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Our file *Notre référence*
13-HPAC-PA2-00740

Impact Assessment Agency of Canada
Owais Khurshid
55 York Street, 6th Floor
Toronto, ON M5J 1R7

Via email: <Email address removed>

Subject: Woodfibre LNG Project – Request for DFO Advice

Dear Owais Khurshid:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO; the Department) received your request for advice on March 2, 2023. Questions to DFO from the Impact Assessment Agency of Canada (IAAC) and DFO responses are outlined in the following section of this letter.

- 1) Does DFO agree with the Proponent's proposal that implementing an exclusion zone of 125-m will manage potential harm or injury in pinnipeds that may be present in Átl'.a7tsem / Howe Sound?
 - a. If not, what guidance and advice can DFO provide to mitigate potential harm or injury in pinnipeds based on best available science, current best management practices or experience on other projects, and site-specific conditions.

DFO Response: Based on the rationale and previous modelling as described in the Proponent's submission, the 125 m exclusion zone is expected to avoid injury to pinnipeds. However, the Department recommends that the Proponent monitor underwater noise during pile driving to ensure that noise thresholds are not exceeded at the exclusion zone boundary. If, during pile driving, underwater noise recordings indicate that the threshold for injury is exceeded at the 125 m pinniped exclusion zone boundary, the exclusion zone should be increased to a new outer limit where sound recordings indicate the injury threshold is not exceeded. In addition, DFO understands that the Proponent is currently conducting additional modelling which may increase confidence in the predicted distance to noise thresholds, and may be used by the Proponent to refine the underwater noise mitigation plan.

- 2) Does DFO agree with the Proponent's proposal that implementing an exclusion zone of 125-m will manage potential behavioural changes in pinnipeds that may be present in Atlantic / Howe Sound?
- a. If not, what guidance and advice can DFO provide to mitigate potential behavioural changes in pinnipeds based on best available science, current best management practices or experience on other projects, and site-specific conditions.
 - b. For any residual effects on pinnipeds that cannot be mitigated, does DFO agree with the proponent's assertion that there will be "no change in the characterization of the predicted residual effects in terms of behavioural change in pinnipeds... as a result of the proposed 125 m exclusion area".

DFO Response: Underwater noise could startle or displace animals; however, behavioural responses are not necessarily predictable from the loudness of the sound and may vary based on how the animal experiences sounds (species differences), the animals age, type of activity they are engaged in, etc. (McCauley et al. 2003; Ellison et al. 2012). While protective of a wide range of marine mammals, the U.S. National Marine Fisheries Service (NMFS) (2013) sound pressure level (SPL) disturbance threshold may not be applicable or achievable in some project applications/environments and requires consideration of injury based thresholds for some species.

Based on the information provided by the Proponent, without mitigation, the underwater noise levels are expected to decrease to 190 dB re 1 μ Pa RMS at approximately 75m from the source, indicating that an exclusion zone at 125m is likely to be conservative for the protection of pinnipeds. DFO recommends that the Proponent undertake ongoing monitoring of underwater noise at the exclusion zone boundary, and implement additional measures, such as increasing the exclusion zone or adjusting the underwater noise mitigation measures, if needed. In addition, DFO understands that the Proponent is currently conducting additional modelling which may increase confidence in the predicted distance to noise thresholds, and may be used by the Proponent to refine the underwater noise mitigation plan.

Typically, mitigation measures recommended by DFO for the protection of pinnipeds include the following:

- Only conduct in-water works, undertakings and activities during daylight hours and when weather conditions permit visual observations of marine mammals.
- If there is a risk of harm to a marine mammal from direct contact, temporarily suspend construction until there is no longer risk of harm from direct contact or the individual has not been resighted for 30 minutes. DFO recommends that the exclusion zone effectively reduces risk to pinnipeds from direct contact with construction equipment (i.e. at least 75-200m).
- Pile installation using a vibratory hammer is the preferred method rather than impact driving (e.g., drop hammer) or drilling. If impact driving methods are used, complete pile installation in accordance with the following mitigation measures:
 - Install an effective sound attenuation device (e.g., bubble curtain) prior to and during impact pile driving.

