Submission

New Zealand King Salmon Company Limited Application to the Environmental Protection Authority

2 May 2012

Environmental Protection Authority
PO Box 131
Wellington

To whom it may concern,

Please find attached the McGuinness Institute's submission on the application of New Zealand King Salmon Co. Limited (NZ King Salmon) to the Environmental Protection Authority (EPA) to apply for additional water space to house nine new salmon aquaculture farms. The Institute believes that sound management and regulation of our marine resources is fundamental to New Zealand's long-term wellbeing, and therefore welcomes this opportunity to contribute research in this area.

In this submission we outline NZ King Salmon's proposal and the central risks and concerns the Institute has with regard to the proposal, then we consider global governance and undertake a scan of best practice governance practice in the area of salmon aquaculture. This informs the Institute's seven substantive recommendations upon which we consider the EPA should make any consent contingent. These submissions suggest more robust and stringent policy processes and measures that not only guarantee the key functions of governance and protection, but also ensure sustainable management of New Zealand's marine resources.

At the time of this submission, the Institute has yet to receive information in response to two requests made under the Official Information Act, and one request to Russell McVeagh on behalf of NZ King Salmon. We expect to receive this information over the coming weeks, and seek to have a clearer understanding of the risks associated with NZ King Salmon's proposal by the time of oral submissions. To this end we request the opportunity to provide further comment and would like to register our interest in speaking on our submission. Our contact details are provided below.

Kind regards,

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About the McGuinness Institute
The McGuinness Institute, formerly the Sustainable Future Institute, was founded in 2004 and is a non-partisan think tank working for the public good, contributing strategic foresight through evidence-based research and policy analysis.

Experience
In preparing this submission we draw on three of the McGuinness Institute's projects, *Project 2058*, *Project Genetic Modification* and *Project One Integrated Report*.

Project 2058 is the Institute's flagship project. It includes a research programme that aims to explore New Zealand's long-term future with a view to putting forward a National Sustainable Development Strategy (NSDS) for New Zealand. One of the areas of interest that we have identified is the country's environmental health and management.

Project Genetic Modification closely monitors developments in genetic modification and related policy both in New Zealand and internationally, for our upcoming report *The Future of Genetic Modification in New Zealand*. Publication of this report is on hold until ERMA completes its review of the HSNO (Methodology) Order 1998, which commenced in 2002; this very important methodology has now been under review for ten years.

Project One Integrated Report advocates the use of one integrated annual report, by both organisations and countries, as a critical mechanism for improving global governance of resources, human health and wellbeing. Integrated reports encourage conversation with all stakeholders about their expectations of a company's commitments and the performance metrics that ensure sustainability in economic, environmental, social and cultural terms.

These three projects are concerned with risk management and long-term strategic thinking for the benefit of New Zealanders. The Institute sees the use and management of New Zealand's marine resources as an integral part of a sustainable future.

Introduction

This submission is in regard to the proposal of New Zealand King Salmon Co. Limited (NZ King Salmon) to the Environmental Protection Authority (EPA) requiring two changes to the Marlborough Sounds Resource Management Plan (MSRMP) and nine resource consents. The submission provides a brief overview of salmon aquaculture in New Zealand; outlines NZ King Salmon's proposal; outlines the central risks and concerns the Institute has with regard to the proposal, and considers global governance and best practice governance in the area of salmon aquaculture.

We strongly recommend a full strategic plan for the Marlborough Sounds region should be developed through extensive consultation with community, local authorities and key stakeholders before this proposal is considered by the EPA (**Recommendation 1**);
If the EPA decides to progress this proposal we also recommend very tight controls be placed on King Salmon including:

Recommendation 2: NZ King Salmon ownership should not change its New Zealand ownership, which is currently 47% NZ owned (ideally this should be increased to 51%);

Recommendation 3:The local community must receive compensation for both actual and potential impacts, and a commitment to on-going consultation;

Recommendation 4: New farms should be gradually introduced only when research indicates the environment can support the expansion,

Recommendation 5: Strict regulations and regular reporting requirements to ensure risks are minimised. Any breaches should incur severe penalties,

Recommendation 6: Protection of heritage sights and views from these sights, and

Recommendation 7: Term of 35 years should be reduced to ten years, with a right to reapply.

The Institute urges the EPA to consider the fact that this region is of significant cultural, heritage, environmental, ecological and tourism value to the Marlborough Sounds and the country, and argues that the above submissions achieve the necessary balance between facilitating economic growth and sustaining our natural resources in the long term.

1. Salmon aquaculture in New Zealand

Chinook salmon, otherwise known as king salmon, is the only variety of salmon farmed on a significant scale in New Zealand (NZSFA, 2005). In 2009, salmon exports amounted to 5088 tonnes and these exports were valued at $380 million (Aquaculture NZ, n.d.). By volume, this accounted for 12% of New Zealand aquaculture exports, and by value, 22% of New Zealand aquaculture exports (ibid.).

New Zealand is currently considered the top performer of all 22 assessed countries in the Global Aquaculture Performance Index (GAPI) rankings (see Appendix 4). It received a normalised score of 73 out of 100 across the ten indicators (SERG, 2011a). The cumulative score for New Zealand was 90 on account of New Zealand's low, dispersed population (ibid.).

The following risks are what the World Wildlife Fund (WWF) identified as the seven key environmental and social impacts of salmon farming. These form the basis of the Institute's risk assessment, considering the probability of each risk (see Appendix 5). The assessments made in this table are informed by the information provided by the Environmental Protection Authority (EPA).

1. ***Benthic impacts and siting:*** Chemicals and excess nutrients from food and feces disturbing the flora and fauna on the ocean bottom (bethos);
2. ***Chemical inputs:*** Excessive use of chemicals – such as antibiotics, anti-foulants and pesticides – or the use of banned chemicals can have unintended consequences for marine organisms and human health;
3. ***Disease/parasites:*** Viruses and parasites can transfer between farmed and wild fish, as well as among farms.
4. ***Escapes:*** Escaped farmed salmon can compete with wild fish and interbreed with local wild stocks of the same population, altering the overall pool of genetic diversity.
5. ***Feed:*** A growing salmon farming business must control and reduce its dependency upon fishmeal and fish oil – a primary ingredient in salmon feed – so as not to put additional pressure on the world's fisheries. Fish caught to make fishmeal and oil currently represent one-third of the global fish harvest.
6. ***Nutrient loading and carrying capacity:*** Excess food and fish waste in the water have the potential to increase the levels of nutrients in the water. This can cause the growth of algae, which consumes oxygen that is meant for other plant and animal life.
7. ***Social issues:*** Salmon farming often employs a large number of workers on farms and in processing plants, potentially placing labor practices and worker rights under public scrutiny. Additionally, conflicts can arise among users of the shared coastal environment.(WWF, n.d.[a])

2. New Zealand King Salmon Co. Limited: Proposal

2.1. New Zealand King Salmon Co. Limited: Company profile

New Zealand King Salmon Co. Limited has been in operation since 1985, first as the Marlborough Salmon Company Limited, and between 1990 and 1996 as Southern Ocean Seafoods Limited (Companies Office, 2011). Currently it is New Zealand's largest vertically integrated aquaculture company (NZKS, n.d.). NZ King Salmon produces 70% of New Zealand's salmon, and 55% of the world's king salmon. New Zealand accounts for 50% of its market, with the remainder being exported (ibid.).

NZ King Salmon was formed in its present state in 1996 through the privatisation and merger of Southern Ocean Seafoods Limited and Regal Salmon Limited (NZKS, n.d.). Southern Ocean Seafoods Limited and Regal Salmon Limited were then registered and incorporated again separately on 12 November 1996 (Companies Office, 2011b; 2011c). The latter was struck off the registry on 22 December 2011 (ibid.).

Until 2008, the company was owned by Evergreen Holdings Limited, part of the Tiong Group (LINZ, 2011), one of the largest private companies in Malaysia with substantial global investments in forestry, property and the media (Direct Capital, 2008). In September of that year, private New Zealand investment company Direct Capital invested alongside management to acquire a 45% shareholding in King Salmon. At present, Evergreen Holdings Limited holds a 51% share of the company, Direct Capital holds a 42% share, and management and directors hold a 7% share (NZKS, n.d.).

2.2. NZ King Salmon's proposal to the EPA

NZ King Salmon has lodged a proposal with the Environmental Protection Authority (EPA), requiring two changes to the Marlborough Sounds Resource Management Plan (MSRMP) and nine resource consents. The MSRMP sets out objectives, policies, methods and rules for the Marlborough Sounds area, with the purpose of promoting sustainable management of the natural and physical resources of the Marlborough Sounds area including the coastal environment (MDC, 2012a).

NZ King Salmon proposes to establish nine new sites for salmon aquaculture in the Marlborough Sounds region. This is in addition to the seven the company currently owns, of which five are operational (NZKS, n.d.). It is requesting consent for eight new salmon farms, and a change in the nature of consent from mussel to salmon farming for another (EPA, 2012).

NZ King Salmon states that it needs more water space in the Marlborough Sounds because of a desire to meet demands for salmon domestically and internationally (NZKS n.d.[a]). This is in line with a target to expand the aquaculture industry to achieve sales of $1 billion by 2025 (ibid.), a target supported by the government (MFish, 2011).

NZ King Salmon opted under the Resource Management Act to take its proposal directly to the Environmental Protection Authority rather than go through the usual council process (NZKS, n.d.[a]). The Minister of Conservation (the Minister), the Hon. Kate Wilkinson, recognised that NZ King Salmon's proposal was of national significance, and consequently referred the matter to a Board of Inquiry (EPA, 2012).

2.3. Board of Inquiry

If NZ King Salmon's application is successful, the changes will more than double the number of salmon farms in the Marlborough Sounds. Consequently, the amount of subsurface structures, fish feed, and fish waste products will increase (EPA, 2012). For example, 40,000 tonnes of fish feed per year will be needed (ibid.). There are environmental implications associated with each of these byproducts that need to be thoroughly examined and independently researched. Further, the development would involve a significant increase in the use of natural resources – notably the Marlborough Sounds coastal marine area (water column and seabed).

The Marlborough Sounds is an area of particular national significance; it has unique ecological, historical, recreational, tourism and transportation value. Any increase in salmon farming threatens the natural significance of the resource in three key ways. Firstly, salmon farms impose aesthetically on their environment, and this is relevant because all the proposed farm sites are located near land that is renowned for its natural character and visual qualities. Two of the proposed farm sites are adjacent to or adjoining areas of 'Outstanding Landscape Value', as noted by the MSRMP (EPA, 2012).

