



Bowen Island, June 15, 2016

Mr. Jonathan Wilkinson, MP
House of Commons
Ottawa ON K1A 0A6
Jonathan.wilkinson@parl.gc.ca

Re: -Letter Impact of the Woodfibre LNG Plant's Cooling System on Herring Stocks [in Howe Sound].

Dear Mr. Wilkinson,

Thank you for your letter dated April 15 2016 from your position as the Parliamentary Secretary to the Minister of the Environment and Climate Change.

We are fully aware that the Federal government made it one of its policy priorities to 'restore robust oversight and thorough environmental assessments of areas under federal jurisdiction' and is now moving towards this, as mentioned in the Speech to the Throne (Dec 2015).

Through the EA Substitution Agreement with the Province of BC, the Federal government accepted the Provincial assessment of Woodfibre LNG's proposal, the result of an EA process it has declared to be broken and to be lacking thoroughness. Once a Government acknowledges deficiencies and promises to act upon these, it cannot simply turn around and suggest everything is fine with the result of that process and that is why we are responding to your letter.

In your letter you mention that DFO's '*Guidelines for Minimizing Entrainment and Impingement of Aquatic Organisms at Marine Intakes in British Columbia*' (DFO-Fedorenko 1991) to be DFO 'best management practices'. Further, your letter also mentions, '*The mitigation measures described in the environmental assessment, including those for herring, are based on science, regulatory standards, and ecological context.*', we conclude that the 'regulatory standards' in case of the cooling system water intake to be the DFO 'Guidelines', since no reference is made to any other standards in your letter.

We will provide you with evidence that for the environmental assessment of the proposed Once-Through-Cooling system herring spawn data and the ecological context were misrepresented.

The history of project descriptions and EA application of the Woodfibre LNG project concerning the type of cooling system is as follows:

December 2013, Golder Associates Ltd. Did, what it is bound to do by the code of ethics of the Professional Engineers and Geoscientist of B.C. (APEGBC) point 3): '*Provide an opinion on a professional subject only when it is founded upon adequate knowledge and honest conviction;*' as it advised Woodfibre LNG to adopt a Closed-Loop Cooling System with Cooling Towers for its proposal, a recommendation Woodfibre LNG adopted and published in its Project Description (Dec. 2013).

- -Golder's advice was based on available DFO Herring spawn data and local knowledge of Herring spawn, 2013/2014 marine baseline field studies, and a strict application of the DFO Guidelines for Water intakes in B.C. (DFO-Fedorenko 1991).
- -Golder's advice for a Closed-Loop Cooling system was based on the knowledge that Herring spawn had been observed and documented around and within 2km of the Woodfibre site.

June 2014 / January 2015, Woodfibre LNG changed its cooling system proposal to Once-Through Cooling, submitted this as part of its Application for an Environmental Assessment Certificate to the BC Environmental Assessment Office January 2015:

- It is laid out in the application that the choice of the type of cooling system is strictly based on design criteria directly adopted from the DFO Guidelines for water intakes in B.C. (WFLNG EA Application Appendix 5.16 Conceptual design of water intake-Jan 2015), and on DFO herring spawn data (App. 1), because, as is suggested, local knowledge of herring spawn, although cited in the EA application (App. 3), could not be found in DFO data nor in scientific literature;
- With this decision, Woodfibre LNG decided to willfully ignore Golder's professional advice, and the Local Knowledge of Herring spawn in upper Howe Sound (Buchanan- Appendix 2);
- DFO made no demands on Woodfibre LNG to seek out local knowledge, although it has stated it knows is available (Appendix. 4). DFO's online Herring spawn data for Howe Sound's Pool 1 for 2012 is Buchanan's data, recognized by the absence of layer and Km information, but is attributed to the wrong location by DFO. DFO did not take initiative to inquire with Buchanan directly concerning Local Knowledge for this assessment;

May 2015, Woodfibre LNG commissioned herring spawn surveys, which came back positive:

- During 4 out of 5 Herring spawn surveys done in the period February to May 2015, herring spawn was found directly in the project area (Woodfibre LNG Project Herring Survey Summary Report – Hemmera May 2015);
- The report states what was known by Woodfibre LNG as it was advised by Golder Associates in 2013: -Herring spawn is present in abundance at and around the Woodfibre site;
- This confirmation of Herring spawn of what was already known by locals, media, Golder Associates, Hemmera Envirochem, and published by Woodfibre LNG, did not prompt DFO to enforce its 2 km Intake Exclusion Zone around Herring spawn areas, as is strongly recommended in the DFO Guidelines for water intakes in B.C. (DFO-Fedorenko 1991), nor did the agency demand the cooling system to be changed to Closed-Loop Cooling, nor did it demand that Woodfibre LNG incorporate Local knowledge of Herring spawn in its assessment.

