate stakeholder engagement:

- Concern that the consultation period coincided with Christmas.
- Concern that stakeholders had not been genuinely engaged and consulted with by either the applicant or Government.
- Comment that the development of the 'Grow' zones in the *Sustainable industry growth plan for the salmon industry* were not developed through a public consultation process.

3.4.5.2 Discussion

The Panel noted that the applicant has provided a summary of their stakeholder consultation activities in Section 3 of their EIS, including a summary of discussions and engagement outcomes with each stakeholder that was consulted. The Panel makes no comment on the effectiveness of the stakeholder engagement as this will vary considerably amongst individuals consulted.

The marine farming planning process is discussed in section 3.4.1 of this report – Marine farming planning process.

The Panel noted that the development of the *Sustainable industry growth plan for the salmon industry* included a seven week public consultation. A report on the consultation process, as well as all the feedback received, can be found at www.dpipwe.tas.gov.au/salmonplan.

The Panel noted that the Draft Plan was exhibited in accordance with section 26 of the Act, for the maximum allowable period, between 9 December 2017 and 9 February 2018.

The Panel has considered twenty-seven representations and heard from four representors at public hearings, in regard to the Draft Plan.

3.4.5.3 Conclusion

As detailed in this report, the Panel has recommended modifications to the Draft Plan based on the merits of the views expressed by representors, and the recommendations of the PA. The recommended modifications to the management controls are presented in Attachment A.

3.4.6 Zone/ Lease size and location

3.4.6.1 Background

Representors expressed the following views in regard to zone / lease size and location:

- New finfish farming development should be undertaken using land-based systems.
- The proposed Storm Bay sites are not 'offshore', new developments should be located further out to sea near the continental shelf.
- If new developments are approved, inshore leases should be relinquished.

- Protection afforded to visual and recreational amenity from beaches on South Arm.

3.4.6.2 Discussion

The Panel noted developments in land-based finfish farming and noted that the development of land-based finfish farming systems in Tasmania will be dependent on economic viability.

The Panel noted that the intent of the use of the term 'offshore' by the applicant reflects the exposure and high energy environment of the proposed marine farming zone rather than its proximity to the coast.

One representor recommended that the 'no grow' zone identified in the Salmon Plan should be extended (from the Derwent River and Fredrick Henry Bay) to the southern tip of Betsy Island.

The establishment of 'no grow' zones is provided for within the Act. The Draft Plan area does not overlap with any existing 'no grow' zone, nor potential 'no grow' zones identified in the Salmon Plan. The area that is the subject of the Draft Plan is further to the south than the 'no grow' zone recommended by the representor.

In accordance with the provisions of the Act, a draft plan or an amendment to a MFDP cannot delete a marine farming zone from a plan, or reduce the maximum leasable area within a marine farming zone. It is therefore not within the scope of the planning process to mandate removal of existing leases.

It is appropriate that the Draft Plan is assessed on its merits in accordance with the Act.

3.4.6.3 Conclusion

The Panel has considered the Draft Plan on its merits in making its determination.

3.4.7 Tasmanian Brand

3.4.7.1 Background

Representors were concerned that the existence of finfish farms in Storm Bay could impact on the Tasmanian, Bruny Island or Tasman Peninsula Brands which rely on the 'clean, green, natural image' e.g. through visual impacts of marine farming infrastructure, or through industry reputation of poor environmental performance.

3.4.7.2 Discussion

Consideration of concerns raised by representors about potential impacts on natural and human values that may contribute to the Tasmanian Brand has been detailed throughout sections 3.2 and 3.3 of this report.

3.4.7.3 Conclusion

The Panel concluded that the Draft Plan is not incompatible with the Tasmanian Brand, however, strong industry environmental performance and compliance is key to maintaining the Tasmanian Brand, underpinning a strong tourism economy, as well as minimising impacts to environmental and social values and existing businesses in the region.

3.4.8 Additional recommendations of the Planning Authority

3.4.8.1 Background

Since the Initial Draft Plan was approved for exhibition, the *Finfish Farming Environmental Regulation Act 2017* has commenced, giving the EPA formal functions and powers in relation to environmental management of finfish farming. In light of these legislative changes, in its Section 28 report, the PA identified a number of changes to management controls that better reflect the new regulatory environment and responsibilities.