Secondly, the MSRMP has classified the Marlborough Sounds area as being of national importance to the protection of endangered species such as the Hector's dolphin and king shag (ibid.). Thirdly, the Marlborough Sounds provides a transport route of national significance for shipping and travel activity, and three of the farm sites are located or partially located on this route (ibid.).

The Minister's decision to treat this proposal as a question of national significance means that it will be considered by a Board of Inquiry as opposed to a local authority (NZKS, n.d.[a]). Therefore the Board of Inquiry's decision regarding the proposal will not be subject to appeal, as it would have been if decided by the Marlborough District Council (MDC, 2012b).

3. Concerns and questions

The Institute has a number of concerns regarding NZ King Salmon's application to the EPA. These inform the substantive submissions we make at section 4.

3.1. The overall benefits for New Zealand and the Marlborough Sounds region

The Institute is concerned that the purported economic benefits for New Zealand and the Marlborough Sounds region are not sufficiently evidenced and need to be clearly supported. The Minister stated in her public notification of the proposal that it has the potential to create positive economic benefits to Marlborough and other regions (EPA, 2012). Aside from job creation, reports of which range widely from 70 (NZKS n.d.[a]) to 1600 new jobs for the Marlborough and Nelson districts (NZKS n.d.[b]), the public notification does not specifically outline how the increase in production will positively benefit the country. Presumably, the Minister believes jobs will create economic flow-on effects; however, NZ King Salmon is predominantly owned by a Malaysian company, so there is no guarantee positive economic benefits from job creation and export earnings will be seen in New Zealand. Further, the Institute questions how much of the new development will be aided by technology as opposed to new staff. It is questionable whether long-term employment will persist beyond the initial stages of the expansion.

The public notification of the proposal predicts that the expansion will result in an additional 20,000 tonnes of salmon per year. However, given the current ownership model, it is unclear who will see the benefits of this increase in production and the possible export earnings. There needs to be greater transparency surrounding ownership of this company; the public should be made aware that 51% of NZ King Salmon is controlled by Evergreen Holdings, which is controlled by the Malaysian company Tiong Group (LINZ, 2011). Any stated economic benefits need to be contextualised with the fact that the current majority shareholder is an offshore investor.

Due to the large intrusion the expansion will have on the Marlborough Sounds region, it is paramount that benefits flow to this community. With regard to the assertions that the expansion will create employment and economic profits, more information as to what those benefits are and where they will go is necessary.

The balance of the shareholding is owned by a private equity fund managed by Direct Capital Partners, with a further small holding owned by management (see Table 1, Appendix 1). The equity fund is a closed-end fund which means it must sell out within an anticipated period – typically three to seven years – with the aim of having participated in the capital growth in the value of the shares in the company. It therefore raises the question of the real long-term benefits to New Zealand of this proposal if the shareholding is sold overseas.

Is broad economic benefit enough? Any economic benefit should be net; i.e. it should take into account the potentially harmful effects of the project on likely recreational and tourism earnings from the area and the likely negative impact on the capital values of nearby properties whose amenities are affected by the farms (see Table 2, Appendix 2).

The use of water space owned in common by the community for private purposes should command a cost to the user that is related to the earnings off it as well as the cost of negative impacts. If not, then one could argue that this is a precedent for the private sector to appropriate, at no cost, any government or community land if an economic benefit can be shown. The lack of financial consideration passing directly back to the community from this transaction makes it at best a naïve deal by the government and the community and at worst a financially negligent one.

From the current proposal, NZ King Salmon stands to gain significant financial benefits. However, those benefits must be viewed in light of the significant costs and loss of benefits imposed on the surrounding community and wider New Zealand. The competing interests of each side need to be seen in their entirety; the benefits to NZ King Salmon and New Zealand generally cannot be viewed in isolation from the costs and loss of benefits New Zealand faces. In Appendix 2, the Institute sets out a model for the EPA to assess the proposed benefits versus the proposed loss of benefits or costs. This is intended only as a model for how the EPA could assess the actual benefits for New Zealand and the Marlborough Sounds region, and a careful and full investigation would need to take place to ensure the purported net benefit is not being overstated. Appendix three sets out the need to complete a detailed risk assessment in terms of (i) the magnitude, (ii) the probability and (iii) the time scale of each risk.

3.2. The speed with which expansion is set to take place

New Zealand King Salmon has publicly stated that it plans to double its production within the next three to five years, and double production again within the following ten years (EPA, 2012). The Institute has concerns about the rapid nature of expansion proposed by NZ King Salmon and submits that this is not in line with best practice in the area. The Cawthorn Institute's *Seabed Report* recommends a slower model for development in the area of aquaculture:

> A conservative approach to fish farm developments involves starting at relatively low production levels, staging the development while monitoring carefully for effects, and making future expansions conditional upon acceptable environmental outcomes. The existing farms in the Marlborough Sounds have been managed under this type of approach since 2003, and it also underpins the management approach in other major salmon-producing countries such as Norway. (Cawthorn Institute, 2011: 58).

3.3. Environmental impact assessment

The Institute is concerned that the environmental impact of the proposed salmon aquaculture has not been fully represented in NZ King Salmon's proposal to the EPA. The proposal is framed in terms of the possible economic benefits for New Zealand, rather than the potential environmental impacts on the region. In addition to the fact that these proposed benefits are speculative and not well-supported, the public needs to be made aware that the short-term economic prosperity created by the farms may come at the expense of long-term environmental effects. Save Our Sounds, a lobby group for the protection of the Marlborough Sounds region, has expressed concerns that the Picton water supply is not equipped to support a processing plant such as NZ King Salmon has proposed to develop (SOS, 2012). This is just one of many potential environmental impacts on the local community.

In February 2000, a decision was made by ERMA to approve an application by NZ King Salmon Company Ltd to develop genetically modified Chinook salmon (the application was known as GMD99003). See page 68 and 74 of the Sustainable Future Institute's report *The History of Genetic Modification in New Zealand* (SFI, 2008). The public were never invited to make submissions, and although the development is now finished, as at 2008 frozen GM semen still remained. Therefore it needs to be clear in the EPA decision that if King Salmon wish to use GM salmon it must do so through a separate application to ERMA.

The Institute wants to know that controls will be in place to ensure that NZ King Salmon's use of the environment, industry and region is sustainable both in the short term and in the long term. Environmental impact assessments need to be regular and conducted by an independent body. It is unclear from NZ King Salmon's proposal who would be responsible for carrying out periodic assessments of the environmental impacts and to whom they would report. It is also

important that regulations are put in place, with serious consequences for non-compliance, and mechanisms are established to allow the community to voice any environmental concerns.

3.4. The Global Context of Salmon Farming

The exponential growth of salmon aquaculture worldwide is seen to pose a major ecological threat to marine ecosystems and human health (Eagle et al., 2005: 427). Damage to wild salmon populations and wider ecosystems has been proven to be caused by the farming of salmon in their native range, when large numbers of salmon are farmed relative to the size of wild populations, and when exotic pathogens are introduced (ibid.). Managing salmon stocks and the practice of salmon farming requires a cross-industry approach, given that the health of salmon populations is affected by a number of industries and factors such as mining, forestry, finfish aquaculture, coastal/land development, fishing and climate change (DSF, 2008: 21). In Appendix 4 the Institute reviews the global landscape of salmon farming, drawing on the World Wildlife Fund's *Final Draft Standards for Responsible Aquaculture* and the Global Aquaculture Performance Index, and scans the governance structures surrounding the practice in three major salmon-producing countries: Canada, Norway and Chile. This highlights a number of potential risks and challenges posed by the expansion of open-cage salmon farming in New Zealand.

The Institute's review found that salmon aquaculture is an industry that is well-developed in a number of countries globally. These countries' experiences provide examples both of best practice and of the dangers and risks inherent in salmon farming. The initiatives of international bodies such as the World Wildlife Fund in developing global standards and guiding principles towards which the salmon aquaculture industry can aspire shape best practice and offer valuable lessons for New Zealand in considering applications such as that of NZ King Salmon.

4. The McGuinness Institute's submission on New Zealand King Salmon Co. Limited's application to the EPA

As outlined in Section 2, NZ King Salmon has made an application to the EPA, requiring two changes to Marlborough Sounds Resource Management Plan (MSRMP) and nine resource consents. The McGuinness Institute submits that the EPA should not approve this application unless consent is contingent on NZ King Salmon and other bodies implementing a number of measures to minimise the risks associated with salmon aquaculture. These submissions are based on the Institute's assessment of the risks identified at Section 1 and the examples of best practice governance and risk management in the area of salmon aquaculture identified at Appendix 4.

Recommendation 1: A full strategic plan for the Marlborough Sounds region should be developed through extensive consultation with the community, local authorities and key stakeholders

The Institute submits that greater strategic planning and long-term thinking needs to be evident in NZ King Salmon's application. The EPA's assessment should be carefully considered in terms of the long-term needs of the local Marlborough Sounds community and New Zealand more broadly. The EPA needs to consider the fact that this region is of significant cultural, heritage, environmental, ecological and tourism value to the local community and country. This region acts as the bridge between our two main islands – historically, physically, and in terms of transportation. It is a cultural and heritage pathway; the region holds particular importance in forming the common identity that underpins our nation. The importance of the area to Maori and Treaty of Waitangi considerations needs to be central to the proposal

In preparing a strategic plan, NZ King Salmon needs to identify key stakeholders in the region, how they may be affected, and possible forms of redress the company can offer. The Institute identifies the following key stakeholders: Marlborough District Council; local residents; tourism operators; and conservationists. The Institute submits that a commercial area of this magnitude needs to be developed through a process of extensive community consultation, taking into account the region's inherent cultural, heritage, environmental, ecological and tourism value, and possible Treaty of Waitangi considerations. The granting of any consent should be contingent on NZ King Salmon submitting a long-term strategic plan that clearly demonstrates how it plans to mitigate any negative impacts on the significant value this region holds.

Recommendation 2: New Zealand King Salmon should be owned by a New Zealand majority shareholding

The current shareholding arrangement will see the oft-cited economic benefits of NZ King Salmon go offshore (see Section 3), while the long-term impacts and risks remain in New Zealand. The Institute submits that the EPA's approval should be contingent on a change in the shareholding structure for this company that mandates New Zealand majority ownership (i.e. at least 51% of shares held by New Zealand-owned companies). This would ensure that economic benefits translate into benefits for New Zealand.