We are aware that *'the Guidelines' are 'not to be interpreted as strict regulations to be adhered to in each and every case. Rather, they provide guidance to developers as to how they can best comply with the provisions of the Fisheries Act.'* (DFO-Fedorenko 1991). However, the wording of the main general siting guideline leaves little room for interpretation: *'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.'* (Appendices 5, 6 & 7)

Clearly, DFO has deviated from its own Guidelines for Intakes in BC (DFO-Fedorenko 1991) . In so doing, it has effectively given Woodfibre LNG carte blanche to do whatever it wants, regardless of the outcome for the recovery of Howe Sound's marine life and the local economies in the area.

In your letter you mention that the intake(s) to be installed at a depth of greater than 25 meters and 2 meters above the sea floor, but this measure is advised to be done in addition to siting the intake at a minimum of 2 km of Herring spawn areas. (Appendices 5, 6 & 7)

Reviewing the actions of Woodfibre LNG to get approval for its proposed Once-Through Cooling system, we can only conclude that:

-Woodfibre LNG was advised (correctly, in our view) by Golder Associates to use a cooling system that would cause minimal marine impact, based on the knowledge that herring, herring spawn and therefore larvae are abundantly present in the area. Golder advised the use of Closed-Loop Cooling with cooling towers;

-Woodfibre LNG, in its application for an Environmental Assessment Certificate, misrepresented the truth about the presence of Herring spawn in the area around Woodfibre to the regulatory agencies, DFO, assessment agency, the BC Environmental Assessment Office and the public;

-Woodfibre LNG's in its application for an Environmental Assessment, selectively used and misrepresented Herring spawn data to mislead the regulatory agencies and the public about the presence of Herring spawn and herring spawn to be more than 2 km away from the project area, all to suggest its proposed cooling system to be appropriate for the location.

-Woodfibre LNG's later conclusion in May 2015 that the proposed Once-Through Cooling system would cause no harm to (forage) fish is not suggested by the article it cited. Woodfibre LNG reasoned that the water intakes should be allowed within 2 km of Herring spawn, since the water intakes are to be installed at 25 meters below zero tide level, but the article cited(Appendix 8) to prove that below 20 meters no or very few (Herring) larvae are found, does not say this. The article deals with geographical distribution of Herring larvae. Not anywhere in the article is it mentioned that Herring larvae would not be found below a depth of 20 m. It only mentions 20 meters as being the depth the nets (bongo-nets) were dropped to. (App. 8)

Once-Through Cooling has been a popular choice because of its lower operational costs than Closed-Loop Cooling systems, but it comes with a price:

- -The seriously harmful effects to fish and aquatic life of Once-Through Cooling has been documented for many years. Under the US Clean Water Act section 316b, the Environmental Protection Agency (EPA) regulates the design and operation of intake structures, in order to minimize adverse impacts and EPA requires all new cooling facilities to use Best Available Technology that matches the water intake reduction of Closed-Loop Cooling. The state of California has determined that Once-Through Cooling is dangerous to Marine Life and has ordered 19 coastal power plants to convert to Closed-Loop Cooling or close. A number of these plants are mentioned as 'good' examples of Once-Through Cooling by Woodfibre LNG in defense of its decision (Appendix 9).

There is no technical report on the DFO assessment, only two letters to the EAO. This seems quite inadequate for such a significant deviation from its own species and habitat protection Standards.

This case goes to the very heart of what is wrong with the model of self-regulating and self-reporting Environmental Assessments in B.C. and it is a clear example of a company shopping around to get the results it wanted. This is the reason many have lost trust in the EA process and why many will not accept its outcome(s).

We do not take lightly to what lengths Woodfibre LNG was willing to go, laid out above, to misrepresent data in an attempt to mislead regulatory agencies and the public.

We hope that you and the Minister will seriously reconsider the position taken on this project. Sufficient grounds have been provided to review and possibly rescind the EA certificate Woodfibre LNG has received. We have found no reason not to enforce the 2 km Intake Exclusion Zone around Herring spawn as laid in this letter: DFO made its decision not to enforce the 2 km Zone in the absence of evidence, while we have provided your Government and its agencies repeatedly with absolute evidence of Herring spawn at the site. We there for urge you to call DFO to act upon this evidence.

We will not back down on this issue that lives so strongly amongst our communities, since it is directly related to the recovery of an area that we see come back from the brink of destruction.

Awaiting your early reply, we remain.

