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POTENTIAL SALMON FARM RELOCATION IN MARLBOROUGH

Social Impact Assessment

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for
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EXECUTIVE SUMMARY

Note to the reader: The full range of social effects of the salmon farming industry is experienced across a broad geographical range of communities - from the immediate vicinity of each salmon farm site in the Marlborough Sounds to the towns in Marlborough where some employees live and the support industries are based, to the city of Nelson when fish processing and company administration takes place, and even further to the salmon hatchery near Takaka in Golden Bay.

Because the assessment reported here focuses on the potential social consequences of re-locating certain salmon farms, the geographic focus of this report is extremely localised - the immediate localities of each farm site.

Any reader who wishes to be informed about the full range of social effects of the salmon farming industry is referred to "The Social and Community Effects of Salmon Farming and Rearing: A case study of the Top of the South Island" (Baines and Quigley, 2016).

Brief for this assessment

1. The Aquaculture Unit of the Ministry for Primary Industries has been working with the Marlborough District Council (MDC) and New Zealand King Salmon (NZKS) on the steps required to implement the Best Management Practice Guidelines for Salmon Farms in the Marlborough Sounds. This includes the potential relocation of some farms to more suitable locations to ensure the agreed standards can be met.

2. This social impact assessment is part of a suite of assessments aimed at identifying whether or not the relocation of individual salmon farms from relatively low-flow locations to relatively high-flow locations would be likely to result in better environmental, social and economic outcomes. Nine potential relocation sites have been identified to be assessed for their suitability.

Approach to assessment

3. The assessment of social effects reported here aims to build upon and supplement the knowledge base from previous studies. In particular, extensive reference is made to the social impact assessment work undertaken on the Plan Change and associated resource consent applications on behalf of NZ King Salmon (Taylor Baines & Associates, 2012) and the recent case study of salmon farming activities across the Top-of-the South undertaken on behalf of the Ministry of Primary

Industries (Baines and Quigley, 2016). Collectively, these two studies involved 90 interviews with key informants throughout the Marlborough Sounds and Marlborough region, and some further interviews have been conducted as part of this assessment.

4. Comparisons of likely effects made between proposed alternative sites and existing salmon farm operations, are based on consideration of empirical experience gained from neighbours of existing salmon farms, consideration of changes in farm management practices that have occurred in recent years and particularly since the EPA decisions were handed down, and consideration of the principle that *"In granting resource consent for the new salmon farms the decision makers have deemed that the establishment of these farms is in keeping with the intention of the RMA. Consent conditions have been imposed to manage the potential effects on amenity values."*

5. The empirical experience gained from neighbours of existing salmon farms was derived originally from neighbour interviews conducted in 2011 and 2012. The two subsequent series of neighbour interviews (January 2016 and July 2016) have confirmed the validity of these conclusions for the purposes of the assessment reported here. It is also important to acknowledge that these follow-up interviews also endorsed the widely held value associated with maintaining the environmental integrity of the benthic ecology.

Scope of assessment

6. In pursuit of better environmental outcomes, an interest in identifying relatively high-flow sites that would better support environmentally-compliant salmon-farming operations essentially means a focus on two locations in the Marlborough Sounds - Waitata Reach and Tory Channel. The report therefore discusses site-specific effects in these two groups - or, to be more specific - the report discusses how the level of site-specific residential amenity effects would be different if certain salmon farms were to be re-located to new sites in Waitata Reach or Tory Channel.

7. Several layers of assessment are reported here -

(i) the likelihood of experiencing significant adverse amenity effects associated with each individual alternative site, when considered on its own;
(ii) a comparison of alternative sites with existing salmon-farming sites, each considered on their own;
(iii) illustrative examples of the "net effect" of swapping particular sites (existing for alternative);
(iv) the likelihood of experiencing significant cumulative effects associated with proximity to more than one salmon-farming operation;
(v) the likelihood of changes in the level of wider community social benefits associated with salmon farming, if relocations are permitted, compared with the No-Change scenario.

8. Mitigation measures against off-site amenity effects that might be additional to those already incorporated in the most recent consent conditions have not been considered in this assessment. The assumption (as stated later in section 3.2) is that the sites are being compared on the basis of the same operational standards[1].

Summary of findings - Waitata Reach

9. Taking into account neighbours' experiences of existing salmon farming operations and the contextual considerations summarised in this report, this assessment makes the following findings for the five alternative sites proposed for assessment in the Waitata Reach -

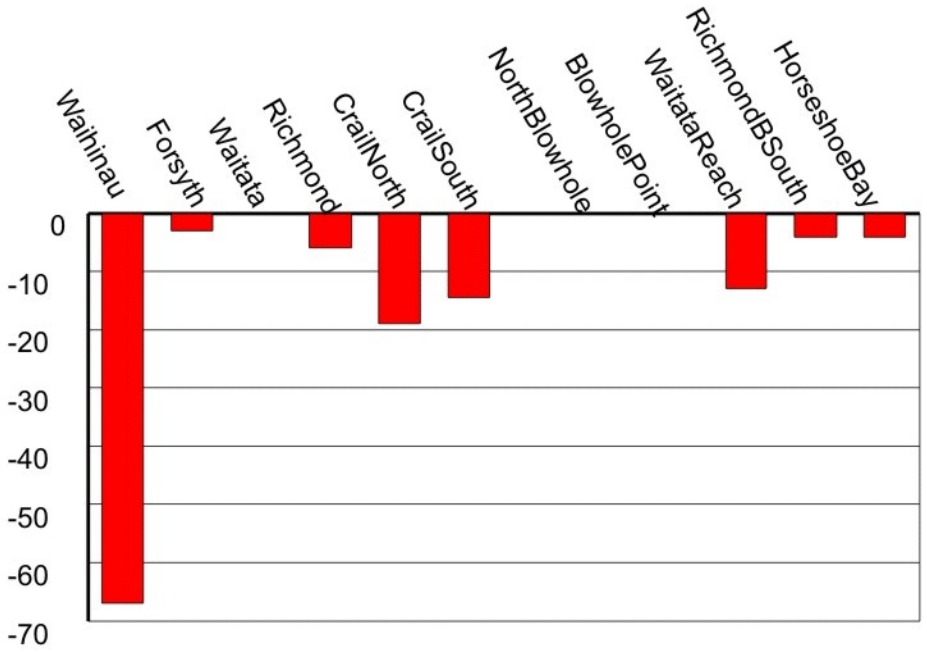
Table 1: Qualitative assessments of off-site residential amenity effects - all Waitata Reach sites

Site	Distance to nearest dwelling with direct LoS	Visual effects	Noise effects	Odour effects	Wildlife nuisance effects	Shoreline solid waste effects
#34 - North Blowhole Point	5.4km	negligible	nil	nil	negligible	nil
#122 - Blowhole Point	5.3km	negligible	nil	nil	negligible	nil
#125 - Waitata Reach	3.2km	minor	negligible	nil	negligible	negligible
#106 - Richmond Bay South	3.5km	minor	negligible	nil	negligible	negligible
#124 - Horseshoe Bay	3.4km	minor	negligible	nil	negligible	minor

10. The results of a semi-quantitative comparison of off-site amenity effects for all sites in the Waitata Reach (existing and alternative) are shown graphically in the following bar chart. [A full description of the semi-quantitative comparison method is provided in Appendix B of this report.]

[1] It should be noted that the 3 newest farms, established in 2015 and 2016, have an independent Peer Review Panel to review the monitoring reports. H Versteeg, Pers.Comm. 4 May 2016.

Figure 1: Semi-quantitative comparison of off-site residential amenity effects - all Waitata Reach sites (existing and possible alternatives)



11. It is estimated that a maximum number of ten existing residential properties (including 13 existing residential dwellings or lodges) would have direct line of sight to more than one site (existing and/or alternative). For dwellings or lodges in this category, the minimum distance to a salmon farm site would be 3.4km and the maximum distance would be 9.6km. While longer-distance views are more likely to be simultaneously cumulative, some of the shortest views would be successively cumulative rather than simultaneously cumulative.

12. It is logical to conclude that, if any of the five alternative sites in the Waitata Reach is likely to generate more than minor adverse cumulative visual effects, it is the Waitata Reach site (#125) itself.

13. With reference to the comparison of existing and alternative sites described graphically above, the greatest reductions in adverse residential amenity effects in the Waitata Reach would arise from relocating the Waihinau and the two Crail Bay salmon farms. On an individual basis, relocating these three salmon farms to any of the alternative sites in the Waitata Reach would result in a net improvement in residential amenity. Because of the separation distances involved, these relocations would also confer significant absolute improvements in residential amenity experienced by the occupants of up to 13 residential properties in the Waitata Reach area.

14. These relocations would achieve a situation where no salmon farms would operate within 1km of a residential dwelling, whilst also enabling full future compliance with the agreed benthic standards.

Summary of findings - Tory Channel

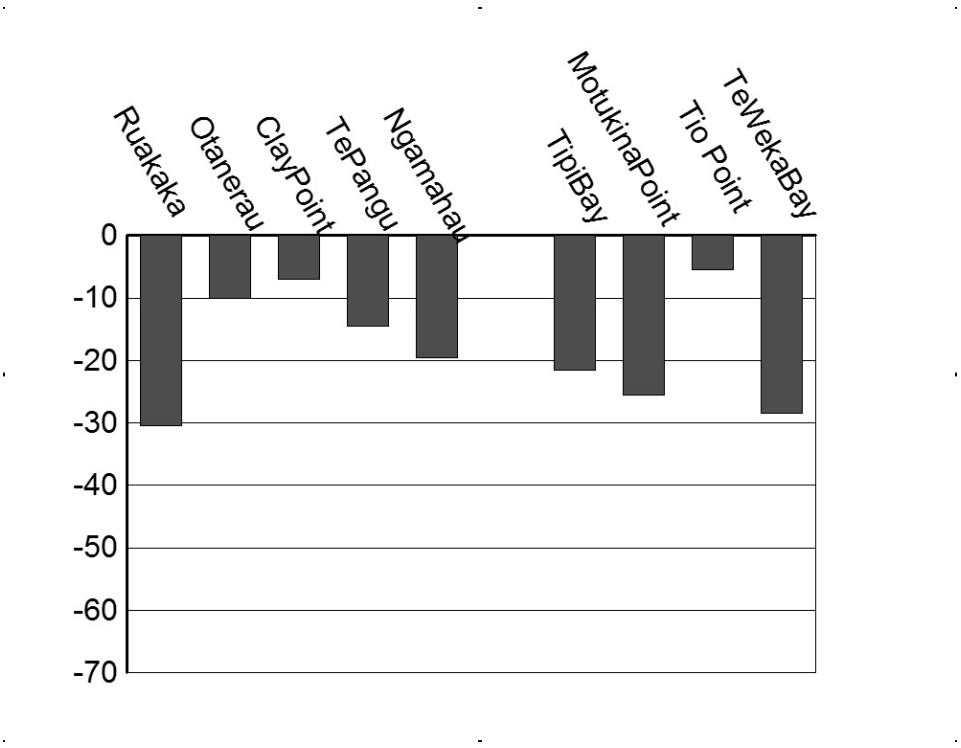
15. The corresponding findings for the four alternative sites proposed for assessment in Tory Channel are tabulated below -

Table 2: Qualitative assessments of off-site residential amenity effects - all Tory Channel sites

Site	Distance to nearest dwelling with direct LoS	Visual effects	Noise effects	Odour effects	Wildlife nuisance effects	Shoreline solid waste effects
#42 - Tipi Bay	1.5km	minor	negligible	negligible	unlikely	unlikely
#82 - Motukina Point	170m	potential for intrusive visual effect - 1 dwelling	potential for intrusive noise effect - 1 dwelling	potential for intrusive odour effect - 1 dwelling	potential for intrusive effect - 1 dwelling	uncertain
#156 - Tio Point	1.5km	minor	negligible	negligible	unlikely	unlikely
#47 - Te Weka Bay	280m	potential for intrusive visual effect - 1 dwelling	potential for intrusive noise effect - 1 dwelling	potential for intrusive odour effect - 1 dwelling	potential for intrusive effect - 1 dwelling	uncertain

16. The results of the corresponding semi-quantitative comparison of off-site amenity effects for all sites in Queen Charlotte Sound and Tory Channel (existing and alternative) are shown graphically in the following bar chart.

Figure 1: Semi-quantitative comparison of off-site residential amenity effects - all Waitata Reach sites (existing and possible alternatives)



17. It is estimated that a maximum number of nine existing residential locations (including 18 existing residential dwellings) would have direct line of sight to more than one site (existing and/or alternative). For dwellings in this category, the minimum distance to a salmon farm site would be 170m and the maximum distance would be 6.2km. At both ends of the scale, these separation distances are substantially less in the Tory Channel setting than is the case in the Waitata Reach setting. While longer-distance views are more likely to be simultaneously cumulative, two properties[2] would experience successively cumulative views of three sites rather than simultaneously cumulative, while a third property[3] would experience simultaneous, long-distance views of three sites.

18. Without alternative site #82 (Motukina Point) -
- the number of residential locations in Tory Channel that would have direct line of sight to more than one site (existing and/or alternative) would reduce from 9 to 3, and the corresponding number of existing residential dwellings in this category would reduce from 18 to 3;

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[2] One dwelling on the southern headland at the entrance to Deep Bay. One dwelling in the embayment at Motukina Point will experience views of three sites - Motukina Point in the foreground, with Clay Point and Ngamahau in the relatively distant background.

[3] One dwelling in a small bay on the north side of Tory Channel, opposite Erie Bay.

- no residential property in Tory Channel would have direct line of sight to more than 2 sites; and
- no residential property in Tory Channel would experience cumulative visual effects from salmon farms that are greater than already deemed acceptable at existing Tory Channel sites.

19. With reference to the comparison of existing and alternative sites described graphically above, two potential site swaps would result in a reduction in adverse residential amenity effects in the Tory Channel/Queen Charlotte group: from relocating the Ruakaka Bay salmon farm to Tipi Bay or Tio Point, and the Otanerau salmon farm to Tio Point, or an alternative site in Waitata Reach.

20. In the zone most critical for residential amenity issues, these relocations would achieve a situation in Queen Charlotte Sound/Tory Channel where the number of residential dwellings within 1km of a salmon farm would reduce from 21 to 8[4] whilst also enabling full future compliance with the agreed benthic standards.

Summary of findings - community-wide social effects

21. Any proposal for salmon farm relocations would result in no change in the total quantum of public water space occupied; the change is in location, not quantity. If no relocations take place, the present quantum of occupied public water space would remain the same for the next 5 years, in the presently consented locations. After that time, the total quantum of occupied public water space will depend on the outcome of any re-consenting processes and the ability of the operator to comply with the agreed benthic standards.

22. The outcome for separation distances between residential dwellings and salmon farms that would result from the hypothetical relocations assumed would be the avoidance of situations where dwellings are close enough to salmon farms to make adverse residential amenity effects highly likely to a situation where they are unlikely. If no relocations are permitted, then the current situation will prevail for at least the next five years.

23. If relocation of some salmon farms enabled an increase in overall production levels of salmon, it is possible that this could be associated with marginal increases in employment of two types: those employed in Nelson processing harvested salmon and those employed in supply-chain companies operating in Picton, Havelock and the Sounds and providing services to salmon farming operations. NZ King Salmon advise that increases in production levels at individual farms are unlikely to result in increased farm staff numbers. If no relocations are permitted, employment levels are unlikely to change in the next five years.

