

COPY

Bowen Island, January 6, 2016

The Honourable Hunter Tootoo, M.P.
Minister of Fisheries, Oceans and the Canadian Coast Guard
200 Kent Street - Station 15N100
Ottawa ON K1A 0A6

The Honourable Catherine McKenna, M.P.
Federal Minister of Environment and Climate Change
House of Commons
Ottawa ON K1A 0A6

Dear Ministers:

Re: Incomplete scientific data on Pacific Herring Spawn result in a flawed BC EA Report – ultimately putting the Pacific Herring Spawn in upper Howe Sound and Howe Sound’s revival at risk

We the undersigned are writing to formally request that under the terms of the Canadian Environmental Assessment Act (CEAA) you decline to accept the process and the findings of the B.C. Environmental Assessment (BCEA) Report for the Woodfibre LNG (WFLNG) project in Howe Sound, BC. Our focus in this letter is *specifically* on the occurrence of Pacific Herring and herring spawning, observed for the last 4 years¹, in multiple locations within the marine Project Development Area (PDA) and the destruction of fish and fish habitat the proposed project’s cooling system could cause.

Importantly, the BC Environmental Assessment Office (BC EAO) in its assessment of Woodfibre’s proposed cooling system failed to consider any comprehensive study of Pacific Herring spawn in the PDA and the environmental effects this project’s cooling system will have on Pacific herring and herring habitat because the DFO and consequently the BCEAO had “insufficient information” on this important issue.

Your Assessment Decision Statement, specifically under section 5 (1) (a) (i) of CEAA 2012, is impossible without this important scientific evidence.

¹ *Appendix: Pacific Herring Spawn Surveys – Howe Sound North - John Buchanan*

Howe Sound

Howe Sound, its entrance visible from Vancouver, is Canada's most southerly fjord. This marine area is surrounded by steep coastal mountains and populated by islands. Howe Sound is unique in that this fjord is successfully recovering from severe environmental damage caused by industrial pollution. Over the timeframe of 100 years, toxic effluent from paper milling, copper mining and chemical processing turned Howe Sound into a biological dead-zone.² After spending over \$99,000,000 (with ongoing monitoring expense) of taxpayers' dollars on the Britannia Mine alone³ and due to treatment of effluent streams, closures of industries and cleaning up of industrial processes, we are observing a recovery of Howe Sound's ecosystem and the return of many species, not limited to Pacific Herring, a variety of Salmon stocks, White Sided Dolphins, Orcas and a variety of whales, and the presence of rare glass sponge reefs (Currently protected by DFO in nine areas through out the Sound.).

Howe Sound is now recovering. Like the survival of a canary in a mine, the reappearance of Pacific Herring, being a high fat source and a key link in the food chain, is a harbinger of this renaissance.

We agree with a number of organizations opposed to the choice of Howe Sound, as proposed by the BC Government and industrial proponents, as a suitable location for new industries.

Though there are numerous other problems with both the procedure and findings of the BC EAO, in this letter we argue that Woodfibre LNG may have been aware of Herring spawn present in the PDA and adjacent shoreline areas at the time the application was written and submitted. Yet adequate mitigation measures, to locate the cooling system's seawater intake at a minimum of 2 km away from Herring spawn as required by DFO Guidelines⁴ is not complied with. This may have possible lethal consequences to Herring spawn. No alternative for the type of cooling system was seriously considered and Woodfibre LNG's proposed offset, in case Serious Harm is caused to Herring spawn in the PDA, is known not to work (*DFO, D.E. Hay and P.B. McCarter – 2015*)⁵.

Neither the DFO Pacific Biological Station's Fisheries Protection Program in Nanaimo⁶ nor the BC EAO have referred to the earlier documented knowledge of Herring spawn in the PDA - the Buchanan Herring Spawn Surveys. In fact, there is no comprehensive body of scientific evidence yet assembled of Pacific Herring spawn in Howe Sound.

