STATE OF MAINE
BOARD OF ENVIRONMENTAL PROTECTION

IN THE MATTER OF

NORDIC AQUAFARMS, INC Belfast and Northport Waldo County, Maine A-1146-71-A-N L-28319-26-A-N L-28319-TG-B-N L-28319-4E-C-N L-28319-L6-D-N L-28319-TW-E-N W-009200-6F-A-N	))))))))))	APPLICATION FOR AIR EMISSION, SITE LOCATION OF DEVELOPMENT, NATURAL RESOURCES PROTECTION ACT, and MAINE POLLUTANT DISCHARGE ELIMINATION SYSTEM/WASTE DISCHARGE LICENSES

PRE-FILED TESTIMONY OF MICHAEL LANNAN NVC/UPSTREAM W1

1. I am Michael Lannan, an environmental engineer with experience in all aspects of air quality management, including air permitting, compliance assessments, control technology evaluations and air pollution control designs, dispersion modeling and air monitoring. I have provided air quality, odor control, noise abatement, and dust solutions for municipalities, industries, and government agencies since during my co-operative education days at Northeastern University three decades ago when I was working for a large engineering firm in the air quality group of their planning and permitting division (See Addendum W1-A).

2. This is my 18th year at Tech Environmental, and I have been the president of Tech Environmental for the past five years, and Tech Environmental is a consulting firm that specializes in helping facilities, neighbors of facilities, and regulators navigate the permitting process with respect to environmental concerns, and with a special emphasis on nuisance potential. Tech Environmental has offices on Front Street in Belfast, in Waitsfield, Vermont, and in Waltham, Massachusetts.

3. Tech Environmental was retained by Upstream Watch to perform technical reviews of Nordic Aquafarms' Site Law of Development Act (SLODA) and Chapter 115 Minor New Source applications, specific to federal, state, and local permitting concerns of air, noise, odor, traffic, and solid waste.

4. Tech Environmental was contracted to review several hundred pages of Nordic Aquafarms' application materials and responses to Requests for Information (RFIs), perform predict project sound levels estimates of the proposed Nordic Aquafarms (the proponent), and evaluate if the provided information given in the application and RFIs is adequate for establishing the burden of proof with respect to "No Adverse" conditions.

Nordic Aquafarms SLODA Application Consultants

6. Section 4 of the Nordic Aquafarm's SLODA application discusses the technical ability of the proponent and the external project team experience. It states that Acentech, was *"retained to provide environmental noise consulting services associated with the design, construction, operation, and maintenance of the Project"* (Exhibit W1-A).

7. The application discusses a subconsultant Gridworks that is evaluating multiple energy options were noise could be a topic of concern, so it appears that Acentech was retained by Gridworks Energy Consulting LLC (Gridworks), to prepare Section 5 of Nordic Aquafarms SLODA application while the primary consultant for Nordic Aquafarms Salmon Facility is Ransom Consulting, Inc. (Exhibit W1-B).

8. Grid works was retained to *"create a sustainable energy infrastructure and ecosystem at its Belfast facility"* (Exhibit W1-A). It is unclear if, or how, noise from the other sustainable energy infrastructures were incorporated in noise assessment. There has been discussion of solar, heat pumps, etc., all of which add noise, but have not been discussed in the application.

9. Acentech is the sub-consultant to Gridworks who is the sub-consultant to the primary consultant Ransom. Because of this arrangement it is imperative that the noise section of the application discusses how a subconsultant-to-a-subconsultant understood the project needs and properly represented the project. This is typically done in the application text itself. It was not.

10. The proponent, and its consulting expert read the BEP rules, and provided a construction sound discussion. There is a list of construction related equipment and associated potential sound at 500 feet, and a qualitative construction sound analysis that suggests compliance with the DEP construction sound requirements presented in Section 5 of the application (Exhibit W1-B). Yet the application has no actual discussion of construction operating scenarios or how many pieces of each piece of construction equipment are included, but no operations equipment list that was used for modeling. Per prior testimony, there is disagreement that construction noise is exempt from regulation, their rules require the information be provided to make sure the facility will not exceed the OSHA limits at the fenceline included in their construction noise rules.