24. A Joint Venture between Te Atiawa and NZ King Salmon has the potential to benefit Te Atiawa in several ways - the opportunity for its people to acquire more skills and

[4] 17 within 1km of Ruakaka and one within 1km of Otanerau, while the alternative site at Motukina Point has 4 dwellings within 1km and the alternative site in Te Weka Bay has one dwelling within 1km.

experience in commercial aquaculture; the environmental improvement made possible by a higher-flow site could contribute in part to satisfying Te Atiawa's kaitiakitanga responsibilities; if the industry becomes more successful, it may lead to even more jobs and management roles for Te Atiawa people. From a Te Atiawa perspective - *"what is good for Te Atiawa people is good for the wider community of Picton and Marlborough"*.

25. The recent case study research on salmon farming in the Top-of-the-South identified and described the nature and scale of NZ King Salmon's involvement with various community initiatives, activities and developments in the Marlborough communities. The scale of these involvements will likely depend upon and be related to the future levels of production and profitability of its business operations. Thus, similar qualitative conclusions can be drawn about the 'relocation' and 'no relocation' scenarios as have been described in the paragraph above.

1 INTRODUCTION

1.1 Brief for this Social Impact Assessment

The Aquaculture Unit of the Ministry for Primary Industries has been working with the Marlborough District Council (MDC) and New Zealand King Salmon (NZ King Salmon) on the steps required to implement the Best Management Practice Guidelines for Salmon Farms in the Marlborough Sounds. This includes the potential relocation of some farms to more suitable locations to ensure the agreed standards can be met.

This social impact assessment is part of a suite of assessments aimed at identifying whether or not the relocation of individual salmon farms from relatively low-flow locations to relatively high-flow locations would be likely to result in better environmental, social and economic outcomes. Nine potential relocation sites have been identified to be assessed for their suitability.

1.2 Background to this proposal for potential salmon farm relocations

1.2.1 The 2012 Private Plan Change and resource consent applications by NZ King Salmon

In addition to 8 salmon farms established over the previous 27 years, NZ King Salmon applied in 2012 (via an EPA Board of Inquiry process) for 9 new sites and was ultimately granted resource consents for three new sites. As a result, NZ King Salmon has consents for salmon farming operations on 11 sites throughout the Marlborough Sounds.

One consequence of having various salmon farm consents granted over such an extended period of time is a considerable variation in the detail of the consent conditions applying to each salmon farm operation.

Another consequence of NZ King Salmon's application for new sites in 2012, and the associated Board of Inquiry process, was the creation of significant tensions, antagonisms and distrust between NZ King Salmon and significant elements within the regional community[5]. This situation resulted in several subsequent Marlborough District Council (MDC) initiatives aimed at restoring trust and improving relationships, notably -

- the Best Management Practice (BMP) Guidelines;
- Marlborough Marine Futures;[6] and
- Marlborough Smart and Connected Aquaculture.

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5 Baines and Quigley, 2016.

6 Aimed at promoting better co-operation amongst government agencies with interests in the marine space. H Versteeg, Pers Comm. 4 May 2016.

1.2.2 The Best Management Practice (BMP) Guidelines

> *"In November 2013 the Marlborough District Council (MDC) and the New Zealand King Salmon Co. Ltd (NZKS) committed to a process to ensure Marlborough develops world-leading salmon farming practices which are environmentally and economically sustainable while making and important social and cultural contribution.*
>
> *This process commenced with a week of intensive meetings and workshops bringing together key figure from industry, regulatory, science providers and Sounds communities to discuss how stakeholders might improve management and understanding of salmon farming in the Marlborough Sounds"*[7]

Two guidance documents resulted from this collaboration -

- Best Management Practice guidelines for salmon farms in the Marlborough Sounds: Benthic environmental quality standards and monitoring protocol (November 2014), and
- Best Management Practice guidelines for salmon farms in the Marlborough Sounds: Operations (November 2015).

The latter document explained transitional expectations in the following way -

> *"Currently there are a range of consent conditions for sites being operated in the Marlborough Sounds. This document represents a significant step towards making these consistent. However, the current operational and legislative environments do not yet allow for a "one size fits all"" approach to farm management and it is important that the older sites in transition remain viable in the meantime.*
>
> *It is acknowledged that some of the existing farms have legacy issues, in that they are not an ideal size or in optimal locations for best practice under current and improved farming practices. The sites granted by the Board of Inquiry will help to resolve this issue, and NZKS will need some time and consideration whilst they align existing and new farms to the BMP guidelines. Consequently, a staged implementation time line for adoption of these BMP guidelines is proposed such that all farms would be compliant by 2024."*

The proposal for potential relocation of certain salmon farms is thus a direct consequence of the BMP guidelines process. Notwithstanding that their existing consents permit their on-going operation for a number of years[8], six existing salmon farms are currently positioned in sites where they would be unlikely to comply with the recently agreed Benthic Guidelines. All these were originally mussel farm sites which were converted to salmon farming.

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7 NZ King Salmon, Sounds Advisory Group and Marlborough District Council, 2015. p.5

8 For Waihinau, Forsyth Bay, Crail Bay (x2) and Otanerau - until December 2024; for Ruakaka - until May 2021. Source MDC Smart Maps, accessed 18 April 2016.

1.3 Structure of this Report

This report contains five further sections -

- Section 2 sets out the approach and methodology adopted for this assessment.

- Section 3 provides background information on the locations of existing NZ King Salmon farms and possible alternative sites and sets out the associated rationale and assumptions used in making this assessment.

- Section 4 provides the briefest cross-referencing to recent descriptive materials relevant to an understanding of the existing social environment in the Marlborough Sounds to avoid unnecessary duplication and to reduce the length of what would otherwise be required in this report.

- Along with several appendices, Section 5 contains the detailed site-specific assessments of certain aspects of potential effects on social wellbeing, with an emphasis on the potential residential amenity effects of salmon farming activities. The analysis includes discussion of cumulative effects and net effects of certain hypothetical relocations (site swaps).

- Section 6 summarises the social implications at the wider community level of possible site relocations.

2 SIA APPROACH AND METHODOLOGY

2.1 Approach and methods

The assessment of social effects reported here aims to build upon and supplement the knowledge base from previous studies. In particular, extensive reference is made to the social impact assessment work undertaken on the Plan Change and associated resource consent applications on behalf of NZ King Salmon (Taylor Baines & Associates, 2012) and the recent case study of salmon farming activities across the Top-of-the South undertaken on behalf of the Ministry of Primary Industries (Baines and Quigley, 2016). Collectively, these two studies involved 90 interviews[9] with key informants throughout the Marlborough Sounds and Marlborough region, and some further interviews[10] have been conducted as part of this assessment.

2.2 Statutory framework for this social assessment

The statutory framework for this assessment is provided by the Resource Management Act 1991 (RMA), with particular reference to sections 5 (objectives) and 7[11] (consideration of amenity values and the quality of the environment).

At the regional level (MDC), the latest Marlborough Resource Management Plan is to be notified, with effectively no change to the status/areas where aquaculture is permitted or prohibited, although these will no longer be referred to as CMZ1 (prohibited) and CMZ2 (permitted).

2.3 Conceptual framework for assessment

For assessing the social effects of salmon-farming operations, particularly the off-site effects that may be experienced within the locality of a working salmon farm, this assessment has drawn upon a conceptual framework for thinking about social wellbeing that has been used by the author in numerous previous RMA-related assessments[12]. This framework points to a consideration of the following aspects -

(i) the quality of neighbourhood and living space, as in residential amenity and physical access;
(ii) personal and public safety, as in navigational risks for small boats;
(iii) opportunities for employment and income, in salmon farming itself and in related businesses;
(iv) opportunities for leisure and recreation;
(v) access to goods and services that might not otherwise be available; and
(vi) influences on participation in community.

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9 46 in Taylor Baines & Associates, 2012 (see Appendix 4), and 44 in Baines and Quigley, 2016 (see Appendix 2).

10 See Appendix A for details

11 For fuller explanation, refer to Taylor Baines & Associates, 2012, Section 2.1 and Appendix 1.

12 For example, Taylor Baines & Associates, 2012 (see Section 2.2).

This social assessment encompasses items (i), (iii), (v) and (vi), but its primary focus is item (i) since residential amenity is particularly and essentially site-specific in nature. Item (ii) is addressed in a separate navigational risk assessment (Navigatus Consulting Limited, 2015) and item (iv) in a separate tourism and recreation assessment (Tourism Resource Consultants, 2016). For the consideration of social effects of employment under item (iii), the framework was elaborated as a result of considering the social benefits of having paid work[13], for the individuals and households involved, and also for the communities in which they live. These have been reported recently for the social effects associated with the existing NZ King Salmon operations in Marlborough[14], thereby expanding the overall scope of assessment beyond the immediate localities of the salmon farms themselves to include wider community-level social effects such as supply-chain business and employment effects and community engagement/investment effects.

Since the proposal being assessed involves nine different possible alternative salmon-farming sites, another dimension of the conceptual framework which is necessary to include concerns the treatment of cumulative effects. For this aspect, the assessment has drawn upon a methodology previously applied to cumulative visual effects assessments[15]. It involves the consideration of three types of cumulative effect -

> (i) *simultaneous cumulative*: effects experienced from more than one salmon-farm site by any single recipient at a single location in one viewing direction;
> (ii) *successive cumulative*: effects experienced from more than one salmon-farm site by any single recipient changing position (viewing direction) at a single location; and
> (iii) *sequential cumulative*: effects experienced from more than one salmon-farm site by recipients in different locations (i.e. shifting between different observation points).

In this case, the potential cumulative effect of several different types of amenity effect simultaneously - related to potentially intrusive odours, potentially intrusive noise and the potential for visual intrusiveness on nearby residential amenity - must also be considered.

The application of cumulative effects assessment for this proposal is somewhat complicated by the fact that 9 alternative 'high-flow' sites are being assessed but only 6 'low-flow' sites are being considered for possible relocation. The cumulative effects assessment must therefore be based on certain explicit assumptions about the number of actual relocations envisaged.

A social impact assessment for a new project might normally be expected to incorporate the potential social effects of the related planning process, and of the construction activities, as well as the operational-phase social effects. Neither the potential planning-phase social effects, nor the construction-phase effects have been assessed in this report for the following reasons. In the case of planning-phase effects, until July 2016 the planning and assessment activities were carried out without the public release of information.

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13 See Quigley and Baines, 2014; Baines and Quigley, 2015 (pp.10-11) and Baines & Quigley 2016 (Tables 2 and 4)

14 Baines & Quigley, 2016 (see Sections 3.2 and 3.4).

15 Baines, J, 2009, paragraph 2.3.4 and Entec UK Ltd, 2008.

In July 2016, the Ministry and the Council convened the Marlborough Salmon Working Group[16] as a consultative body to provide advice on the remainder of the planning and decision-making process. Thus at the time of writing this report, there has been little public release of detailed information about the proposal for possible salmon farm re-locations. As a result, it is simply inappropriate to attempt an assessment of social effects of the planning process at this stage. As regards construction-phase effects, when considering the focus on residential amenity effects as outlined above, it is unlikely that such effects would be greater or markedly different from the operational-phase effects. In some respects[17], they would likely be less. Thus, for the purpose of site comparisons, which is the primary purpose of this assessment, the focus has been on the social effects that would likely occur from permanent occupation of each site by a salmon farm operation rather than the transient construction-phase effects.

2.4 Methods

As in previous social assessment work on aquaculture in the Marlborough Sounds, this assessment has adopted a multi-method approach to gathering information, incorporating -

- visits by boat to all potential alternative sites;
- operational and design information requested from NZ King Salmon;
- mapped information[18] on the location of various activities and infrastructure throughout the Marlborough Sounds;
- interviews with a range of key informants with knowledge of activities in the Marlborough Sounds;
- interviews with property owners in the vicinity of existing salmon farms;
- interviews with property owners in the vicinity of proposed alternative sites; and
- discussion with other experts assessing particular effects of this proposal and reference to their written reports, particularly the Tourism and Recreation Assessment[19].

As explained in Section 2.1 above, this assessment also draws extensively on several previous studies of aquaculture and particularly salmon farming in the Marlborough Sounds, carried out during the past four years.

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16 Membership representing MPI, MDC, DoC, Te Tau Ihu Iwi, Aquaculture NZ, Environmental Defence Society, Marine Farming Association, NZKS, Guardians of the Sounds, Sounds Advisory Group, Kenepuru and Central Sounds Residents Association.

17 Towing an existing salmon farm to an alternative site is not itself without precedent. It would involve vessel movements that are familiar, and no more intrusive than the kind of vessel activity that takes place during harvesting in terms of visual and noise intrusion. Furthermore, construction-phase activity would involve no odour risks associated with farm operation.

18 The recent development by the Marlborough District Council of the Smart Maps facility on its website is a particularly informative source of such information, providing the capability to measure distances between specific locations. See http://maps.marlborough.govt.nz/portal/

19 At the time of writing this draft report, reports in draft had been made available on Navigational Risk, Landscape Assessment and Tourism and Recreational Assessment.

2.5 Scope of assessments

Several layers of assessment are reported here, as follows -

(i) the likelihood of experiencing significant adverse amenity effects associated with each individual alternative site, when considered on its own;
(ii) a comparison of alternative sites with existing salmon-farming sites, each considered on their own;
(iii) illustrative examples of the "net effect" of swapping particular sites (existing for alternative);
(iv) the likelihood of experiencing significant cumulative effects associated with proximity to more than one salmon-farming operation;
(v) the likelihood of changes in the level of wider community social benefits associated with salmon farming, if relocations are permitted, compared with the No-Change scenario.

Comparisons made of likely effects between proposed alternative sites and existing salmon farm operations, are based on consideration of accumulating empirical experience gained from neighbours of existing salmon farms[20], consideration of changes in farm management practices that have occurred in recent years and particularly since the EPA decisions were handed down, and consideration of the principle that *"In granting resource consent for the new salmon farms the decision makers have deemed that the establishment of these farms is in keeping with the intention of the RMA. Consent conditions have been imposed to manage the potential effects on amenity values."*[21]

Mitigation measures against off-site amenity effects that might be additional to those already incorporated in the most recent consent conditions have not been considered in this assessment. The assumption (as stated later in section 3.2) is that the sites are being compared on the basis of the same operational standards[22]. There are only two other possibilities for mitigation: one would be to consider further altering the location of a site itself to move it further away from residential property. This has not been considered since each site is already situated at the point-to-point boundary across the 'entrance' of its bay. The other possibility would involve the purchase of the nearby residential property. Where this is a relevant consideration (as in sections 5.4.4 and 5.4.6) this has been noted.

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20 In addition to the 6 neighbours of existing salmon farms interviewed in 2011 and 2012 as part of the SIA work for the Plan Change and Resource Consent hearing, and the 4 neighbours interviewed in January 2016 as part of the research on Social and Community Effects of Salmon Farming and Rearing across the Top-of-the-South Island, 5 additional neighbours of existing Tory Channel salmon farms were interviewed in July 2016.

21 Section 2.1, p.4 of the Residential Amenity Management Plan required as a condition of the EPA decisions in 2012.

22 It should be noted that the 3 newest farms, established in 2015 and 2016, have an independent Peer Review Panel to review the monitoring reports. H Versteeg, Pers.Comm. 4 May 2016.

