

Honorable Minister Eddy Joyce
Department of Municipal Affairs and Environment
West Block, Confederation Building
P.O. Box 8700
St. John's, NL A1B 4J6
Email: MAinfo@gov.nl.ca

Newfoundland and Labrador Coalition for Aquaculture Reform
Att: Bill Bryden
PO Box 63
Lumsden, NL
709-530-2637
<http://NL-CAR.ca>
info@nl-car.ca

Dear Minister Joyce:

Pursuant to s.107 of the Environmental Protection Act (EPA) we, the Newfoundland and Labrador Coalition for Aquaculture Reform, are writing to ask for an appeal of the decision to release the EA Reg. 1874 - Harbour Breton Fish Meal Plant from environmental assessment.

Separating various sections of the aquaculture process under different corporate entities does not validate the circumvention of the spirit of the Environment Act and Regulation. Similarly, simply renaming the waste channel or section of the aquaculture process under a new name does not validate project splitting. The main purpose of an EA registration is to allow scrutiny of an entire process for potential environmental impacts. This must include all aspects of a project from start to final product with, in fact, emphasis on waste, pollution, and possible harmful effects on the environment. Failing to include critical parts of a process requires re-submission such that all aspects of the project can be subject to public scrutiny.

If registering an aquaculture production is required then this must include all aspects of the production line including processing and waste management. As per the Environmental Assessment Regulations (2003) which states:

Aquaculture

29. An undertaking that will be engaged in farm raising fish or shellfish where that undertaking will intervene in the rearing process to enhance production by keeping the animals in captivity, stocking and feeding the animals and protecting the animals from predators including

(a) fish or shellfish farming in salt water or fresh water ; and

(b) fish or shellfish breeding and propagating or hatchery services,

where the undertaking will include the construction of shore based facilities other than wharves and storage buildings and

(c) permanent marine trap or weir fisheries,

shall be registered.

Aquaculture is defined in the Aquaculture Act as:

“Definitions

2. In this Act

(a) "aquaculture" means

(i) the farming of fish, molluscs, crustaceans, aquatic plants and other aquatic organisms with an intervention in the rearing process to enhance production by activities such as regular stocking, feeding, and protection from predation, and includes following **and processes to mitigate environmental degradation** and the placement of necessary gear and equipment, and”

This is further supported in the Aquaculture Act as the Act itself governs processing of aquaculture products pursuant to the section on Regulations:

11.2 The minister may make regulations

(g) **respecting the isolation, quarantine, detention, treatment, disposal or destruction of aquatic animals, the disposal or destruction of feed, the disinfection, quarantine, detention or prohibition of movement or transport of related gear, equipment, tanks, ponds and other facilities and vehicles, and other measures to mitigate the development of pathogenic agents or prevent the spread of pathogenic agents;**

(q) respecting **methods of** handling, buying, selling, holding in possession, offering or advertising for sale, **processing** and maintaining the quality of aquatic plants or animals;

This follows through to management and administration of the aquaculture finfish processing via 4.3.1 of the policy handbook here: http://www.fishaq.gov.nl.ca/licensing/pdf/fplp_manual_04_16.pdf which states:

“4.3.1 Policy

Aquaculture processing license holders are limited to processing only raw material sourced from Newfoundland and Labrador aquaculture sites licensed under the Aquaculture Act.”

The links in the “aquaculture process” are intrinsic and exemplified by <http://www.assembly.nl.ca/Legislation/sr/Annualregs/2007/nr070076.htm> which regulates aquaculture finfish processing by requiring:

35(2) *A finfish processor operating within a 20 kilometre radius of a finfish farm site licensed under the Aquaculture Act is subject to the following requirements:*

(a) *liquid waste effluent generated by or from the processing operation shall be collected in an **approved containment system**; and*

(b) *liquid effluent shall be treated with an **approved disinfectant and neutralized prior to release into the environment.***

And: (f) *"disinfection" means the reduction of the amount of microorganisms to a level that **does not pose a health risk**;*

(NB The proposed site is within 20 kms of a licensed aquaculture finfish site.)

Moreover, the concept of an “entire [aquaculture] project” was recently upheld by the government regarding an aquaculture project that was attempting to split the process into sections. Re: http://www.mae.gov.nl.ca/env_assessment/bulletins/Y2015/20151120.pdf

“PROJECT UPDATE: Marystown Atlantic Salmon Hatchery (Reg. 1814) Proponent: Grieg Nurseries NL Ltd. The Department of Environment and Conservation has determined the environmental

assessment **cannot proceed until a description of the entire project**, including the salmon hatchery, the sea cage components and triploid fish is registered as a single undertaking, pursuant to Section 29 of the Environmental Assessment Regulations, 2003 as follows:

29. An undertaking that will be engaged in farm raising fish or shellfish where that undertaking will intervene in the rearing process to enhance production by keeping the animals in captivity, stocking and feeding the animals and protecting the animals from predators including (a) fish or shellfish farming in salt water or fresh water; and (b) fish or shellfish breeding and propagating or hatchery services, where the undertaking will include the construction of shore based facilities other than wharves and storage buildings and (c) permanent marine trap or weir fisheries, shall be registered.

The proponent may submit supplementary information to be combined with the current submissions or withdraw the current proposal and re-submit a new document **which describes the full scope of the project**. Regardless of which approach is taken, another 45 day screening review period which will include a 35 day public review period will be required. ”

We are appealing on the grounds that the decision to allow this project to proceed without ordering an environmental impact statement is contrary to the principles, purpose, and requirements of the EPA and is therefore unreasonable and unlawful. Moreover, the project was not adequately described regarding several issues. Releasing a project without a full description allows for only internal review of issues and mitigation strategies without public scrutiny in contravention of the Environment Act and Regulations.

The submission made by the proponent as registration #1874 and the requirements made in the release by the Minister were not consistent with the EPA based on existing peer reviewed studies, current knowledge on finfish contagions, required bio-security safeguards, and effective monitoring of those biosecurity measures near the processing facility effluent. In addition, the proponent and Minister failed to protect the environment from POPs (persistent organic pollutants), many unregulated, despite the availability to the proponent of mitigating and preventative measures. This also disregards the spirit of the EPA. There is an ineffective description of the biosecurity measures regarding the equipment washing waste water collection and treatment and their monitored effectiveness as well as waste treatment sludge disposal. Moreover, the current blood filters and settling ponds being approved by government as providing processing plant and hatchery effluent “biosecurity” are not designed to eliminate or reduce to acceptable levels viral particles and pathogens typically carried by aquaculture finfish. This speaks to the current inadequacy within this regulatory and management regime. Such a “blood filter” should not be allowed to be approved as biosecuring this or future aquaculture effluent. A review conducted by a panel of EU vets found bleaching, de-bleaching, and either evaporation or geofiltration is required to reduce viral titres to acceptable limits. In the proponent's own EA registration they suggest that a cheaper, cost reducing/profit enhancing method is being proposed. The proponent failed to submit any monitoring of the effects of the suggested “biosecurity” measures beyond an undetermined and un-scrutinized by the public plan to be submitted to Fish Health staff. No “near wharf effluent outfall” monitoring of wild fish for pathogens and parasites (zoonotic nor epizootic) was submitted nor required by the Minister contrary to any meaningful assessment of the biosecurity methods suggested and spirit of the EPA. No ARMs (antimicrobial resistance) testing nor monitoring regime was described by the proponent nor were any required by the Minister despite masses of peer reviewed evidence suggesting this is an issue and a desire by the federal government, for more than a decade, to have this safeguard put in place. This is a major concern for the WHO, OIE, CARA (Canadian Antimicrobial Resistance Alliance <http://www.can-r.com/>), CAPE (Canadian

Association of Physicians for the Environment (<https://cape.ca/>), and every NGO nationally and globally that is involved with such issues. Whether or not open net pens or well boats will occasionally be docked near the effluent outfall of the plant, thus exposing held fish to the outfall, is not mentioned in the submission nor by the Minister's release; again in contravention to the EPA spirit.

We outline our argument in the paragraphs below.

EIS Required

The Environmental Protection Act

The purpose of the NL Environmental Protection Act (EPA) (Part X) is “to facilitate the wise management of the natural resources of the province and to protect the environment and quality of life of the people of the province” by ensuring that development projects proceed in an environmentally acceptable manner. The Crown is bound by the EPA (s.3.1), and in the case of conflict between the EPA and any other Act, the EPA prevails (s.4.1). Decision options The EPA requires any undertaking that may have an impact on the environment to be registered for environmental assessment. After an initial screening review, the EPA enables the minister (cabinet or courts) to decide on an appropriate response based on the circumstances.

EPA Options

The EPA authorizes three options:

- a) release the project from further assessment;
- b) order an environmental preview report; or
- c) order an environmental impact statement (EIS).

In the case of the Harbour Breton Meal Plant aquaculture processing proposal, the least rigorous option was chosen and the project was released from further environmental assessment.

By what standard should the decision be evaluated?