Additionally, the PA has further reviewed the Initial draft management controls and recommended a number of other minor changes to clarify and update the management controls that apply to the Draft Plan. This included revising the draft management controls in relation to interactions with wildlife. The PA recommended that additional function and rigour would be achieved by replacing draft controls 3.13.9 through 3.13.15 with two controls; one prohibiting deliberate interactions with wildlife; and the second requiring compliance with operational requirements issued by the Secretary.

3.4.8.2 Discussion

The Panel has considered the modifications recommended by the PA to reflect the changes to the regulatory environment and responsibilities resulting from the commencement of the *Finfish Farming Environmental Regulation Act 2017*. The Panel considered that these modifications were required.

The Panel has also considered the modifications to management controls 3.13.9 through 3.13.15 and considered that the changes were required.

3.4.8.3 Conclusion

The Panel recommended that any future modification to the initial Draft Plan by the PA included the proposed modifications to management controls 3.13.9 through 3.13.15. These have been included in the Draft Plan as modified.

4 CONCLUSIONS

4.1 Determinations

Pursuant to section s.29(3) of the Act, the Panel determined that the Planning Authority modifications to 'Draft Storm Bay North MFDP' were not of a substantial nature, and pursuant to section 29(4), directs that the provisions relating to public exhibition, representation and hearings do not apply to that modification.

After complying with s.29(1) of the Act, the Panel determined pursuant to s.29(2)(d) of the Act to accept the (modified) draft plan without change.

The Panel pursuant to section 31(1) of the Act, was satisfied that;

The draft plan including any modification to the plan is acceptable; and

The Director, EPA, did not provide any notice under section 17A(1) of the Act, to include any matter to be included in the draft plan relating to environmental management of finfish farming.

The Panel further determined under section 31(1) to recommend to the Minister that the Draft Plan as modified be approved.

4.2 Additional Recommendations

4.2.1 Environmental Monitoring

The Panel considers that the development of a biogeochemical model for Storm Bay and the Derwent Estuary is critical for the understanding of the environmental impacts and the future management of salmon farming through the adaptive management regime. The Panel also urges a strong commitment from the Government to the funding of this research and the environmental monitoring requirements.

The Panel also recommends that initially, the monitoring regime should be extensive and robust and continue until such time as there is sufficient confidence in the model that would permit a scaling back of the level of monitoring.

The Panel is of the view that a comprehensive monitoring program should include:

- water quality;
- sediment condition in lease areas;
- inshore and deep reefs; and
- intertidal areas.

The Panel further highlights the importance of the integrated monitoring program that includes additional water quality and physiochemical monitoring commensurate with potential risks at various operational phases.

To increase transparency the Panel recommends and supports endeavours by both operators and the Regulator to release performance and monitoring information.

4.2.2 Rate of Development

The Panel recommends that the Companies be encouraged to take a conservative/cautionary approach to their rate of development with respect to levels of stocking in leases to ensure that the monitoring regime and adaptive management responses are not overtaken by unacceptable environmental impacts.

4.2.3 Planning for mass-mortality events

Mortalities are reported and managed under Environmental Licence conditions. While the Panel notes that management of single or minor multiple mortalities is well embedded, there is an absence of planning for waste management in the event of mass mortalities. The Panel recommends that the Biosecurity Plan should explicitly address how operators will deal with disposal of mortalities following a mass mortality event. This should include *inter alia* the method of containment, extraction, transport, waste treatment, waste disposal, and biosecurity measures that would be applied throughout these steps. While it is accepted that the circumstances for an actual mass mortality may alter this plan it is reasonable to expect due consideration of the basic process for waste management and the options for final entombment.

5 APPENDICES

APPENDIX A: STATEMENT OF REASONS FOR DETERMINATION UNDER SECTION 41(2)(a) OF THE MARINE FARMING PLANNING ACT 1995

Attachment A –Briefings to the Marine Farming Planning Review Panel

APPENDIX B: MARINE FARMING PLANNING REVIEW PANEL

APPENDIX A: STATEMENT OF REASONS FOR DETERMINATION UNDER SECTION 31(1) OF THE *MARINE FARMING PLANNING ACT 1995*

I, Craig Midgley, Chairperson of the Marine Farming Planning Review Panel (the Panel), provide this statement of reasons for the determination of the Panel, under section 31(1) of the *Marine Farming Planning Act 1995* (the Act), to recommend to the Minister for Primary Industries and Water that the Draft Storm Bay North Marine Farming Development Plan, November 2017 as modified be approved.

A list of the members of the Marine Farming Planning Review Panel is provided in Appendix B.