Recommendation 3: The local community must receive compensation for both actual and potential impacts, and a commitment to ongoing consultation

In addition to changes in the ownership model, NZ King Salmon should be required to make regular contributions to the local Marlborough community, which will be subject to significant risk and impact. The EPA should make the expansion subject to NZ King Salmon making a clear commitment in terms of the redress the local community will receive. This could be in the form of a regular financial contribution to projects and initiatives aimed at preserving and sustaining the region, or otherwise supporting the region as the community sees fit. In addition, NZ King Salmon should be required to engage in regular and ongoing consultation with the community, to ensure a strong dialogue exists.

Recommendation 4: New farms should be introduced gradually, and only if research indicates the environment can support such expansion

The Institute submits that the rate of expansion proposed by NZ King Salmon poses a significant threat to the Marlborough Sounds region, and the EPA should instead require slower, more controlled expansion. Extensive research needs to take place to ensure the region can sustain and manage the risks attached to the full expansion and, if not, the expansion should be capped. When considering the long-term viability of the proposal, the EPA should consider whether the region can sustain the full nine farms over the 35-year period over which the proposal extends.

Recommendation 5: The consent should be contingent on strict regulations and regular reporting to ensure risks are not realised. Any breaches should incur severe penalties

Any consent granted for new farms should be subject to NZ King Salmon carrying out an annual review. These reviews need to be undertaken by independent inspectors reporting to the EPA, the local council and the community. Further, the NZ King Salmon farms should be mandated to obtain accreditation under the finalised standards for responsible salmon aquaculture (see Appendix 5). These standards set out a clear and comprehensive set of principles, indicators and measures against which the farms can be assessed.

Recommendation 6: Protection of heritage sites and the views from these sites

The Institute perceives the area to be affected by the Marlborough Sounds region to be of significant heritage value. The Marlborough Sounds is home to several key sites of historical importance, including Captain Cook's Lookout on Arapawa Island, Ship Cove – Cook's favourite New Zealand base during his three voyages of exploration – and the inlet in Queen Charlotte Sound, where in 1770 Captain Cook's raised the British flag upon declaring formal possession of New Zealand for the British Crown (McGuinness & White, 2011: 9). There should also be consideration of the significant Iwi customary interests in the Marlborough Sounds area. No proposed salmon aquaculture site should be visible from these national heritage sites.

Recommendation 7: Term of 35 years should be reduced to ten years, with a right to reapply

The current proposal seeks to obtain consent for the next 35 years. The Institute argues that this is too long and entrusts too much control in NZ King Salmon over the use of the region. The Institute argues that tying successive generations into a 35-year consent is not in the spirit of sustainable management of our marine resources; a great deal of research and science may become apparent as this is an emerging industry. By reducing the consent to ten years, with an option for renewal, the area can be considered for other uses such as a World Heritage Site, which is a major opportunity for the tourist industry as already seen in the Fiordland region. Given the ease with which salmon cages can be moved, a move in ten years would be not be an unfair prospect for NZ King Salmon to consider.

5. Summary

The Institute strongly supports greater scrutiny, tighter controls and more robust risk management in the EPA's consideration of NZ King Salmon's proposal to expand its salmon aquaculture production. It is essential the EPA consider the significant cultural, heritage, environmental, ecological and tourism value of this marine area to the Marlborough Sounds community and wider New Zealand. Any consent granted must reflect the national significance of the area, the risks and impacts inherent in the practice of salmon aquaculture and the long-term implications of development of this scale.

Appendix 1: Timeline of New Zealand King Salmon Co. Limited and related companies

This table demonstrates the number of registered companies involved in this salmon aquaculture enterprise in the Marlborough Sounds, and the overlap of directors involved. Where the primary company, 'The New Zealand King Salmon Co. Limited', appears, including under its previous names, it is noted with (TNZKSCL). Except where indicated, all information is retrieved from the New Zealand Companies Office. Efforts have been made to list all relevant companies and directors involved in the enterprise, however it should be noted that there may be other related companies that have been registered under different names. Company directors may have changed during the times of registration. There is an overlap between several of the directors of the primary company in question 'The New Zealand King Salmon Co. Limited' and the investment company, 'Direct Capital Limited' – namely, Mark Hutton and John Ryder. Further, Paul Steere is involved in both the primary 'The New Zealand King Salmon Co. Limited' company and also 'King Salmon Limited', as well other related companies including 'Regal Salmon Limited', and the (now struck off) 'Southern Ocean Seafoods Limited'.

This may be noteworthy because currently the primary company is 42% owned by 'Direct Capital' and 7% owned by unspecified 'Management and Directors' (NZKS, n.d.). Thus the exact split about who owns what shares is unclear. The lack of openness around the ownership of Evergreen Holdings Limited by Malaysian company Tiong Group, this ambiguity contributes to a lack of transparency.

Table 1: Timeline of New Zealand King Salmon Co. Limited and related companies

	Date	Company	Directors and Shareholders
1.	28 May 1985	'Queen Charlotte Holdings No 1 Limited', under the name of 'South Island Salmon Company Limited' is registered and incorporated.	Thomas Song Chai Leng Jack Lee Porus
2.	29 October 1985	'The New Zealand King Salmon Co. Limited' registered and incorporated under the name of 'Marlborough Salmon Company Limited' (TNZKSCL).	Mark Robert Hutton Jack Lee Porus John William Dudley Ryder Thomas Chai Leng Song Paul James Steere Thomas Wilton Sturgess
3.	13 March 1990	'Marlborough Salmon Company' name changed to 'Southern Ocean Seafoods Limited' (TNZKSCL).	As above at 2.
4.	06 November 1995	'South Island Salmon Company Limited' name changed to 'Regal Marketing Limited'.	As above at 1.
5.	19 February 1996	'Regal Marketing Limited' name changed to 'The New Zealand King Salmon Company Limited'.	As above at 1.
6.	09 July 1996	'Southern Ocean Seafoods' name changed to 'The New Zealand King Salmon Co. Limited' (TNZKSCL).	As above at 2.
7.	Unspecified date 1996	Privatisation and merger of Southern Ocean Seafood Ltd and Regal Salmon Ltd (NZKS, n.d.).	As above at 2.

8.	12 November 1996	'Regal Salmon Limited' established and incorporated as new company.	Grantley Bruce Rosewarne Paul James Steere
9.	12 November 1996	'Southern Ocean Seafoods Limited' established and incorporated as new company.	Grantley Bruce Rosewarne Paul James Steere
10.	24 December 1996	'Queen Charlotte Holdings No 1 Limited' struck off New Zealand Companies Register	As above at 1.
11.	17 July 2003	'Evergreen Holdings Limited' registered and incorporated under the name of 'Evergreen Insurance Brokers Limited'.	Winson Poh Cheong Maggie Shu Men Low Chris Sit Sally Fui Ying Yao
12.	22 December 2003	'Evergreen Insurance Brokers Limited' name changed to 'Evergreen Holdings Limited'.	As above at 11.
13.	15 December 2005	'Evergreen Holdings Limited' changed name for one day to 'Topwell Holdings Limited'.	As above at 11.
14.	16 December 2005	'Topwell Holdings Limited' changed name back to 'Evergreen Holdings Limited'.	As above at 11.
15.	31 May 2006	'Direct Capital Limited' registered and incorporated.	Mark Robert Hutton Ross Andrew George William James Kermode John William Dudley Ryder
16.	07 August 2008	'New Zealand King Salmon Investments Limited' registered and incorporated as a separate company.	Mark Robert Hutton Jack Lee Porus John William Dudley Ryder Thomas Chai Leng Song Paul James Steere Thomas Wilton Sturgess
17.	8 September 2008	Direct Capital invests in New Zealand King Salmon (Direct Capital, 2008).	As above at 15.
18.	15 March 2011	'King Salmon Limited' registered and incorporated	Grantley Bruce Rosewarne Paul James Steere
19.	3 October 2011	'The New Zealand King Salmon Co. Limited' (TNZKSCL) submits proposal to the Environmental Protection Authority for additional water-space	As above
20.	22 December 2011	'Southern Ocean Seafoods Limited struck off New Zealand Companies Register	As above

Appendix 2: Cost/benefit Analysis and Risk Assessment of NZ King Salmon's proposal

The EPA must complete two types of assessments:

(i) A Cost/Benefit Analysis (see below)

(ii) A Risk Assessment looking especially at the (i) magnitude, (ii) the probability and (iii) the time scale of each risk. (see Appendix 3)

Note: This table has been completed using information obtained under an Official Information Act request to the EPA. At the time of this submission, information was still not available to inform a comprehensive cost/benefit. This information should be received in the coming weeks and the Institute would seek to have a clearer understanding of the risks associated with NZ King Salmon's proposal at the time of oral submissions.

Table 2: Cost/Benefit Analysis of NZ King Salmon's proposal

Benefits[1] to New Zealand	Loss of benefits to New Zealand	Cost[2] to New Zealand	Net benefit (loss) to New Zealand
For example: Infrastructure development in the Marlborough Sounds resulting from expansion	For example: Loss of property values close to salmon aquaculture	For example: Risk of environmental pollution and ecological destruction	**[[For EPA's assessment]]**
For example: Increased jobs in the Marlborough Sounds region	For example: Loss of 'clean, green' image, resulting in drop in tourism and jobs in the tourism industry	For example: Cost of losing 'clean green' brand	**[[For EPA's assessment]]**

[1] ***Benefit*** means the value of a particular *positive* effect expressed in monetary or non-monetary terms (*Hazardous Substances and New Organisms* (*Methodology) Order* 1998: s 2)

[2] ***Cost*** means the value of a particular *adverse* effect expressed in monetary or non-monetary terms (ibid.).

Appendix 3: Risk Assessment of NZ King Salmon's proposal

The EPA must complete two types of assessments:

(i) A Cost/Benefit Analysis (see Appendix 2)

(ii) A Risk Assessment3 looking especially at the (i) magnitude, (ii) the probability and (iii) the time scale of each risk. (see below)

Note: This table has been completed using information obtained under an Official Information Act request to the EPA. At the time of this submission, information was still not available to inform a comprehensive risk assessment. This information should be received in the coming weeks and the Institute would seek to have a clearer understanding of the risks associated with NZ King Salmon's proposal at the time of oral submissions.

Table 3: Risk Assessment: Magnitude of risks associated with salmon aquaculture

	Minor impact	Medium-size impact	Major impact	Catastrophic impact
1. *Benthic impacts and siting*				
2. *Chemical inputs*				
3. *Disease/parasites*				
4. *Escapes*				
5. *Feed*				
6. *Nutrient loading and carrying capacity:*				
7. *Social issues*				

[3] **Risk** means the combination of the magnitude of an adverse effect and the probability of its occurrence (ibid.).