Dunsmuir v. New Brunswick, 2008 SCC 9 demonstrates that the standard of review of an administrative outcome of this nature is reasonableness. “*Reasonableness is concerned mostly with the existence of justification, transparency and intelligibility within the decision-making process and with whether the decision falls within a range of possible, acceptable outcomes which are defensible in respect of the facts and the law.*” This definition implies that the evaluation becomes an “*assessment of the range of options reasonably open to the decision maker in the circumstances*” to “*identify the outer boundaries of reasonable outcomes within which the decision maker is free to choose.*” An unreasonable decision is one which is “*not supported by any reasons that can stand up to a somewhat probing examination*” (Canada (Director of Investigation and Research) v. Southam Inc., 1997 1 SCR 748).

How are the circumstances surrounding the decision determined?

The circumstances surrounding the decision are created by the relevant information available at the time of the decision as well as the guidance provided by the EPA. The minister is expected to consider all credible sources of relevant information to make a fair and proper decision that is consistent with the purpose and direction provided by the EPA. Information sources include (but are not limited to):

information provided by the proponent, information and advice provided by consulted government agencies, information obtained through the public consultation process, and *available scientific information about the environment to which the project relates and/or about the activities proposed*.

How is the relevancy of information determined?

The Environmental Assessment Regulations (EAR) provide significant guidance in determining the relevancy of information to the decision at hand. This guidance is in the form of specific conditions which must be met to demonstrate the reasonableness of each possible choice as well as 23 screening criteria which are to be used in determining whether those conditions are met (EAR s.23, s.24, s.25).

Our argument, considering the discussion above, is that:

1. The decision to release the undertaking from further environmental assessment does not meet the standard of reasonableness.
2. Given the circumstances and a proper application of the screening criteria, the only reasonable decision available was to order an environmental impact statement.
3. Because the undertaking was released without an environmental impact statement, the Environmental Protection Act has not been applied appropriately and its purpose to “protect the environment and quality of life of the people of the province and facilitate the wise management of the natural resources of the province” has therefore not been achieved. We outline our arguments in support of each of these points below.
4. Conditions of the release ignored mitigation and monitoring measures that the proponent also ignored. Egs ARMs, POPs, wash effluent collection and treatment, adjacent wild fish monitoring, etc

Attachments A and B provide additional support for our argument in the form of detailed responses to each of the screening criteria (for release (EAR s.23) vs. EIS (EAR s.25)) contained in the Regulations as well as references to the scientific literature, where relevant.

1. The decision to release the undertaking from further environmental assessment does not meet the standard of reasonableness. The EAR (s.23) set two conditions under which an undertaking can be released: (a) there are no environmental or public concerns; or (b) the environmental effects of the undertaking will be mitigated under an Act of the province or of Canada.

The EAR provide 11 screening criteria to guide the decision as to whether releasing an undertaking is reasonable. Our analysis of each of those criteria indicates that this undertaking fails to meet all 11 of them; therefore, the decision is not defensible in respect to the facts or the law and cannot be justified given the information at hand.

Our detailed analysis of those criteria is provided in Attachment A and summarized below:

a. There are no environmental or public concerns. There is clear evidence of both significant environmental and public concerns. The potential for this project to have significant negative impacts on wild salmon and finfish in general is supported by the large body of peer reviewed scientific literature demonstrating, conclusively, that effluent from net pen salmon aquaculture processing may impact wild salmonids through a number of mechanisms.

Simply put, this undertaking will, among other things, introduce a new and potentially devastating source of finfish pathogens into a fragile marine environment and a very fragile population of wild Atlantic salmon. The open net pen aquaculture process is unique in the bio accumulation of POPs. No ARMs (antimicrobial resistance) testing nor monitoring regime was described by the proponent nor were any required by the Minister despite masses of peer reviewed evidence suggesting this is an issue and a desire by the federal government, for more than a decade, to have this safeguard put in place. The depth of peer reviewed publications on these subjects and lack of adequate legislation in NL and federally is substantial. This was not addressed by the proponent nor the Minister. Understanding the consequences of this decision and addressing the public's/First Nations' concerns - even if the prospect of ecosystem disruption is remote (which it is not) - is a requirement under the EPA which was not met in this case.

b. The environmental effects of the undertaking will be mitigated under an Act of the province or of Canada. Before receiving final approval, the undertaking must receive further permits, licenses, and approvals from the Provincial Department of Fisheries and Land Resources. These agencies are governed by the NL Aquaculture Act and Regulations and the Canadian Fisheries Act and Aquaculture Activities Regulations. However, there is strong evidence that the environmental effects of this project will not be mitigated under these Acts and Regulations for the following broad reasons:

1. These acts and regulations do not contain sufficient provisions to require the ministers and their agents to collect further information, develop mitigation measures, and design appropriate monitoring programs to ensure that the impacts of the project on wild salmon and finfish are mitigated. Environmental protection is not contained within the stated purposes of the NL Aquaculture Act. Indeed, the Act lists development of the aquaculture industry in collaboration with the private sector and securing property rights of industry participants as its primary aims, which clearly prioritizes industry needs over environmental protection. Furthermore, a recent analysis conducted by Gardner Pinfold Consulting reveals that compared to other jurisdictions, NL has some of the weakest aquaculture regulations in the north Atlantic with respect to protecting wild salmon. In particular, NL regulations are deficient in terms of: setting maximum sea lice loads; setting maximum number of escapes per license; limiting viral disease mortality and requiring a reduction plan; avoiding damage to the seafloor under cages; avoiding damage to critical habitats and sensitive species; maintaining water quality around the sea cage sites; monitoring of effluent potentially affecting exposed wild fish stocks; publicly reporting sea lice loads, fish escapes, and disease outbreaks; and providing for meaningful public consultation and complaint resolution. Likewise, the federal Fisheries Act contains only weak provisions to protect wild fish from the impacts of aquaculture. The Fisheries Act aims to prevent "serious harm" to fish which is narrowly defined as the death of fish or permanent alteration/destruction of habitat. However, most of the impacts from aquaculture occur without directly causing the death of fish (e.g., impacts from sub-lethal infections, impacts from ecological interactions, etc.). Consequently, most of the expected impacts of this project on wild Atlantic salmon and wild finfish can not be mitigated by the Fisheries Act.
2. These acts and regulations have not been sufficient to prevent previous net-pen aquaculture developments and processes from significantly impacting wild salmon and wild finfish populations in NL. There is a long and documented history of farmed salmon effluent from existing net pen operations. In fact, DFO and COSEWIC both conclude that aquaculture has contributed to the decline of salmon populations on the south coast. On a broader scale, there is a wealth of scientific information demonstrating that the products of net pen salmon aquaculture

and wild salmonids do not coexist without negative impacts on wild stocks, using the current regulations and requirements to manage the industry. Indeed, the recent Gardner Pinfold analysis of aquaculture regulations indicates that even in jurisdictions with the highest regulatory standards (e.g., Norway) wild Atlantic salmon populations have suffered significant direct impacts from aquaculture. Salmon in DFOs DU4, which is within the proponents effluent outfall, are SARA listed due to the effects of open net pen aquaculture; including pathogens.

3. The Aquaculture Regulations require that effluent from aquaculture finfish processing requires that plants located within 20 kms of an open net pen operation must have an approved effluent treatment system. The spirit of this was to acknowledge that, unlike wild finfish, aquaculture reared fish are heavily laden in pathogens. Moreover, this regulation was designed to only protect the aquaculture finfish from re-infection by infectious aquaculture fish being processed. The effects of these pathogens on wild fish are ignored. This speaks volumes of the many senior advisors/managers involved and their unwillingness to protect wild stocks. These same managers/advisors will be approving the effluent treatment for the proponent without any public input or scrutiny unless an EIS is required. Many processing plants have been allowed to process pathogen laden aquaculture finfish and dump the effluent into the marine environment untreated as long as they were not within the 20 km limit of an open net pens site. Many if not all open net pen reared fish that are processed carry contagions that affect aquaculture finfish growth and survival rates. However, this ignores many pathogens that can negatively effect wild finfish or human health and that are surveilled in an ad hoc manner by mangers or simply not tested for (eg PRv, etc) and ignored (eg ARMs, etc) as they do not seriously effect growth rates and mortality rates **in an open net pen environment**. In fact, during any federal or provincial approvals for processing and sale only a handful of over 50 pathogens are considered. A “sick” fish may eventually reach market size in an environment were food, protection, antibiotics, etc are supplied but wild fish with the same aquaculture amplified and spread afflictions would fail miserably in the wild where prey must be captured, predators avoided, arduous mating competitions and migrations must be completed, etc. Current practices, “biosecurity measures”, and surveillance by the aquaculture industry, DFO, CFIA, and the NL DFLR ignores this when monitoring aquaculture parasites and pathogens. The current “bar” for the level of affliction prevention is “whatever it takes to get the constantly sick fish to market”. No legal requirements or legal monitoring regimes are in place nor are they legally demanded or defined by government for any effective aquaculture effluent treatments. The treatment effects therefor have unknown effectiveness. This is also the case for registration #1784.