Background

On 22 September 2017, the applicant, Petuna Aquaculture Pty Ltd, requested under section 16 of the Act, applied for approval to prepare a Draft Plan.

The proposed Draft Plan seeks to create a new marine farming zone in the north central area of Storm Bay, southeast of Betsey Island. The proposed marine farming zone is 430ha with a maximum leasable area of 273.1ha.

The applicant prepared the Draft Plan along with an environmental impact statement (EIS). The EIS provides a description of the proposal. It contains a description of existing environmental conditions, an assessment of the potential effects on those conditions as a consequence of the Draft Plan and the proposed operations. It proposes mitigation measures and identifies any likely residual effects after mitigation.

Findings on Material Questions of Fact relating to the Determination

In making its determination to reject the Draft Plan, the Panel made the following findings of fact.

1. Pursuant to section 9(1) of the Act, the functions of the Panel are, amongst other things, to:
    a. consider draft marine farming development plans; and
    b. to consider environmental impact statements; and
    c. to consider comments made on Draft Plans; and
    d. to make recommendations to the Minister in respect of Draft Plans.
2. On 22 September 2017, Petuna Aquaculture Pty Ltd (the applicant) requested approval, under section 16 of the Act, to prepare a Draft Plan.
3. On 8 November 2017, pursuant to section 16(3)(a) of the Act, the Minister granted approval to Petuna Aquaculture Pty Ltd to prepare a Draft Plan.
4. On 10 November 2017, pursuant to section 17(a) of the Act, the PA advised the Panel of the Minister's approval for the applicant to prepare a Draft Plan.
5. Section 17A of the Act came into effect on 4 December 2017. Section 17A(3) was not in effect at the time of the application or approval to prepare the Draft Plan and the Director, EPA could not have issued a notice under section 17A(1).
6. Pursuant to section 23 of the Act, an Environmental Impact Statement (EIS) was prepared by the applicant to accompany the Draft Plan, based on guidelines prepared by the PA.
7. On 10 November 2017, the applicant submitted to the PA, the Draft Plan and EIS.
8. In accordance with section 25(1), on 10 November 2017, the PA submitted to the Panel, a

copy of the Draft Plan and the EIS to accompany the Draft Plan prepared by the applicant, for the Panel's consideration.

9. On 23 November 2017, the Panel met with the applicant to discuss the proposal.

10. On 23 November 2017, the Panel considered the Draft Plan in accordance with section 25(3) of the Act and determined that it was suitable for exhibition because it:

    a. complied with section 21 of the Act; and

    b. outlined any marine farming zone; and

    c. identified any maximum leasable area; and

    d. was accompanied for an environmental impact statement; and

    e. contained draft management controls.

11. In accordance with section 25(2)(a) of the Act, on 24 November 2017, the Panel referred the Draft Plan to the Minister for approval for it to be publically exhibited.

12. The Minister approved the public exhibition of the Draft Plan under section 26(1) of the Act on 3 December 2017.

13. The PA publicly exhibited the Draft Plan together with the EIS between the 9 December 2017 and the 9 February 2018, in accordance with section 26(2) of the Act.

14. On 4 December 2017, the *Finfish Farming Environmental Regulation Act 2017* took effect which amends several Acts relating to the management of finfish farming activities, including the *Marine Farming Planning Act 1995*, and establishes Tasmania's *Environmental Management and Pollution Control Act 1994* (EMPCA) as the primary piece of environmental regulation legislation for finfish farming. The changes established the legal structure that now empowers the Director, EPA with an independent statutory role for the environmental regulation of the State's finfish farming industry, and established an Environmental Licence as a new regulatory instrument for finfish farming activities.

15. On 7 May 2018, the PA forwarded to the Panel a report in accordance with section 28 of the Act. The report contained:

    a. a copy of each representation received;

    b. a copy of each request for a hearing received;

    c. a detailed response from Petuna Aquaculture Pty Ltd in relation to major issues raised in each representation; and

    d. the PA's statement of its opinion as to the merit of each representation and the impact on the Draft Plan as a whole; and

    e. recommendations in relation to the Draft Plan.

16. Twenty-seven (27) written submissions were received in relation to the Draft Plan, including twenty-five (25) which met the requirements of a 'representation' under section 27 of the Act. Eleven (11) representors also requested a hearing pursuant to section 27(2)(c) of the Act.

17. On 9 May 2018, in accordance with section 17A(4) of the Act, the Panel provided to the Director, EPA, a copy of the report forwarded to the Panel under section 28 of the Act.