3 THE PROPOSAL FOR RELOCATING CERTAIN EXISTING SALMON FARMS

3.1 NZ King Salmon existing operations

At the present time, NZ King Salmon has existing consents to construct and operate salmon farms on 11 sites in the Marlborough Sounds (refer to map on following page) -

- Ruakaka (Queen Charlotte Sound) - established 1985,
- Waihinau Bay (Outer Pelorus) - established 1989;
- Otanerau[23] (East Bay, Outer Queen Charlotte) - established 1990;
- Te Pangu (Tory Channel) - established 1992;
- Forsyth Bay - established 1994 (alternates[24] with Waihinau Bay);
- Clay Point (Tory Channel) - established 2007,
- Crail Bay - two existing farms purchased from Pacifica Salmon in 2011, but not operated since 2011,
- Ngamahau[25] (consented in 2012; became operational in October 2015),
- Waitata (consented in 2012; became operational in January 2016), and
- Richmond (consented in 2012, became operational in May 2016).

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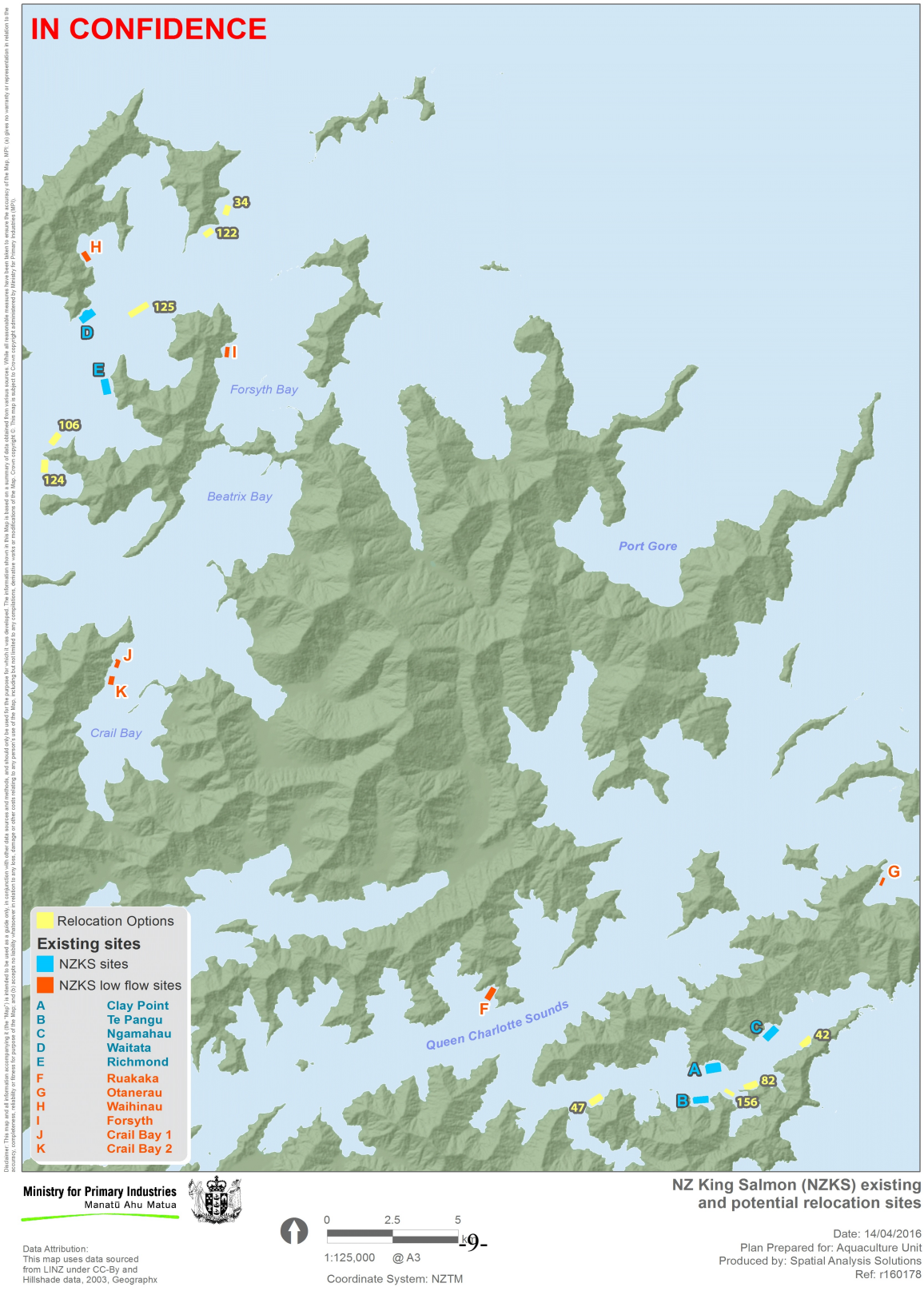
23 Due to relatively warm water temperatures, the salmon farm at Otanerau Bay operates only nine months of the year. During January-March, the Otanerau Bay salmon farm is not farmed.

24 The Waihinau Bay farm was first moved to Forsyth Bay in 1997, returned to Waihinau Bay in 2001, transferred again to Forsyth Bay in 2009 and most recently returned to Waihinau Bay in November 2011.

25 The three sites consented in 2012 as a result of the Board of Inquiry process (Ngamahau, Waitata and Richmond) are required to operate initially at well below maximum production capacity for a minimum of three years. If environmental monitoring results are satisfactory, production is permitted to increase incrementally, with full production capacity not expected for at least 16 years (i.e. 2031/32)

Figure 3.1: Map of existing and possible alternative salmon farm sites



Some salmon farm sites operate in relatively low-flow marine environments[26] which would be unlikely to remain economic[27] in future if required to comply with the agreed Benthic Standards and associated operating protocols. Comparative flowrates are summarised in the following table -

Table 3.1: Comparative flowrates of existing salmon farm sites

"Low-flow" sites		*"High-flow" sites*	
Site location	***Flow (cm/sec)***	***Site location***	***Flow (cm/sec)***
Ruakaka (QC)	3.7	Waitata (Pelorus)	17.6
Otanerau (QC)	6	Richmond (Pelorus)	15.7
Waihinau (Pelorus)	8.4	Clay Point (Tory Channel)	19.6
Forsyth (Pelorus)	3	Te Pangu (Tory Channel)	15
Crail Bay North (Pelorus)	3	Ngamahau (Tory Channel)	21.1
Crail Bay South (Pelorus)	3		

3.2 NZ King Salmon proposal for relocations

No decisions have been taken about which salmon farms might actually be relocated in future. This assessment is but one of a range of assessments exploring the possible merits of relocation, and is intended to inform such decisions. Thus, the findings of this assessment will not be determinative on their own. Rather, these findings will be considered along with the findings of the other assessments, to ensure that all critical perspectives - environmental, social, cultural and economic - influence any decision to relocate a salmon farm.

The following assumptions have been adopted for the purposes of this assessment of potential social effects -

(i) The re-location of salmon farms will not result in any increase in the number of consented salmon farming sites, nor in the total water surface area available to NZ King Salmon for salmon farming.
(ii) NZ King Salmon will surrender the consents for any salmon farm site that is vacated.
(iii) Any re-located salmon farm will be operated in compliance with the BMP Guidelines and Benthic Standards agreed by the Guidelines Working Group, thus providing assurance of the containment of benthic effects within well-defined site-specific zones.
(iv) Relocating an existing salmon farm from a low-flow site to a high-flow site could enable increased production levels at the relocated salmon farming operation so long

26 Comparative flowrate data is taken from Table 10 in Keeley N.B, 2012

27 Current estimates are that historic production levels would have to be reduced by about 60% in order for these sites to comply with the benthic Guidelines. Pers.Comm Mark Gillard, NZ King Salmon Environmental Compliance Manager, 2 May 2016.

as the operation remains compliant with the agreed Benthic Standards.
(v) Relocating existing salmon farms will have no effect on the total number of staff required to operate the farms.
(vi) If overall salmon production increased as a result of salmon farm relocations (assumption (iv)), this may result in an increase in staff numbers for processing and service supply-chain companies.
(vii) Establishment of a salmon processing plant in Picton will not be considered unless and until total salmon production coming across the wharves in Picton and Havelock reaches at least 15,000 tonnes/year.
(viii) Changes in salmon farm design will be adopted in new generation farms. Some will utilise circular cages with no barges attached permanently - i.e. no accommodation at the site, while others will utilise the more familiar rectangular cages, although with fewer/larger steel cages.
(ix) Changes in farm operations have also occurred since the EPA Board of Inquiry decision. These include -

- fewer staff overnighting on farms;
- greater use of underwater net cleaning, resulting in less frequent lifting of nets for cleaning;

(x) Any relocated salmon farms will be operated to the same standards as the most recently consented farms, indicating the same degree of mitigation effort against off-site amenity effects.

It is not assumed that all alternative sites will be either acceptable - across the full range of effects assessments - or needed.

4 EXISTING SOCIAL ENVIRONMENT

The existing social environment which provides the backdrop for this assessment has been the subject of several recent assessments reported previously. This extensive description will not be repeated here, but can be found at pp.12-29 of Taylor Baines & Associates (2012) and updated at pp. 78-84 of Baines and Quigley (2016).

More localised site-specific observations of settings in the localities of the proposed alternative sites will be summarised in Section 5 of this report, based on observations during site visits and subsequent interviews.

5 ASSESSMENT OF SITE-SPECIFIC SOCIAL EFFECTS

5.1 Scope of site-specific assessments

Previous assessments identified concerns about the long-term environmental and ecological sustainability of salmon farming activities expressed by numerous people[28]. Indeed, the universal expression of interest in this issue reflects the importance attached to maintaining environmental quality not simply because of its immediate amenity effects, but also because of the potential consequences for many other parties, including residents of the Sounds, commercial and recreational fishers, tourism operators, those who enjoy sea-based recreation in the Sounds and the ecological legacy for future generations if water quality and ecological health are not maintained at high standards.

In pursuit of better environmental outcomes, an interest in identifying relatively high-flow sites that would better support environmentally-compliant salmon-farming operations essentially means a focus on two locations in the Marlborough Sounds - Waitata Reach and Tory Channel. The report therefore discusses site-specific effects in these two groups.

The focus in this section of the assessment report is primarily on the potential for adverse effects on residential amenity values for people who live permanently in the Sounds or visit the Sounds on occasions, either as bach owners or visitors to one of the lodges.

5.2 The focus of site-specific assessments of amenity effects

Previous assessments identified clearly a range of social issues and potential adverse effects which have been experienced in the past[29]. A number of these social issues have been addressed in the past, with conditions in the EPA decision that reinforce the necessary changes in farm management procedures required for compliance. Risks to personal safety from the use of firearms to control seagulls, and the social effects of elevated shark numbers come into this category. Consequently, this assessment at the site-specific level focuses on the likelihood of visual, noise and odour intrusion as well as the potential for wildlife nuisances and shoreline solid waste effects.

5.2.1 Off-site visual, noise and odour effects

Assessing the likelihood of adverse residential amenity effects is based on an analysis of separation distances, with a particular focus on residential dwellings which have direct line of sight to any salmon farm or alternative site. In situations where an alternative site is proposed in close proximity to a residential dwelling[30], immediate neighbours have been interviewed in order to gain an understanding of the local circumstances. The benchmark estimates of minimum separation distances required to reduce the likelihood of adverse

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28 See Taylor Baines & Associates, 2012, section 5.3, p.31.

29 Ibid. p.32

30 Within 500m (e.g. alternative sites #47 and #82).

effects from salmon-farming operations on residential amenity reflect land-based experience, not sea-level, water-based experience[31]. As previously reported[32], the salient conclusions from those interviews can be summarised as follows -

- regarding potential effects on residential visual amenity: at 1.5-2.0km a salmon farm is no longer an intrusive visual element, and at 3km it is "barely noticeable";

- regarding potential effects on residential noise amenity: beyond 700-1,000m in direct line of sight, a salmon farm is no longer an intrusive element in the residential noise environment; however, intervening land will generally provide an effective barrier;

- regarding potential effects on residential amenity from unpleasant odours: beyond 700m off-site odour from a salmon farm is unlikely to be an intrusive element in the residential odour environment, and intervening land does not necessarily provide an effective barrier at these close quarters although it may reduce the level of intrusiveness.

The above conclusions were derived originally from neighbour interviews conducted in 2011 and 2012. The two subsequent series of neighbour interviews (January 2016 and July 2016)[33] have confirmed the validity of these conclusions for the purposes of the assessment reported here. It is also important to acknowledge that these follow-up interviews also endorsed the widely held value associated with maintaining the environmental integrity of the benthic ecology.

When considering the potential 'catchment' of residential dwellings that might be subject to visually intrusive effects, experts conducting landscape and visual effects assessments generally adopt explicit scales of separation distance in relation to assessed effects. In the case of expert visual effects assessments in the Marlborough Sounds - in contrast to the empirical social assessments reported above - somewhat greater separation distances have been allowed for, as shown in the following table provided by Boffa Miskell (2011)[34] to the EPA Board of Inquiry.

Table 5.1: Visibility from land-based viewpoints by separation distance

Distance	0-1km	1-2.5km	2.5-5km	5 km and beyond
Visibility	Dominant	Prominent	Visible	Partially visible or minor part of view.

31 In other words, the estimates are based on interviews with farm neighbours which discussed their experiences from their property, and specifically from the vicinity of their dwelling.

32 Taylor Baines & Associates, 2012, pp.43-44 and Appendix 5.

33 Refer Appendix A.

34 Resource and Environmental Management Ltd, 2014, p.7.

As will be discussed later in this report, the difference between the two spatial scales merely confirms and reinforces the distinction that off-site visual effects are likely to be experienced at greater separation distances than off-site noise or odour effects. For the purposes of quantified comparisons of cumulative amenity effects between sites, reported later in this document, both scales have been referred to[35]. The differences indicate the significance of concentrating on smaller or larger visual catchments.

5.2.2 Social amenity effects from wildlife nuisances

There is no dispute that seagulls and seals are all part of the normal ecology of the Sounds. The mere presence of these creatures in the neighbourhood environments of Sounds residents is not in itself a cause for any significant social effect. Potential social effects arise when particular activities such as marine farming alter the behavioural patterns of wildlife species in such a way as to create a nuisance which did not exist previously. Furthermore, their presence at a salmon farm is not in itself the cause of an adverse, off-site social effect; rather it is the potential for seals in exceptional numbers to spill over into adjacent areas such as rocky headlands frequented by local residents or neighbouring landowners, or for seagulls in exceptional numbers to roost on nearby jetties.

The social effects which have in the past been reported by neighbours of existing salmon farms are specific: (a) the significant nuisance to property owners with jetties caused by large concentrations of seagulls congregating on jetties and fouling them, resulting in extra work and reduced utility, and (b) the effect of seals colonising areas of the rocky shore which are currently used by neighbouring residents, and thereby deterring future use by their potentially aggressive behaviour.

Separation distance is one factor that will influence the likelihood and level of potential risk of such adverse social effects. However, because these effects are associated with ecological behaviours and not purely physical phenomena (as in the case of visual, noise and odour effects), there is greater uncertainty in identifying spatial thresholds. The natural behaviour of fur seals is to establish haul-out areas on rocky shorelines as close as possible to their food source[36]. Similar behaviour can be expected for seabirds in relation to roosting sites such as jetties.