Aquaculture fish are reared using antibiotics throughout their life cycle but it is the on land processing stage where the human-fish interaction is greatest. AMR genetic material jump quickly from fish bacteria to human bacteria in such a situation. Sadly, despite several attempts at having AMRs in aquaculture managed federally no results nor any actionable plans were ever developed nor implemented over the last 2 decades. No AMRs (antimicrobial resistance) testing nor monitoring regime was described by the proponent nor were any required by the Minister despite masses of peer reviewed evidence suggesting this is an issue and a desire by the federal government, for more than two decades, to have this safeguard put in place. Tomova et al. 2015 and McIntosh et al. 2008 are prime examples why this so desperately needed. No effective provincial nor federal monitoring or mitigation is in place.

No near wharf/outfall wild fish monitoring for effluent treatment effectiveness was required nor was base-line data required (ie a “before and after” monitoring regime). No mention was made by the proponent nor the Minister of the potential for fish to be held at or near the wharf and effluent outfall

alive during pre-harvest. Current “blood filters” and testing of effluent for phage sized particles as practised by government and implemented by processing plants will not “neutralize, nor sanitize” the effluent given that most, if not all, finfish viruses are many times smaller than a bacterial phage. The transfer of pathogens and parasites from wild fish to aquaculture fish, followed by amplifications and increases in virulence in open net pens, then re-transfer back to wild fish, is something this industry calls “spill-over and spill-back”. Pathogen and parasite issues in the outfall area of the plant regarding equipment washing water (a 2 hour process between shifts left undescribed) have been ignored by both the proponent and Minister. This is especially concerning regarding the common practice of holding fish in open net pens or harvest boats near the processing plant. Pathogens and parasites can be held in refugia near the processing plant via native marine life exposed to any contaminated effluent thus amplifying any spill back issues. No mitigation nor monitoring was proposed nor required.

The Fish Inspection Regulations

(<http://www.assembly.nl.ca/Legislation/sr/Annualregs/2007/nr070076.htm>) state that:

” *the fish shall be*

(d) *protected from physical damage, **contamination** and weather at all times;*”

4. Government has very limited to no control over what happens to the end products of the salmonid renderings from registration #1874 once it is released from the EA process. It is possible that these end up as human food, cosmetics, pet food, etc. POPs accumulate in oily fish such as aquaculture salmonids at a rate of 4 to 11 times the rates found in terrestrial animals. Moreover, unlike many regions such as Norway, the NL fish are fed a diet high in POPs from both terrestrial and marine feed ingredient sources due to a lack of POPs filtration during the feed pellet creation stage. While a single POP in the fish's flesh may be below the legal limits, the government monitoring and regulating system does not consider cumulative cocktail effects of multi-POPs being ingested (Ruzzin *et al.* 2015) . Moreover, most POPs are simply unregulated in Canada (eg ethoxyquin metabolites) but should be considered Dorea 2006.

Ethoxyquin is also known as Santoquin, Santoflex, Quinol. It was originally developed in rubber industry to prevent rubber from cracking due to oxidation of isoprene. The Monsanto Company (USA) taking into account its high antioxidant efficiency and stability as well as low costs of synthesis refined it later for use as a preservative in animal feeds because it protects against lipid peroxidation and stabilizes fat soluble vitamins (A, E). Presently, ethoxyquin is used primarily as an antioxidant in canned pet food and in feed intended for farmed fish or poultry.

Ethoxyquin metabolites are found at extreme levels in the belly fat and skin found in wastes that the proponent will be renderings (Bohne *et al* 2008, Lundebye *et al* 2010, 2007). The end products (oil and meal) with then have further amounts of ethoxyquin added as this pesticide is used as an artificial antioxidant by the fish meal and oil industry (thus how it ends up in the salmon). It metabolites are known to cross the human blood brain barrier (Bohne unpubl data), while another metabolite causes genotoxic effects in cell culture (Lundebye 2007) and organ issues in rats. Blaszczyk *et al* 2013 reviewed its use. It has been recommend for banning as an antioxidant (Blaszcycyk 2013) and remains unapproved as a food additive in both the EU and Canada. A recent 2016 study found levels as high as 18 times above EU limits, moreover all salmon flesh sampled from grocery stores from various provenances globally tested positive for ethoxyquin (illegal as a human food additive) and 32 of 38 samples were above EU limits when both ethoxyquin and its dimer were considered (Greenpeace 2016 <https://www.greenpeace.de/presse/presseerklaerungen/greenpeace-analyse-chemie-speisefisch>).

Rendering the tissues with the highest concentration of this pesticide and then adding yet more ethoxyquin to stabilize the resulting meal and oil sets up a positive feed back loop via the aquaculture feed-pellet-rendering cycle the proponent is engaged in which could affect human health (Bohne *et al* 2007).

In addition, *in vitro* studies have shown that EQ induces chromosomal aberrations in human lymphocytes. According to a recent European Food Safety Authority (EFSA) scientific opinion, EQ shows structural alerts for mutagenicity, carcinogenicity and DNA binding, whereas the toxicological profile of 1,8 0 -EQDM is considered to reflect that of EQ. In the studies of Bohne *et al.* 2007 in which Atlantic salmon were fed for 12 weeks with the feed containing this antioxidant, four compounds were identified in their muscles: parent EQ (6-ethoxy-1,2-dihydro-2,2,4- trimethylquinoline), deethylated EQ (6-hydroxy-2,2,4-trimethyl-1,2-dihydroquinoline), quinone imine (2,6-dihydro- 2,2,4-trimethyl-6-quinolone, QI), and EQ dimer (1,8-di(1,2- dihydro-6-ethoxy-2,2,4-trimethylquinoline, EQDM). Studies have suggested that it is responsible for a wide range of health-related problems in dogs as well as in humans (see Blaszczyk *et al* 2013 review).

Based on the spirit of the Environmental Act, these POPs should be removed from our environment at the most effective “bottle-neck” which due to bio-accumulation factors, is the fish meal and oil processing plants. The technology exists and in fact is being utilized more by the aquaculture feed pellet industry. Recently, many of the world's major feed pellet producers stated that POP filtration technology will be implemented at every plant by 2017. Unfortunately these are not the major feed pellet suppliers used here in NL and thus our aquaculture salmonids will remain extremely high in POPs - in fact the highest tested in any food substance by several recent studies. Ethoxyquin, a pesticide used as an artificial antioxidant, metabolizes to 14 subcompounds in salmonids many of which are far more stable than the parent compound and none of which are regulated by the CFIA, Federal Environment, nor Health Canada. Most have not undergone any testing. At least one crosses the human blood brain barrier. Another has shown strong carcinogenicity tendencies in cell culture, and another has been shown to be harmful in rat models. Fish meal and oil from aquaculture finfish that are extremely high in ethoxyquin and its metabolites will be retreated with yet more ethoxyquin by the proponent thus compounding the sum of the ethoxyquin metabolites to many times the level of the limit for feed pellets. Ethoxyquin is simply not allowed as a food additive in human foods (North America/EU) yet is found both in its native state and bio-active metabolized state at extreme levels in aquaculture produced finfish. Recently at levels as high as 18 times above EA allowable limits. Most salmon tested recently from German supermarkets and sourced globally were above legal limits when both ethoxyquin and the primary ethoxyquin metabolite (its dimer) were considered. Current CFIA feed “labelling laws” will not prevent the extreme amounts of ethoxyquin metabolites from being present in the end products of Reg #1874. Neither a list of POPs found in the fish nor mitigation measures were found in the submission (reg #1874) nor the Minister's release requirements in contravention of the EPA.

Conclusions

This undertaking does not meet the conditions or screening criteria for release as outlined in the EPA and EAR. There are clear concerns about the impacts of the project on wild Atlantic salmon and the broader environment, and a significant amount of public concern has been generated. The Aquaculture Act and the Fisheries Act (and the licensing and approval processes that they mandate) are not sufficient to mitigate the impacts that have been identified nor are they sufficient to further understand and address the concerns of the public. Nor are any federal regulations. Given the information available, the stated purpose of the EPA and the specific guidance provided by the EPA and EAR, the

decision to release the project from further environmental assessment does not meet the standard of reasonableness because it cannot be justified or defended in respect to the facts and the law.

2. The only reasonable decision available was to order an Environmental Impact Statement.

The EAR (s.25) provide clear guidance as to when an Environmental Impact Statement (EIS) is required:

“Where the minister determines with respect to an undertaking that there

(a) may be significant negative environmental effects; or (

*b) is of significant public concern, **the minister shall require an environmental impact statement.**”*

The EAR (s.25) provide 9 screening criteria to guide the decision as to whether or not an EIS is required. Our analysis of each of those criteria indicates that this undertaking meets all of those criteria; therefore, the circumstances required an EIS to be ordered. Our detailed analysis of those criteria is provided in Attachment B and summarized below:

a. There may be significant negative environmental effects As noted above and explained in more detail in Attachment A, there are clear and compelling scientifically-based reasons to believe that this undertaking will have significant negative impacts on wild Atlantic salmon and the broader marine environment. There are also clear and compelling reasons to believe that those impacts will not be mitigated by the remaining licensing and approvals processes as mandated under other Acts of the province or of Canada. This project ignores a number of technologies and mitigation strategies that are easily employed.