Table 4: Risk Assessment: Probability of risks associated with salmon aquaculture

	Virtually impossible	Unlikely	Possible	Probable	Certain
1. *Benthic impacts and siting*					
2. *Chemical inputs*					
3. *Disease/parasites*					
4. *Escapes*					
5. *Feed*					
6. *Nutrient loading and carrying capacity:*					
7. *Social issues*					

Table 5: Risk Assessment: Duration of risks associated with salmon aquaculture

	Less than 1 year	1-5 years	5-10 years	10+ years
1. *Benthic impacts and siting*				
2. *Chemical inputs*				
3. *Disease/parasites*				
4. *Escapes*				
5. *Feed*				
6. *Nutrient loading and carrying capacity:*				
7. *Social issues*				

Appendix 4: Global Context

I. Global governance: Managing the risks and benefits of salmon farming

Salmon production is an area of rapid expansion, with the largest growth being in farmed salmon – not wild salmon (WWF, n.d.[a]). Current salmon farming or harvesting is largely undertaken with the use of floating sea cages, which usually take the form of large, floating mesh cages (ibid.).

There are a number of risks posed by salmon farming, some of which pose greater threats to particular countries and eco-systems than others. Table 7 looks at these risks in terms of their probability, and balanced against the possible benefits. The World Wildlife Fund identified seven key environmental and social impacts posed by the rapid expansion of the salmon aquaculture industry, as outlined in Section 1.

This list provides a comprehensive overview of the main environmental and social risks posed by salmon farming. Further to this list, intensive salmon farming poses a number of risks to the unique culture and heritage of local communities. There may be issues around the traditional uses of the land and marine areas. Further, the environmental risks of salmon farming may sit uneasily with industries such as tourism that rely on the strength of the local environment and ecosystem. As seen in the Global Scan at Part III, salmon farming takes place primarily in semi-sheltered coastal areas, such as bays or sea lochs (WWF, n.d.[a]). These marine areas may also be sites of cultural importance, and the risks inherent in salmon farming practices needs to be considered in light of the unique importance of these areas.

In response to the risks salmon farming poses and the lack of global standards regulating the practice, the WWF undertook a process of community dialogue with a view to creating a set of standards to minimise the key negative environmental and social impacts of salmon aquaculture (WWF, n.d.[b]). This consultation formed part of the wider Aquaculture Dialogues. These Dialogues stemmed from the perceived need to engage a broad and diverse group of people in the development of standards for responsible aquaculture, and have resulted in eight roundtables that have thus far consulted more than 2,000 people – farmers, conservationists, academics, government officials and others – since beginning in 2004 (ibid).

The *Final draft standards for responsible salmon aquaculture*, released after the Dialogue process, sets out seven principles and a number of corresponding indicators against which the standards can be assessed. The purpose of the principles is 'to provide platform to minimise or eliminate the social and environmental impacts of salmon aquaculture while permitting the salmon farming industry to remain economically viable' (WWF, 2012: 11). Each principle has a number of corresponding indicators that constitute standards by which farms must abide to receive certification. The standards apply to the planning, development and operation of salmon aquaculture production systems, with focus of on production and the immediate inputs to production (WWF, 2012: 7). They are intended for broad application, and can be applied to all locations and scales of salmon aquaculture production (ibid.). When the draft standards have been finalized, a new committee – the Aquaculture Stewardship Council (ASC) – will assume responsibility for working with independent, accredited, third-party entities provide certification for farms that comply with the standards (ibid.). The seven guiding principles developed through the process and the corresponding indicators and standards are set out in Table 7.

II. Global measures: The Global Aquaculture Performance Index (GAPI)

The Global Aquaculture Performance Index[4] ranks the performance of a number of salmon-producing nations. Each country is given a normalised score and cumulative score, which reflects the scale of production, based on ten indicators of the ecological impacts of finfish aquaculture (SERG, 2011b). The indicators are based on inputs (capture-based aquaculture, ecological energy, industrial energy, sustainability of feed), discharges (antibiotics, antifoulants (copper), biochemical oxygen demand, parasiticides) and use of biochemicals (escapes, pathogens) (ibid.). The scores allow a comparison of performance across countries and this section draws on the findings of the GAPI project.

The following section undertakes a global scan of three major salmon producing nations: Norway, Chile and Canada – all of which have received GAPI ratings. Norway obtained the second-highest score in the GAPI assessment, with a score of 72 (SERG, 2011a). However, the cumulative score was significantly below the country average at 34 (ibid.). This was a reflection of the size of Norway's Atlantic salmon industry, which accounts for 21% of total marine finfish production assessed by GAPI (ibid.).

Similarly, Chile received an above average GAPI score of 65 and low cumulative score of 30, the second worst cumulative rating of all assessed countries (SERG, 2011a). This low score reflects the significant waste and biological impacts of Chile's vast salmon farming industry (ibid.).

Canada obtained a score of 70 across the ten indicators assessed under the GAPI (SERG, 2011a). This was above the average country score of 59. Its cumulative score drops to 64, which reflects the relatively large size of its Atlantic salmon industry (ibid.). This is slightly below the country average of 67. Areas of particular weakness appeared to be in industrial energy (57), antifoulants (copper) (28) and escapes (39) (ibid.).

III.Global Scan

Norway, Chile and Canada are three of the largest players in the salmon aquaculture industry. Table 1 sets out the size and location of salmon aquaculture activities across all three contexts. This global scan considers the structures, bodies and legislation governing the aquaculture industry across all three contexts. This highlights best practice in the area, and also demonstrates weaknesses in governance mechanisms from which New Zealand can learn.

Table 6: Salmon aquaculture in Norway, Chile and Canada: Industry size and location

	Norway	Chile	Canada
Size of industry	In 2003, 507,413 tonnes of Atlantic salmon were produced in Norway (FAO, 2004). Atlantic salmon is by far the most important species in Norwegian	Chile produced a volume of 385,799 tonnes of Atlantic salmon in 2005 (NCSTR, 2007). Salmonids (salmon and trout) amount to 84% of	In 2009, finfish accounted for 76% of total aquaculture production in Canada, of which 93% was salmon. The total output of all farmed species in 2009 was 155,000 tonnes, of

[4] The Global Aquaculture Performance Index (GAPI) is a science-based, data-driven tool enabling rigorous and objective evaluation of the environmental performance of marine aquaculture production systems (SAUP, n.d.). It was developed by Dr. John Volpe and the Seafood Ecology Research Group at the University of Victoria, Canada (ibid.). Derived from Yale and Columbia University's 2008 Environmental Performance Index (EPI), the GAPI allows interested parties and policymakers to make more informed and sustainable decisions related to their farmed seafood purchases and policies, respectively (ibid.).

	aquaculture, accounting for more than 80 percent of total production. (FAO, 2005).	the total production in Chilean aquaculture and practically 100% of all fish produced in fish farms (ibid.).	which, 70.5% was salmon. British Columbia is the largest salmon producer with a market value of $394M, followed by New Brunswick ($159M) and the rest of Atlantic Canada ($100M). In 2009, British Columbia and New Brunswick produced 93,000 tonnes of salmon, representing 85% of total salmon production in Canada (FOC, 2011).
Location of aquaculture industry	There are eight key aquaculture sites along the Norwegian coast. These sites are in in the following regions: Troms/Finnmark, Nordland, Trøndelag, Møre og Romsdal, Sogn og Fjordane, Hordlan Troms/Finnmark, Nordland, Trøndelag, Møre og Romsdal, Sogn og Fjordane, Hordland, Rogaland and Ager (FAO, 2005).	Chilean aquaculture is located mainly in coastal marine farms, particularly in the Los Lagos Region, where the principal products are salmon and trout (which are also produced in the Aysén and Magallanes regions), along with chorito mussels and the pelillo algae. Important volumes are also produced in the Coquimbo Region (Northern scallops and pelillo algae) and in the Atacama Region (Northern scallops, pelillo algae, and abalone) (NCSTR, 2007).	Most salmon farms are located in the province of British Columbia. Total revenue from aquaculture (all species) in 2009 was $800 million: 52.3% from British Columbia, 20.7% New Brunswick ,11.7% Newfoundland, 7.3% Nova Scotia, 3.9% Prince Edward Island, 2.2% Ontario, 1.2% Quebec, 0.7% Prairies (FOC, 2011).

Norway

Norway is a major producing country of Atlantic Salmon, which with Atlantic cod accounted for 90% of total marine finfish in Norway in 2007 (SERG, 2011a). In 2007, Norway accounted for 33 per cent of the world's total production of cultured salmon (FAO, n.d.: 6). Farmed salmon is now one of Norway's main export commodities, with aquaculture and related industries contributing significantly to the country's economy (FAO, 2005).

The governing legislation in the area of management, control and development of fish farming is the Aquaculture Act 2003. This Act seeks to 'contribute to the balanced and sustainable development of the aquaculture industry and to its development as a profitable and viable regional industry' through a licensing system governing the establishment and operation of fish farms (FAO, n.d.). Further, the Food Production and Food Safety Act has responsibilities in the

area, given its mandate to regulate the production, cultivation and distribution of foodstuffs, seeds and feed, as well as other issues related to food and plant health (ibid.).

The main agency responsible for the public management of the aquaculture industry is the Directorate of Fisheries, which operates under the Ministry of Fisheries (ibid.). It is responsible for co-ordinating, administrating and executing surveillance and control measures in the area of fisheries (ibid.). A number of other agencies also have responsibilities in the area of public management of fisheries, including the Norwegian Coastal Administration, the Norwegian Food Safety Authority and the Ministry of Environment (ibid.). Further, a number of these agencies have regional and local bodies have responsibilities in regulating and monitoring fisheries and related activities.

The rapid expansion of intensive salmon farming in Norway has caused a number of ecological and health-related problems. Severe problems with bacterial diseases (such as vibriosis, cold water vibriosis and furunculosis) emerged in the 1980s, and attempts to treat the diseases with antibiotics were unsuccessful (FOA, n.d.). This problem lead to extensive contamination of fish stocks and marine ecosystems, with the height of antibiotic use in 1987 seeing close to 50 tonnes of antibiotics being administered during the year (ibid.). Subsequent environmental regulation and the development of fish vaccines saw this markedly decrease, and the use of antibiotics in salmon production has been less than one tonne per year since 1996 (ibid.).

Chile

In 2008 salmon was one of Chile's largest export commodities, with salmon farms in Southern Chile harvesting over 600,000 metric tonnes of salmon in 2006 (Johnston, 2011). However, this figure halved with the onset of the infectious salmon anaemia virus (ISA), which spread through salmon farms in the Los Lagos, Aysén and Magallanes regions in Southern Chile beginning in 2007 (United Press International, 2010).