11. Even if the list and approach was representative at the time, the assumptions made in May of 2019, before the many rounds of RFIs and responses were provided could not still be accurate. If one simply considers the stack sound emissions alone, at the higher stack height, this is clear.

Nordic Aquafarms SLODA Application Section 5-Noise

12. Section 5: Noise of the SLODA application assumes that the applicable regulation for the project is Chapter 375.10 of Maine's Site Location of Development Law Regulations: Control of Noise and the city of Belfast Code of Ordinance. And that the limits are 55 dBA and 45 dBA for daytime and nighttime respectively. This is because of the existing nature trails, houses of worship, and residential uses abutting nearly 100% on the fenceline (with the exception of the corner of the property that abuts Matthews Brothers).

13. The proponent did not perform the collection of, or at least did not provide in its permit documents, background sound data.

14. In its application, the proponent did not include the project's predicted tonal sound level impacts as per Chapter 3755.10.C.1.d: *"For the purposes of determining compliance with the above sound level limits, 5 dBA shall be added to the observed levels of any tonal sounds that result from routine operation of the development "(*Exhibit W1-C).

15. Exhibit W1-B states that the *"Sound associated with routine operation of the proposed Project will be produced by electric motors, water pumps, fans, filters, water flow, boilers, chillers, and engine-driven*

electric generators with all to be located inside industrial-grade Project buildings. Sounds associated with routine operation of exterior equipment will be produced by ventilation intakes and exhausts, cooling towers, and registered over-the-road trucks coming to and from the Project site." Many of these sounds often have peaks in common octave bands.

16. Figure 3 of the noise assessment presents contours of the A-weighted hourly equivalent Leq sound levels. *"The buildings and individual equipment are shown in blue on this figure"* (Exhibit W1-B).

17. The noise assessment report simply describes the sources as "*building and individual equipment*". This is obviously not detailed enough to determine what, where, how, why, and when with respect to potential for adverse impacts.

18. In the final paragraphs of the noise assessment the proponent states that *"It is expected that regulated equipment during routine operation will produce sound levels that are equal to or lower than the applicable noise level limits contained in Chapter 375.10 of Maine's Site Location of Development Law Regulations. See Sections 3 and 5 of this report for a more detailed discussion"* (Exhibit W1-B). This "*detailed discussion*" suggests in paragraph 4 on page 5, "*The Project will be designed and operated such that the routine hourly equivalent operating sound levels from regulated equipment will comply with noise limits that are applicable to the Project.*" This paragraph could apply to any project anywhere. This statement is not a detailed discussion. If fact, it suggests that the noise modeling was done with generic information prior to design. If so, what are the assumptions, and why this is in conflict with a direct response to an RFI that they were based upon "project supplied information".

<u>Nordic Aquafarms Response to Request for Information</u>

19. In response to the Request for Information (RFI) dated October 9th, 2019, Nordic Aquafarms stated that their "*sound model was based on project-supplied information, which identified the ventilation systems, generator system, building construction, attenuators, and equipment layout. The 180 sources in the sound model cover primarily air inlet fans, air outlet fans, and open vents for the various tank buildings with attenuators as necessary to provide a typical sound power level for each individual source of 60 to 65 dBA*" (Exhibit W1-D). The proponent does not provided "*sound level specifications*" for the 180 sound sources they have stated was modeled as requested in Question #2. If this statement were accurate, it would take no time to put them all into a table with the uncontrolled data and the control assumed to meet their source-by-source limit. Nordic chose not once, but more than once to not provide this information, at DEP's and at my personal requests.