This project will occur in an area which is identified and managed as an Ecologically and Biologically Significant Area, and wild Atlantic salmon in DFO's DU4 (south coast of NL) have been assessed as “Threatened” by COSEWIC. Both DFO and COSEWIC have identified salmon aquaculture as contributing to observed declines in salmon populations. Both of these conditions (location in an environmentally sensitive area and impacts on rare/endangered species) are clear and specific triggers under the EAR for requiring an EIS. Likewise, DFO has noted that baseline information on wild salmon in DU4 is lacking. Moreover, the CFIA Wild Fish survey recently conducted in NL did not include sampling locations and species living in processing plant effluent outflows.

Lack of baseline data and the need for the collection of original field data are also clear and specific triggers for requiring and EIS.

b. The undertaking is of significant public concern. Data collected by the NL government in 2014 indicates that public concern about the environmental impacts of aquaculture (and specifically the impacts on wild Atlantic salmon) has existed in the province for a number of years. Furthermore, this specific undertaking has generated significant public concern and controversy since being announced, as evidenced by comments made in public and social media, and in submissions (from both an international and provincial NGO that act as umbrellas for dozens of member groups) made to the minister through the public consultation phase of the screening review. Concerns expressed by the public have been numerous, ranging from broad concerns about the general environmental impacts to very specific concerns about the impacts on workers and marine life, especially concerning effluent, biosecurity, POPs, and monitoring. Currently, the government does not have established policies that adequately address the concerns expressed by the public. As noted above, there are a number of acts

and regulations that govern the aquaculture industry in NL; however, these have clearly not been adequate to address the public's long standing concerns about diseases, and pollution associated with salmonid aquaculture.

The federal government does have adequate monitoring of ARMs (antimicrobial resistant pathogens) that open net pen aquaculture has been repeatedly shown to amplify and transfer to human pathogens - nor adequate monitoring processing plant effluent in general regarding pathogens. However, this inadequacy appears to have been ignored in the approval of this project and relegated to an internal review by provincial Fish Health employees.

Conclusions

The EPA and EAR provide clear and specific guidance as to when and EIS is required. Furthermore, the EPA provides little room for a discretionary decision when the conditions supporting an EIS are met: i.e., "the minister shall require an environmental impact statement" [emphasis added]. In this case, both broad conditions for an EIS (significant environmental impacts and public concern) are clearly met, as are the screening criteria to be used in determining the relevancy of information supporting that decision.

Given the information available and the specific guidance provided by the EPA and EAR, the only reasonable decision under the circumstances (i.e., the only decision that is justifiable and defensible in respect to the facts and the law) is to order the proponent to prepare an environmental impact statement for the project.

3. Because the undertaking was released without an environmental impact statement, the Environmental Protection Act has not been applied appropriately and its purpose to "protect the environment and quality of life of the people of the province and facilitate the wise management of the natural resources of the province" has therefore not been achieved.

The Environmental Protection Act provides a framework for environmental protection and preservation and contributes to the goal of sustainable development for Newfoundland and Labrador. The stated purpose of Part X of the Act (Environmental Assessment) is

"to facilitate the wise management of the natural resources of the province and to protect the environment and quality of life of the people of the province"

by ensuring that development projects proceed in an environmentally acceptable manner. The EPA is binding upon the Crown, its corporations, agents, administrators, servants, employees and agencies. The EPA is based on a number of guiding principles which provide the basis for achieving the goals of environmental protection and preservation, and sustainable development. These include:

Sustainable Development:

The principle of sustainable development respects the use of both renewable and non-renewable resources to satisfy human needs, improve the quality of life, and protect and preserve life-sustaining natural systems, without jeopardizing the needs of future generations.

Precautionary Approach:

In order to achieve sustainable development, policies must be based on the precautionary principle. Environmental measures must anticipate, prevent and attack the causes of environmental degradation. Where there is a threat of serious or irreversible damage to the environment, all reasonable environmental protection measures must be taken; lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation (Bergen ministerial Declaration on Sustainable Development, 1990). The precautionary principle is codified in several items of domestic legislation (e.g., Oceans Act, S.C. 1996; c. Canadian Environmental Protection Act, 1999; Endangered Species Act, S.N.S. 1998).

Stakeholder Involvement:

Everyone has an individual and collective obligation to protect the environment and make wise use of resources, and to participate in decisions that affect people and the environment. As noted in *Labrador Inuit Association v. Newfoundland (minister of Environment and Labour) 1997*, the EPA, ***“if it is to do its job, must therefore be applied in a manner that will counteract the ability of immediate collective economic and social forces to set their own environmental agendas. It must be regarded as something more than a mere statement of lofty intent. It must be a blueprint for protective action.”***

Clearly, the courts view the EPA as binding the government to apply the legislation in a manner that facilitates the development of protective action by making reasonable decisions in accordance with the guiding principles and stated purpose of the legislation. As outlined above and described in detail in the appendices, the registration #1874 proposal has been released from environmental assessment without an EIS, leaving many uncertainties and many of the potential risks and impacts on threatened wild Atlantic salmon and finfish and the environment unassessed, poorly understood, and unmitigated. Furthermore, these risks and impacts are likely to remain that way, given the deficiencies in the licensing and approval process required under other Acts. Consequently, the decision to release the undertaking without ordering an EIS is not consistent with the guiding principles or stated purpose of the EPA because, without the information that would be supplied through an EIS, it cannot be demonstrated:

- 1) that all reasonable protective measures have been (or will be) taken;
 - 2) that appropriate measures have been taken to protect and preserve life sustaining natural systems, without jeopardizing the needs of future generations;
 - 3) that the public has had adequate opportunities to participate in the decision-making process and have their concerns addressed;
 - 4) that the project, in its current form, constitutes a wise use of the province's resource; and therefore
 - 5) that the environment and quality of life of the people of the province have been protected.
- Rather than the EPA being used as a blueprint for developing protective actions (i.e., by ordering an EIS to better assess and understand the potential risk and impacts and develop appropriate mitigation actions), responsibility for environmental protection has been passed to Fisheries and Oceans Canada and the provincial Department of Fisheries and Land Resources where promotion of the aquaculture industry is policy and where economic and social forces will likely take precedence.

Thus, the EPA has not been applied in “a manner that will counteract the ability of immediate collective economic and social forces to set their own environmental agendas.” As a consequence, the government has failed to discharge its responsibility as mandated by the EPA to “protect the environment and quality of life of the people of the province and facilitate the wise management of the natural resources of the province.”

Conclusion

The Environmental Protection Act and Environmental Assessment Regulations provide clear guidance in determining the proper decision following an initial screening review of an undertaking submitted for environmental assessment. In the case of the proposal, the decision to release the undertaking from further review without ordering an environmental impact statement does not meet the standard of reasonableness because the decision cannot be demonstrated to be justifiable, and it does not stand up to a probing examination based on the information available. Failure to use the EPA as a blueprint for developing protection actions through an EIS process means that many of the environmental impacts of the project will remain unassessed, poorly understood, and unmitigated and monitored, which is inconsistent with the purpose and guiding principles of the Act. More generally, this case presents an excellent opportunity to address the practice of aquaculture waste and recycling management. The scientific literature is very clear that aquaculture generated disease and parasites, AMRs, and POPs whether introduced intentionally or otherwise, can have significant negative and irreversible environmental consequences. At a minimum, the introduction of any POPs, AMRs, and marine pathogens and parasites into Newfoundland's sensitive marine environment should not be permitted without an EIS.

The Newfoundland and Labrador Coalition for Aquaculture Reform (NL-CAR) does not undertake this appeal lightly. We recognize the economic contribution of the aquaculture industry to the province of Newfoundland and Labrador, and we understand the benefits this project could bring to communities such as Harbour Breton. Moreover, we advocate for reuse and recycling of fish waste; including cuttings. NL-CAR is not opposed to aquaculture development that is environmentally, economically, and socially sustainable, but we can not support projects when science indicates that wild salmon will be at risk. Clearly, we have some concerns about this project and, at this point, we do not feel that the risks have been adequately assessed or the impacts mitigated to the extent that they could be. We also recognize that the salmon aquaculture industry in Newfoundland (and indeed across Canada) is suffering from a lack of public confidence, due largely to its real and perceived impacts on wild salmon and the environment. Approval to aquaculture waste systems into an area where wild salmon and finfish are threatened, have closed commercial seasons due in a major part to disease issues, sans POPs filtration, etc without a full and transparent environmental assessment and despite significant public concern, does not help the situation. An environmental impact statement process that involves an open, transparent, science-based evaluation of the existing environment (including wild Atlantic salmon, finfish and POPS), potentially significant environmental effects, and proposed and additional/alternative mitigation measures as well as the design of effective monitoring programs would go a long way towards reducing environmental impacts of the project and towards restoring public confidence in the industry and the governments charged with regulating it.