Prior to the ISA outbreak of 2007 and 2008 the salmon farming industry in Chile was growing both exponentially and unsustainably, lacking sanitary controls (Barrionuevo, 2008). Salmon were farmed in overcrowded industrial cages, with little space between cages (Imhoff, 2009). As a result of this proximity infections, fungal illnesses and parasites such as sea lice, spread easily within the salmon populations, resulting in the Chilean salmon industry using large quantities of antibiotics on salmon (Imhoff, 2009) (Barrionuevo, 2008). The 'stress' this proximity and overcrowded environment caused the fish, is one of the reasons experts believe the ISA virus spread easily, as attention was not being paid to the long term effects of the farms (Anson, 2009) (Anderson, 2012).

As a consequence of the devastating ISA outbreak in 2007 and 2008, the Chilean government has established the new regulatory framework called, Programa Sanitario Específico de Vigilancia y Control de la Anemia Infecciosa del Salmón. This programme emphasises enforcing higher standards in the salmon farming industry and frequent testing for the presence of ISA in salmon populations (Ansoleaga Bengoechea, 2011). This involves increased surveillance and strict testing for the presence of ISA in all salmon farms, including at least one from every cage (ibid). If tests come back positive, immediate action is taken and the frequency of ISA tests is increased (ibid). Other new measures as part of the new framework include, regulation of thorough cleaning of all equipment that comes into contact with the fish, and breaking the areas of salmon production into distinctive zones, whereby salmon farming is coordinated (ibid). This new regulatory framework is described by Chile's National Director of Sernapesca as learning from the mistakes made in the salmon industry prior to the ISA outbreak and taking more preventative measures to ensure it does not happen again (Sernapesca, 2011).

The full environmental impacts of salmon farming in Chile remain unknown, but some are already being observed. Environmentalists have noted the consequences of salmon food pellets and faeces, stripping water of oxygen, killing other marine life and spreading disease (Barrionuevo, 2008). Local fishermen in the Los Lagos region have said they are catching significantly less fish overall since the introduction of intensive salmon farming (Barrionuevo, 2008). Another observed environmental impact of farmed salmon in Chile, is the escapement of around ten million salmon from salmon farms annually (Oceana, n.d). Escaping salmon have very severe ecological impacts including, predation and competition with native species and transmission of diseases to native wild fish species. (Oceana, n.d)

Canada

Canada is the fourth-largest producer of Atlantic salmon globally (SERG, 2011a). Governance and regulation of salmon farming takes place at both a state and federal level in Canada. At a federal level, the primary legislation governing the farming of salmon is the Fisheries Act, and the Department of Fisheries and Oceans (DFO) has a range governance responsibilities in regards to salmon farming (DFO, 2005). The DFO states that all coastal developments, including salmon farms, are required to undergo 'lengthy environmental assessment' and ensure that conservation measures are adopted, before applications are approved (ibid.). Further, they state that Habitat Officers routinely review sites to ensure harmful alterations, disruptions and destructions of the ocean and freshwater habitat are not occurring. The DFO rejects that salmon farming is inherently bad for the environment, and states that the Canadian federal system for governing the practice has in place a number of checks and balances for the management of the salmon farming industry: Environmental Assessment, The National Aquatic Animal Health Program, and Canada's National Code on Introduction and Transfers on Aquatic Organisms (ibid.).

The work of the DFO and other federal and state-level governance initiatives has been subject to significant criticism in the past. The David Suzuki Foundation, a research centre specialising in issues around salmon aquaculture, states that the DFO 'acts more like an advocate than a regulator, adding to the distress of those troubled about the effects of what amounts to having high-density feedlots floating in our waters' (Volpe, 2001: 2). The Foundation claims that the DFO's dealing of issues around salmon aquaculture have been subject to 'serious questions' from both Canada's Auditor General and the Senate Fisheries Committee (ibid.: 3). However, over the past decade, significant improvements appear to have been made in the way salmon farming is managed. Most recently, the DFO released the Proposed Regulatory Regime to Manage the Release of Aquaculture Substances (formerly known as the Fish Pathogen and Pest Treatment Regulations. The purpose of this regime is to ensure sustainable aquaculture in Canada: to protect fish and fish habitat, while enabling economic development (DFO, 2012: 2). The regime seeks to implement an overall regulatory regime to ensure a coordinated, integrated approach to risk management is taken, and to ensure the Fisheries Act sufficiently manages all aquaculture activity (ibid.).

In British Columbia (B.C.), salmon are seen to be of heightened importance to the local ecosystem, economy and culture (DSF, 2006). B.C. also is considered a major farm salmon producer in Canada (DFO, 2005). Resultantly, B.C. has implemented a comprehensive governance system for monitoring and enforcing standards in salmon farming. This included annual inspections and on-site audits of all active salmon farms to ensure compliance (ibid.). In the context of B.C., the management of salmon in the Nass River is cited a successful model of governance for the practice of salmon farming, as it is informed and directed in part by local communities and stakeholders' with close ties to the area and resources (DSF, 2008). Utilising local knowledge and encouraging a sense of ownership and investment within communities is seen to be a successful model for rebuilding salmon stocks and maintaining the viability of commercial fishing (ibid.).

Appendix 5: Draft Principles, criteria, indicators and standards for grow-out, developed by the Salmon Aquaculture Dialogues

Source: WWF, 2012: 12-70

Table 7: Draft Principles, criteria, indicators and standards for grow-out

Note: Indicators 8.1-8.24 and the corresponding standards are relevant to salmon farming at freshwater smolt sites, as opposed to farming at saltwater grow-out sites.

Principle	Indictor	Standard
1. Comply with all applicable national laws and local regulations	1.1.1: Presence of documents demonstrating compliance with local and national regulations and requirements on land and water use	Yes
	1.1.2: Presence of documents demonstrating compliance with all tax laws	Yes
	1.1.3: Presence of documents demonstrating compliance with all relevant national and local labor laws and regulations	Yes
	1.1.4: Presence of documents demonstrating compliance with all relevant national and local labor laws and regulations	Yes
	8.1: Compliance with local and national regulations on water use and discharge, specifically providing permits related to water quality	Yes
	8.2: Compliance with labor laws and regulations	Yes
2. Conserve natural habitat, local biodiversity and ecosystem function	2.1.1: Redox potential or sulphide levels in sediment outside of the Allowable Zone of Effect (AZE)	Redox potential > 0 millivolts (mV) or Sulphide ≤ 1,500 microMoles / l
	2.1.2: Faunal index score indicating good to high ecological quality in sediment outside the AZE	AZTI Marine Biotic Index (AMBI) score ≤ 3.3, or Shannon-Wiener Index score > 3, or Benthic Quality Index (BQI) score ≥ 15, or Infaunal Trophic Index (ITI) score ≥ 25
	2.1.3: Number of macrofaunal taxa in the sediment within the AZE	≥ 2 highly abundant taxa that are not pollution indicator species
	2.1.4: Definition of a site-specific AZE based on a robust and credible modeling system	Yes, within three years of the publication of the SAD standard
	2.2.1: Weekly average percent saturation of dissolved oxygen (DO)on farm	≥ 70%

	2.2.2: Maximum percentage of weekly samples from 2.2.1 that fall under 2 mg/liter DO	5%
	2.2.3: For jurisdictions that have national or regional coastal water quality targets, demonstration through third-party analysis that the farm is in an area recently classified as having "good" or "very good" water quality	Yes
	2.2.4: For jurisdictions without national or regional coastal water quality targets, evidence of weekly monitoring of nitrogen and phosphorous levels on farm and at a reference site	Yes
	2.2.5: Demonstration of calculation of biochemical oxygen demand (BOD) of the farm on a production cycle basis	Yes
	2.3.1: Percentage of fines in the feed at point of entry to the farm	< 1% by weight of the feed
	2.4.1: Evidence of an assessment of the farm's potential impacts on biodiversity and nearby ecosystems	Yes
	2.4.2: Allowance for the farm to be sited in a protected area or High Conservation Value Areas (HCVAs)	None
	2.5.1: Number of days in the production cycle when acoustic deterrent devices (ADDs) or acoustic harassment devices (AHDs) were used	0, within three years of the date of publication of the SAD standard
	2.5.2: Prior to the achievement of 2.5.1, if ADDs or AHDs are used, maximum percentage of days in the production cycle that the devices are operational	≤ 40%
	2.5.3: Number of mortalities of endangered or red-listed marine mammals or birds on the farm	0
	2.5.4: Evidence that the following steps were taken prior to lethal action against a predator: 1. All other avenues were pursued prior to using lethal action 2. Approval was given from a senior manager above the farm manager 3. Explicit permission was granted to take lethal action against the specific animal from the relevant regulatory authority	Yes
	2.5.5: Evidence that information about any lethal incidents on the farm has been made easily publicly available	Yes
	2.5.6: Maximum number of lethal incidents on the farm over the prior two years	< 9 lethal incidents, with no more than two of the incidents being marine mammals
	2.5.7: In the event of a lethal incident, evidence that an assessment of the risk of lethal incident(s) has been undertaken and demonstration of concrete steps taken by the farm to reduce the risk of future incidences	Yes

	8.3: Evidence of an assessment of the farm's potential impacts on biodiversity and nearby ecosystems that contains the same components as the assessment for grow-out facilities under 2.4.1	Yes
	8.4: Maximum total amount of phosphorus released into the environment per metric ton (mt) of fish produced over a 12-month period	5 kg/mt of fish produced over a 12-month period; within three years of publication of the SAD standards, 4 kg/mt of fish produced over a 12-month period
	8.5: Water quality monitoring matrix completed and submitted to ASC	Yes
3. Protect the health and genetic integrity of wild populations	3.1.1: Participation in an Area-Based Management (ABM) scheme for managing disease and resistance to treatments that includes coordination of stocking, fallowing, therapeutic treatments and information-sharing.	Yes
	3.1.2: A demonstrated commitment to collaborate with NGOs, academics and governments on areas of mutually agreed research to measure possible impacts on wild stocks	Yes
	3.1.3: Establishment and annual review of a maximum sea lice load for the entire ABM and for the individual farm	Yes
	3.1.4: Frequent on-farm testing for sea lice, with test results made easily publicly available within seven days of testing	Yes
	3.1.5: In areas with wild salmonids, evidence of data and the farm's understanding of that data, around salmonid migration routes, migration timing and stock productivity in major waterways within kilometers of the farm	Yes
	3.1.6: In areas of wild salmonids, monitoring of sea lice levels on wild out-migrating salmon juveniles or on coastal sea trout or Arctic char, with results made publicly available	Yes
	3.1.7: In areas of wild salmonids, maximum on-farm lice levels during sensitive periods for wild fish	0.1 mature female lice per farmed fish
	3.2.1: If a non-native species is being produced, demonstration that the species was widely commercially produced in the area by the date of publication of the SAD standard	Yes
	3.2.2: If a non-native species is being produced, evidence of scientific research completed within the past five years that investigates the risk of establishment of the species within the farm's jurisdiction and these results submitted to ASC for review	Yes, within five years of publication of the SAD standard
	3.2.3: Use of non-native species for sea lice control or on-farm management purposes	None