Another factor which will influence the likelihood and level of potential risk (or sensitivity to this risk) is the established patterns of use of the land by neighbouring residents, a factor which will be different in each case and particular to each locality. This issue was explored in interviews with potentially close neighbours

5.2.3 Social amenity effects from accumulated solid waste on nearby shorelines

When solid waste material, mainly in the form of ropes and a variety of plastic items, accumulates along the shoreline and on the beaches, it detracts from the enjoyment of those

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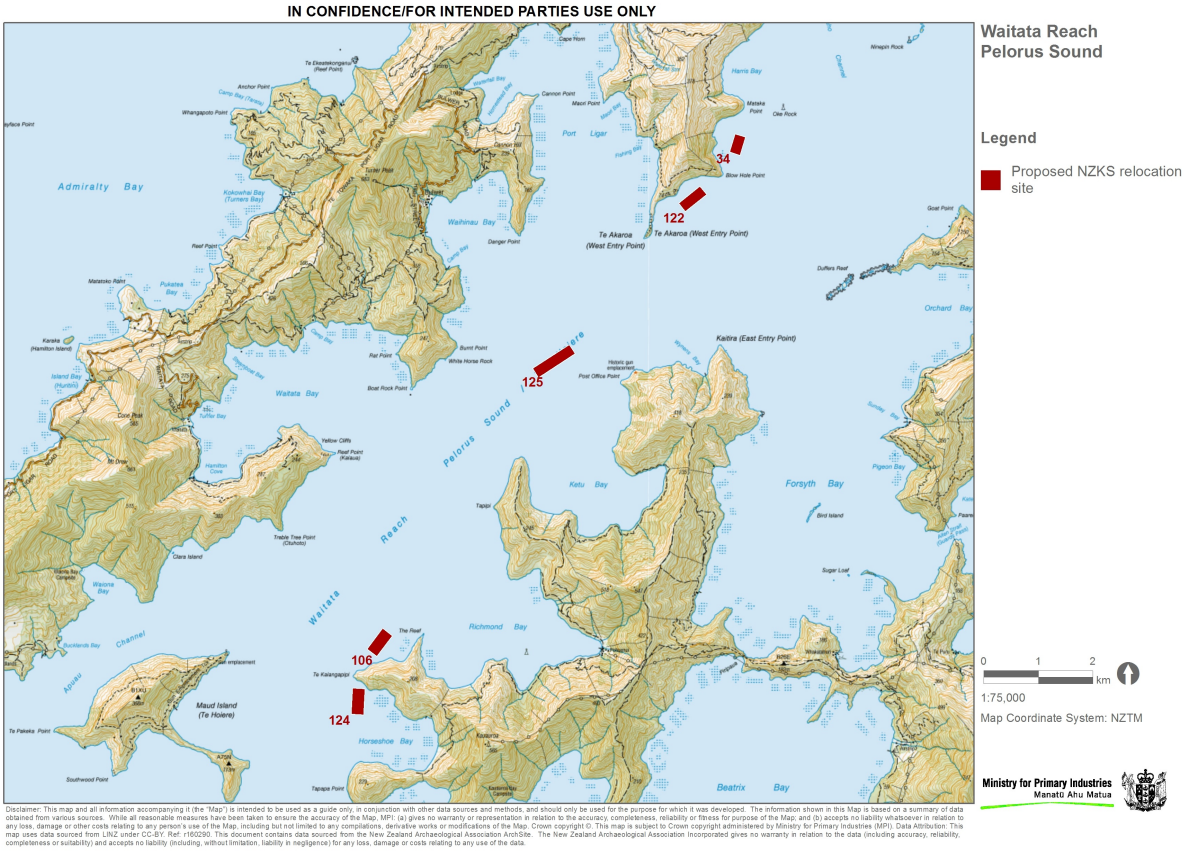
35 Refer Appendix B.

36 Pers.Comm. MW Cawthorn. 30 September 2011.

Figure 5.1: Locations of potential alternative sites - Waitata Reach



places and is also often viewed as a symptom of potential ecological harm to marine species.

There is little dispute that solid waste from marine farming activities and other activities[37] does accumulate over time along the shorelines around the Sounds. While most observers interviewed previously expressed the view that salmon farming is generally not the predominant contributor, there was also a consensus that salmon farming activities cannot be completely exonerated as one source of the solid waste, being located in marine environments which from time to time are subject to extremely hostile weather conditions.

Previous interviews with salmon farm managers did indicate some variation in the levels of effort devoted to beach clean ups at the various existing farm sites.

37 e.g. passing recreational boaties, yachties, ferry passengers, mussel farms.

5.3 The Waitata Reach group

5.3.1 Overview of alternative site locations

The Waitata Reach group proposed as possible alternative sites involve five locations spread across the full 12km length of Waitata Reach as shown in Figure 5.1 on the following page.

At the northern extremity are two sites - named North Blowhole Point and Blowhole Point - for each of which three circular cages would be used. Some 3km south, in the centre of the Reach is a single site for which five circular cages would be used and no barge would be attached permanently. About 6.5km further south, at the south end of Richmond Bay is a single site for which rectangular steel cages would be used and a barge attached, with another alternative site more than 1km further south in Horseshoe Bay, for which a similar rectangular structure and barge would used.

5.3.2 Existing social environment in Waitata Reach

The description presented here is drawn from assessment work initiated in 2012 and updated in 2015. Further detailed site-specific observations are provided in the subsequent sections for each site.

Land ownership and land/water use adjacent

Land cover adjacent to Waitata Reach differs markedly between the eastern and western sides.

Two of the possible alternative sites (Richmond Bay South and Horseshoe Bay) are located adjacent to privately-owned Pohuenui Station which forms the entire eastern shoreline of Waitata Reach. The land adjacent to each site and generally covered in low-level re-generating bush rises steeply, obscuring landward views of the sites from most locations on Pohuenui Station itself. Pohuenui Station, which still carries 2,200 head of sheep, remains a working farm, with large areas of open grassland. All access is via boat, and barges are used to transfer stock and wool, or farm vehicles for maintenance. The station manager's dwelling is situated at the head of Richmond Bay, as is an accommodation lodge frequented by people[38] interested in pig hunting, fishing, walking and cycling and enjoying the relatively remote environment. The farm has a network of some 80km of tracks suitable for driving, walking or cycling. The coastline around Pohuenui Station hosts mussel farms in every major embayment[39] except Ketu Bay. Further north, near Duffers Reef, about seven mussel farms are situated in Orchard Bay at the northern end of Forsyth Island[40].

In contrast to the farming focus of the eastern side of Waitata Reach, the western side has a predominantly conservation focus. In 2012, Waihinau Bay had three permanent households

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38 Reported by the manager as numbering overall about 1200-1300 bed nights per annum

39 Beatrix Bay (13), Kauauroa Bay (10), Horseshoe Bay (10), Richmond Bay (3), Forsyth Bay (15).

40 See Figure A1 of Graphic Attachment One prepared by Boffa Miskell Limited as part of the Landscape Report.

involved in eco-tourism or short-stay accommodation as well as several holiday homes. Interviewing in 2015 revealed a reduction in the number of permanent residents resulting from children having grown up and left home and failure of the Wildlife Lodge to become established, resulting in its sale. The principal cause of reduced visitor numbers to the rental accommodation was the imposition of the cod bans and other cod fishing controls - *"a huge effect on our tourism numbers, between September and December when there is a total ban in this part of the Sounds."*

Waitata Bay, and the various smaller embayments within it, has numerous holiday homes dotted around the shoreline. Above the southern entrance to Waitata Bay, just south of Reef Point, is an eco-tourism venture associated with the Tui Nature Reserve. This enterprise, which began over 20 years ago, provides visitor accommodation within the area of its own biodiversity project[41], which attracts both tourists to stay and scientists engaged in environmental research. Its owners also provide eco boat tours based around the Waitata Reach with activities based around the gannet colony in Beatrix Bay, the king shag colony on Duffers Reef, Maud Island, and Duncan Bay and Elaine Bay in Tennyson Inlet. There are also blue penguins and shag colonies near the Tui Nature Reserve itself.

Data on the District Council's Smart Maps website indicates that the coastline in Waihinau Bay currently hosts 9 mussel farms, while Waitata Bay hosts 14 mussel farms and Port Ligar a further 20 mussel farms. Many of these mussel farms have in the past been associated with adjacent land ownership. An application is currently before council to renew existing resource consents three marine farm sites located along the shoreline below the Tui Nature Reserve between Reef Point and Treble Tree Point. The remaining western coastline of Waitata Reach to beyond Maud Island remains devoid of aquaculture. . The Landscape Report[42] prepared for the 2012 EPA hearing described the cultural patterns present along this western side of the reach in terms of *"scattered dwellings, jetties and mussel farms"*, notes the *"visible network of tracks across the slopes"*, and observes that while Port Ligar *"has retained large tracks of pastoral activity, the upper slopes of Waitata and Waihinau Bays are largely characterised by the regeneration of native bush and shrublands."*

Trends in overall resident population

In the non-urban parts of the Sounds, the usually resident population has fluctuated over the past decade and a half, but with an overall downward trend, falling 18 percent between 1996 and 2013. However the pattern was not uniform throughout. In the Outer Sounds, the resident population declined by 33 percent over this period , while in Inner Sounds the resident population declined by 11 percent over the same period . A point of difference in permanent population trends has emerged in the Inner Sounds, between Queen Charlotte Sound (8 percent increase between 1996 and 2013 from 336 to 363) and Pelorus, Mahau and Kenepuru Sounds (23 percent decrease between 1996 and 2013, from 546 to 420). The growth in Queen Charlotte Sound is likely to have been associated with servicing increased visitor numbers to the Queen Charlotte Track.

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41 Restoration and re-introduction of native flora and fauna species and associated ecological research activities.

42 At p.31.

Dwellings in vicinity and in direct line of sight of an alternative site

With the exception of dwellings in the Tui Nature Reserve, all dwellings which have views out into Waitata Reach are located close to the heads of the bays which surround the Reach, meaning that relatively few existing dwellings[43] will have direct lines of sight to these proposed sites. As the data below show, the possible alternative sites in Waitata Reach all have separation distances of 3.2km or more to the nearest dwellings with direct lines of sight.

Distinctive locations/destinations nearby

At the southern end of Waitata Reach, more at least 3.4km from the nearest alternative site proposed is Maud Island, a Restricted Access Reserve - for scientific and species protection administered by the Department of Conservation. All visitors require permits, and must demonstrate some degree of benefit to the purposes of the reserve[44], which is predator-free. Visitors[45] tend to do voluntary work such as weed control and ecological monitoring, and schools visits are limited to no more than 4 school parties per year[46] from nearby schools in the District. Representatives from other groups wanting to establish off-shore reserves also visit to learn about how to do this. Maud Island has one resident staff household - a couple with two children, who live on the island for 9 months of the year. There is one staff dwelling and one lodge for visitors. Overall, typically 100-150 individuals visit the island each year, including school parties.

To summarise the commercial accommodation available along the Waitata Reach, various kinds exist - in the Tui Nature Reserve, Richmond Bay (Pohuenui Nature Resort), and Waihinau Bay (motels).

5.3.3 Sites 34 and 122 - adjacent Blowhole Point

As the name suggests, site 34 (North Blowhole Point) is located 400m north of Blowhole Point, on the western side of the entrance to Waitata Reach, while site 122 is located 250m southwest of Blowhole Point.

As noted by Hudson[47], the bay and adjacent hill-slopes behind site 34 are east-facing, and the bay is fully exposed to the open sea. The coastal edge here is abrupt and rocky, with slopes rising steeply behind the bay. Vegetation is highly modified, and comprises large areas of plantation forestry and pasture, and some early-stage regenerating indigenous vegetation. There are some wilding pines spreading out from the plantation area. Exposure

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43 Four in Waitata Bay (Camp Bay) plus the dwellings previously described in Waihinau Bay.

44 Which has several rare terrestrial species - parrot, frogs, weavels, weta, ...

45 All visitors, contractors and staff must pass through strict quarantine protocols, involving passing through a sanitised room, searching equipment, food and clothing for pathogens, exogenous seed sources, etc - typically a 2-hour process.

46 Typically involving 20-25 students and accompanying adults, staying for one or two nights during a 2-week period in Term 1.

47 Hudson Associztes, 2016. pp.24 and 49.

and maritime influence is extreme. The slopes of Te Akaroa behind the proposed site 122 rise steeply from the coastal edge, which is rocky with a narrow strip of beach at low tide. Slopes adjacent to the site are almost unmodified – a track is visible extending west-east horizontally across Te Akaroa headland behind the proposed site.

Both embayments have several existing mussel farms already established adjacent to the proposed alternative sites. While the surface structures that would apply to site 34 are located just outside the headland-to-headland line, those for site 122 are located within the corresponding headland-to-headland line. As a result, there are no dwellings within Waitata Reach that could possibly have a direct line of sight of a salmon farm at either of these alternative sites. Indeed, the only dwellings with direct line of sight are on Forsyth Island, at a distance of more than 5km. Dwellings on the adjacent farming property and its neighbouring farming property are well masked from views and in any case are located at distances of 3.9km and 4.3km respectively.

The adjacent property, Te Kopi farm, still operates as a farm[48]. At the present time, a mature stand of pine trees covers much of the hillside on the steep land adjacent to both sites. Pine trees also cover the southernmost 400m of Te Akaroa Point, ensuring no visual connection between site 122 and dwellings in Waitata Reach[49].

Several rocky points exist within the immediate vicinity of both sites, providing potential haul-out points for seals that are remote from any dwellings, and the nearest jetties are some 4km away.

Separation distances to dwellings with direct line of sight and the closest dwellings that do not have direct line of sight are summarised in the following table.

[48] Sheep were seen grazing the hillside immediately above site 34 during the site visit on 2 May 2016.

[49] Even if this were not the case, the nearest dwelling would be at a distance of some 9km.

Table 5.3 : Separation distances to nearest residential dwellings - Blowhole Point sites

Site	Separation distances between dwellings and nearest part of surface structure	Description
For dwellings WITH direct line of sight		
#34 - North Blowhole Point	5.4-5.8km	1 dwelling + 1 lodge on Forsyth Island, eastern side of Forsyth Bay
#122 - Blowhole Point	5.3-5.7km	1 dwelling + 1 lodge on Forsyth Island, eastern side of Forsyth Bay
For dwellings with NO direct line of sight		
#34 - North Blowhole Point	3.9-4.3km 4.6km 5.1km 5.5-5.8km	2 dwellings at north end of Port Ligar 1 dwelling on northern side of Waihinau Bay Lodge on western side of Port Ligar ~10 dwellings, including motel cabins on western side of Waihinau Bay
#122 - Blowhole Point	4.1-4.2km 3.9km 4.6km 4.7km	2 dwellings at north end of Port Ligar 1 dwelling on northern side of Waihinau Bay Lodge on western side of Port Ligar ~10 dwellings, including motel cabins on western side of Waihinau Bay

Taking into account neighbours' experiences of existing salmon farming operations and the contextual considerations summarised above, this assessment makes the following provisional findings -

Table 5.4: Summary of potential effects on residential amenity - Blowhole Point sites

Site	Distance to nearest dwelling with direct LoS	Visual effects	Noise effects	Odour effects	Wildlife nuisance effects	Shoreline solid waste effects
#34 - North Blowhole Point	5.4km	negligible	nil	nil	negligible	nil
#122 - Blowhole Point	5.3km	negligible	nil	nil	negligible	nil

5.3.4 Site 125 - Waitata Reach

Site 125 (Waitata Reach) is located out in the middle of the Reach, at distances of 1.2km from Post Office Point at the entrance to Ketu Bay and 2.3km from Danger Point at the entrance to Waihinau Bay. The setting here is essentially maritime in nature. The character of land use on the nearest landfalls has been described previously in section 5.3.2 above. The closest rocky points are on the eastern side of the Reach, well away from any dwellings, while the closest jetties are in Waihinau Bay, some 3.2km distant.