Sincerely:



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Attached: -the WFLNG Herring spawn map; -The Buchanan Herring spawn map

CC:

The Honourable Mr. LeBlanc, Minister of Fisheries, Oceans and the Canadian Coast Guard (acting); The Honourable Ms. McKenna, Minister of Environment and Climate Change; The Honourable Ms. Polak, BC Minister of Environment; Mr. Hardie MP, Fleetwood Port-Kells; Chief Campbell, Squamish Nation; Chief Williams, Squamish Nation; Ms. Goldsmith-Jones, MP West Vancouver-Sea to Sky Country-Sunshine Coast; Mr. Simms, MP & Chair of FOPO; Ms. May, MP Saanich – Gulfislands; Mr. Strahl, MP-Chilliwack-Hope; Mr. Donnelly, MP-Port Moody-Coquitlam; Mr. Sturdy, MLA-West Vancouver – My Sea to Sky; Mr. Simons, MLA-Sunshine Coast; Ms. Reid, RDG Pacific Region DFO

Appendix 1: WFLNG Forage Fish and Other Fish Assessment

As mentioned WFLNG's choice of cooling system was based on, amongst other assessments, the Forage Fish and other Fish assessment (See WFLNG Application for an EA Certificate Jan 2015 Section 5.18).

PLEASE open the Woodfibre LNG Herring spawn Assessment map: a section of WFLNG's map, part of its EA application, titled Figure 5.18-2: 'Spawning areas and rockfish conservation areas in RAA' – here referred to as 'the WFLNG map'. (file: CCB-WFLNG-HerringSpawnMap-upperHoweSound-v1.2.pdf)

The WFLNG map visualizes online DFO Herring spawn data for section 280 – Howe Sound and is more a reflection of DFO's spotty survey activity in Howe Sound over the years than an accurate picture. Some data is attributed to wrong location(s), and almost all data is biased towards areas with Human population, suggesting that survey activity was undertaken after spawn observations of the public or local officials were communicated to DFO, or simply being a poor way of visualizing information.

Figure 5.18-2 was used by WFLNG to determine if spawn was present in or close to the project development area. On page 22 of the section, WFLNG states:

'The closest spawning area to the LAA in the RAA that has been documented by DFO is located approximately 3.5 km east of the LAA, off the northern reach of Watts Point (Figure 5.18-2). Available herring spawn data in this area spans from 1958 to 2012 and habitats are ranked between minor to high (DFO 2013a).'

WFLNG concludes at the end of this section (WFLNG Application for EA Certificate Section 5.18-4):

'Effects to forage fish and other fish species falls under federal jurisdiction with the federal Fisheries Act. As no significant residual effects are likely after mitigation, an authorization under the Fisheries Act is not anticipated.'

Appendix 2: Independent Herring spawn surveys in upper Howe Sound 2010 - 2016

PLEASE open the map 'Locations of Pacific Herring spawn in upper At'kitsem / Howe Sound 2010 – 2016' version 7.2' here referred to as 'the Buchanan Map': (File: CCB-HerringSpawn-upper-HoweSound-CoolingSys-v7.2.pdf and JB-UHS-HerrinSpawn-Data-2010-2016-v1.4.pdf)

The map visualizes, amongst other things, Herring spawn survey data Mr. John Buchanan has recorded in upper Howe Sound since 2010. The red lines indicate the length of Herring spawn and the frequency of spawning events for the adjacent shore line areas. The survey method provides information of length and width of the spawn events.

Dr. D.E. Hay, former DFO scientist, Herring specialist and currently adjunct Professor at the UBC Institute for the Oceans and Fisheries agreed to review Buchanan's Herring spawn data for 2010 – 2015. Dr. Hay's answer was as follows:

'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 photo's and video's. 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.' (Email Dr. D.E. Hay to Anton van Walraven - Dec 11 2015)

Herring spawn south and east of Woodfibre since 2011 has been fluctuating annually between 3.5 to 8.7 km since 2011. The documented lengths are a strong indication that the area around Woodfibre is important for Herring as a spawning area in Howe Sound. The fluctuations in length should partly be attributed to number of times Buchanan was able to do spawn surveys during a season and should not directly be understood as less presence of Herring spawn during a year.

Mr. Buchanan did share his 2012 survey findings with the DFO in Nanaimo. The data was wrongly attributed to the shore line directly south east of Squamish, instead of East and South of the Woodfibre site. See the 2012 data table included on the WFLNG map: Length 7000 meters.

Mr. Buchanan did inform the BC EAO about his survey findings during Public Comment Period for the WFLNG project early 2015, but his comments are absent from the comments published online nor were they referred to in the EA report.