Such an approach would be consistent not only with the aims and intent of the EPA, but also with the high standard for environmental assessment that has been set by this government over the past months. With that in mind, and in light of the information and arguments that we have presented in this document and the Attachments, we respectfully request that the decision to release the project from further environmental assessment be revised and that the proponent be ordered to prepare an environmental impact statement in accordance with s.55 of the Environmental Protection Act.

Attachment A:

Evaluation of Screening Criteria for Release
In making a determination that there are:

- (a) no environmental or public concerns or
- (b) the environmental effects of the undertaking will be mitigated under an Act of the province or of Canada, the minister may consider a number of screening criteria. These criteria, along with our analysis are presented below.

Criterion A1 The comprehensiveness of the description of the undertaking.

The proponent has not provided a description of the undertaking that is comprehensive enough to allow the expected environmental impacts to be identified, understood, and mitigated. Regarding equipment wash water, the proponent does not describe how this equipment washing water will be collected and treated regarding biosecurity nor does the Minister require this. No mention is made of POPs or POPs reducing technologies which have been adopted by many salmon feed pellet companies due to the bio-accumulation that happens in oily marine fishes (including salmon) and proven effective eg Marine Harvest. Consequently, the proponent was not able to provide a comprehensive description of these technologies nor how effective they will be for mitigating the expected impacts.

Likewise, the Minister has acknowledged that there is potential for the project to have negative impacts on wild fish via equipment wash water effluent but has provided no avenue for public scrutiny of any mitigation designs nor effective post treatment environmental monitoring. In the past, this has resulted in sub par ineffective and un-monitored effluent treatments at hatcheries (simple settling ponds within a few meters of a salmonid stream and exposed to nature) and aquaculture processing plants that have either no effluent processing or ineffective processing of effluent and ineffectively monitored of the outfall environment. Blood filters do not stop salmonid viruses - almost all of which are many times smaller than phages. In fact, no description or assessment of what those mitigation requirement would be nor their impacts was provided by either the proponent or Minister. Instead, they have simply relied on their unproved statement that there will be no impacts and, consequently, used that argument to avoid providing a comprehensive description. The transfer of pathogens and parasites from wild fish to aquaculture fish, followed by amplifications and increases in virulence in open net pens, then re-transfer back to wild fish, is something this industry calls “spill-over and spill-back”. This contagion “feed-back loop” is not found in wild harvested fish nor their processing. Pathogen and parasite issues in the outfall area of the plant regarding equipment washing water (a 2 hour process between shifts left un-described) have been ignored by both the proponent and Minister. This is especially concerning regarding the common practice of holding fish in open net pens or harvest boats near the processing plant. Beyond direct exposure, pathogens and parasites can be amplified and held in refugia near the processing plant via native marine life exposed to any contaminated effluent thus amplifying any spill-back issues. No mitigation nor monitoring was proposed nor required.

AMR has long been a concern at the human-antibiotic reared fish interface (Price *et al* 2013, Norwegian School of Veterinary Science. 2012, Cabello *et al.* 2016, Shah *et al* 2014, Tamova *et al.* 2015). While the serious negative consequences and effects are acknowledged by both several federal agencies (<https://www.canada.ca/en/health-canada/services/publications/drugs-health-products/federal-action-plan-antimicrobial-resistance-canada.html>) and the open net pen salmonid aquaculture industry (various reports), as well as being extensively studied globally and specifically regarding salmonid open net pen products, - the proponent and Minister disregarded any effects this may have on the

proponent's staff, our environment, and the health and marketing impacts on our wild fish stocks. No study or examinations have been done in NL nor are the antibiotic usage rates made public – although egregious amounts are being used in a bio-insecure wild lake (Long Pond) and our marine environment across vast areas from which the processing plant gathers repeatedly treated and unmoving penned salmonids. In every study ever conducted on stationary open net pens outrageous amounts of multi antibiotic resistance has been found (eg 81% of all bacterial species sampled up to 8 Kms from the pens site, Cabello et al 2013). Moreover, the genetic material that instills the resistance is quickly and readily transferred to human and other animal (eg gulls) pathogens (ie epizootic and zootic). The AMRs containment, sterilization, mitigation, and monitoring regime necessary for open net pen reared fish must be far more stringent than that required for wild fish handling and processing.

Criterion A2: Whether or not there is a demonstrated commitment by the proponent to conduct an environmentally sound undertaking.

The proponent claims that they will conduct an environmentally sound undertaking, however the veracity of that claim is questionable for two reasons:

1. The parent company, Barry Group Inc, has a poor environmental and compliance record elsewhere in NL regarding effluent treatment (ineffective sterilization and zero outfall monitoring) of processing plants including salmonid aquaculture processing plants. Moreover POPs have been ignored by this company at it's Burgeo meal and oil plant used to process aquaculture salmonids. Similarly, AMR has been ignored at the companies aquaculture finfish processing plants. Workers have not be educated on AMR issues/mitigation and no staff or nearby environmental monitoring has been done. The current CFIA microbial monitoring requirements, made in private by the company itself and hidden from public scrutiny, are patently inadequate and narrow in scope. Moreover, leaving aquaculture fish (sometimes held alive) for extended time frames, in the processing plant outfall has been practised (and town sewage outfall!). This exposes the human outfall microbes to masses of antibiotics (80+% pass through the fish unmetabolized and still effective) as well as exposing the fish to *E. coli* and the *full gambit of untreated human sewage*. Not surprisingly, the salmonid processing plants owned by Barry Group have been shut down or reprimanded *repeatedly* for CFIA monitored microbes that exceeded legal limits. *NB, the CFIA ignores finfish and epizootic pathogens completely. Only 5 zonotics are considered in the Barry Group internal monitoring for contaminations and effective AMR testing is ignored.*
2. The proponent's commitment to providing an environmentally sound undertaking is not supported by the information provided in their project registration. As outlined in NL-CAR member's original submission to the department, there is a wealth of scientific information that demonstrates, conclusively, that salmonid aquaculture processing can have, and often does have, significant negative impacts on our environment through a number of mechanisms (ineffective effluent treatment descriptions, POPs, AMRs, environmental monitoring, etc). Despite this large body of knowledge, the proponent claims that their project will have no significant impacts on wild salmon because of the mitigation measures they propose. However, all of the mechanisms by which aquaculture finfish processing has been demonstrated to impact the environment have not been addressed by the proponent, and the relevant scientific information has not been acknowledged or discussed by the proponent in their project description, in their assessment of the risks of the project, in monitoring regimes and strategies, or in support of their claim of no significant impacts. Their claim of no significant impacts cannot be justified based on existing science or by the information provided by the proponent

about their proposed mitigation methods. Indeed, the weight of scientific evidence suggests that many of the claims regarding potential impacts and proposed mitigation measures made by the proponent are misleading or false.

Given the proponent's poor record elsewhere, their failure to use the existing scientific evidence to adequately discuss and evaluate the risks and potential impacts of the project on finfish, marine life, human life, and the environment in general in an objective and unbiased manner, the lack of washing water collection and disposal description, and the lack of information provided about the effectiveness of the mitigation measures they propose, it is not reasonable to accept that they have demonstrated a commitment to conduct an environmentally sound undertaking. Indeed, they have simply made an unsupported claim about the lack of potential impacts from their project, and this claim appears to be intentionally misleading.

Criterion A3: The compatibility of the undertaking with other resource use in the area of the undertaking.

The undertaking will not be directly physically incompatible with existing resource use (i.e., the operations will not directly physically interfere with existing fisheries). However, the weight of scientific information strongly suggests that this project, as released, will have negative impacts on human health (eg AMRs, POPs), the health of marine resources such as wild fish stocks, and the marketing of marine fish stocks. If those impacts occur as expected, they will result in a loss of ecological, social, and economic values. This loss is potentially significant. Such impacts and loss of values have already occurred in fisheries in Bay d'Espoir where the once-prolific fish stocks no longer produce enough to support commercial, recreational, or subsistence fisheries in most years.