Table 5.5 : Separation distances to nearest residential dwellings - Central Waitata Reach

Site	Separation distances between dwellings and nearest part of surface structure	Description
For dwellings WITH direct line of sight		
#125 - Waitata Reach	3.2-3.5km 3.5km 4.8km 5.7-6.1km 6.4km	~10 dwellings, including motel cabins on western side of Waihinau Bay 1 dwelling on northern side of Waihinau Bay Eco-lodge (Tui Nature Reserve) + dwelling - elevated site 2 dwellings at north end of Port Ligar 1 dwelling at southern end of Waitata Bay
For dwellings with NO direct line of sight		
#125 - Waitata Reach	3.0-3.2km 5.3km 9.0km	2 dwellings at northern end of Waitata Bay (Others at greater distances) 2 dwellings at head of Richmond Bay 2 dwellings on Maud Island (1 dwelling; 1 lodge)

Any issues to do with navigational safety are addressed in the navigational risk assessment report. A salmon farm on this site would not have a barge attached permanently. In terms of the potential effects on residential amenity, the separation distances suggest these will generally be experienced as negligible when the site is considered on its own. Since the site would be exposed to extreme weather from any quarter in such an exposed location, the risk of debris being generated occasionally might be somewhat greater than in other locations. However, the likelihood of such solid waste material arriving at any particular shoreline is conversely mitigated by the distances involved.

Table 5.6 : Summary of potential effects on residential amenity - Central Waitata Reach

Site	Distance to nearest dwelling with direct LoS	Visual effects	Noise effects	Odour effects	Wildlife nuisance effects	Shoreline solid waste effects
#125 - Waitata Reach	3.2km	minor	negligible	nil	negligible	negligible

5.3.5 Site 106 - Richmond Bay South

Site 106 (Richmond Bay South) is located approximately 600m west of The Reef (headland) at the southern entrance to Richmond Bay, adjacent to a mussel farm in the same embayment, and inside the headland-to-headland line for Richmond Bay. As Hudson notes[50], the headland slopes are fairly extensively covered with coastal scrubland regeneration. There are small areas of pasture remaining on the top of the headland to the south, and vegetation is bare in parts, although there are a few wilding pines on the southern-most slopes. There do not appear to be any tracks leading into this particular embayment, suggesting it is not much used for the land-based recreation that takes place on the farm. The closest dwellings are between 3.5km and 3.9km distant, including the Tui Nature Reserve at an elevated site on the western side of the Reach.

Table 5.7: Separation distances to nearest residential dwellings - Richmond Bay South

Site	Separation distances between dwellings and nearest part of surface structure	Description
For dwellings WITH direct line of sight		
#106 - Richmond Bay South	3.5km 3.9km 5.7-5.8km 5.8km	Eco-lodge (Tui Nature Reserve) + dwelling - elevated site 2 dwellings on Maud Island (1 dwelling; 1 lodge) 4 dwellings at northern end of Waitata Bay Cluster of dwellings south of Waiona Bay, opposite Maud Island
For dwellings with NO direct line of sight		
#106 - Richmond Bay South	1.4km 3.9km	1 dwelling on north side of Horseshoe Bay 2 dwellings at the head of Richmond Bay (1 lodge + 1 dwelling)

Several rocky points are within 600m of the site, but the nearest jetty is almost 1.5km away in Horseshoe Bay, suggesting that the risk of wildlife nuisances would be negligible. Taking into account neighbours' experiences of existing salmon farming operations and the contextual considerations summarised above, this assessment makes the following provisional findings -

Table 5.8: Summary of potential effects on residential amenity - Richmond Bay South

Site	Distance to nearest dwelling with direct LoS	Visual effects	Noise effects	Odour effects	Wildlife nuisance effects	Shoreline solid waste effects
#106 - Richmond Bay South	3.5km	minor	negligible	nil	negligible	negligible

[50] Hudson Associates, 2016. p.34

5.3.6 Site 124 - Horseshoe Bay

Site 124 (Horseshoe Bay) is located within Horseshoe Bay[51], which also hosts 10 existing mussel farms. Few dwellings have direct line of sight; the nearest being the visitor lodge and staff house on Maud Island at a distance of 3.4km.

Table 5.9: Separation distances to nearest residential dwellings - Horseshoe Bay site

Site	Separation distances between dwellings and nearest part of surface structure	Description
For dwellings WITH direct line of sight		
#124 - Horseshoe Bay	3.4km 4.2km	2 dwellings on Maud Island (1 dwelling; 1 lodge) Eco-lodge (Tui Nature Reserve) + dwelling - elevated siite
For dwellings with NO direct line of sight		
#124 - Horseshoe Bay	1.0km 4.5km 5.6km	1 dwelling on north side of Horseshoe Bay 2 dwellings at head of Richmond Bay Cluster of dwellings south of Waiona Bay, opposite Maud Island

As Hudson notes[52], the south-facing side of the headland has moderately steep slopes above a coastal edge which is rocky and abrupt in some places, but also has stretches of narrow beach. Thus the backdrop to the site is similar in visual character to that of Site 106 (Richmond Bay South) with numerous rocky points nearby at distances between 350m and 600m, and the nearest jetty some 1.2km away near the head of Horseshoe Bay. The proximity of this concentration of marine farms to the dwelling and foreshore in Horseshoe Bay means that some solid waste is likely to arrive on the foreshore from time to, although it is less likely to come from a salmon farm than from mussel farms, because the former are permanently staffed while the latter are visited only occasionally. Furthermore, staff are in a position to monitor the shoreline periodically and take remedial action if necessary.

Table 5.10: Summary of potential effects on residential amenity - Horseshoe Bay site

Site	Distance to nearest dwelling with direct LoS	Visual effects	Noise effects	Odour effects	Wildlife nuisance effects	Shoreline solid waste effects
#124 - Horseshoe Bay	3.4km	minor	negligible	nil	negligible	minor

[51] Inside the headland-to-headland line.

[52] Hudson Associates, 2016. p54.

5.3.7 Comparison of existing and alternative sites

The previous sections (5.3.3 to 5.3.6) have provided qualitative assessments in RMA terms for each possible alternative site in the Waitata Reach on an individual basis[53].

Before contemplating the next two steps in the assessment of social effects - the cumulative effects of multiple sites and the net effects of specific re-locations or site swaps - it is instructive to attempt a semi-quantitative[54] comparison of all existing salmon farms in Waitata Reach with all the alternative sites in Waitata Reach.

For the purposes of such a semi-quantitative comparison, it is accepted that the existence and the operation of a salmon farm will inevitably create some loss of residential amenity value at places where people live or visit for holidays that are in close proximity to the salmon farm - too close, and the loss of amenity value will be experienced as unacceptable, but the degree of amenity loss diminishes with increasing distance.

The method adopted here is to allocate negative scores to amenity loss in direct relation to separation distance, such that the negative score decreases with increasing separation distance. Furthermore, since residential amenity can be influenced by several factors acting simultaneously (visual presence, the potential for intrusive noise and the potential for intrusive odours), this method allows for quantifying such contemporaneous effects cumulatively while also taking into account the fact that each factor's influence will decay over different separation distances - visual effects are likely to be experienced as intrusive over a much wider area than noise or odour effects. To achieve a semi-quantitative comparison, the negative scores for each band of separation distance are multiplied by the number of independent dwellings present within the same band of separation distance and the results added for each band to determine an overall score for a site. The details are set out fully in Appendix B.

The results of this semi-quantitative comparison of off-site amenity effects for all sites in the Waitata Reach (existing and alternative) are shown graphically in the following bar chart.

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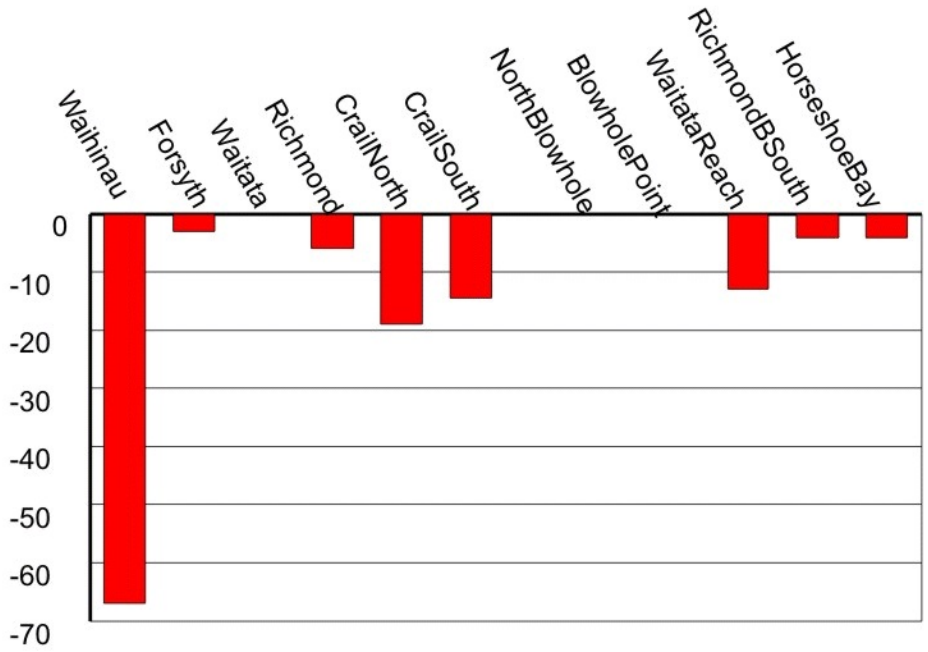
[53] i.e. ignoring the presence of any other salmon farms within Waitata Reach, either existing or alternative.

[54] "Semi-quantitative" in the sense that the assessor generates comparative scores for which the absolute quantitative numbers have no meaning when considered individually.

Figure 5.2: Semi-quantitative comparison of off-site amenity effects for Waitata Reach sites



This summary, in conjunction with the corresponding tabulated scores presented in Appendix B, can be used as the basis for several conclusions about the relative merits of each site, with respect to residential amenity considerations only -

- the recently consented Waitata and Richmond sites generate nil and negligible loss of residential amenity respectively because of their relative remoteness; for the Richmond site, the assessed effect is associated simply with relatively long-distance visual effect for five residential properties;
- given the number of dwellings at relatively close quarters to the existing Waihinau site, the assessed effect is substantially greater than at any other site and is associated with relatively close-range odour, noise and visual effects combined;
- the existing Crail Bay North and Crail Bay South sites would[55] also experience amenity loss resulting from the combination of intrusive odour, noise and visual effects at relatively close quarters, although the numbers of residential properties potentially affected are substantially fewer than at the Waihinau site;
- the two alternative sites either side of Blowhole Point at the northern entrance to Waitata Reach generate nil loss of residential amenity because of their remoteness;
- further south, within the Reach, any potential loss of residential amenity attributed to Richmond Bay South and Horseshoe Bay is associated simply with relatively long-

[55] Recall that since these two sites were purchased by NZ King Salmon in 2010 they have been de-commissioned and therefore not actually in operation. The amenity reductions assessed are those that would be likely to occur if these consented sites were to be re-activated by NZ King Salmon.

distance visual effect for four residential properties;
- the location of the Waitata Reach site itself (#125), although at considerable distance, has long-distance sight lines to thirteen residential properties, and therefore is assessed as potentially generating more residential amenity loss than the Richmond Bay South or Horseshoe Bay sites;

It should be remembered that these comparisons assume the same standard of operation at each site, both in terms of design and operational practices, when in fact the off-site amenity effects from new salmon farms are likely to be less than from existing farms, particularly older farms. This introduces an element of conservatism to some comparisons.

5.3.8 Assessment of cumulative effects of multiple sites

As described in section 2.3, three types of cumulative effect are differentiated: simultaneous, successive and sequential.

Even though no decisions have been taken regarding possible relocations of existing salmon farms, in order to assess the potential for cumulative effects, it has been assumed that all potential alternative sites in Waitata Reach could in future be occupied by salmon farms re-located from elsewhere.

Under this scenario, it is estimated that a maximum number of ten existing residential properties (including 13 existing residential dwellings or lodges) would have direct line of sight to more than one site (existing and/or alternative). For dwellings or lodges in this category, the minimum distance to a salmon farm site would be 3.4km and the maximum distance would be 9.6km. While longer-distance views are more likely to be simultaneously cumulative, some of the shortest views would be successively cumulative rather than simultaneously cumulative.

For eight of these properties (including 9 dwellings) two[56] out of the five alternative and four existing sites would be involved at distances between 4.1km and 9.6km. At these distances, the cumulative visual effects are assessed as negligible, even where they are simultaneously visible.

One other property, involving the Department of Conservation house and lodge on Maud Island would have direct line of sight of three sites, at distances of 3.4km, 3.9km and 6.4km. The furthest of these is assessed as having negligible visual effect, while the two closer sites, when compared with other existing situations[57], is assessed as having little more than negligible effect.

The one remaining property, Tui Nature Reserve, occupies a prominent elevated site on the western side of Waitata Reach. This property, with a lodge and a dwelling having views to

[56] Not always the same two sites.

[57] For example, the situation in Te Pangu Bay with the Clay Point farm and the recently re-consented Te Pangu farm.

the north and east[58], would potentially have direct line of sight (from the residences) of four existing farms or alternative sites, at distances of 3.5km to 4.8km, although no more than two sites are likely to be viewed simultaneously[59]. Furthermore, there may be locations on the Tui Nature Reserve property where three sites could be visible successively[60]. The potential visual effect on this property would therefore be greater than on any other property in this part of the Sounds.

The 2012 Board of Inquiry expressed its concerns about the cumulative visual effects of multiple salmon farming sites in the Waitata Reach. However, the five sites proposed for that Board's consideration were all located in a relatively concentrated area[61] towards the northern end of the Reach, affording the possibility of simultaneously cumulative views of three or four sites and the certainty of successively cumulative views of five sites within the area. That Board granted consents for two of the sites - Waitata[62] and Richmond. When compared with the alternative sites, which span 12km of Waitata Reach, from Blowhole Point in the north to Horseshoe Bay in the south, the cumulative visual effect would seem somewhat less. However, given the Board's determination[63] that *"from a visual and aesthetic point of view the two most prominent farms of Kaitira and Tapipi are the defining element of the decisive cumulative effect"* and the conclusion in section 5.3.7 above that *"the location of the Waitata Reach site itself (#125), although at considerable distance, has long-distance sight lines to thirteen residential properties, and therefore is assessed as potentially generating more residential amenity loss than the Richmond Bay South or Horseshoe Bay sites"*, it is logical to conclude that, if any of the five alternative sites in the Waitata Reach is likely to generate more than minor adverse cumulative visual effects, it is the Waitata Reach site (#125) itself.