	3.3: Use of transgenic salmon by the farm	None
	3.4.1: Maximum number of escapees in the most recent production cycle	300
	3.4.2: Accuracy of the counting technology or counting method used for calculating stocking and harvest numbers	≥ 98%
	3.4.3: Estimated unexplained loss of farmed salmon is made publicly available	Yes
	3.4.4: Evidence of escape prevention planning and related employee training, including: net strength testing; appropriate net mesh size; net traceability; system robustness; predator management; record keeping and reporting of risk events (e.g., holes, infrastructure issues, handling errors, reporting and follow up of escape events); and worker training on escape prevention and counting technologies	Yes
	8.6: If a non-native species is being produced, the species shall have been widely commercially produced in the area prior to the publication of the SAD standards	Yes
	8.7: Maximum number of escapees in the most recent production cycle	300 fish
	8.8: Accuracy of the counting technology or counting method used for calculating the number of fish	≥98%
4. Use resources in an environmentally efficient and responsible manner	4.1.1: Evidence of traceability, demonstrated by the feed producer, of feed ingredients that make up more than 1% of the feed.	Yes
	4.2.1: Fishmeal Forage Fish Dependency Ratio (FFDRm) for grow-out	< 1.35
	4.2.2: Fish Oil Forage Fish Dependency Ratio (FFDRo) for grow-out OR Maximum amount of EPA and DHA from direct marine	FFDRo < 2.95 or (EPA + DHA) < 30 g/kg feed
	4.3.1: Timeframe for all fishmeal and fish oil used in feed to come from fisheries certified under a scheme that is an ISEAL member and has guidelines that specifically promote responsible environmental management of small pelagic fisheries	< 5 years after the date of publication of the SAD standards
	4.3.2: Prior to achieving 4.3.1, the FishSource score for the fishery(ies) from which all marine raw material in feed is derived	All individual scores ≥ 6, and biomass score ≥ 8
	4.3.3: Prior to achieving 4.3.1, demonstration of third-party verified chain of custody and traceability for the batches of fishmeal and fish oil which are in compliance with 4.3.2	Yes
	4.3.4: Feed containing fishmeal and/or fish oil originating from by-products or trimmings from IUU catch or from fish species that are categorized as vulnerable, endangered or critically endangered, according to the IUCN Red List of Threatened Species	None
	4.4.1: Presence and evidence of a responsible sourcing policy for the feed manufacturer for feed ingredients that comply with recognized crop moratoriums and local laws	Yes

	4.4.2: Percentage of soya or soya-derived ingredients in the feed that are certified by the Roundtable for Responsible Soy (RTRS) or equivalent	100%, within five years of the publication of the SAD standards
	4.4.3: Evidence of disclosure to the buyer of the salmon of inclusion of transgenic plant raw material, or raw materials derived from transgenic plants, in the feed	Yes, for each individual raw material containing > 1% transgenic content
	4.5.1: Presence and evidence of a functioning policy for proper and responsible treatment of non-biological waste from production (e.g., disposal and recycling)	Yes
	4.5.2: Evidence that non-biological waste (including net pens) from grow-out site is either disposed of properly or recycled	Yes
	4.6.1: Presence of an energy use assessment verifying the energy consumption on the farm and representing the whole life cycle at sea	Yes, measured in kilojoule/mt fish/production cycle
	4.6.2: Records of greenhouse gas (GHG) emissions on farm and evidence of an annual GHG assessment	Yes
	4.6.3: Documentation of GHG emissions of the feed used during the previous production cycle, as outlined in Appendix V, subsection 2	Yes, within three years of the publication of the SAD standards
	4.7.1: For farms that use copper-treated nets, evidence that nets are not cleaned or treated in situ in the marine environment	Yes
	4.7.2: For any farm that cleans nets at on-land sites, evidence that net-cleaning sites have effluent treatment	Yes
	4.7.3: For farms that use copper nets or copper-treated nets, evidence of testing for copper level in the sediment outside of the AZE	Yes
	4.7.4: Evidence that copper levels are < 34 mg Cu/kg dry sediment weight OR in instances where the Cu in the sediment exceeds 34 mg Cu/kg dry sediment weight, demonstration that the Cu concentration falls within the range of background concentrations as measured at three reference sites in the water body	Yes
	4.7.5: Evidence that the type of biocides used in net antifouling are approved according to legislation in the European Union, or the United States, or Australia	Yes
	8.9: Evidence of a functioning policy for proper and responsible treatment of non-biological waste from production (e.g., disposal and recycling)	Yes
	8.10: Presence of an energy-use assessment verifying the energy consumption at the smolt production facility	Yes, measured in kilojoule/mt fish/production cycle
	8.11: Records of greenhouse gas (GHG) emissions at the smolt production facility and evidence of an annual GHG assessment (See Appendix V, subsection 1)	Yes

5. Manage disease and parasites in an environmentally responsible manner	5.1.1: Evidence of a fish health management plan for the identification and monitoring of fish diseases and parasites	Yes
	5.1.2: Site visits by a designated veterinarian at least four times a year, and by a fish health manager at least once a month	Yes
	5.1.3: Percentage of dead fish removed and disposed of in a responsible manner	100%
	5.1.4: Percentage of mortalities that are recorded, classified and receive a post-mortem analysis	100%
	5.1.5: Maximum viral disease-related mortality on farm during the most recent production cycle	≤ 10%
	5.1.6: Maximum unexplained mortality rate from each of the previous two production cycles, for farms with total mortality > 6%	≤ 40% of total mortalities
	5.1.7: A farm-specific mortalities reduction program that includes defined annual targets for reductions in mortalities and reductions in unexplained mortalities	Yes
	5.2.1: On-farm documentation that includes, at a minimum, detailed information on all chemicals and therapeutants used during the most recent production cycle, the amounts used (including grams per ton of fish produced), the dates used, which group of fish were treated and against which diseases, proof of proper dosing, and all disease and pathogens detected on the site	Yes
	5.2.2: Allowance for use of therapeutic treatments that include antibiotics or chemicals that are banned in any of the primary salmon producing or importing countries	None
	5.2.3: Percentage of medication events that are prescribed by a veterinarian	100%
	5.2.4: Compliance with all withholding periods after treatments	Yes
	5.2.5: Maximum farm level cumulative parasiticide treatment index (PTI) score as calculated according to the formula	PTI score ≤ 13
	5.2.6: For farms with a cumulative PTI ≥ 6 in the most recent production cycle, demonstration that parasiticide load is at least 15% less that of the average of the two previous production cycles	Yes, within five years of the publication of the SAD standard
	5.2.7: Allowance for prophylactic use of antimicrobial treatments	None
	5.2.8: Allowance for use of antibiotics listed as critically important for human medicine by the World Health Organization (WHO)	None
	5.2.9: Number of treatments of antibiotics over the most recent production cycle	≤ 3
	5.2.10: If more than one antibiotic treatment is used in the most recent production cycle, demonstration that the antibiotic load is at least 15% less that of the average of the two previous production cycles	Yes, within five years of the publication of the SAD standard
	5.2.11: Presence of documents demonstrating that the farm has provided buyers of its salmon a list of all therapeutants used in production	Yes

	5.3.1: Bio-assay analysis to determine resistance when two applications of a treatment have not produced the expected effect	Yes
	5.3.2: When bio-assay tests determine resistance is forming, use of an alternative, permitted treatment, or an immediate harvest of all fish on the site	Yes
	5.4.1: Evidence that all salmon on the site are a single-year class	100%
	5.4.2: Evidence that if the farm suspects an unidentifiable transmissible agent, or if the farm experiences unexplained increased mortality, the farm has: 1. Reported the issue to the ABM and to the appropriate regulatory authority 2. Increased monitoring and surveillance on the farm and within the ABM 3. Promptly made findings publicly available	Yes
	5.4.3: Evidence of compliance with the OIE Aquatic Animal Health Code	Yes
	5.4.4: If an OIE-notifiable disease is confirmed on the farm, evidence that: 1. the farm has, at a minimum, immediately culled the pen(s) in which the disease was detected 2. the farm immediately notified the other farms in the ABM 3. the farm and the ABM enhanced monitoring and conducted rigorous testing for the disease 4. the farm promptly made findings publicly available	Yes
	8.12: Evidence of a fish health management plan, approved by the designated veterinarian, for the identification and monitoring of fish diseases and parasites	Yes
	8.13: Percentage of fish that are vaccinated for selected diseases that are known to present a significant risk in the region and for which an effective vaccine exists	100%
	8.14: Percentage of smolt groups tested for select diseases of regional concern prior to entering the grow-out phase on farm	100%
	8.15: Detailed information, provided by the designated veterinarian, of all chemicals and therapeutants used during the smolt production cycle, the amounts used (including grams per ton of fish produced), the dates used, which group of fish were treated and against which diseases, proof of proper dosing and all disease and pathogens detected on the site	Yes
	8.16: Allowance for use of therapeutic treatments that include antibiotics or chemicals that are banned in any of the primary salmon producing or importing countries	None
	8.17: Number of treatments of antibiotics over the most recent production cycle	≤ 3
	8.18: Allowance for use of antibiotics listed as critically important for human medicine by the WHO	None
	8.19: Evidence of compliance with the OIE Aquatic Animal Health Code	Yes