Only after its application was submitted and made public (January 2015), and presence of Herring spawn in the PDA was raised in public comments and working group questions, did Woodfibre LNG commission Hemmera Envirochem Inc.(Hemmera) to perform Herring spawn surveys within its PDA.⁷

The BC EAO prematurely concluded in the WFLNG Assessment Report that the proposed cooling system with its seawater intake and discharge, only 50 m away from observed Herring spawn, (as

² *Howe Sound Environmental Effects Report Monitoring (EEM) cycle one interpretative report. (Hatfield Consultants Ltd. 1996)*

³ *Cleaning up Britianna Mine site to cost \$99 million (Vancouver Sun, June 2006)*
<http://www.canada.com/vancouver/news/story.html?id=7daaad90-7a09-4fcb-ad94-f44a4557fbdb>

⁴ *Guidelines for Minimizing Entrainment and Impingement of Aquatic organisms at Marine Intakes in B.C. [the Guidelines] (DFO-Fedorenko, 1991)*

⁵ <http://www.pac.dfo-mpo.gc.ca/science/species-especes/pelagic-pelagique/herring-hareng/herspawn/pages/project-eng.html>

⁶ *DFO letter May 6 2015 – Attn. to Ms. Amber Paulson, EAO -*

⁷ *Woodfibre LNG Herring Survey Summary Report – (Hemmera - May 2015)*

opposed to 2 km) was unlikely to cause serious harm, even though DFO had corresponded that ‘Insufficient information has been provided to understand the exact number of [Herring and fish] larvae which may be entrained.’”⁸

Absence of comprehensive data on Marine Resources in Howe Sound

There is a lack of baseline information and consistent data concerning Marine Resources in Howe Sound and specifically in regard to consistent and comprehensive Herring spawn survey data. This is noted by many in the scientific community who have worked or work in Howe Sound.⁹ Online DFO Fish Herring spawn data for Howe Sound (*region 280*)¹⁰, has significant time gaps and it is also skewed towards shore areas close to human habitation. Reasons for limited survey data for Herring spawn could be due to Herring spawn ‘disappearing events’ or the fact that Howe Sound’s high levels of pollution were reasons to consider the area to be inconsequential for DFO data gathering. Reasons for the limited number of locations where surveys were done, might be because the surveys were driven by (public) reports of spawn.

In the absence of regular DFO Herring spawn surveys in Howe Sound (probably due to lack of priority, funds and personnel), others started doing research, survey and data collection work.¹¹ For instance, since 1996 the Vancouver Aquarium’s Howe Sound Research Group has been doing research in Howe Sound. Since 2010, John Buchanan has surveyed for Herring spawn in Howe Sound North, including the area around the Woodfibre site, now the proposed PDA. Buchanan documented Herring spawn in 2011, 2012, 2013, 2014, and 2015 directly adjacent to and well within 2 km from the Woodfibre site. This work was never considered in the EA process.

The Buchanan Herring Spawn survey work

We asked Dr. Douglas E. Hay, Adjunct UBC and former DFO researcher if he was willing to review Buchanan’s work. Dr. Hay’s response to Buchanan’s work was as follows:
“Regarding John Buchanan’s Pacific Herring survey work in Howe Sound: there is documented information on spawning and survey dates and relatively precise information on spawning locations. Therefore from these observations, that note the start and points of spawn along the shoreline, the linear length of the spawn can be estimated. These observations are consistent with data in the DFO herring spawn database from “surface” surveys (in contrast to dive surveys). The spawn observations are documented with photos and videos. Although, Mr. Buchanan’s data do not include information on layer and width information, in a form similar to that collected by DFO, the information is, nevertheless, informative and valuable. Therefore this is documented Herring spawn data and information that could be incorporated in DFO’s Herring Spawn database.” (Attached in appendix: E-mail correspondence between Anton van Walraven and Dr. D. E. Hay - Nov - Dec 2015.)

⁸ DFO letter June 26 2015 – Attn. to Ms. Amber Paulson, EAO -

⁹ Howe Sound Science and Knowledge Workshop 27 March 2015 Summary Report

http://futureofhowesound.org/wp-content/uploads/2015/07/Howe_Sound_Science_Knowledge_Workshop_Report_June2015-1.pdf

¹⁰ Section 280, Howe Sound (North & South) Herring Spawn Map and Records- (Ministry of Fisheries and Oceans website: <http://www.pac.dfo-mpo.gc.ca/science/species-especes/pelagique-pelagique/herring-hareng/herspawn/280fig-eng.html>)

¹¹ -the Vancouver Aquarium Howe Sound group has done research in Howe Sound since 1996,
-Mr. John Buchanan has been surveying North Howe Sound for Herring and Herring spawn, as a personal initiative since, 2010.

-Woodfibre LNG commissioned field studies and surveys in the proposed PDA in 2013, 2014 & 2015.