As noted elsewhere in this document, aquaculture operations in the area have been cited by both DFO and COSEWIC as having a negative impact on the productivity of the salmon population in all DU 4 salmon stocks (entire south coast) including the 19 rivers adjacent to the proposed project. There is some concern that this undertaking might be directly incompatible with other fisheries resource use in the area. Local crab and lobster fishers and buyers have expressed concern about the proposed project suggesting we are one youtube video away from having irreparable damage done to their ability to market their products as being harvested from wild and pristine bays. Moreover, the source of the recent epidemic of VHS IVa, a pacific strain of a deadly fin fish virus currently wrecking havoc on our herring stocks, has never been determined. What is known, is that 2 of 3 CFIA positive test results were taken adjacent to rainbow trout open net pen aquaculture sites. Moreover, VHS IVa is a known rainbow trout (and salmon) aquaculture virus that has been transported and spread by aquaculture operations. While the caged fish quickly build a resistance to the pathogen and can be grown to market size while carrying the virus, this does little to protect wild stocks. This virus has been implicated in the the complete collapse of herring fisheries in peer reviewed studies and is CFIA and OIE reportable. Mere months ago, and within 12 months of the CFIA testing for VHSv in our herring stocks, the entire spring herring purse seine fishery what shut down completely along the entire NL south coast. This is a concern for commercial harvesters who suspect aquaculture outfall may be an issue. Moreover, ISAv HPR 0 infected aquaculture fish are allowed to be harvested and processed despite this virus being an OIE and CFIA reportable strain of ISAv. While HPR 0 may not be causing disease in the penned aquaculture fish during the instant of detect or weeks or months later during harvest, this does not mean that it can not cause disease once triggered to be expressed by, for example, stress. Nor does it mean that it can not immediately cause disease in wild fish fin that contract it. Once again, the CFIA has set the bar to "whatever it takes to get the fish to market" while ignore any and all ecological ramifications and monitoring in the natural environment. Most strains of ISAv detected in NL are

unique and completely untested via virulence trials/contests against wild fish and are new to science. This is due to the extreme and unnatural rate of mutation that the open net pen method facilitates (Plarre *et al.* 2005, Nylund *et al.* 2007). Thus massive amounts of heavily ISAv HPR0 infected fish will be processed at the proponents facility while ignoring the Precautionary Principle and any likely effects on wild fish via effluent. Many fish species adjacent to the project can contract ISAv including herring, cod, trout, char, pollock, lumpfish etc (Nylund *et al.* 2002, Kibenge *et al.* 2016). Experimental trials have detected ISAV replication, without disease, in many fish species including brown trout (Nylund, Alexandersen & Rolland 1995; Nylund & Jakobsen 1995); rainbow trout (Nylund *et al.* 1997; MacWilliams *et al.* 2007); arctic char, *Salvelinus alpinus* L. (Snow, Raynard & Bruno 2001); herring, *Clupea harengus* L. (Nylund *et al.* 2002); and Atlantic cod, *Gadus morhua* L. (Grove *et al.* 2007). Thus, many species may harbour and spread ISAV, and a latent carrier status was suggested for salmonids (Nylund & Jakobsen 1995).

Moreover, ISAv testing by CFIA has proven ineffective (Kibenge *et al.* 2016, Cohen Commission).

Several viruses, including PRv, are completely ignored by the NL Fish Health monitoring regime despite DFO admitting that it causes disease in salmonids. <http://www.cbc.ca/news/canada/british-columbia/farmed-salmon-bc-disease-hsmi-aquaculture-1.3593958> This virus was detected in Atlantic Canada aquaculture fish samples in 2012 (Morton, A. unpubl data - per. comm April 2017). Once again, unless it causes severe losses to industry's return on investment, CFIA and NL Fish Health ignore the pathogen and any effect it will have on non-salmonids and wild salmonids regarding food acquisition, predator avoidance, mating, migration, etc. (Morton and Routledge, 2016). We can wax lyrically about the list of likely and potential pathogens in any effluent from the proponents proposal that neither the CFIA, Health Canada, NL Fish Health, Environment Canada, DFO, etc adequately manage mitigate and monitor, but as the effective treatment is the same for all such parasites and pathogens we hope the above discussion is sufficient to trigger an appeal, an adequate EIS to effectively address the issue (Scheel *et al.* 2007, Price *et al.* 2013, Morton and Routledge 2016,). A panel of EU vets, after an 6 year review of all methods available to finfish processors concluded that bleaching, debleaching and either evaporation or geofiltration was the only method viable (Skall and Olesen 2011).

No effective regulatory framework for aquaculture effluent exists in Canada. Disposal at sea via a gurry ground "Dumping at Sea" permit has long been denied the federal Department of Environment by policy (per. comm. 2015) for any open net pen aquaculture waste due to undisclosed issues (disease transmission worries, POPs, antibiotic use and AMRs, coastal nitrification, etc come to mind).

Similarly, we have no legislation in NL regarding this issue and the 2005 report entitled "REPLACEMENT CLASS SCREENING REPORT- DISPOSAL OF FISH OFFAL AT SEA IN NEWFOUNDLAND AND LABRADOR" is based on 1994 screening criteria and completely ignores aquaculture issues. This issue has been ongoing for nearly 3 decades despite numerous reviews, panels, and committees.

Criterion A4: Whether or not the undertaking occurs in an environmentally or other sensitive area.

DFO's DU 4 (entire south coast) for salmon is SARA listed as threatened and twice was nearly listed as endangered (DFO 2007b). Adjacent SARA listed wolffish were also ignored. Despite that this region is an environmentally sensitive area that is managed under an integrated management plan, the proponent has not explained how their activities would fit into and be managed under that plan. This is also true for the recently announced Marine Protected Area, and adjacent Ecological Reserve with declining

salmon populations.

Criterion A5: The defined boundaries of the undertaking and whether or not the undertaking is contained within that area.

The proposed effluent would occur throughout the marine ecosystem and as aquaculture viruses have been spread 1000s of kms via migrating fish the footprint is massive. Similarly, a cocktail () of POPs that is more numerous and higher than any food product tested to date by science (Hites *et al.* 2004, Kelly *et al.* 2011, Ruzzin *et al.* 2010, 2014, Matovani *et al.* 2015,) would be distributed in unknown amounts and concentrations in human and non-human end products. Health Canada and CFIA allow the aquaculture production chain (meal and “marine oils” for pellets) and fish products to have the highest levels of POPs in Canada and do little to protect Canadians. In fact, most POPs are unregulated and allowable PCB/Dioxin/etc levels for farmed salmon are many times that of pork or chicken. Eg <http://www.inspection.gc.ca/animals/feeds/regulatory-guidance/rg-8/eng/1347383943203/1347384015909?chap=2> Allowable levels are based on normal production levels rather than safety. For eg in vegetable oil a level of 1.5 ng/kg is the limit yet in Aquaculture salmon rendered oil it is ten times this at 16ng/kg. Again, a separate level is singled out for aquaculture salmon oils at 0.3 MILLIGRAMS per kilogram of PCBs. This in tern is based on dated 1998 WHO recommendations. A margin-of-exposure approach advocated by the U.S. Environmental Protection Agency (EPA 2002) was ignored by the CFIA. Foran 2005, also reported cancer risks, based on the proposed U.S. EPA cancer slope factor for DLCs (U.S. EPA 2002) that would be generated at particular salmon consumption levels. Their results demonstrate clearly that consumption of some farmed Atlantic salmon, even at relatively modest levels, raises human exposure to DLCs above the lower end of the WHO TDI and considerably above background DLC intake for adults in the United States. This same argument holds for meal and oil versions of farmed salmon. Ruzzin *et al.* 2015, expressed that the cocktail effects of multi POPs are ignored.

Section 5.2 of the Feed Regulations govern marine fish meals and oils and allow aquaculture renderings to be used as a feed ingredient. <http://laws-lois.justice.gc.ca/eng/regulations/SOR-83-593/page-11.html> Organic labelled livestock feeds must use only ensilaged aquaculture meals and oils (due to ethoxyquin and other pesticides being in the fish's flesh) but no such restriction are in place for non-organic fish feeds.

Aquaculture feeds made of fish meal and fish oil are the main vehicle for transfer of environmental pollutants to farmed fish. The main fish contaminants can bio-accumulate and affect development in humans (eg Ruzzin *et al.* 2012). Numerous studies have linked persistent organic pollutants (POPs) like pesticides and polychlorinated biphenyls (PCBs) to adverse effects and non-communicable diseases, even at low doses of exposure (Carpenter, 2013; Ruzzin *et al.*, 2012; Vandenberg *et al.*, 2012).

Aquaculture feed ingredients as well fish species have a different liability to contamination depending, e.g., on the lipophilicity of the specific chemicals. Up-to-date risk-benefit assessments show that high intake of fish may lead to an undesirable intake of pollutants which is not sufficiently balanced by the concurrent intake of protective nutrients, such as PUFA. The use of vegetable-based feed ingredients in aquaculture has been explored from the standpoints of economic sustainability and fish productivity to a greater extent than from those of food safety and nutritional value. Available data show that vegetable oils can significantly modulate the lipid profile in fish flesh, depending on the oil and fish species. The use of vegetable ingredients can drastically reduce the accumulation of the main contaminants in fish; likewise the presence of other “unconventional” contaminants (e.g.PAHs) and the nutritional value of fish flesh could deserve more attention in the assessment of novel aquaculture feeds. As the industry

shift to use less fish meal and oil the POP profile in any waste rendered will shift to pork/chicken/soy/corn etc contributed POPs and be bio-accumulated in the farmed salmon changing the POP contaminate profile. No control will be had over the distribution of these POPs provincially, nationally or Internationally (eg shipped to the Cargill salmon feed pellet plant that then makes our feed pellets leaving all the POPs unfiltered - and then reshipped back to NL and fed to our open net pen aquaculture fish and dumped in our bays?). Aquaculture buys 57% of all fish meal produced globally (Cashion et al 2017). A salmonid feed meal is being planned by Grieg and the closest and thus cheapest source of marine oils will be the proponents project. Re: <http://www.thetelegram.com/business/2016/10/5/grieg-nl-employment-information-session-4656941.html> Pre-construction testing for on-site contaminants has been done by Grieg (re: former fish processing plant site). This will likely also be the case for Marine Harvest given the scale of the licenses just bought from Gray's Aqua. Once the Barry Group meal and oil project #1874 is released no restriction on distribution or use of the POP laden meal and oil will be had. Policy and suggestions can not be legally enforced.