6. Develop and operate farms in a socially responsible manner	6.1.1: Evidence that workers have access to trade unions (if they exist) and union representative(s) chosen by themselves without managerial interference	Yes
	6.1.2: Evidence that workers are free to form organizations, including unions, to advocate for and protect their rights	Yes
	6.1.3: Evidence that workers are free and able to bargain collectively for their rights	Yes
	6.2.1: Number of incidences of child labor	None
	6.2.2: Percentage of young workers that are protected	100%
	6.3.1: Number of incidences of forced, bonded or compulsory labor	None
	6.4.1: Evidence of comprehensive and proactive anti-discrimination policies, procedures and practices	Yes
	6.4.2: Number of incidences of discrimination	None
	6.5.1: Percentage of workers trained in health and safety practices, procedures and policies on a yearly basis	100%
	6.5.2: Evidence that workers use Personal Protective Equipment (PPE) effectively	Yes
	6.5.3: Presence of a health and safety risk assessment and evidence of preventive actions taken	Yes
	6.5.4: Evidence that all health- and safety-related accidents and violations are recorded and corrective actions are taken when necessary	Yes
	6.5.5: Evidence of employer responsibility and/or proof of insurance (accident or injury) for 100% of worker costs in a job-related accident or injury when not covered under national law	Yes
	6.5.6: Evidence that all diving operations are conducted by divers who are certified	Yes
	6.6.1: The percentage of workers whose basic wage (before overtime and bonuses) is below the minimum wage	0 (None)
	6.6.2: Evidence that the employer is working toward the payment of basic needs wage	Yes
	6.6.3: Evidence of transparency in wage-setting and rendering	Yes
	6.7.1: Percentage of workers who have contracts	100%
	6.7.2: Evidence of a policy to ensure social compliance of its suppliers and contractors	Yes
	6.8.1: Evidence of worker access to effective, fair and confidential grievance procedures	Yes
	6.8.2: Percentage of grievances handled that are addressed within a 90-day timeframe	100%
	6.9.1: Incidences of excessive or abusive disciplinary actions	None
	6.9.2: Evidence of a functioning disciplinary action policy whose aim is to improve the worker	Yes
	6.10.1: Incidences, violations or abuse of working hours and overtime laws	None
	6.10.2: Overtime is limited, voluntary, paid at a premium rate and restricted to exceptional circumstances	Yes

	6.11.1: Evidence that the company encourages and sometimes supports education initiatives for all workers (e.g., courses, certificates and degrees)	Yes
	6.12.1: Demonstration of company-level policies in line with the standards under 6.1 to 6.11 above	Yes
	8.20: Evidence of company-level policies and procedures in line with the labor standards under 6.1 to 6.11	Yes
7. Be a good neighbor and conscientious citizen	7.1.1: Evidence of regular and meaningful consultation and engagement with community representatives and organizations	Yes
	7.1.2: Presence and evidence of an effective policy and mechanism for the presentation, treatment and resolution of complaints by community stakeholders and organizations	Yes
	7.1.3: Evidence that the farm has posted visible notice at the farm during times of therapeutic treatments and has, as part of consultation with communities under 7.1.1, communicated about potential health risks from treatments	Yes
	7.2.1: Evidence that indigenous groups were consulted as required by relevant local and/or national laws and regulations	Yes
	7.2.2: Evidence that the farm has undertaken proactive consultation with indigenous communities	Yes
	7.2.3: Evidence of a protocol agreement, or an active process to establish a protocol agreement, with indigenous communities	Yes
	7.3.1: Changes undertaken restricting access to vital community resources without community approval	None
	7.3.2: Evidence of assessments of company's impact on access to resources	Yes
	8.21: Evidence of regular consultation and engagement with community representatives and organizations	Yes
	8.22: Evidence of a policy for the presentation, treatment and resolution of complaints by community stakeholders and organizations	Yes
	8.23: Where relevant, evidence that indigenous groups were consulted as required by relevant local and/or national laws and regulations	Yes
	8.24: Where relevant, evidence that the farm has undertaken proactive consultation with indigenous communities	Yes

Note: Indicators 8.1-8.24 and the corresponding standards are relevant to salmon farming at freshwater smolt sites, as opposed to farming at saltwater grow-out sites.

Appendix 6: Outstanding information requests

Table 8: List of Information Requests Outstanding

Information Request Correspondence:			
Date	To	From	Subject
A: OIA26042012 26/04/12	Jenny Clafferty EPA	McGuinness Institute	Status of infections and diseases and chemicals and medical treatments
Reply 1/05/12	McGuinness Institute	Jenny Clafferty EPA	
Reply 1/05/12	McGuinness Institute	Jenny Clafferty EPA	
B: IR26042012	James Gardener-Hopkins, Russel McVeagh	McGuinness Institute	Details of past NZ King Salmon farms
C: OIA02052012 05/02/12	Jenny Clafferty EPA	McGuinness Institute	Funding and expenses of NZ King Salmon's proposal application

A: OIA26042012 26/04/12

26 April 2012

Environmental Protection Authority
Private Bag 63002
Waterloo Quay
Wellington 6140

Dear Jenny Clafferty,

Official Information Request regarding King Salmon's Proposal: OIA2704201203

The McGuinness Institute is in the process of preparing a submission on King Salmon's Proposal for Plan Changes and Resource Consent Applications in the Marlborough Sounds.

In order to prepare this submission, the Institute would like greater clarity on certain aspects of this proposal. We request detail about the following preliminary questions:

1. What infections and/or diseases have been reported in the farming of salmon in New Zealand since its establishment in the mid-1980s? Please provide references where possible.
2. What chemicals and additives have been used in the farming of salmon in New Zealand? Please provide references where possible.
3. In regards to the current proposal before the EPA, please outline what chemicals and additives are being considered for use, if the King Salmon proposal is approved. We have been unable to find a complete list in the proposal.

4. In addition, we would appreciate if you could email the entire King Salmon proposal in one PDF document to us, to enable ease of search and therefore assurance that we are not missing key elements of the proposal. We suggest that this should also be made available to the public on your website.

The Institute would appreciate a prompt response to these questions and concerns, given the deadline next Wednesday for submissions on King Salmon's proposal. However, if this is not possible, we would still like a response to these questions, as it is our intention to also orally submit on this proposal.

If you would like to discuss this request further, please do not hesitate to contact the Institute.

Email response from Jenny Clafferty to McGuinness Institute, May 1 2012

Hi Ella

Per our conversation just now, we will get a formal response to you however in the meantime as I know you are under time pressure:

1. A copy of the proposal on a CD is one its way to you on a courier. We do not have the application as one document sorry (and it would be absolutely huge).

2. Re your questions 1 and 2. We don't hold this information but have referred those questions to the Ministry of Primary Industries, who may. I have spoken to Mat Bartholomew (Senior Aquaculture Analyst) at that Ministry. He has advised me that they are unable to get a response to you before the submission period on the NZ King Salmon proposal closes, however they will respond and Mat is happy for you to contact him to discuss your questions in the meantime should you wish - Mat.Bartholomew@fish.govt.nz.

   As discussed, please don't feel that you need to include full details of your evidence in your submission. As long as you cover all the matters that concern you, you can expand on them in your evidence.

3. Re your question 3, that question is best answered by the applicant. You could contact either their solicitors (who are their address for service): james.gardner-hopkins@russellmcveagh.com and James.Marriner@russellmcveagh.com or NZ King Salmon directly: Grant Rosewarne, Chief Executive Officer, New Zealand King Salmon Co Ltd - email address Grant.rosewarne@kingsalmon.co.nz or phone numbers: 03 5464 860 027 2460 980

Regards

Jenny Clafferty

Second email response from Jenny Clafferty to McGuinness Institute, May 1 2012

Hi again Ella

A quick update – I have asked NZ King Salmon (via Russell McVeagh) for a response to your question 3. We'll be back in touch once we get a response.

Regards

Jenny Clafferty

PROJECT LEADER

B: IR26042012

Dear James Gardener-Hopkins

The McGuinness Institute is in the process of preparing its submission on the New Zealand King Salmon Proposal in the Marlborough Sounds.

We have had some difficulty accessing the King Salmon website since Tuesday morning (www.kingsalmon.co.nz, see attached document). Given the approaching deadline for submissions on the proposal, we request your help in answering our initial four questions listed below:

1. How many salmon farming sites are currently in operation by King Salmon in the Marlborough Sounds?
2. How many hectares of salmon cages are on each site?
3. How long are the terms of resource consents for the current sites?
4. What date do the resource consents for the current sites finish?

We have placed these questions in the following table:

Site Location	Max Ha. of salmon cages per site (e.g. 1h)	Term of resource consent (e.g. 25 years)	Date/Year resource consent expires (e.g. Feb 2018)
1			
2			
Etc			

We look forward to your prompt response on these matters and thank you for your assistance.

Kind regards

Rory Sarten
Head of Research

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C: OIA02052012

Environmental Protection Authority
Private Bag 63002
Waterloo Quay
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Dear Jenny Clafferty,

Official Information Request regarding King Salmon's Proposal: OIA0205201204

The McGuinness Institute is in the process of preparing a submission on King Salmon's Proposal for Plan Changes and Resource Consent Applications in the Marlborough Sounds. A recent article, *New Zealand King Salmon faces efforts to halt its expansion*, on the Fish Information and Services website (see http://www.fis.com/fis/worldnews/worldnews.asp?l=e&country=0&special=&monthyear=&day=&id=51763&ndb=1&df=0) raises concerns in the Institute that the King Salmon management have raised expectations about the process and resulting EPA decision. In order to gain clarity about the source of these expectations and to understand the benefits, costs and risks of this proposal the Institute would like information about certain aspects of King Salmon's expenditure on the proposal and any financial assistance from the government. We therefore request answers to the following questions:

1. Relationship between Government and King Salmon: King Salmon Chief Grant Rosewarne has stated that 'We're doing everything that government and business and quasi-government organisations are asking, in terms of taking what was a commodity product, branding it, following it all the way through to export markets.' The Institute would like clarification concerning what is meant by this. What has been the relationship between King Salmon, Government and quasi-government organisations?
2. Government Funding/Grants: What government funding or grants has been given to (i) King Salmon, (ii) New Zealand Salmon Farmer's Association Inc, and (iii) Aquaculture New Zealand, and (iv) other industry groups over the last five years? Please delineate between (a) funds directly relevant to the current proposal and (b) funds for other purposes. We already note that New Zealand's aquaculture industry has received NZ$550,000 from the Aquaculture Market Development Contestable Fund.
3. Cost of Processing Application: This same article notes that NZ$6million has been spent on King Salmon's application, being a sunk cost of this application. Because this expenditure has been put into the public arena, it is important to understand how the NZ$6million been spent on the proposal? We therefore request that the NZ$6million be broken down with regard to costs such as (i) branding, marketing and advertising, (ii) external scientific consultants, (ii) external legal consultants, (iv) external financial consultants, (v) community engagement, (vi) personnel, (vii) compliance costs, and any other notable cost areas.

The Institute appreciates that a response to these questions and concerns will not be possible before the deadline for submissions passes; however, we would still like a response to these questions as it is our hope that the Institute will be given the opportunity to orally submit before the EPA.