The Buchanan Herring Spawn survey work data is attached to this letter in Appendix: *Pacific Herring Spawn Surveys – Howe Sound North - John Buchanan*

Woodfibre LNG commissioned Marine resource surveys

WFLNG's, commissioned Desktop review and Field studies, documented in its EA application: *Appendix 5.10-1: Marine Resource Baseline studies and Forage Fish and other fish assessment (application section 5.18)*¹². Desktop review included the limited online DFO Herring Spawn data, and a search of available grey literature. The grey literature review found a local news article about a citizen¹³, clearly identified as Mr. John Buchanan from Squamish - BC, surveying for Herring spawn within and directly adjacent to the PDA.¹⁴ No efforts were made to contact Mr. Buchanan. The incomplete DFO data for Howe Sound was adopted for the assessment, but the results of the grey literature search were not pursued by WFLNG.

WFLNG commissioned Field studies during early Summer 2013, and April and June of 2014. Juvenile and adult Herring were captured within the PDA at locations S5, GN5 and Gn7¹⁵ as summarized in the study: *"The subtidal and intertidal areas of the project area survey serve as a feeding and migratory habitat for marine fish species, such as Pacific herring, saddleback gunnel, sculpins shiner perch, striped perch, pile perch, white-spotted greenlings, blackbelly eelpouts and several species of sole."* And also *"Forage fish species (e.g., Pacific herring, eulachon, surf smelt and Pacific sand lance) are known to spawn in Howe Sound or Squamish River. However, no forage fish spawning habitat is registered within the LAA [PDA]."*¹⁶

In response to concerns raised by stakeholders and the public during the EA review process, WFLNG commissioned Herring Spawn field studies for 2015 and 2016. New Herring spawn was observed in the PDA in 4 out of 5 surveys done during February, March and April 2015, contrary to their earlier findings and consistent with Buchanan's work. Understanding the seriousness of these survey results, WFLNG's consultant Hemmera responded with the following recommendation: *"there is substantial opportunity to improve the Project site for herring spawning through the addition of shallow rocky reefs."*¹⁷

¹² Woodfibre LNG EA application Appendix 5.10-1: Marine Resource Baseline studies 2 of 3 – 10.1 page 154 – 157 Golder Associates Ltd.

¹³ Woodfibre LNG Application for an Environmental Assessment Certificate January 2015 - Section 5.18- Page 22 – Paragraph 2
http://a100.gov.bc.ca/appsdata/epic/documents/p408/d38525/1421092563617_KQQVJ0PJSG1lcH9LDD8L1J0CQhQw7NgD32kZQsvpHsxWNdyq1qCg!1378338455!1421086505978.pdf

¹⁴ Citizens scientist observes herring – The Pique (J. French 2013)
<http://www.piquenewsmagazine.com/whistler/citizen-scientist-observes-herring/Content?mode=print&oid=2452543>

¹⁵ Woodfibre LNG EA application Appendix 5.10-1: Marine Resource Baseline studies 2 of 3 – 10.1 page 154 – 157 Golder Associates Ltd.

¹⁶ Woodfibre LNG EA application Appendix 5.10-1: Marine Resource Baseline studies 2 of 3 – 10.1 page 163 – Golder Associates Ltd..

¹⁷ Woodfibre LNG Herring Survey Summary Report: page 8– (Hemmera - May 2015)

Herring spawn enhancement or reestablishment, not possible nor practical

On the DFO's dedicated webpage to Herring Spawning Areas of British Columbia (DFO, Hay and Carter 2015) it states: *'Moreover, it should be realized that herring "enhancement" or "re-establishment" does not appear to be possible or practical at the present time (Hay and Marliave 1988). Therefore, if herring spawning habitat is lost, we cannot necessarily expect the impacted stocks to spawn in other locations nor can we realistically expect that new spawning habitat can be created.'*¹⁸

The Fisheries Act and DFO Guidelines for marine intakes in B.C.

Since 1975 requirements for fresh water and sea water intakes have been regulated under the Canadian Fisheries Act.

The DFO 'Guidelines for Minimizing Entrainment and Impingement of Aquatic organisms at Marine Intakes in B.C.' (DFO, Fedorenko - 1991)¹⁹ were created with the understanding that *"they are particularly important in the view of large herring spawning populations that are found in the intertidal and subtidal British Columbia (i.e. zones affected by tides and zones below the tidal influence) where potential seawater intakes maybe sited."* (DFO, Fedorenko - 1991)

The importance of keeping marine intakes away from Herring spawn is articulated in DFO's general siting guideline that states: *'Do not site intakes at or near herring spawning areas that show historical spawning over time. Allow a minimum of 2 km between an intake structure and a documented herring spawning area. Distances less than 2 km pose a serious risk to herring and other marine fish larvae which have little or no swimming ability.'* (DFO, Fedorenko - 1991)

The DFO Guidelines continue to be used as intake standards in design processes and as assessment criteria for Regulatory Agencies. For example in WFLNG's report 'Seawater Cooling System Intake Information Request' (Hemmera May 2015), the 'Guidelines' are referenced 6 times. It is also referenced by the BC EAO in the Assessment Report section 5.5.2 page 95.