20. Question #2 in Exhibit W1-D asked for the equipment sound information and also some other questions. While it may be possible to think that their response was sufficient to address the request for the equipment data by their response discussing 180 source in a holistic manner, the very next question, Question #3 said **"Please submit sound level specifications for all outside sound-generating machinery"**. This question ONLY asked for the data. It could only be interpreted as a site-wide sound discussion request. It was plainly an equipment sound data request. The response completely ignored this request, and simply stated *"Please see above answer to Question 2 for response""*. There can be no doubt that the proponent understood this question and simply chose not to provide the required information. Without this information provided, their sound analysis is a completely hypothetic, unsubstantiated exercise. It was performed by a subconsultant to a subconsultant and there is no text in the application that justifies that the subconsultant to the subconsultant understood the actual project at the time this analysis was provided. Therefore, it should be stricken from the application. This fact alone should be sufficient to understand that the proponent has not and cannot possible satisfy the burden of proof for this project under the SLODA requirements with this unsubstantiated report.

21. In response to the RFI dated October 9th, 2019, the proponent states that the *"Dynamic insertion loss values for these attenuators range from 0 to 29 dBA."* Again as requested in the question they respond to as seen in Exhibit W1-D, the proponent does not provided "*sound level specifications*", and depending on the equipment location and the dynamic insertion loss values for the attenuators it can determine whether the project has an adverse impact at the protected project locations. This not a typical approach to sound mitigation. It is unrealistic, and unlikely to be followed.

Nordic Aquafarms Inconsistencies and Lack of Information

22. The proponent elected not to include the project's predicted tonal sound level impacts or to provide equipment tonal sound data. This decision was made by the proponent. There was a conscience decision to not provide the equipment, total, and tonal sound. This is not standard environmental consulting practice.

23. Because the proponent did not consider tonal sound directly, it is required to add 5 dBA to the results to adjust for this decision per SLODA rule Chapter 3755.10.C.1.d. When Tech applied the additional 5 dBA factor that is required in lieu of providing the tonal sound, with no other adjustments to the proponent's analysis, to the revised Table 2 provide in response to RFI dated August 22nd, 2019 (see Exhibit W1-E). Please note that this 5 dBA adder is not a "penalty", but a "short-cut". It is typically used by smaller projects where a basic analysis will suffice. This is not one of those proposed projects. The proponent elected to take this short-cut, and complete the analysis this way. The estimated sound levels with an additional 5 dBA to account for tonal sound, the project estimated sound levels ends up being over the nighttime limit of 45 dBA at the nearby protected location 3 (Exhibit W1-F, Table 1).

24. Please note that this analysis only included six fenceline receptors and not the entire offsite area. Since no modelling files were provided, it is not possible to know how many areas of exceedance are also present in addition to this discrete location.

25. Exhibit W1-G is an annotated image of Figure 3 from the sound report, illustrating how the provided inconsistencies in the figure and unrealistic results determine that the project would be not be incompliance. The bullets below refer to different colored arrows that Tech has superimposed on the "compliance" figure to spatially locate the bullet on the figure:

a. The yellow arrow points to the general area of the engine plant. The stacks exact location, orientation, stack height with respect to its enclosure, base elevation to surroundings buildings is unknown. Since the proponent did not provide building and site information, and modeling assumptions, it did not demonstrate that the assessment includes the proper physical operating scenarios.

b. The orange arrow shows a very dense area with a receptor, a contour and the property line. It is unclear whether the maximum sound is actually at this receptor or further away. Also in the more recent plans, there is an additional building in the upper right corner that is not shown in the original figure. The six receptors may, or may not represent worst-case concerns.

c. The purple arrow points to a clear channeling of sound, which is outlined by the yellow contour. It is unclear whether equipment, terrain, or modeling assumptions created this anomaly, but it should have been discussed and explained.

d. The blue arrows refer to the Town of Northport, which is not mentioned in a discussion of protected areas; therefore, the proponent needs to provide the required land uses, local zoning, and comprehensive plan to complete the assessment for Northport. In addition it should have included receptor locations that extend to Northport. It is as if the BEP process that acknowledged that the project is located in both Belfast and Northport does not exist. The proponent's noise analysis cannot be considered complete as it does not even address noise into Northport.