5.3.9 Assessments of net effects of specific re-locations

With reference to the comparison of existing and alternative sites described in section 5.3.7 above, the greatest reductions in adverse residential amenity effects in the Waitata Reach would arise from relocating the Waihinau and the two Crail Bay salmon farms. On an individual basis, relocating these three salmon farms to any of the alternative sites in the Waitata Reach would result in a net improvement in residential amenity. Because of the separation distances involved, these relocations would also confer significant absolute

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58 These are provisional conclusions, based on assessment work in 2012, a visual simulation from the Tui Nature Reserve lodge prepared by Boffa Miskell for the EPA hearing in 2012, and the water-based visit to Waitata Reach sites on 2 May 2016.

59 For example, Waitata Reach + Richmond, or Richmond + Richmond Bay South, or Richmond Bay South + Horseshoe Bay.

60 Waitata, Waitata Reach and Richmond.

61 An area of sea estimated at 6.3sq.km and spanning less than 5km of the length of the Waitata Reach.

62 Note that the Waitata salmon farm does not appear to be directly visible from the residential buildings on the Tui Nature Reserve - as observed from the Waitata salmon farm itself (2 May 2016).

63 At paragraph 712(a) of the Board's Decision

improvements in residential amenity experienced by the occupants of up to 13 residential properties in the Waitata Reach area.

Whist the adverse residential amenity effects of the existing Forsyth Bay salmon farm are already minimal because of its remote location, two of the alternative sites (#34 North Blowhole Point and #122 Blowhole Point) have even less potential for adverse effects.

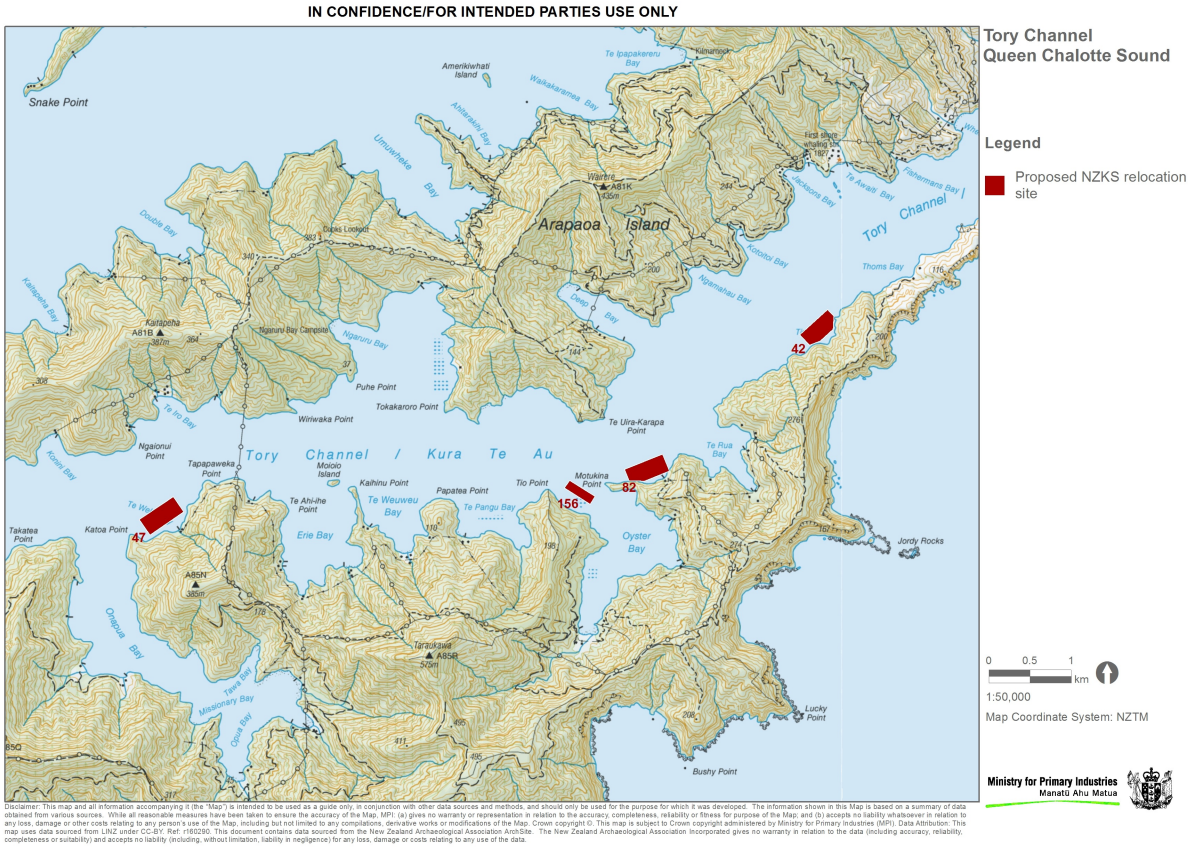
In the zone most critical for residential amenity issues, these relocations would achieve a situation where no salmon farms would operate within 1km of a residential dwelling, whilst also enabling full future compliance with the agreed benthic standards.

5.4 The Tory Channel Group

5.4.1 Overview of alternative site locations

The Tory Channel group proposed as possible alternative sites involve four locations spread over an 8km length of the Channel as shown in Figure 5.3.

Figure 5.3: Locations of potential alternative sites - Tory Channel



All sites would be considered for rectangular cages with permanently attached barges, similar to the design of structures on the new Ngamahau salmon farm.

The outermost site is at Tipi Bay, some 3km south of the Cook Strait entrance to Tory Channel. The second alternative site is some 2.5km southwest, off Motukina Point, whilst the third alternative site is a further 1.0km west, off Tio Point and the fourth is a further 4.5km west, off Te Weka Bay.

5.4.2 Existing social environment in Tory Channel

In contrast with Waitata Reach where the straight-line distance between opposing headlands is typically in the range 2-3km, Tory Channel is a more spatially confined water space with corresponding distances typically in the range 0.8-1.5km. This situation means that more dwellings[64] are located in the likely area of interest when assessing the potential for residential amenity effects from salmon farming.

Tory Channel provides the principle entrance to Cook Strait for ferries between Picton and Wellington[65] and other maritime traffic coming and going to the Cook Strait area, as well as locals traveling from their homes and fishermen and sightseers just out for a day in Tory Channel.

A substantial amount of land on both sides of Tory Channel is in forestry, and none is actively farmed now with the exception of farming properties at the northern entrance to Tory Channel. Major efforts have been made to eradicate wilding pines at the western entrance to Tory Channel, including Dieffenbach Point and the southernmost portion of Arapawa Island.

Currently, reserves in the conservation estate in this part of the Sounds are fragmented and relatively little used, although the Department is looking to restore some of the reserves. Some of the land in the scenic reserve behind Te Weka Bay was gifted back to Te Atiawa as part of a treaty settlement.

5.4.3 Site 42 - Tipi Bay

Tipi Bay is a shallow embayment on the eastern side of Tory Channel directly opposite Kotiotoi Bay. The nearest dwelling is situated further north, on a farming property in Thom's Bay on the same side of the Channel, but has no direct line of sight. However, numerous bays on the western side of the channel have dwellings, with considerable property sub-divisions around Deep Bay and Te Awaiti Bay. As Hudson notes[66], the bay is only shallowly enclosed, with spurs and gullies rising steeply behind it to the ridgetop. It is the spurs dropping from this peak which shallowly enclose the proposed site from the gateway between Tory Chanel and Cook Strait. The land behind Tipi Bay exhibits no sub-divided sections, with exotic forestry at the southern end transitioning progressively into pastoral

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64 The large majority being holiday baches.

65 With these sizeable vessels passing through the channel at least six time each day

66 Hudson Associates, 2016. p.9.

farming towards Thom's Bay. Apart from the new Ngamahau salmon farm, commissioned in January 2016, there are no other marine farming activities in this part of Tory Channel. The historic remnants of New Zealand's last shore-based whaling activity, the Perano Whaling Station, is situated in Fisherman's Bay more than 2km north of the site.

Separation distances to dwellings with direct line of sight and the closest dwellings that do not have direct line of sight are summarised in the table below.

Table 5.11: Separation distances to nearest residential dwellings - Tipi Bay site

Site	Separation distances between dwellings and nearest part of surface structure	Description
For dwellings WITH direct line of sight		
#42 - Tipi Bay	1.5km 1.7km 1.9km 2.3km 2.5km 2.6km 3.5km	1 dwelling in Kotoitoi Bay 1 dwelling in Ngamahau Bay ~8 dwellings in Te Awaiti Bay and adjacent bay 1 dwelling on the headland south of Deep Bay 1 dwelling on the headland south of Whekenui Bay 1 dwelling on the south side within Deep Bay 3 dwellings in Okukari Bay
For dwellings with NO direct line of sight		
#42 - Tipi Bay	1.3km 1.8km 2.1km	1 dwelling in Thoms Bay 1 dwelling in Jacksons Bay 1 dwelling in Fishermans Bay

A distinct rocky promontory exists at the end of the Bay, about 150m north of the site, while the nearest jetty services the pastoral farming property in Thoms Bay, some 1.2km distant.

Taking into account neighbours' experiences of existing salmon farming operations and the contextual considerations summarised above, and given that the Board of Inquiry found[67] that *"overall the visual effects would be low"* for the Ngamahau farm in relation to a dwelling just under a kilometre away, this assessment makes the following provisional findings -

Table 5.12: Summary of potential effects on residential amenity - Tipi Bay site

Site	Distance to nearest dwelling with direct LoS	Visual effects	Noise effects	Odour effects	Wildlife nuisance effects	Shoreline solid waste effects
#42 - Tipi Bay	1.5km	minor	negligible	negligible	unlikely	unlikely

[67] At paragraph 1272.

5.4.4 Site 82 - Motukina Point

Motukina Point is at the elbow in Tory Channel where ferries make a distinct turn, when passing in either direction. Outbound ferries adopt the southernmost route, passing some 200-300m from the proposed alternative salmon farm site and some 500m from the house in the adjacent embayment. This embayment lies between Te Rua Bay to the east and Oyster Bay to the west. While the former has no marine farming activity within, the latter has at least six marine farms. Much of the land immediately surrounding this embayment is covered in exotic forestry which comes down practically to sea level giving the appearance of limited foreshore access. However, the substantial dwelling in the embayment itself is surrounded on the landward side by a patch of predominantly regenerating bush with a few wilding pines present. The house is occupied permanently, having been in its current ownership for more than a decade. The property has been developed to provide accommodation for up to 14 people[68], with the jetty and small beach providing opportunities for a variety of marine recreational activities. Although this corner location in Tory Channel renders the site visible to a relatively large number of dwellings, apart from the one dwelling in the embayment itself, the majority are at distances of more than 4km.

Table 5.13: Separation distances to nearest residential dwellings - Motukina Point site

Site	Separation distances between dwellings and nearest part of surface structure	Description
For dwellings WITH direct line of sight		
#82 - Motukina Point	170m 1.0-1.2km 1.4km 4.3km 4.4km 5.2km 6.2km 6.2km	1 dwelling in the bay at Motukina Point 3 dwellings on north side of Te Rua Bay 1 dwelling on the headland south of Deep Bay 1 dwelling in small bay opposite Erie Bay (north side of Tory Channel) ~7 dwellings in Te Awaiti Bay 1 dwelling on headland south of Whekenui Bay 3 dwellings in Okukari Bay 1 dwelling in the bay west of Te Iro Bay
For dwellings with NO direct line of sight		
#82 - Motukina Point	640m 650m 1.2km 2.0km 2.2km 2.3km 2.4km	1 dwelling on east side of Oyster Bay 1 dwelling on south side of Te Rua Bay 2 dwellings in Te Rua Bay and 1 dwelling in Oyster Bay 1 dwelling near the head of Oyster Bay 1 dwelling in Te Pangu Bay 1 dwelling at the head of Oyster Bay 1 dwelling in Ngamahau Bay

The nearest areas of rocky foreshore are at either end of the embayment itself, and the

[68] www.holidayhouses.co.nz/Browse/List.aspx?navigation=search&region=any&minprice=Any&maxprice=Any&minguests=Any&keyword=Motukina+Point. The property is clearly available for renting, mainly during the summer, according to the booking calendar.

nearest jetty would be about 120m from the salmon farm structure. The proximity to turning ferry traffic has generated a concern about the potential for ferry wash/wake to exacerbate solid waste deposition on the beach and foreshore in the vicinity of the proposed Motukina Point site. However, existing shoreline monitoring work carried out under the auspices of the District Council, does not involve monitoring stations in this location[69] resulting in an absence of empirical data that might address this concern.

A relevant consideration in the Board of Inquiry decision[70] on the Ngamahau site in 2012 was that *"The fact that King Salmon have come to an arrangement with some of the owners of land adjacent to the Ngamahau farm has simplified the situation from a recreational point of view. In the normal course of events this farm would have been a dominating factor for these adjacent land owners."* In the absence of similar mitigating arrangements, the operation of a salmon farm so close to a dwelling in the embayment at Motukina Point would inevitably pose a risk of multiple intrusive off-site effects on nearby residential amenity.

Table 5.14: Summary of potential effects on residential amenity - Motukina Point site

Site	Distance to nearest dwelling with direct LoS	Visual effects	Noise effects	Odour effects	Wildlife nuisance effects	Shoreline solid waste effects
#82 - Motukina Point	170m	potential for intrusive visual effect - 1 dwelling	potential for intrusive noise effect - 1 dwelling	potential for intrusive odour effect - 1 dwelling	potential for intrusive effect - 1 dwelling	uncertain

5.4.5 Site 156 - Tio Point

Tio Point lies at the entrance to Oyster Bay. As with the previous site, much of the land immediately surrounding Oyster Bay is covered in exotic forestry which comes down practically to sea level giving the appearance of limited foreshore access. Oyster Bay also hosts six consented marine farms. The two nearest to Tio Point are owned by Te Atiawa O Te Waka-A-Maui Limited. Compared with other sites, relatively few existing dwellings have direct line of sight and no dwellings would be closer than 1.0km to this site. Two rocky promontories are relatively close by on opposite sides of the entrance to Oyster Bay, but the nearest jetties are 1km distant or more.

69 The nearest foreshore monitoring sites being at Tipi Bay and Moioio Island.

70 At paragraph 1020.

Table 5.15: Separation distances to nearest residential dwellings - Tio Point site

Site	Separation distances between dwellings and nearest part of surface structure	Description
For dwellings WITH direct line of sight		
#156 - Tio Point	1.5km 1.9- 2.1km 3.7km 5.4km 7.1km	1 dwelling in Oyster bay 2 dwellings on north side of Te Rua Bay 1 dwelling in small bay opposite Erie Bay (north side of Tory Channel) 1 dwelling in the bay west of Te Iro Bay 3 dwellings in Okukari Bay
For dwellings with NO direct line of sight		
#156 - Tio Point	1.0km 1.2km 1.5km 1.6-1.8km 2.0km 2.2km	1 dwelling in the bay at Motukina Point 1 dwelling on the east side of Oyster Bay 1 dwelling in Te Pangu Bay 2 dwellings at the head of Oyster Bay 1 dwelling on the east side of Ngaruru Bay 2 dwellings in Te Rua Bay

Table 5.16: Summary of potential effects on residential amenity - Tio Point site

Site	Distance to nearest dwelling with direct LoS	Visual effects	Noise effects	Odour effects	Wildlife nuisance effects	Shoreline solid waste effects
#156 - Tio Point	1.5km	minor	negligible	negligible	unlikely	unlikely

5.4.6 Site 47 - Te Weka Bay

Te Weka Bay is located near the entrance to Tory Channel from Queen Charlotte Sound. The backdrop to the Bay is a scenic reserve, although exotic trees have infiltrated to an extent. While a single dwelling and jetty is situated at close quarters within Te Weka Bay, there are about 10 dwellings with direct line of sight to the site directly across the Channel in Te Iro Bay and an adjacent bay, at distances of 1.4-1.5km.