Woodfibre LNG's proposed seawater cooling system inappropriate

Woodfibre LNG's choice of cooling system was based on the assumption Herring spawn was **NOT** present in the PDA and adjacent shore-line areas. Their assumption was clearly wrong as proven by their own Herring spawn study (Hemmera 2015) and accordingly, their choice of cooling system is totally inappropriate and used only in areas where Herring or Herring spawn are not present.

WFLNG's choice of cooling method is explained in 'Woodfibre LNG Project – Assessment of Alternative Cooling methods' (Woodfibre LNG April 2015).

¹⁸ ' <http://www.pac.dfo-mpo.gc.ca/science/species-especes/pelagic-pelagique/herring-hareng/herspawn/pages/project-eng.html>

¹⁹ *Guidelines for Minimizing Entrainment and Impingement of Aquatic organisms at Marine Intakes in B.C.'* (DFO, Fedorenko - 1991) http://publications.gc.ca/collections/collection_2007/dfo-mpo/Fs97-4-2098E.pdf

Intake design

The Design Criteria for the water intake are provided in WFLNG's EA Application Appendix 5.16-1 'Conceptual Design of water intake' and are directly adopted from the DFO Guidelines (*DFO, Fedorenko - 1991*) and are applicable only to a location where no historic Herring spawn is present. To be clear, Woodfibre's seawater intake design, as approved by the BCEAO is not appropriate if Herring and Herring spawn are present within 2km of the intake.

The proposed system is an open-loop cooling also known as Once Through Cooling with a capacity of taking in and discharging 408 million liters of seawater per day. It is schematically explained in WFLNG's EA Application Appendix 5.16-1, Appendix 5.10-5 'Conceptual Design of Diffuser', and 'Woodfibre LNG Project: Response to the Seawater Cooling System Intake Information Request' (*Hemmera 2015*).

Discharge

The effluent will be discharged at a dept of 40 meters below zero tide level and is explained in WFLNG's EA Application Appendix 5.10-5 'Conceptual Design of Diffuser'.

The calculated discharge temperature of 10 degrees Celsius above the temperature of seawater at intake is the increase in water discharge temperature as produced by Nuclear Power Plants, and may well effect fish and fish spawn not only in the immediate area, but also possibly throughout upper Howe Sound.²⁰

Serious problems with the Woodfibre proposal as supported by the BC EAO

The Proponent, Woodfibre LNG, has not been ordered to adjust its application to bring it in line with the DFO Guidelines for seawater intakes (*DFO, Fedorenko - 1991*): *Despite these factors:*

1. It is clear that Herring spawn is present in the Project Development Area (PDA). From close inspection of the information provided in the application, it has become clear that Woodfibre LNG has been aware of the possibility of Herring spawn, in and close to the PDA, at the time the application was written and submitted, but was absolutely aware of Herring Spawn in the PDA after it was presented with evidence from its own consultant in May 2015 (*Hemmera – 2015*).
2. The design criteria for WFLNG's Cooling system including, its intake and discharge, are inappropriate for a location where is Herring spawn is present.,
3. DFO has requested an update of the 'appropriateness of mitigation measures taking into consideration discovered and potential herring spawn locations'²¹.
4. The DFO general siting guideline (*DFO, Fedorenko - 1991*) for marine intakes to be located at a minimum of 2 km away from documented Herring spawn was ignored.
5. The proposed offset of project related Serious Harm 'to enhance' and or 'create' is known not to work (*DFO, D.E.Hay and P.B. McCarter – 2015*)²².

²⁰ 'A GIS-approach to assess the impact of two pulp mills (Woodfibre and Port Mellon) on intertidal biodiversity in the Howe Sound region, British Columbia, Canada (*Willems 2004*)

(<http://www.ecotoxicology.ca/Students/WouterThesis.pdf>)

²¹ Letter from DFO to the BC EAO dated May 6 2015

The DFO Pacific Biological Station has failed to review the application thoroughly in regard to Herring Spawn in the PDA and adjacent shore line areas for reasons that are unclear.