e. The red arrow points to the far side of the wastewater plant. This building contains a large pump station, multiple stages of wastewater treatment processes for up to 8 million gallons per day, and water treatment processes for up to 2 million gallons per day, but according to the model, the net effect of the building is actually blocking sound instead of emitting sound. This is simply not consistent with any other wastewater treatment plant, we have ever seen. It is as if there are no intakes or exhausts, no odor control, no process equipment, no operational doors, nothing present. It is simply not representative.

f. A general observation for this figure, is that their six receptors are not representative of worst-case ground level sound. While worst-case sound is at the fenceline, it is not always at exposure height. In this case, the buildings are so massive and so close to the fenceline, they actually shield the sound at ground level directly at the fenceline in some locations, but further away the direct line-of-sight to the abutters is established, so the worst-case sound impacts in some cases are clearly within the abutters' properties. This is evident by the isopleth patterns.

26. Exhibit W1-G just scratches the surface with respect to glaring omissions and inconsistencies. It cannot be the basis of establishing the burden of proof with respect to sound emissions. The acoustical modeling provided raises more questions about the projects adverse effect on nearby protected locations than clarifies them.

27. The proponent does not provided *"sound level specifications"* for the 180 sound sources they have stated was modeled, but they do suggest that an unknown number of mitigation scenarios with "*0-29 dBA*" of mitigation is proposed. This is simply unhelpful for determining compliance or offering conditions. Furthermore, it is simply impossible to perform a direct an independent model comparison.

Tech Environmental Acoustic Modeling

28. User selected noise modeling parameters that are incorporated in the model (terrain, ground absorption, reflection loss, attenuation, building heights, equipment heights, receptor heights, number of sound sources etc.) can drastically alter the final results of the acoustic model, and one will not know by simply examining a model output figure and comparison table. If equipment information that is not applicable to this proposed project is provided to the modeler, or inappropriate site assumptions have been made, then the results may not be representative. It is an industry standard to provide these.

29. Without the actual model, Tech was still able to perform an adjustment to their modeling for the change in stack heights. We performed two different acoustic models, with the information provided in the SLODA application and sound data from Tech's sound database to examine potential changes to their modeling that were clearly identified like stack height changes, building changes, etc.

30. Tech's sound database is a collection of equipment data obtained from different vendors over our many years of acoustical modeling. The engine exhaust sound data that was used in the model is for a CAT 3512 which is similar to the engine CAT 3516 (A CAT 3512 has four cylinders, and the CAT 3516 has 16 cylinders) that the proponent states that they will be using, and which is referred to in Chapter 115 Minor New Source

License Application (Exhibit W1-H. For the condenser, the sound pressure level used was what was provided in the response to RFI dated October 9th, 219 (Exhibit W1-D).

31. The first acoustic model was performed based on the worst case scenario of 8 Engine Exhaust and 8 condensers, and using the most current building plans and elevations provided in the response to RFI November 8, 2019 (Exhibit W1-I). Again, if the engines are run for peak shaving approximately 10% of the year, they must be run at 85% or less to keep them within warranty and within Best Management Practices for maintaining any air emission guarantees (that have not been formally provided, but nonetheless) and for prolonging equipment life cycles.

32. The second model run was based on the original building plans and elevations, and only 7 engines that the proponent states they modelled (Exhibit W1-J).

33. Since we do not have their noise model files, the receptors were placed graphically in the same locations as they were shown in the noise assessment figure (Exhibit W1-B).

30. The stack height was higher in the modified application run because the stack heights were raised from the actual stack heights proposed in the application to reduce the air impacts from the proposed buildings. This added stack height unfortunately also reduces the shielding for sound. The modified application modeling run at the higher stack height had a much great localized sound impact. While on may suggest that the modeling was an approximation with similar sound data. Tech did not attempt to use the modified model run directly. Instead the difference between the two model runs at the six receptors where examined. By examining the difference, Tech could isolate the increase in sound from the increase height, and then add hat to the original model. The revised sound values provided with the self-imposed 5 dBA adder for tonal sound are included in a new table. (Exhibit W1-F, Table 2).

31. Table 2 (Exhibit W1-F) demonstrates that after the stack height adjustment is considered the only receptor location that could possibly still meet both the 55 dBA and 45 dBA limits was location 6 which was the furthest away, and the most shielded from the change in stack height.