Mr. Buchanan's work was compiled in a report (November 2015) and sent with a letter to Minister Tootoo and Minister Mckenna on Jan 6 2016 (<http://ccb Bowen.ca/herringletter/>)

While WFLNG's herring spawn survey March 24 2016 video: WFLNG consultant Hemmera concluded: No Herring spawn found. <https://www.youtube.com/watch?v=Ih9AR6bTJglv> ,

Buchanan herring spawn report 4, March 27 2016 video: Buchanan observed 1.4 km of spawn starting in the marine PDA going south. <https://www.youtube.com/watch?v=B2XcmgXRx70>

Appendix 3 –Woodfibre LNG EA Application in section 5.18 – page 22 paragraph 2:

"A news article reported that a citizen observed herring eggs along the shore just north of Woodfibre and south of Woodfibre to an area directly across the sound from Britannia Beach in February 2013 (Pique News Magazine 2013). This information has not been found in an online search of DFO documents and scientific literature, and the exact location of the siting is not known."

Appendix 4: DFO and local knowledge

DFO is aware that local knowledge of spawn events is documented, as it recently admitted in a newspaper article:

"The annual DFO herring spawn survey concentrates on areas where large spawning events are observed, in order to document the presence, timing and amount of the main spawning biomass. In recent years most survey activity has occurred along the Vancouver Island shore (Nanaimo to Comox areas). In addition to these SCUBA surveys, DFO receives spawn reports from community groups, First Nations, and local residents, and where possible these spawn events are verified, measured and documented. In an area such as Howe Sound, the local residents and/or streamkeeper groups often have more detailed information on herring spawn locations and we rely on their expertise to help document the presence of herring and spawn." (Statement added to Squamish Chief newspaper article 'No logdump here please, say Herring advocates – Feb 11 2016).

Appendix 5: WFLNG Herring spawn surveys in project development area (PDA) 2015 and 2016

WFLNG commissioned Hemmera Envirochem Inc. to undertake a series of five Herring spawn surveys within the project development area from February 17 2015 to April 29 2015. Buchanan's findings were confirmed: - In 4 out of 5 surveys, Hemmera's employees observed Herring spawn in the project development area. Herring spawn was found at 50 meters from the proposed location of the intake for the Cooling system.

Hemmera was commissioned to do more survey work WFLNG in 2016. The company returned to the project development area and surveyed the same locations it had surveyed in 2015. Its March 24 2016 Youtube video report concludes no Herring spawn was found.

Appendix 6: DFO response and assessment of Herring spawn presence in EA assessment process

Before WFLNG published its Herring spawn report, DFO responded to WFLNG's 'Response to the Seawater Cooling System Intake Information Request'. A letter from DFO's Fisheries Protection Program (FPP) dated May 6 2015 and sent to the BC Environmental Assessment Office states: *'It is FPP [Fisheries Protection Program] understanding that the proponent's [Woodfibre LNG's] conclusions of serious harm to fish and appropriateness of proposed mitigation measures were derived with a belief that herring spawn did not occur or was limited within the marine PDA [Project Development Area].'* and *'FPP request that the proponent update their conclusions of serious harm to fish resulting from the Seawater Cooling Intake System and appropriateness of mitigation measures taking into consideration discovered and potential herring spawn locations.'*

After the publication of WFLNG's Herring Survey Summary report (Hemmera May 2015) and at least one telephone conversation between WFLNG, EAO and DFO, in WFLNG's response to the May 6 2015 letter, it states that: *'The conclusion of no serious harm to fish remained unchanged'*, and that *'EAO and DFO agree that the information provided to date on the seawater cooling system intake is sufficient for the environmental assessment stage of the Project. In addition, DFO agrees that mitigation measures (e.g., siting, screens) provided to limit impacts on herring are reasonable and that opportunities are available to offset potential impacts on herring.'* (WFLNG - June 25 2015)

The next day, June 26 2016, DFO send a letter adopting much of WFLNG's letter, but also stating that *'Insufficient information has been provided to understand the exact number of larvae which may be entrained. However based on the proposed location of the intake, herring spawning locations and anticipated larvae movement, entrainment of juvenile herring is unlikely to result in population level impacts.'* and, *'In the event that Serious Harm to fish cannot be mitigated the proponent may be required to obtain a Fisheries Act Authorization and offset project related Serious Harm.'*

Appendix 7: DFO Guidelines for Marine Intakes in B.C.

The DFO 'Guidelines for Minimizing Entrainment and Impingement of Aquatic Organisms at Marine Intakes in British Columbia' (DFO-Fedorenko 1991) are DFO's Best Management Practices to site, to design and to assess water intakes in BC.