18. On 21 June 2018 the Director, EPA advised the Panel that all matters that may have formed the basis for a notice under section 17A were adequately included in the Draft Plan and was not seeking any additional changes to management controls.
19. Pursuant to section 12(1B)(b) of the Act, on 24 February 2018, the Panel advertised by Public Notice, the dates, location and time of the hearing.
20. Pursuant to section 12(1B)(a) of the Act, on 8 March 2018, the Panel gave notice to each person who made a request for a hearing under section 27(2)(c) of the Act.
21. In accordance with the requirements of section 12 of the Act, the Panel held a hearing in public in Hobart, on 15 May 2018. Four (4) representors presented at the hearing.
22. On 16 August 2018, in accordance with section 29(1) of the Act, the Panel considered the initial Draft Plan and the report prepared for it by the PA under section 28 of the Act. At the time of its consideration, there were no notices from the Director EPA in effect under section 17A(1).
23. In considering the initial Draft Plan, the Panel formed the view that the Draft Plan did not meet the requirements of section 21(1)(c) of the Act. Based on this finding, the Panel determined to reject the Draft Plan under section 29(2)(b) of the Act.
24. In accordance with section 29(3A), on 24 August 2018 the Panel notified the PA in writing of its determination and the reasons for making it.
25. On 13 September 2018 pursuant to section 30(1) of the Act the Panel provided the PA its report on the assessment of the Draft Plan and provided the PA two months in which to submit to the Panel a modification to the Draft Plan.
26. In accordance with section 30(1) of the Act, on 10 October 2018, the PA submitted to the Panel a modification to the Draft Plan and accompanying statement of the PA's response to the Panel's recommendations.
27. At its meeting of 15 October 2018, the Panel made determinations under section 29 of the Act that the modifications were not of a substantial nature, and accepted the Draft Plan without change.
28. In considering the Draft Plan and pursuant to section 31(1)(b), it was noted that there were no notices in effect, under section 17A(1) of the Act and determined the Draft Plan as modified complied with section 21 of the Act.
29. Also on the 15 October 2018, the Panel determined, in accordance with section 31(1) of the Act, to recommend to the Minister that the Draft Storm Bay North Marine Farming Development Plan November 2017, as modified, be approved.

Material on Which Findings Were Based

In making the determination, the Panel relied on the following material.

1. The Draft Plan;
2. The EIS prepared to accompany the Draft Plan;
3. The report made under section 28 of the Act; and
4. The representations made at the hearings on 15 May 2018 in relation to the Draft Plan.
5. Advice provided by the EPA, CVO and the PA at the request of the Panel.

6. Advice provided by the applicant at the request of the Panel.
7. Advice provided by industry veterinarians and Professor Larry Hammell, who is conducting a review of the draft industry biosecurity plan.
8. Advice provided by the PA accompanying the modification to the Draft Plan.

Determination

The Panel was satisfied that at the time of its consideration, there were no notices in effect under section 17A(1) of the *Marine Farming Planning Act 1997;* and the Draft Plan as modified:

1. furthers the objectives of resource management within the area covered by the Draft Plan; and
2. designates an area as a marine farming zone within the area covered by the Draft Plan; and
3. specifies the area to which the Draft Plan relates; and
4. is co-ordinated with any marine farming development plan applying to any adjacent area; and
5. has regard for the use and development of the region as an entity in environmental, economic, recreational and social terms; and
6. seeks a co-ordinated approach with respect to any matter affecting adjacent land under the jurisdiction of the Marine and Safety Authority or council; and
7. has regard to the biological and physical requirements of fish species to be farmed in that area; and
8. provides for any other matter which this Act requires to be included in a marine farming development plan; and
9. is consistent with State Policies made under section 11 of the State Policies and Projects Act 1993; and
10. contains any matter the Panel requires;

The Panel accordingly determined under section 31(1) to recommend to the Minister for Primary Industries and Water that the Draft Storm Bay North Marine Farming Development Plan November 2017, as modified, be approved.

CRAIG MIDGLEY

CHAIRPERSON

MARINE FARMING PLANNING REVIEW PANEL

30 November 2018

Attachment A – Briefings to the Marine Farming Planning Review Panel

Briefing from the Applicant - Panel Meeting of 23 November 2017

The applicant provided background to their proposed MFDP and accompanying EIS and took questions from the Panel.