Consequently, there is a strong possibility that the impacts of this project on the marine environment and industrial food and non-food production chains could extend well beyond the confines of the project site. To quote Dr Ruzzin, an award winning aquaculture toxicologist, during an interview with one of Norway's largest papers, "we have the technology to reduce POPs in this production chain and we must use it."

Criterion A6: The technology to be employed for the undertaking and whether or not it is environmentally benign.

The undertaking will employ a number of technologies that are incomplete regarding the processing of aquaculture waste. Of particular concern is the plan to ignore POPs and save money by not filtering them POPs as is done by major feed manufacturers not supplying our producers. 57% of all fish oil and meal is used as aquaculture feed while a majority of the remaining fish meal and oil sales are in the feed industries (Cashion et al 2017). Thus unfiltered POP remain in the human contact chain even if accumulated on a lawn as pet feces. Equipment washing water treatment is not described in enough detail to make an assessment but anything sort of the bleaching de-bleaching and either evaporation or geofiltration recommended by the UE review (2012) would not uphold the spirit of the EA.

A possible ethoxyquin metabolite feed-back loop may be present given that the meal and oil could be used for feed pellets (Bohne et al 2007, Hoolaas et al 2008). This can bio-accumulate the metabolites including those with unknown and known negative issues (see review by Blaszyk et al 2013).

For these reasons, the use of proposal, as is and released, cannot be considered an environmentally benign technology at this point.

Criterion A7: Issues of concern relating to the environmental effects of the undertaking.

As NL-CAR described in our original submission to the department (via a member), there is a wealth of scientific information about the impacts of net pen aquaculture processing on the local environment (AMR, POPs, effluent, etc), and ineffective aquaculture processing has already been demonstrated to be having a negative impact on the environment.

There are broad environmental concerns about pollution from aquaculture generated fish waste processing, that extend into and beyond the local environment.

These concerns are more general in nature. As noted in Criterion A1-6 above, some of these issues are potentially exacerbated by lack of proper AMR and POP mitigation and monitoring, potential fish handling and storage in the outfall, and effluent handling description.

Criterion A8: Whether or not licences, certificates, permits, approvals or other documents of authorization required at law will mitigate the environmental effects referred to above.

Before receiving final approval, the undertaking must receive further permits, licenses, and approvals from the NL fish plant licensing board. This board are governed by the NL Aquaculture Act and Aquaculture Regulations (administered by the NL DFLR) and the Canadian Fisheries Act and the CFIA and federal Environment. The approval and permitting process will not be sufficient to mitigate the environmental effects referred to above for three reasons: 1. Acts and regulations governing the approval and permitting process do not contain sufficient provisions to require the Board to assess, understand, or mitigate the threatening processes and/or impacts identified.

NL Aquaculture Act.

The purposes of the NL Aquaculture Act are to:

- 1) promote, in consultation with the private sector, the prudent and orderly development of the aquaculture industry;
- 2) secure property rights of aquaculture businesses;
- 3) minimize conflicts with competing uses; and
- 4) facilitate cooperative decision making between various levels of government.

None of these purposes state or imply that environmental protection in general (or the protection of the marine environment) is to be given a priority in the administration and application of the Aquaculture Act. These stated purposes do imply, however, that the interests of the private sector (i.e., aquaculture companies such as the proponent of this project) are to be given priority in aquaculture development and decision making. Consequently, when conflict between environmental protection and the interests of the private sector occur, it is clear that the Aquaculture Act authorizes the minister of Fisheries and Aquaculture to prioritize industry development and the needs of the private sector over environmental protection. The NL Aquaculture Act does allow the Minister to incorporate environmental protection provisions into processing licensing conditions, but no such conditions are required by the act. Likewise, the Act does not require the minister to assess and understand potential environmental impacts before issuing a license, except in the case of introductions of non-native species or strains where the Act directs the minister to ensure that the introduction has been assessed under Part X of the Environmental Protection Act (under the assumption that the animals proposed for introduction or transfer will escape into the natural environment). Clearly, the Aquaculture Act is intended to defer to the Environmental Protection Act for the proper assessment and mitigation of environmental impacts from introductions, and those impacts must be assessed under the assumption that containment systems will fail.

Federal Fisheries Act.

Likewise, the federal Fisheries Act contains only weak provisions to protect wild fish from the impacts of aquaculture and does not require the minister of DFO to assess, understand, or mitigate the identified threatening processes or impacts. The Fisheries Act does contain provisions to prevent “serious harm” to fish. However, serious harm to fish is narrowly defined as the death of fish or permanent alteration/destruction of habitat. Most of the impacts from aquaculture identified in Criterion A7 occur without causing “serious harm” as defined by the Act. For example, sub lethal infection do not result in

the death of the wild fish involved. However such infections would have dire consequences for sick fish in the wild result in reduced survival, reduced population-level resilience and, eventually, decreased population size and possibly extirpation. Likewise, diseases such as ISA or HSMI may impact reproductive success of wild fish without actually killing the fish. Negative ecological interactions produced by AMR and POPs can also lead to significant fitness impacts without resulting in death to wild marine life. Consequently, given the definition of “serious harm” contained in the Fisheries Act, most of the potential impacts identified in Criterion A7 will not be mitigated by the Fisheries Act because the impacts occur without directly causing the death of wild fish or permanent alteration of fish habitat. In theory, the Fisheries Act should serve to mitigate these impacts because they fit the definition of “serious harm” and therefore should be prevented under the act. However, neither the Fisheries Act nor the Aquaculture Activities Regulations contain provisions for the monitoring, reporting, or mitigation of AMRs, or POPs.

The regulatory environment under which aquaculture operations in Newfoundland operate do not meet internationally accepted standards for preventing impacts from AMR and POPs.

Existing Acts and regulations have not been sufficient to prevent aquaculture operations from having significant impacts.

Likewise, existing aquaculture processing operations have been demonstrated to negatively impact local environs and human health (Price et al 2015, Morton and Routledge 2016, Ruzzin et al 2015). Despite this, the proponent has not provided enough detail to allow the level of these effects to be determined for this project. Indeed, rather than provide an open and transparent science based discussion of these known impacts and the likelihood that they will occur, the proponent has simply claimed that none of these known impacts will occur in this project, and provided incomplete and misleading information in support of that claim. In particular, the proponent has provided incomplete and misleading information about the risks associated with the waste material and end products. Likewise, they have provided insufficient information about the effectiveness of other proposed mitigation measures such as equipment washing effluent and end sludge. These significant information deficiencies need to be corrected.

Criterion A10: Whether or not the means of determining further information have been identified

Despite the significant uncertainties and information gaps that remain (see above), there has been no plan or proposal put forward by the proponent or the minister to collect further information under public scrutiny. Likewise, the remaining licensing/approval process for the project does not mandate the collection of the information necessary to appropriately assess, understand, and mitigate the identified impacts by the public. As noted in Criteria A9 above, we identified a significant number of information gaps and uncertainties that remain with this project and, in response, have made a number of recommendations for further information to be collected prior to production including:

- Baseline studies to characterize the adjacent disease and parasite loads of wild finfish and shellfish
- Concern regarding fish being stored exposed to the effluent outfall.
- AMRs education, mitigation, and monitoring
- POPs monitoring and filtration

.Although CFIA and Health Canada have clearly identified a number of significant information gaps and made numerous recommendations for research and monitoring studies regarding AMRs and POPs, the actual means of collecting this necessary information have not been identified. Given that this proposal has now been passed for licensing, there is no further mechanism that mandates or facilitates the design and implementation of the necessary studies. Given that much of the information highlighted by CFIA/Health Canada/Environment Canada as necessary would need to be collected (or begun to be collected) prior to commencement of the project, the only way to properly develop the means of collecting that information is through an environmental impact statement process.

Criterion A1: The environmental effect of the technology to be used and mitigating factors of the technology.

There are a number of technologies ignored by the proponent that would mitigate POP and AMR concerns. A discussion of the mitigating effects necessitates they first be recognized and utilized by the proponent.

Lack of these details mean that monitoring the direct and indirect impacts of the project on the environment will not be possible.

Attachment B

Evaluation of Screening Criteria for Environmental Impact Statement In making a determination that there may be significant negative environmental effects; the minister is directed to consider a number of screening criteria. These criteria, along with our analysis are presented below.

Criterion B1: Whether or not the environmental baseline information provided with respect to the undertaking is sufficient for predicting environmental effects.