- The pinniped exclusion zone is to be, at minimum, the distance from the sound source where sound levels do not exceed underwater acoustic thresholds for injury.
- Conduct hydroacoustic monitoring during impact pile driving to verify that underwater acoustic thresholds are not exceeded at identified exclusion zones.
- If hydroacoustic monitoring indicates sound levels in excess of injury thresholds at the exclusion zone boundary, impact pile driving should cease and only resume after additional measures are implemented to effectively reduce sound levels below the thresholds.
- If pinnipeds are not observed in the exclusion zone during the prestart period, a soft start procedure is recommended where the impact energy is gradually increased over a 10 minute period. The soft start procedure is also recommended any time after there is a break of 30 minutes or more during impact pile driving.
- If a pinniped enters the exclusion zone, pile installation should be suspended until the individual has left the exclusion zone or has not been resighted for 30 minutes.

With appropriate mitigation and monitoring, DFO is of the opinion that adverse effects to pinnipeds from pile driving can be avoided.

- 3) The proponent has incorporated site-specific conditions in Átl'.a7tsem / Howe Sound (e.g., current and historical anthropogenic disturbance levels, geological and bathymetric considerations, and the status of Átl'.a7tsem / Howe Sound as a UNESCO Biosphere Region) to support the conclusion that implementing similar smaller pinniped-specific exclusions zone(s) in Átl'.a7tsem / Howe Sound would not increase the extent to which environmental effects considered during the initial environmental assessment are adverse for pinnipeds. From DFO's perspective, is the proponent's assessment reasonable and adequate? Is there any additional information that the proponent should incorporate in this assessment?

DFO Response: The implementation of a suitable pinniped exclusion zone is expected to prevent adverse effects to pinnipeds, irrespective of any of the factors or conditions inherent to the larger project setting.

- 4) Are the Agency's proposed amendments to condition 3.8 protective of pinnipeds that may be present in Átl'.a7tsem / Howe Sound from injury and behavioral impacts? If not, what elements of the proposed amendments would DFO like to see modified?

DFO Response: In consideration of the rationale and the previous modelling described in the Proponent's submission, the Agency's proposed condition is consistent with DFO expectations. DFO understands that this approach includes the adaptive management of a minimum 125 m exclusion zone to avoid pinniped exposure to noise levels that could cause injury. DFO also understands that the Proponent is currently conducting additional modelling which may further inform the selection of appropriate mitigation measures. If updated site specific modelling is provided that indicates the 190 dB threshold may extend further than

125 m, then the proposed exclusion zone could be adjusted accordingly and/or additional sound dampening measures applied.

- 5) Should the type of noise (impulsive vs continuous .non-impulsive.) be a consideration when implementing pinniped-specific exclusion zone(s)? If so, are there appropriate thresholds (in terms of distances and/or noise injury and behavioral thresholds) to consider for each type of noise?

DFO Response: While there are proposed thresholds for cumulative sound exposure limits for pinnipeds, there is uncertainty associated with application, monitoring and effectiveness of these thresholds. Underwater noise criteria for cumulative impacts and continuous sound sources assumes that the species being protected is exposed to a single sound source, having a consistent sound level, and at the same distance over a given period of time. Impulsive sound sources present the greatest potential for injury and, to date, DFO has accepted pinniped exclusion zones based on a threshold to prevent injury from impulsive sound sources.

- 6) The Agency is currently relying on the pre-2016 NOAA thresholds (referenced in the proponent's submission as well as the Agency's recommended changes to condition 3.8). Are the pre-2016 NOAA thresholds still reliable and conservative to determine exclusion zones for pinnipeds considering the revisions made to NOAA thresholds in 2018?