The single dwelling in Te Weka Bay has been in its current ownership for more than three decades, involving several generations of the same family. Recent development has accentuated the outdoor living attributes of the property; a lack of light pollution and the relative quietness of the bay characterise the night time ambience. The dwelling is occupied at various times throughout the year; mainly in the Christmas and summer holiday period, but also periodically throughout the year.

As Hudson notes[71], slopes rise steeply from the water here to an elevation of around 380masl, forming a large headland between two more major bays off Tory Channel (Erie and Onapua). Two main spurs descend from the headland into Tory Channel to enclose Te Weka Bay to the west and east. Thus the bay itself is sheltered from the norwester and from the southerly, making it popular for water skiing and also good for mooring yachts. The Bay is popular for fishing - cod fishing off the points at each end and fishing for gurnard reported in the middle of the Bay. It is popular with fishing charter companies who visit most days in the summer. Tidal movements in this part of the Channel are reported as creating a noticeable eddy pattern in the bay, which causes floating debris to accumulate on the beach from time to time. Several prominent rocky outcrops exist within Te Weka Bay, at distances of 250-500m from the site.

Table 5.17: Separation distances to nearest residential dwellings - Te Weka Bay site

Site	Separation distances between dwellings and nearest part of surface structure	Description
For dwellings WITH direct line of sight		
#47 - Te Weka Bay	280m 1.4km 1.5km 3.0km 3.9-4.3km	1 dwelling in Te Weka Bay 8 dwellings in Te Iro Bay 2 dwellings in bay to east of Te Iro Bay 1 dwelling in bay between Maraetai and Hitaua Bays 3 dwellings on west side of entrance to Maraetai Bay
For dwellings with NO direct line of sight		
#47 - Te Weka Bay	1.0km 1.1km 1.5km 1.6km 1.6-2.1km	1 dwelling in the bay between Te Weka and Erie Bays 1 dwelling in the bay to the west of Te Iro Bay 1 dwelling on west side of Erie Bay 1 dwelling in Konini Bay 2 dwellings on the west side of Onapua Bay

With the dwelling so close in the immediate bay, a similar argument applies as for Motukina Point - that in the absence of mitigating arrangements associated with property acquisition, the operation of a salmon farm so close to a dwelling in the bay would inevitably generate intrusive off-site effects on nearby residential amenity. Furthermore, Tory Channel is narrower here than at the Te Pangu/Clay Point location, meaning that dwellings on the northern side of Tory Channel are on the threshold of experiencing loss of visual amenity as well.

[71] Hudson Associates, 2016. p.14.

Table 5.18: Summary of potential effects on residential amenity - Te Weka Bay site

Site	Distance to nearest dwelling with direct LoS	Visual effects	Noise effects	Odour effects	Wildlife nuisance effects	Shoreline solid waste effects
#47 - Te Weka Bay	280m	potential for intrusive visual effect - 1 dwelling	potential for intrusive noise effect - 1 dwelling	potential for intrusive odour effect - 1 dwelling	potential for intrusive effect - 1 dwelling	uncertain

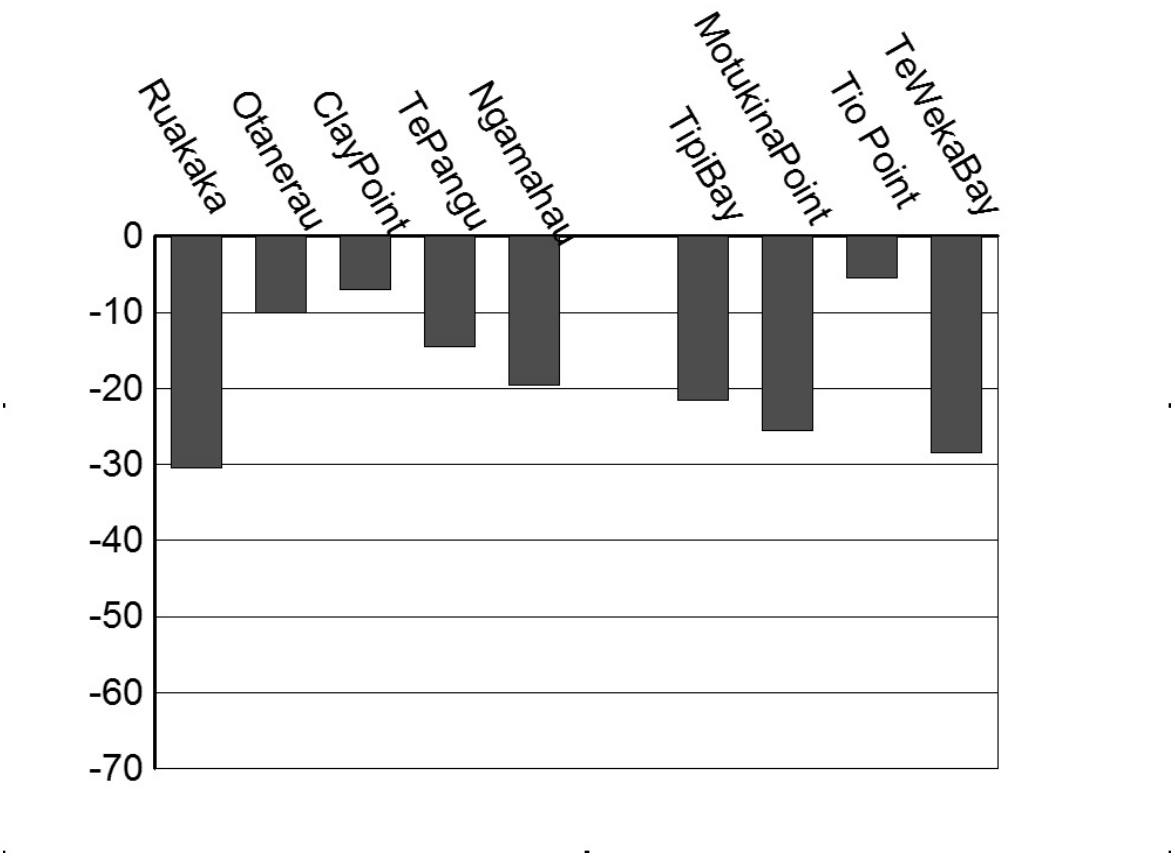
5.4.7 Comparison of existing and alternative sites

The previous sections (5.4.3 to 5.4.6) have provided qualitative assessments in RMA terms for each possible alternative site in Tory Channel on an individual basis[72].

As was presented previously for sites in the Waitata Reach, the results of the corresponding semi-quantitative comparison of off-site amenity effects for all sites in Tory Channel (existing and alternative) are shown graphically in the following bar chart.

[72] i.e. ignoring the presence of any other salmon farms within Tory Channel, either existing or alternative.

Figure 5.4: Semi-quantitative comparison of off-site amenity effects for Tory Channel sites



This summary, in conjunction with the corresponding tabulated scores presented in Appendix B, can be used as the basis for several conclusions about the relative merits of each site, with respect to residential amenity considerations only -

- with the exception of the Ruakaka salmon farm, the most recently developed new farm, Ngamahau, has the greatest potential adverse effect on the residential amenity in its vicinity of all existing salmon farms in Queen Charlotte and Tory Channel, and this is attributable to a combined risk of potential odour, noise and visual amenity effects;
- the existing Ruakaka salmon farm has the greatest overall adverse effect on nearby residential amenity because of the relatively high number of dwellings less than 1km away from the farm; most of the amenity reduction is attributable to the risk of adverse odours at relatively close proximity, even though most dwellings do not have

direct line of sight;
- amenity reductions near Te Pangu result from a combination of adverse odour, noise and visual effects whereas amenity reductions for the Clay Point farm are associated predominantly with just visual effects at an intermediate distance;
- the potential total residential amenity reduction associated with the alternative site at Tipi Bay is very similar to that associated with the existing farm at Ngamahau, except that at Tipi Bay the reduction is due exclusively to a visual effect;
- the Tio Point site may generate adverse visual effects, but the level of overall effect is low due to the combination of separation distances and small number of dwellings involved;
- the sites at Motukina Point and Te Weka Bay exhibit relatively high negative scores due to the combined risks of noise[73], odour and visual effects at dwellings in such close proximity.

5.4.8 Assessment of cumulative effects of multiple sites

Even though no decisions have been taken regarding possible relocations of existing salmon farms, in order to assess the potential for cumulative effects, it has been assumed that all potential alternative sites in Tory Channel could in future be occupied by salmon farms.

Under this scenario, it is estimated that a maximum number of nine existing residential properties (including 18 existing residential dwellings) would have direct line of sight to more than one site (existing and/or alternative). For dwellings in this category, the minimum distance to a salmon farm site would be 170m and the maximum distance would be 6.2km. At both ends of the scale, these separation distances are substantially less in the Tory Channel setting than is the case in the Waitata Reach setting. While longer-distance views are more likely to be simultaneously cumulative, two properties[74] would experience successively cumulative views of three sites rather than simultaneously cumulative, while a third property[75] would experience simultaneous, long-distance views of three sites.

However, without alternative site #82 (Motukina Point) -

- the number of residential properties in Tory Channel that would have direct line of sight to more than one site (existing and/or alternative) would reduce from 9 to 3, and the corresponding number of existing residential dwellings in this category would reduce from 18 to 3;
- no residential property in Tory Channel would have direct line of sight to more than 2

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73 The technical Noise Assessment, provided by Marshall Day Acoustics (2016, Table 2, p.11), indicates that these two sites would create the highest residential noise exposure for the nearest neighbours of any potential alternative sites

74 One dwelling on the southern headland at the entrance to Deep Bay. One dwelling in the embayment at Motukina Point will experience views of three sites - Motukina Point in the foreground, with Clay Point and Ngamahau in the relatively distant background.

75 One dwelling in a small bay on the north side of Tory Channel, opposite Erie Bay.

sites; and
- no residential property in Tory Channel would experience cumulative visual effects from salmon farms that are greater than already deemed acceptable at existing Tory Channel sites.

5.4.9 Assessments of net effects of specific re-locations

With reference to the comparison of existing and alternative sites described in section 5.4.7 above, two potential site swaps would result in a reduction in adverse residential amenity effects in the Tory Channel/Queen Charlotte group: from relocating the Ruakaka Bay salmon farm to Tipi Bay or Tio Point, and the Otanerau salmon farm to Tio Point

In the zone most critical for residential amenity issues, these relocations would achieve a situation in Queen Charlotte Sound/Tory Channel where the number of residential dwellings within 1km of a salmon farm would reduce from 21 to 8[76] whilst also enabling full future compliance with the agreed benthic standards. [Postscript: if the alternative sites at Tipi Bay, Motukina Point and Te Weka Bay are eliminated from being considered for re-location - leaving Tio Point as the only alternative site in Tory Channel - then the number of residential dwellings within 1km of a salmon farm in Queen Charlotte Sound/Tory Channel would reduce from 21 to 3[77].]

[76] 17 within 1km of Ruakaka and one within 1km of Otanerau, while the alternative site at Motukina Point has 4 dwellings within 1km and the alternative site in Te Weka Bay has one dwelling within 1km.

[77] This assumes that the Ruakaka Bay farm is moved to Tio Point and the Otanerau farm is moved to a location in Waitata Reach.]

6 STRATEGIC ASSESSMENT OF SOCIAL EFFECTS FROM PROPOSED RELOCATIONS OF EXISTING SALMON FARMS

6.1 Scope of this Strategic Social Assessment

In the social assessment carried out for the EPA hearing in 2012, the scope for the assessment was described as follows[78] -

> *"A strategic level assessment of social effects addresses the central question: is there scope for further salmon farm development in the Marlborough Sounds, considering the potential cumulative social effects across the Marlborough Sounds and the competing social interests."*

In this assessment the central question is re-phrased as follows: is there scope for better salmon farm development in the Marlborough Sounds through the relocation of certain existing salmon farms, where "better" refers to "better environmental, social and economic outcomes" - a potential win-win-win outcome?

As previously, this strategic-level assessment therefore addresses a set of questions at a broader, community-wide level.

6.2 Assessment of community-wide social effects

6.2.1 Permanent private occupation of public space

The 2012 Plan Change proposal sought new and additional public water space in the Marlborough Sounds for salmon farming. Ultimately, 3 new sites were consented.

Any proposal for salmon farm relocations would result in no change in the total quantum of public water space occupied; the change is in location, not quantity.

If no relocations take place, the present quantum of occupied public water space would remain the same for the next 5 years, in the presently consented locations. After that time, the total quantum of occupied public water space will depend on the outcome of any re-consenting processes and the ability of the operator to comply with the agreed benthic standards.

[78] Taylor Baines & Associates, 2012, section 5.1, p.30.

The following table summarises the schedule for consent expiry for all the existing salmon farm sites -

Table 6.1: Salmon farm consent expiry dates

Date	Salmon farm site
May 2021	Ruakaka
December 2024	Waihinau Forsyth Crail Bay Otanerau Clay Point
February 2036	Te Pangu
April 2046	Richmond Waitata Ngamahau

6.2.2 Separation distances between salmon farms and nearest dwellings

Any estimate of change in the overall pattern of separation distances must be based on assumptions about specific potential site swaps. The assumptions set out below are purely for illustrative purposes. They were selected by the report author and reflect consideration of the objective of reducing resident exposures to off-site amenity effects. This set of assumptions has not been discussed with interested parties and it is expressly noted that no decisions have been made at this point in the process. For the purposes of this assessment, the following site swaps are assumed -

Table 6.2: Author's illustrative assumptions regarding re-location

FROM	TO
Waihinau	North Blowhole Point
Forsyth	Blowhole Point
Crail Bay North	Richmond Bay South
Crail Bay South	Horseshoe Bay
Ruakaka	Tipi Bay
Otanerau	Tio Point

Separation distances between dwellings which would have direct line of sight and their nearest salmon farm are summarised in the following table -

Table 6.3: Comparison of the scale of regional effects dependent on separation distance - post re-location illustrative scenario compared with prior to re-location

Site	*# <500m*	*Additional # <1,000m*	*Addtional # <1,500m*	*Additional # <2,000m*	*Total # <2,000m*
All sites "FROM" (above table)	8	6	0	2	16
All sites "TO" (above table)	0	0	0	~12	~12

It is evident from the above table that the outcome for separation distances between residential dwellings and salmon farms that would result from the hypothetical relocations assumed would be the avoidance of situations where dwellings are close enough to salmon farms to make adverse residential amenity effects highly likely to a situation where they are unlikely. This merely illustrates the potential that salmon farm re-location could contribute to improving the experience of off-site residential amenity effects associated with the present number of consented salmon farms.

If no relocations are permitted, then the current situation will prevail for at least the next five years.

6.2.3 Cumulative employment effects

As in the previous section, any estimate of change must be based on an assumption about specific potential site swaps. For the purposes of this assessment, the same site swaps are assumed.