There is no baseline information provided about POPs or AMRs in current open net pen aquaculture generated salmonids in NL nor the handling and processing thereof, nor the meal and oil renderings thereof. Recent results published from 2015 data show an alarming shift in Omega 3 (marine) to Omega 6 (land) production by the fish. This signals the rapid shift to land based feed inputs and away from marine feed inputs. We can only assume this is from Cooke Aquaculture generated fish from their NL operations. This may not reflect the main rendering sources used by the proponent (Northern Sea Harvest) as they may not use the same feed sources, have the same handling and rearing facilities, same antibiotic use and protocols, etc. Sources of inputs should have been specifically named due to differences in rearing and feed inputs and thus POPs and AMRs. Re: https://www.mun.ca/harriscentre/reports/DAVE_WASTE_15-16.pdf

Moreover, a complete POPs and AMRs analysis listing and quantifying constituents should have been provided such that a discussion about mitigation technologies (eg filtration or sanitation techniques) could be facilitated.

As discussed above, wash water collection, AMRs, fish holding bio-security etc were similarly ignored thus preventing mitigation discussions.

Criterion B2: Whether or not original field data collection is required.

Predicting and mitigating the impacts of this project on wild fish and human health will require information on a range of issues including (but not limited to):

- 1) POP in the meal and oil products and sludge waste
- 2) AMRs being generated in fish farm vs non-fish farm areas
- 3) transfer rates or AMR genetics between aquaculture fish bacteria and human pathogens
- 4) pathogens and parasites in the wash waste water beyond those looked at by CFIA and NL Fish Health monitoring
- 5) wild fish health monitoring adjacent to the wharf
- 6) impacts on fish held in the outfall near the wharf

These data have never been collected by Barry Group Inc during the aquaculture fish rendering process.

Criterion B3: Whether or not the undertaking would be located in an environmentally sensitive area.

There are several adjacent environmentally sensitive areas that are managed under an integrated management plan, ecological or marine reserve and the proponent has not explained how their activities would fit into and be managed under that plan, and they have not acknowledged the cumulative effects of their proposed operations on the bay given the other stressors that the bay is currently experiencing. Due to the nature of a marine environment and migratory fish impacts from the project could be very far reaching regarding disease transmission and AMRs as well as POPs should the meal and oil end up being used in products like feed pellets that are dumped adjacent to or in the sensitive or protected areas.

Criterion B4: Whether or not hazardous or toxic substances in combination with unknown or experimental technology are intended to be used with respect to the undertaking.

Net pen salmon farming makes extensive use of drugs and chemicals (which are toxic to the environment) to control diseases and parasites. The chemicals may be contained in the fish.

Moreover, open net pen aquaculture fish processing waste used by the proponent (ie frames, guts, and cuttings) is prone to some of the highest POPs ever measures in a human food product. This is particularly so for belly fat and skin which may have more than 100 times the POP levels found in the meat. These toxins were ignored by the proponent despite that technology exists to filter them out. Thus the product will be allowed to pass on a cocktail of POPs.

AMRs technology and monitoring aides were also ignored and no discuss nor strategy developed.

Equipment washing waste water collection and handling were ignored and the technology not described.

The Minister released the project to Fish Health but this circumvents any public scrutiny and fails to provide any details of the technology that would be used nor mitigation measures.

Given that this information was clearly not available or requested during the limited environmental assessment that has occurred for this project, the potential impacts of toxic chemicals on the environment have clearly not been adequately assessed.

Criterion B5: Whether or not the undertaking emissions, discharges or effluent may exceed limits

imposed by law.

Effluent monitoring as proposed by the Minister's own release phage testing) will not adequately monitor for viral contagions much smaller than bacterial phages. Wastewater collection and effluent handling were not discussed and we have grave concerns about monitoring this unconstrained and uncontained water use. Sludge disposal and monitoring for POPs was also not described.

As part of the licensing and approvals process, the proponent will be required to prepare and submit a waste management plan that complies with all applicable regulations. However, as noted in Criteria A8, current regulations around monitoring for evidence of pollution and contagions do not meet the internationally established "best practice" standards and are therefore unlikely to be effective at preventing localized pollution. It is not possible to conclude whether or not the amounts of discharges and effluents produced by this project will exceed limits imposed by law because:

- a) the proponent has provided no estimates of discharge and effluent levels; and
- b) there are no laws limiting the amount of effluents discharged into the environment by salmon aquaculture processing operations in Newfoundland.
- c) many POPs are under review in Canada and many more simply not registered nor regulated federally.
- d) again, AMRs are still being worked on by CFIA and Health Canada and no limits exist.

Criterion B6: The environmental effects of the undertaking upon rare or endangered species.

As noted in Criterion A7, there is a vast amount of scientific evidence indicating that this project will have significant negative impacts. Rather than provide an in-depth assessment of the risks of their proposal, the proponent has simply stated that their project will not have significant impacts. As we have discussed above and in our original submission to the department, this claim cannot be substantiated by the information provided by the proponent or by the extensive scientific information on the impacts. Given the inaccurate and misleading claims about the potential impacts of this project as discussed above, it is impossible to accept their claims about the potential impacts.

Criterion B7: The economic importance of a resource to which the undertaking relates.

The Atlantic salmon resource has significant economic importance to the people of Newfoundland and Labrador. The province has 186 scheduled Atlantic salmon rivers which produce a combined catch (recreation and subsistence, retained and released) of approximately 50,000 to 60,000 salmon per year. An important (but not the only) measure of the economic importance of the resource is the amount of money people spend on their recreational salmon fishing activity. A report prepared by Gardner Pinfold Consultants indicates that the Gross Domestic Product (GDP) value for wild Atlantic salmon in NL in 2010 was approximately \$33 million. In that year, anglers spent approximately \$27 million on salmon angling (Gardner Pinfold 2011). Currently, there is no estimate of the amount of money spent on fishing in the adjacent rivers could be affected; however, in 2014, those rivers had a total of ~3,500 rod days of recreational salmon angling effort, suggesting that expenditures for salmon fishing on those rivers is likely to be significant. We note, however, that there is potential for this project to have impacts on many wild fish stocks (diseased effluent), processing plant staff health (AMRs), and the

general public and aquaculture region in NL (POPs reintroduced in a concentrated area or process after bio-accumulation). Consequently, any estimate of the economic importance of the resources potentially affected should not be limited to the fishing activity that occurs in the Bay. The recent purse seine fishery closure by DFO for spring herring in 3PS (entire south coast) during an aquaculture virus outbreak (VHS IVa – pacific strain) from unknown origins (a known aquaculture virus) emphasizes the need to implement the Precautionary Principle and take all measures to allow a full and proper EIS. Some aquaculture POPs are known to accumulate in shellfish, should the meal and oil be used unfiltered this will likely have long term effects.

In making a determination that an undertaking may be of significant public concern, the minister is directed to consider the following criteria.

Criterion B8: Whether the public acceptability of the undertaking is seriously questioned.

Public concern over the acceptability of salmon aquaculture processing and its impacts on the environment in general and human health has been growing throughout the province for many years. This concern is based on the impacts directly observed by members of the public on the natural environment as well as growing public awareness of scientific studies that have conclusively demonstrated a range of environmental impacts of salmon processing waste, particularly significant impacts on feed pellet production and pet food. Such concern has been increasingly expressed in numerous public media outlets over the past number of years, even in the absence of specific plans to expand the salmon aquaculture industry in the province. In 2013, the Newfoundland government engaged in a public consultation process in support of developing a new aquaculture strategy for the province: 80% of respondents to the online questionnaire said that the salmon aquaculture industry has a poor or very poor reputation, and respondents expressed significant concerns over the impacts on wild fish and the overall sustainability of the industry (Government of Newfoundland and Labrador 2014).

We note that the two main NGO concerned with aquaculture (ASF and NL-CAR) both made serious submission during the public consultation process – but were ignored and provided with false information by government regarding mitigation of some of those concerns.

Public sentiment at that time was that entire aquaculture projects were being broken into pieces so that project splitting would reduce the likelihood of a project being rejected while using substandard technology and ignoring mitigation strategies (re;Grieg fiasco). Likewise, the registration and subsequent release of the entire project has again resulted in many members of the public questioning the acceptability of the project in various public and social media. Given the breadth and depth of the concerns expressed, the public is not likely to accept anything less than a full EIS for this project including the issues outlined above.

Criterion B9: Whether government policy has been established to address public concerns.

Existing government policy is not sufficient to address the public concerns regarding this project. The provincial government released a Sustainable Aquaculture Strategy in 2014 to guide future policy and investment decisions aimed at fostering the success of the industry. This document, however, provides only general direction for policy development and does not contain any specific policies that would address the public's concerns over this specific project. The fact that significant public concern over salmon aquaculture remains two years after the release of the aquaculture strategy document indicates that the Aquaculture Strategy has not been effective at addressing public concerns.

Given the lack of baseline information that has been identified by this appeal request, lack of information about the fate of waste water, POPs, AMRs, etc, lack of information about the potential ecological interactions between wild fish and end products (meal/oil and effluent) etc., it is not possible to address the public's concerns about the potential impacts of the project. The way to address these concerns is through a thorough and transparent EIS process with a thorough review of the above issues and deficiency in the proponents submission.

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