Panel Field Trip – 23 April 2018

Panel members attended a field trip accompanied by two representatives from DPIPWE and a representative from each of the companies proposing finfish farming expansion in Storm Bay. The field trip provided an opportunity for Panel members to view the proposed marine farming zones from the water, to view existing marine farming operations in Storm Bay, and to ask any questions of the representatives of each proponent.

Briefing from the Chief Veterinary Officer - Panel Meeting of 23 April 2018

DPIPWE's Chief Veterinary Officer, Rod Andrewartha, briefed The Panel on biosecurity in the Storm Bay region. Discussion included;

- Appropriate separation distances between companies based on international comparisons and the different pathogen risks
- The lack of international standards in relation to separation distances across the known different pathogen risks
- Water (pathogen) circulation based on modelling work within Storm Bay including seasonal variations
- The application of best international practices including the stocking of single year classes in Storm Bay

Briefing from IMAS - Panel Meeting of 23 April 2018

Dr Catriona MacLeod and Dr Jeff Ross (Institute of Marine and Antarctic Studies) briefed the Panel on the current FRDC Project 24 including key outputs that will inform future management in Storm Bay. They also gave an overview of biogeochemical monitoring and modelling work that is being developed to inform future management and planning in the Storm Bay region.

APPENDIX B: MARINE FARMING REVIEW PANEL

The Marine Farming Planning Review Panel (the Panel) is a statutory body established by the Marine Farming Planning Act 1995.

Section of the Marine Farming Planning Act 1995	**Panel Member**
s.8(2)(a) Chair person	Craig Arthur Midgely
s.8(2)(b) a person with ability and experience in planning issues nominated by the Chairperson of the Tasmanian Planning Commission	Pamela Scott*
s.8(2)(c) a person with ability and experience in environmental management.	Louise Cherrie*
s.8(2)(ca) a person with ability and expertise in fish health and biosecurity	Professor Barbara Nowak*
s.8(2)(d) a person with ability in marine resource management.	Professor Colin Buxton
s.8(2)(e) a person with ability to assess boating, recreational and navigational issues.	Vacant*
s.8(2)(f) a person with experience in marine farming	Pheroze Jungalwalla
s.8(2)(fa) a person with expertise in local government issues.	Neil McLarty Campbell
s.8(2)(g) a person nominated by the Minister.	Heather Chong

Not all members were able to participate in the marine farming planning review process. Those members who did not participate in the final determinations are marked with an asterisk in the table above. Section 3 of the Act stipulates that a quorum of five Panel members must be met to transact any business of the Panel. Whilst not all members were able to participate in formulating the determination, the quorum was met.

Disclosure of interests

A member of the Marine Farming Planning Review Panel (Panel) has a statutory requirement under the *Marine Farming Planning Act 1995* (the Act) to disclose the nature of any interest that would conflict with the proper performance of the member's duties in relation to a matter being considered or about to be considered by the Panel. Where such a conflict arises, the Act requires that the member must disclose the nature of the interest at a meeting of the Panel. A disclosure is then required to be recorded in the minutes of the meeting and the member must not, unless the Panel determines otherwise, take part in any decision of the Panel in respect to that matter. Further, for the purpose of making a determination by the Panel, a member who has a direct or indirect pecuniary interest in the matter, must not take part in the determination [Schedule 2 – Membership of Panel, s.6 (see excerpt below)].

In a practical sense, this is addressed through the maintenance of a register of pecuniary interests and as a standing agenda item for each meeting of the Panel. At the beginning of each meeting, the Panel Chairperson asks members whether, since the previous meeting they may have acquired any new interest that may be related, or perceived to be related, to their role on the Panel which needs to be added to the Register. Additionally, members are asked whether they have any interest related to any agenda item for that meeting. Newly appointed Panel members are required to have recorded on the Register, any interest prior to their first meeting.

No Panel member had a conflict of interest in relation to the Draft Plan.

***Marine Farming Planning Act 1995* - SCHEDULE 2 - Membership of Panel**

6. Disclosure of interests

(1) If a member has or acquires an interest that would conflict with the proper performance of the member's duties in relation to a matter being considered or about to be considered by the Panel, the member must disclose the nature of that interest at a meeting of the Panel.

(2) A disclosure under sub clause (1) is to be recorded in the minutes of the meeting of the Panel and the member, unless the Panel otherwise determines, must not –

(a) be present during any deliberation of the Panel with respect to that matter; or

(b) take part in any decision of the Panel with respect to that matter.

(3) For the purpose of making a determination by the Panel under sub clause (2), a member who has a direct or indirect pecuniary interest in the matter to which the disclosure relates must not take part in making the determination.