If relocation of some salmon farms enabled an increase in overall production levels of salmon, it is possible that this could be associated with marginal increases in employment of two types: those employed in Nelson processing harvested salmon and those employed in supply-chain companies operating in Picton, Havelock and the Sounds and providing services to salmon farming operations. NZ King Salmon advise that increases in production levels at individual farms are unlikely to result in increased farm staff numbers.

If no relocations are permitted, employment levels are unlikely to change in the next five years.

6.2.4 Te Atiawa involvement in salmon farming in the Marlborough Sounds

As mentioned in section 2.3 of this report, a cultural impact assessment has been commissioned separately from this social impact assessment. It is also worth noting that previous research identified social benefits from Te Atiawa's involvement in salmon aquaculture. Furthermore, interviewing for this assessment highlighted the potential for several social benefits to arise if salmon-farm relocation were to result in the use of the Tio Point alternative site, which is adjacent to an existing Te Atiawa licensed mussel farming area.

A Joint Venture between Te Atiawa and NZ King Salmon has the potential to benefit Te Atiawa in several ways -

- the opportunity for its people to acquire more skills and experience in commercial aquaculture;
- the environmental improvement made possible by a higher-flow site could contribute in part satisfying Te Atiawa's kaitiakitanga responsibilities;
- if the industry becomes more successful, it may lead to even more jobs and management roles for Te Atiawa people.

From a Te Atiawa perspective - *"what is good for Te Atiawa people is good for the wider community of Picton and Marlborough".*

6.2.5 NZ King Salmon involvement in the Marlborough Sounds community

The recent case study research on salmon farming in the Top-of-the-South (Baines & Quigley, 2016 (In Press)) identified and described the nature and scale of NZ King Salmon's involvement with various community initiatives, activities and developments in the Marlborough communities. The scale of these involvements will likely depend upon and be related to the future levels of production and profitability of its business operations. Thus, similar qualitative conclusions can be drawn about the 'relocation' and 'no relocation' scenarios as have been described in section 6.2.3 above.

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APPENDICES

Appendix A: Separation distances of neighbours interviewed about their direct experiences of existing salmon farms

Appendix B: Semi-quantitative comparison of total residential amenity loss associated with off-site visual, noise and odour effects.

Appendix A: Separation distances of neighbours interviewed about their direct experiences of existing salmon farms and potential neighbours interviewed with respect to possible alternative sites

Closest salmon farm	*Direct Line of Sight (LoS) from dwelling*	*Separation distance*
Interviews in June 2011 and March 2012		
Waihinau	LoS	300m
Waihinau	LoS	350m
Waihinau	LoS	400m
Waihinau	LoS	750m
Otanerau	No LoS	1.8km
Te Pangu	LoS	350m
Interviews in January 2016		
Te Pangu	LoS	350m
Ruakaka	No LoS	600m
Ruakaka	No LoS	700m
Otanerau	No LoS	1.8km
Interviews in July/August 2016		
Te Pangu	No LoS	660m
Te Pangu	LoS	3.0km
Clay Point	LoS	1.8km
Clay Point	LoS	2.2km
Ngamahau	LoS	410m
Ngamahau	No LoS	1.2km
Ngamahau	No LoS	1.3km

Closest alternative site	*Direct Line of Sight (LoS) from dwelling*	*Separation distance*
Interviews in August 2016		
Motukina Point	LoS	170m
Te Weka Bay	LoS	280m

Appendix B: Semi-quantitative comparison of total residential amenity loss associated with off-site visual, noise and odour effects.

Sources of amenity loss

For the purposes of such a semi-quantitative comparison, it is accepted that the existence and the operation of a salmon farm will inevitably create some loss of residential amenity value at places where people live or visit for holidays that are in close proximity to the salmon farm - too close, and the loss of amenity value will be experienced as unacceptable, but the degree of amenity loss diminishes with increasing distance.

Based on the social assessment work carried out in 2012 (see Taylor Baines & Associates, 2012, Appendix 5), the significance of separation distance is summarised as follows -

Visual effects:

When viewed at close range in the setting of the Marlborough Sounds, neighbours describe a salmon farm as an un-natural element, sometimes described as *"ugly and an eyesore", "intrusive", "aesthetically unpleasant", "like an industrial activity"*, or simply *"unacceptable"*, and therefore detracting from the visual amenity of the neighbourhood that they live in. These responses relate to observations at distances between 300m and 1,200m. The intensity of response appears to reflect a gradient related to distance. Indeed, several of the respondents acknowledged that distance has a powerful moderating influence on this effect, making the observation, also based on their direct experience, that at 1.5-2.0km a salmon farm is no longer an intrusive element and at 3km it is barely noticeable. Other aspects which they reported as making a difference to the visibility of a salmon farm are the colour of the structures and the height of the accommodation barge (singe-storey or double storey).

Noise effects:

People living at close quarters (300m-700m) consistently report a common experience of noise from salmon farm operations. They report that at 300m-400m salmon farm noise is not a literally continuous nuisance, but they report that frequently (on a daily basis) salmon farm noise detracts from what is otherwise the peace and quiet of the Bay, and also that *"it's more noisy when they're harvesting*[79]*"; "harvest time is like a factory in the Bay".* There is agreement amongst respondents that under certain circumstances (e.g. wind direction, time of day, acoustic protections not in place), the most intrusive noise sources are the generators and the water blasters, with nuisance from the latter reported at distances up to 600m-700m. Taken together, these responses indicate that, while neighbours report hearing salmon farm noise even at much greater distances (1,000m-3,000m) on an occasional basis, they do not tend to experience a significant loss of residential amenity at distances of 700m-1,000m or more.

Some of those interviewed acknowledged that NZ King Salmon has made improvements in recent years to reduce its levels of noise generation from salmon farm operations, in

[79] Harvesting may take place five days a week over a period of 2-3 months at any single salmon farm.

response to issues raised by neighbours. They also acknowledged that intervening topography is an effective way of eliminating adverse noise effects, even at relatively close distances, if there is no direct line of sight.

Odour effects:

Interviewee responses on the topic of odour effects indicate that their experience of adverse odour effects occurs within a much more confined spatial area around a salmon farm than is the case for the adverse noise effects reported. Five respondents with experience of salmon farm operations at 500m or less reported unpleasant odour experiences on occasions - described as *"stinking on occasions within 200m"; "periodic stench"* at 350m; *"can be unpleasant downwind"* at 500m. These responses are consistent that the effect is not present continuously. The responses invariably attribute the odour to the lifting and cleaning of nets. Several also commented that they used to experience adverse odour from the presence of morts, but that NZ King Salmon has amended its farm management practices to address this issue.

These observations were reinforced in further interviews in 2015 with the additional observation that, while intervening land is an effective barrier to otherwise intrusive noise at short distances, it is not so effective a barrier to intrusive odour.

Estimated critical thresholds from social assessment work

As noted previously in section 5.2.1 of this report, the salient conclusions from those interviews can be summarised as follows -

- regarding potential effects on residential visual amenity: at 1.5-2.0km a salmon farm is no longer an intrusive visual element, and at 3km it is "barely noticeable";

- regarding potential effects on residential noise amenity: beyond 700-1,000m in direct line of sight, a salmon farm is no longer an intrusive element in the residential noise environment; however, intervening land will generally provide an effective barrier;

- regarding potential effects on residential amenity from unpleasant odours: beyond 700m off-site odour from a salmon farm is unlikely to be an intrusive element in the residential odour environment, and intervening land does not necessarily provide an effective barrier at these close quarters although it may reduce the level of intrusiveness.

On the basis of these conclusions, the following bands of separation distance were developed -

0-500m	500m-700m	700m-1.0km	1.0-1.5km	1.5-2.0km

Modified thresholds associated with the Residential Amenity Management Plan

When considering the potential 'catchment' of residential dwellings that might be subject to visually intrusive effects, experts conducting landscape and visual effects assessments generally adopt explicit scales of separation distance in relation to assessed effects. In the case of expert visual effects assessments in the Marlborough Sounds - in contrast to the empirical social assessments reported above - somewhat greater separation distances have been allowed for, as shown in the following table entitled 'Visibility from land-based viewpoints', referenced from the Residential Amenity Management Plan prepared as an outcome of the EPA decisions.

0-1km	1-2.5km	2.5-5km	5 km and beyond
Dominant	Prominent	Visible	Partially visible or minor part of view.

For the purposes of this semi-quantitative comparison exercise, these two scales were amalgamated into the following bands of separation distance -

0-500m	500m-1.0km	1.0-2.5km	2.5-5.0km

Scores reflecting relative amenity reduction

The method adopted here is to allocate negative scores to amenity loss in direct relation to separation distance, such that the negative score decreases with increasing separation distance. Furthermore, since residential amenity can be influenced by several factors acting simultaneously (visual presence, the potential for intrusive noise and the potential for intrusive odours), this method allows for quantifying such contemporaneous effects cumulatively while also taking into account the fact that each factor's influence will decay over different separation distances - visual effects are likely to be experienced as intrusive over a much wider area than noise or odour effects. The amenity reduction scores used in this semi-quantitative comparison are shown in the following table, noting that reduced odour effects are allowed for in situations where the separation distance is low but intervening land exists.

	0-500m	500m-1.0km	1.0-2.5km	2.5-5.0km
Odour with direct line of sight	-4	-2	0	0
Odour with NO direct line of sight	-2	-1	0	0
Noise with direct line of sight	-3	-1.5	0	0
Visual with direct line of sight	-2.5	-2	-1.5	-1

Calculating relative scores for overall amenity reduction associated with each salmon-farming site

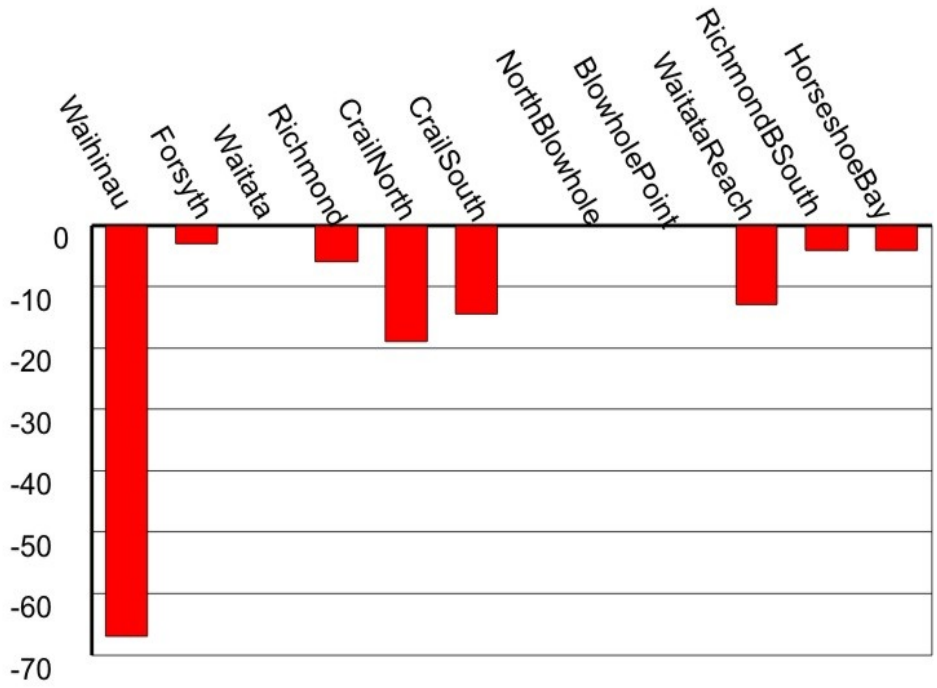
To achieve a semi-quantitative comparison, the negative scores for each band of separation distance are multiplied by the number of dwellings present within the same band of separation distance. These values are then added together to give an overall (relative or comparative) score.

Data on the numbers of residential properties associated with each band of separation distance from the corresponding salmon-farm site are provided in sections 5.3 and 5.4 of this report.

Summary of overall residential amenity reduction scores: sites in Waitata Reach/Forsyth/Crail Bays

	Odour	Noise	Visual	Total
Existing salmon farm sites:				
Waihinau	-26	-19.5	-21.5	-67
Forsyth	-1	0	-2	-3
Waitata	0	0	0	0
Richmond	0	0	-6	-6
Crail North	-8	-6	-5	-19
Crail South	-4	-3	-7.5	-14.5
Alternative sites:				
North Blowhole	0	0	0	0
Blowhole Point	0	0	0	0
Waitata Reach	0	0	-13	-13
Richmond Bay South	0	0	-4	-4
Horseshoe Bay	0	0	-4	-4

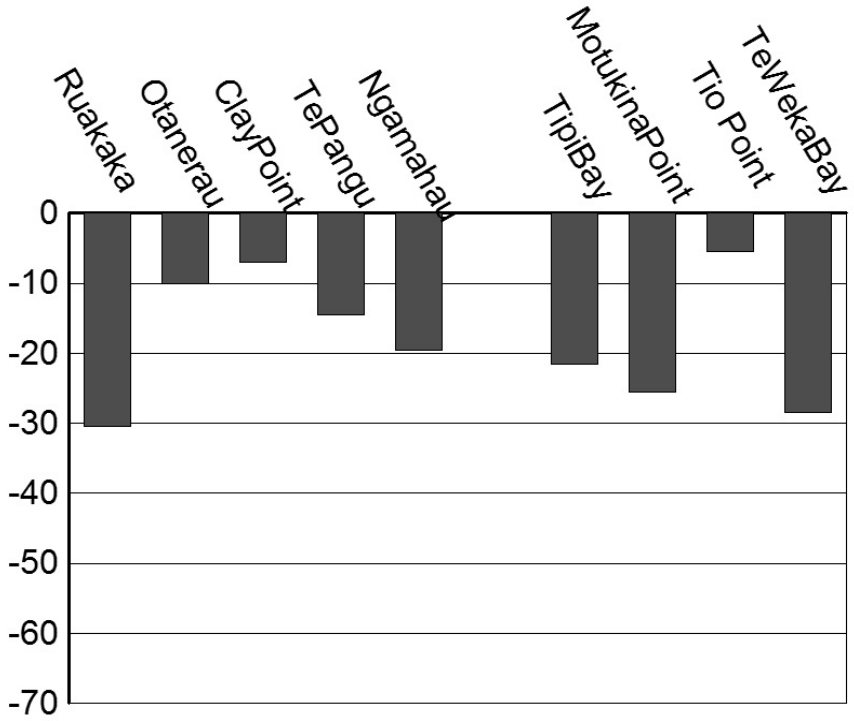
A graphical comparison is presented below



Summary of overall residential amenity reduction scores: sites in Tory Channel/Queen Charlotte Sound

	Odour	Noise	Visual	Total
Existing salmon farm sites:				
Ruakaka	-20	-3	-7.5	-30.5
Otanerau	-2	-1.5	-6.5	-10
Clay Point	-1	0	-6	-7
Te Pangu	-7	-3	-4.5	-14.5
Ngamahau	-6	-4.5	-9	-19.5
Alternative sites:				
Tipi Bay	0	0	-21.5	-21.5
Motukina Point	-6	-3	-16.5	-25.5
Tio Point	0	0	-5.5	-5.5
Te Weka Bay	-4	-3	-21.5	-28.5

A graphical comparison is presented below


Ruakaka
Otanerau
ClayPoint
TePangu
Ngamahau
TipiBay
MotukinaPoint
Tio Point
TeWekaBay
0
-10
-20
-30
-40
-50
-60
-70