If you would like to discuss this request further, please do not hesitate to contact the Institute.

Wendy McGuinness
Chief Executive

References

Anderson, R. (2012). *Resurgent Chile projects record salmon production.* Retrieved 29 April, 2012 from http://www.seafoodsource.com/newsarticledetail.aspx?id=1488

Ansoleaga Bengoechea, J. L. (2011). *Establece Programa Sanitario Especifico de Vigilancia y Control de la Anemia Infecciosa del Salmón (PSEVC-ISA) y Deroga Resoluciones Que Indica.* Sernampesca, Ministerio de Economia, Fomento y Turismo. Valparasio: Gobierno de Chile.

Aquaculture New Zealand (n.d.). *Overview.* Retrieved April 30, 2012 from http://aquaculture.org.nz/industry/overview/

Anson, A. (2009). *The Global Spread of Infectious Salmon Anaemia.* Retrieved 29 April, 2012 from http://www.thefishsite.com/articles/598/the-global-spread-of-infectious-salmon-anaemia

Barrionuevo, A. (2008). *Salmon Virus Indicates Chile's Fishing Methods.* Retrieved 29 April, 2010 from http://www.nytimes.com/2008/03/27/world/americas/27salmon.html?_r=2&pagewanted=all

Cawthorn Institute (2011, August). *New Zealand King Salmon Company Limited: Assessment of Environment Effects – Benthic.* Retrieved 1 May 2012 from http://www.epa.govt.nz/Publications/Appendix%204%20Seabed%20Report.pdf

David Suzuki Foundation (DSF) (2006). *The Will to Protect: Preserving B.C.'s Wild Salmon Habitat.* David Suzuki Foundation: Vancouver.

David Suzuki Foundation (DSF) (2008). *B.C.'s Beautiful Sea: Heritage Worth Preserving.* David Suzuki Foundation: Vancouver.

Department of Fisheries and Oceans Canada (DFO) (2005, June). *Myth and Realities about Salmon Farming.* Retrieved 27 April, 2012 from http://www.dfo-mpo.gc.ca/media/back-fiche/2005/salmon-eng.htm

Department of Fisheries and Oceans Canada (DFO) (2012, February). *A Proposed Regulatory Regime to Manage the Release of Aquaculture Substances.* Retrieved April 27, 2012 from http://www.dfo-mpo.gc.ca/aquaculture/consultations/2012/RASRR-eng.htm

Direct Capital (2008, September). *Direct Capital invests in New Zealand King Salmon*. Retrieved 30 April 2012 at http://www.directcapital.co.nz/News.aspx?id=60

Eagle, J., Fleming, I., Goldburg, R., Hinda, K., Naylor, R., Williams, S., Volpe, J., Whoriskey, F., Kelso, D., Mangel, M. (2005). Fugitive Salmon: Assessing the Risks of Escaped Fish from Net-Pen Aquculture. *BioScience, 55(5),* 427-437.

Environmental Protection Authority (EPA) (2012, March). *Public Notice – King Salmon Proposal – Proposed Plan Changes and Resource Consent Applications*. Retrieved 23 April 2012 from http://www.epa.govt.nz/Publications/Public%20notice%20King%20Salmon.pdf

Fisheries and Oceans Canada (FOC) (2011). *Aquaculture Canada: Facts and Figures.* Retrieved May 1, 2012 from http://www.dfo-mpo.gc.ca/aquaculture/ref/stats/aqua-ff-fc-2009-eng.htm

Food and Agriculture Organization of the United Nations (FAO) (n.d). *World Review of Fisheries and Aquaculture.* Retrieved 30 April, 2012 from ftp://ftp.fao.org/docrep/fao/011/i0250e/i0250e01.pdf

Food and Agriculture Organization of the United Nations (FAO) (2004). *Fishery and Aquaculture Country Profile, Norway*. Retrieved May 1, 2012 from http://www.fao.org/fishery/countrysector/FI-CP_NO/en.

Food and Agriculture Organization of the United Nations (FAO) (2005). *National Aquaculture Sector Overview: Norway*. Retrieved April 27, 2012 from http://www.fao.org/fishery/countrysector/naso_norway/en

Imhoff, D. (2009). *Chile's Salmon Farms Verging on Breakdown.* Retrieved 29 April, 2012 from http://www.huffingtonpost.com/dan-imhoff/chiles-salmon-farms-vergi_b_229836.html

Johnston, C. (2011). *The Recovery of the Chilean Salmon Industry.* Retrieved 29 April, 2012 from http://www.thefishsite.com/articles/1198/the-recovery-of-the-chilean-salmon-industry

Land Information New Zealand (LINZ) (2011, November). *Decision Summaries - The New Zealand King Salmon Co. Limited*. Retrieved at 1 May 2012 from http://www.linz.govt.nz/overseas-investment/decisions/decision-summaries/the-new-zealand-king-salmon-co-limited

Marlborough District Council (MDC) (n.d.). *Marlborough Sounds Resource Management Plan.* Retrieved at 23 April 2012 from http://www.marlborough.govt.nz/Your-Council/RMA/Marlborough-Sounds-Resource-Management-Plan.aspx

Marlborough District Council (MDC) (2012a, April). *Submission on New Zealand's King Salmon Proposal.* Retrieved at 1 May 2012 from http://www.marlborough.govt.nz/sitecore/shell/Controls/Rich%20Text%20Editor/~/media/Files/MDC/Home/Your%20Council/RMA/MSRMP/Proposed%20Changes/24%20and%2025/King%20Salmon%20submission%2016%20April%202012%20for%20Website.ashx

Marlborough District Council (MDC) (2012b, April). *Media Release NZ King Salmon Application Now Publicly Notified.* Retrieved 1 May 2012 at http://www.marlborough.govt.nz/Your-Council/News-Notices/Media-Release-NZ-King-Salmon-Application-Now-Publicly-Notified.aspx

McGuinness, W., & White, M., (2011). *Nation Dates*. Wellington, NZ: Sustainable Future Institute.

McGuinness, W., White, M., & Versteeg, S. (2008). *The History of Genetic Modification in New Zealand. Sustainable Future Institute*. Retrieved 2 May, 2012 from http://www.mcguinnessinstitute.org/Site/Publications/Project_Reports.aspx

Ministry of Fisheries (MFish) (2011, August). *New Law Supports Sustainable Aquaculture*. Retrieved at 1 May 2012 from http://www.fish.govt.nz/en-nz/Press/New+law+supports+sustainable+aquaculture.htm

Ministry of Fisheries (MFish) (2011, October 7). *Aquaculture.* Retrieved April 27, 2012 from http://www.fish.govt.nz/en-nz/Aquaculture/default.htm?WBCMODE=PresentationUnpublished%25252b

National Commission for Scientific and Technological Research: Chile (NCSTR) (2007). *The Fishery and Aquaculture Sectors in Chile.* Retrieved May 1, 2012 from http://www.embassyofchile.se/espanol/Documentos/Pesca_Acuic_Fishery_Aquac_BD.pdf.

New Zealand Companies Office (Companies Office) (2011a). *The New Zealand King Salmon Co. Limited (287485).* Retrieved 27 April 2012 from http://www.business.govt.nz/companies/app/ui/pages/companies/287485#

New Zealand Companies Office (Companies Office) (2011b). *Regal Salmon Limited (834866).* Retrieved 1 May 2012 from http://www.business.govt.nz/companies/app/ui/pages/companies/834866

New Zealand Companies Office (Companies Office) (2011c). *Southern Ocean Seafoods Limited (834867).* Retrieved 1 May 2012 from http://www.business.govt.nz/companies/app/ui/pages/companies/834867

New Zealand King Salmon (NZKS) (n.d.) *Company Structure.* Retrieved 26 April 2012 from http://www.kingsalmon.co.nz/Company/index.html

New Zealand King Salmon (NZKS) (n.d. [a]). *EPA Application – Application for Additional Water Space.* Retrieved 30 April 2012 from http://www.kingsalmon.co.nz/application-for-additional-water-space/index.html

New Zealand King Salmon (NZKS) (n.d. [b]) *Our Publishing Room – Current News and Media*. Retrieved 30 April 2012 from http://www.kingsalmon.co.nz/NewsMedia/index.html.

New Zealand Salmon Farming Association (NZSFA) (2005). *Salmon Aquaculture in New Zealand.* Retrieved April 27, 2012 from http://www.salmon.org.nz/aboutsalmon.shtml

Oceana (n.d.). *Farmed Salmon Escapes.* Retrieved 29 April from http://oceana.org/en/our-work/protect-marine-wildlife/salmon/learn-act/farmed-salmon-escapes

Sea Around Us Project (SAUP) (n.d.). *GAPI.* Retrieved May 1, 2012 from http://www.seaaroundus.org/sponsor/gapi.aspx

Seafood Ecology Research Group (SERG) (2011a). *Country Performance.* Retrieved April 27, 2012 from http://web.uvic.ca/~gapi/explore-results/countryresults.html

Seafood Ecology Research Group (SERG) (2011b). *GAPI Indicators.* Retrieved April 27, 2012 from http://web.uvic.ca/~gapi/explore-gapi/indicators.html

Sernapesca (2011). *Sernapesca reafrima su compromise con el desrrollo sustentable de la Acuicultura.* Retrieved 29 April from http://www.sernapesca.cl/index.php?option=com_content&view=article&id=1304:sernapesca-reafirma-su-compromiso-con-el-desarrollo-sustentable-de-la-acuicultura&catid=1:ultimas&Itemid=69

United Press International (2010). *Disease decimates salmon farms in Chile.* 29 April, 2012 from http://www.upi.com/Science_News/2010/08/17/Disease-decimates-salmon-farms-in-Chile/UPI-73471282080634/

Volpe, J. (2001). *Super un-Natural*. David Suzuki Foundation: Vancouver.

Wild Salmon Supporters (WSS) (n.d.). *Wild Salmon: The foundation of coastal life.*

World Wildlife Fund (WWF) (2012). *Final draft standards for responsible salmon aquaculture*. Retrieved May 1, 2012 from http://www.worldwildlife.org/what/globalmarkets/aquaculture/WWFBinaryitem26597.pdf

World Wildlife Fund (WWF)(n.d.[a]). *Aquaculture: Salmon.* Retrieved April 27, 2012 from http://www.worldwildlife.org/what/globalmarkets/aquaculture/dialogues-salmon.html

World Wildlife Fund (WWF)(n.d.[b]). *Aquaculture Dialogues*. Retrieved 30 April, 2012 from http://www.worldwildlife.org/what/globalmarkets/aquaculture/aquaculturedialogues.html