DFO Response: Both the 2013 and 2018 versions of the NMFS guidance identify noise thresholds to prevent permanent threshold shift (PTS) in pinnipeds. However, the thresholds are established based on different metrics, which are not directly comparable. According to Caltrans 2020¹, the difference between the two measurement metrics can be estimated as a difference of 5 to 10 dB in many environments. Therefore, the NMFS (2013) guidance is expected to be similar to the NMFA (2018) guidance and conservative with respect to avoiding permanent injury to pinnipeds.

- 7) Should the assessment of the proposed changes to the conditions take into account the upcoming Government of Canada's Ocean Noise Strategy and/or the UNESCO Biosphere Region designation Átl'.a7tsem / Howe Sound? If so, what additional elements should be taken into consideration in the Agency's analysis?

DFO Response: The implementation of a suitable pinniped exclusion zone is expected to prevent adverse effects to pinnipeds, irrespective of any of the factors or conditions inherent to the larger project setting.

- 8) The Proponent's June 2022 submission to the Agency indicates: "DFO has approved pinniped specific exclusion area boundaries for BC projects with pile installation activities. that varied from 150 m down to 75 m from pile installation activities, and in one case even removed the requirement for a pinniped exclusion area" (PDF p. 10). The submission provides examples of pinniped exclusion area boundary distances for four projects. The Proponent also state that pinniped-specific exclusions zone(s) for the Project is justified because marine mammal monitoring conducted for another marine

¹ Caltrans 2020. *Technical Guidance for the Assessment of Hydroacoustic Effects of Pile Driving on Fish*. Sacramento, CA, USA.

infrastructure project in northern BC, where similar pinniped-specific exclusions zone(s) have been implemented, has “showed an abundance of seal observations and a lack of seal and sea lion behavioural disturbance or displacement from habitat within the Project area during the construction period” (PDF p. 5).

DFO Response: No response requested.

- 9) Did/will DFO approve pinniped-specific exclusion zone(s) as part of the *Fisheries Act* authorization process for marine components of the Woodfibre LNG Project?
- If so, what thresholds were/will be used to approve the boundary distance(s) for the pinniped-specific exclusion zone(s)?
 - If thresholds were not/will not be used, how did/will DFO derive the approved boundary distances?

DFO Response: The Department is currently reviewing an application for *Fisheries Act* authorization for the Woodfibre LNG Project. No decision has been made at this time regarding approval of an authorization. Conditions of the *Fisheries Act* Authorization with respect to implementation of avoidance and mitigation measures would be informed by existing federal project conditions, current science, and site-specific modelling.

- 10) The Proponent’s June 2022 submission to the Agency indicates that populations of pinnipeds in Átl’ a7tsem / Howe Sound appear stable (PDF p. 5). Comments received during the public comment are of the view that pinnipeds may remain vulnerable to anthropogenic disturbance in Átl’ a7tsem / Howe Sound, and that the Proponent’s assertion that populations are stable is not adequately supported. For example, exposing Steller sea lion populations to increased noise disturbance and encroachment by implementing smaller pinniped-specific exclusions zone(s) could reverse recent observed population increase in Átl’ka7tsem/Howe Sound.
- Is the Proponent’s characterisation of pinnipeds’ population trends in Átl’ a7tsem/Howe Sound accurate to support the conclusion that implementing smaller pinniped-specific exclusions zone(s) would not increase the extent to which environmental effects considered during the initial environmental assessment are adverse for pinnipeds (taking into account the at-risk status of Steller sea lion)? If not, what additional information should the Proponent consider?

DFO Response: The implementation of a suitable pinniped exclusion zone is expected to prevent adverse effects to pinnipeds, irrespective of any of the factors or conditions inherent to the larger project setting.

If you have any questions with the content of this letter, please contact Kevin deBoer at our Vancouver office at 236-380-0145 or by email at Kevin.deBoer@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

<Original signed by>

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Regional Manager
Fish and Fish Habitat Protection Program