The introduction to the Guidelines states:

'The guidelines are particularly important in view of the large herring spawning populations that are found in the intertidal and subtidal British Columbia waters (i.e. zones affected by tides and zones below the tidal influence) where potential seawater intakes may be sited.'

and

'The guidelines are restricted to issues of entrainment and impingement of marine organisms and are not intended to encompass other technical issues, social and economic concerns, or concerns that other agencies may have. It is emphasized that the guidelines are not to be interpreted as strict regulations to be adhered to in each and every case. Rather, they provide guidance to developers as to how they can best comply with the provisions of the Fisheries Act.'

Guidelines applicable to the presence of Herring spawn:

'2. SITING - GENERAL

Select intake areas where field studies indicate low abundance of organisms during most times of the year for most species. Greatest concern is for the more vulnerable smaller organisms, such as plankton, macro-invertebrates and fish larvae and juveniles.

Avoid estuaries since they serve as nursery areas for anadromous and marine species.

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 could pose a serious risk to herring and other marine fish larvae which have little or no swimming ability.

4. SITING WITH RESPECT TO SHORELINE TOPOGRAPHY

Avoid areas with topographical features that promote eddies (e.g. upstream of a peninsula). Such eddies may cause the retention of marine organisms which consequently will be more vulnerable to an intake placed at that site. Here an irregular shoreline cannot be avoided, place the intake at the end of land protuberance.

5. SITING WITH RESPECT TO INTAKE DEPTH

Install screened stationary intakes at a minimum depth of 25 m below the zero tide level. This guideline is in addition to not siting marine intakes near sensitive fish larval areas. The depth guideline is designed to locate the intake below the layer where marine organisms are found in greatest numbers.' [Emphasis added]

Appendix 8: Once-Through Cooling system intakes in an area with Herring spawn

After WFLNG's commissioned Herring spawn surveys came back positive, it suggested that locating the intake well within 2 km from documented Herring spawn would cause no serious harm. In the WFLNG Response to Seawater Cooling Intake Information Request April 2015 (updated May 2015), WFLNG determines serious harm as follows:

1. *'Although the seawater cooling intake will be located within 2 km of herring spawn, it is not likely to cause serious harm to herring....As the seawater cooling system will be at a depth greater than 25m, it will be much deeper than the herring spawn.'*
2. *'Although it is possible for herring larvae to be entrained, the occurrence of herring larvae at depths below -20 is low (Hay and McCarter 1997, DFO 2015), therefore the likelihood of entrainment is also low.'*

Hay and McCarter 1997 refers to an article 'Larval distribution, abundance, and stock structure of British Columbia herring' in the Journal of Fish biology. The above statement attributed by WFLNG to

Hay and McCarter is not supported by the content of the article. The mention of a depth of 20 meter is in relationship to the sample nets dropped to a depth of 20 meters. The larva distribution discussed in the article is geographical distribution, not vertical. It is not mentioned anywhere in the article Herring larvae would not be found below a depth of 20 m.

Appendix 9: Once-Through Cooling and harm to aquatic organisms

The Serious and Harmful effects of Once-Through Cooling on aquatic organisms are well studied and documented since the mid 1970ties. This body of scientific knowledge forced the US Environmental Protection Agencies (EPA) to implement Section 316b under the Clean Water Act. Drastic changes were introduced to minimize the impact of Once-Through Cooling systems on aquatic organisms. In California A 93% reduction is now required, being the equivalent of a reduction a Closed-Loop Cooling system would accomplish due to its 93% reduction in water intake.

In justifying the supposed suitability of OTC, in an April 2015 document, WFLNG cited various examples of local and international thermal and chlorine discharge levels of plants using OTC. The Moss Landing Power Plant - was the largest example of OTC WFLNG gave. WWFLNG knew or should have known that Moss Landing, a California Power Plant had been ordered (in 2010) to convert to Closed-Loop Cooling Dec 31, 2020.

The withholding of information is found throughout Woodfibre LNG's information. Another example of providing limited information can be found in the listed example of the Millstone Power Plant, although its daily intake is not mentioned, it was quickly found to be a daily intake of 7,570,000,000 liters of seawater. This plant is known to be extremely harmful for seven fish species recorded. The Plant is required to use Best Available Technology under the US Clean Water Act section 316b, but the owners have refused to update their cooling system, stating it to be too costly. ([http://www.citizenscampaign.org/PDFs/Licensed to Kill full report.pdf](http://www.citizenscampaign.org/PDFs/Licensed_to_Kill_full_report.pdf) page 47)