1. The first official DFO correspondence to the BC EAO into this matter is dated May 6 2015 just after Woodfibre's survey report reporting Herring spawn in the PDA was published.
2. The Guideline to locate marine intakes at a minimum of 2 km from Herring spawn is not being enforced, even though evidence was provided that Herring spawn was found in the PDA.
3. The off-set of project related Serious Harm proposal by Woodfibre LNG was accepted although DFO's dedicated webpage to Herring Spawning Areas of British Columbia (DFO, Hay and Carter 2015) clearly states these measures do not work.
4. This new Government should not support a project likely to reverse Howe Sound's renaissance by potentially authorizing the kill of Herring, herring spawn, and the many other aquatic organisms recovering in Howe Sound. Unfortunately this is DFO's current position: *"In the event that Serious Harm to fish cannot be mitigated, the proponent may be required to obtain a Fisheries Act Authorization..."* – Mr. Renny Talbot, DFO Senior Fisheries Protection Biologist.

The BC EAO is incomplete in its environmental assessment of the harm to Marine Fish:

1. The BC Environmental Assessment Office has failed to consider information from parties other than DFO (which admits it has incomplete data) and Woodfibre LNG, in regard to Herring spawn within and close to the DPA and its decisions are based on incomplete, flawed data.
2. Conclusions regarding project related Serious Harm are based on admittedly insufficient information and therefore, its conclusions in the Woodfibre LNG Assessment Report Chapter 5.5 Marine Fish and Mammals are premature.

Conclusion

We contend that the EA process by which the project has proceeded to this point and the Environmental Assessment Report is flawed and incomplete. It fails to examine Woodfibre LNG's application carefully, concerning key Pacific Herring spawn, specifically in the PDA, and the proponent's knowledge of Herring spawn in the project development area and adjacent shore line areas. The Woodfibre LNG proposed marine intake violates the 2 km DFO Guideline in regard to Herring Spawn and the consequential environmental damage this method of cooling will cause. Woodfibre LNG has not proposed a serious alternative for the cooling system, one that would be appropriate in the presence of Herring spawn. Under section 35(2) of the Fisheries Act (referencing "serious harm to fish") DFO has failed to clarify whether authorization is required. The proponent has not applied for or been granted that authorization.

We question whether the "environmental effects" mentioned in section 5 of the CEAA 2012 and the "factors" identified in section 19 of the CEAA 2012 have been appropriately addressed.

²² <http://www.pac.dfo-mpo.gc.ca/science/species-especes/pelagic-pelagique/herring-hareng/herspawn/pages/project-eng.html>

We are of the opinion that granting an Environmental Certificate is inconsistent with the overarching goal articulated in the Mandate Letter for the Ministry of Fisheries, Oceans and Canadian Coastguard, the key element of which is:

'Your overarching goal will be to protect our three oceans, coasts, waterways and fisheries and ensure that they remain healthy for future generations. Canada is uniquely blessed with an abundance of freshwater and marine and coastal areas that are ecologically diverse and economically significant. Canada has a responsibility to the world to steward our resources with care.'

We also believe that Howe Sound, with its unique past, present and current renaissance, should become an example of scientific study into ecosystem recovery. Howe Sound, is an incredibly beautiful, wild yet proximate marine recreation area not only for Howe Sound Communities and Metro Vancouver but for Canadian and International Tourism as well.

Rather than stepping backward and allowing Howe Sound to be re-industrialized, move ecologically forward utilizing the mechanism of Marine Area Protection, a top priority outlined in both Ministries Mandate Letters²³.

Your Government's election promises bring added impetus to bear on the scope and weaknesses of the EA process and add to the arguments for review.

Yours truly,

J.H. Anton van Walraven

Thomas E. Rafael

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Attached appendixes:

-*Pacific Herring Spawn Surveys – Howe Sound North - John Buchanan*

-*Email correspondence between Anton van Walraven and Dr. D.E. Hay – Nov – Dec 2015*

CC:

-The Honourable Mary Polak, Minister of Environment of British Columbia

-Ms. Pamela Goldsmith – Jones, M.P., Parliamentary Secretary to the Minister of Foreign Affairs

-Mr. Michael Shepard, Project Assessment Manager, BC EA office

-Telásemkin Siyám Chief Bill Williams, Hereditary Chief Squamish Nation

-Syeta'xtn Councillor Chris Lewis, Spokes person Squamish Nation Council

-Ms. Erin Hanson, Consultation and Accommodation Coordinator, Tsleil-Waututh Nation

-Mr. Renny Talbot, Senior Fisheries Protection Biologist, DFO Pacific Biological Station

²³ *'...to increase the proportion of Canada's marine and coastal areas that are protected – to five percent by 2017, and ten percent by 2020 – supported by new investments in community consultation and science.'*