32. Although, the previous stack height adjustment clearly does not demonstrates compliance, Tech wanted to also examine the generic 180 sources controlled to 60 to 65 dBA, so Tech also did one hypothetical model. We took the bare minimum of information provided for the engine plant and of the 180 sources. The engine plant sources were placed at the engine plant, and the remaining sources were spread out generically over the other process buildings. With these generically controlled sources, Tech still experienced modeling results that suggests that the project does not comply with the 55 dBA nighttime and 45 dBA nighttime limits.

33. I am not presenting results of the generic hypothetical analysis of equally spaced sources, as I cannot defend the source locations, or the approach. It was merely completed to see if what they proposed generically in their RFI response, with the new stack height, was even a reasonable approximation of the results presented, and I could then provide a professional opinion. The statement that the 180 sources located somewhere around the site, and are all limited to a maximum of 65 dBA simply does demonstrate the burden of prove that the facility will not cause adverse noise impacts. And this is with us hypothetically spreading the sources out around the buildings. In reality they will need to be, where they need to be so it is likely that here will be clusters of sound sources creating higher potential sound to some areas.

34. Standard sound modeling protocol would require a proponent to discuss uncontrolled/unmitigated sound or mitigated sound with a discussion of the specific mitigation. Unfortunately, neither were provided. In addition no receptors were provided in the Town of Northport, and Northport was not discussed in the sound study. Upstream Watch had requested equipment sound data multiple times so we could assess the impact

on both Belfast and Northport. DEP requested equipment sound information on more than one occasion and it was not provided to us or to them. Any modeling performed that could be considered appropriate would have assumptions that should have been provided for:

i. terrain,
ii. ground absorption,
iii. building reflection loss,
iv. building material,
v. building heights,
vi. building location,
vii. receptor locations,
viii. receptor heights,
ix. type of sound sources,
x. the number of sound sources to incorporated,
xi. sound source locations,
xii. sound source heights,
xiii. sound source octave band data,
xiv. attenuation octave band data, and
xv. Safety factors.

35. It is now clear that no actual equipment sound information was provided prior to the air quality pre-filed deadline, so unfortunately, a noise analysis had to be completed now with the information available. Although noise was excluded as a hearing topic, it is being provided herein as sworn written testimony, at the same time as the odor rebuttal and air quality pre-filed testimony because they are all interrelated. It is important that the analyses use the same "data availability snapshot in time".

36. Based upon the multiple approaches taken to analyze this sound study, it is now clear without a shadow of a doubt that noise will project towards the Little River and beyond. It was clear from our stack analysis alone, it was also obvious when the incremental stack sound was added to their factors, and even with multiple hypothetical analyses, that noise will reach Northport to the south, southwest, and west.

37. I have supplied our noise data assumed for our stack height differential analysis (Exhibit W1-K). While I would normally propose to share our analysis as well at this time, that is simply not prudent. We used the same model, Cadna-A that the proponent used with very reasonable assumptions, but it is simply not practical for our analysis, submitted by a concerned citizens group's expert, to be scrutinized without the proponent's sound data and modeling information that is required by rule to be provided as part of the permitting process. We will gladly share any and all modeling files and assumptions, if the proponent shares theirs, so they can be scrutinized equally. This is really overly generous by Upstream Watch, as the burden of proof is still squarely on the proponent.

38. As a result of this analysis of the available information and my testimony, it is my professional opinion, that this project as proposed will have a significant adverse impact on infrastructure and noise beyond the boundaries of the property line in nearly all directions.

39. As a result of this analysis of the available information and my testimony, it is my professional opinion, that this project as proposed will be plainly audible in Belfast and in Northport and have a significant adverse noise impact on nature trails in both Belfast and in Northport.

40. As a result of this analysis of the available information and my testimony, it is my professional opinion that the proponent has never provided sound receptors in Northport, and has never suggested that it would be

plainly audible Northport to any degree.

41. As a result of this analysis of the available information and my testimony, it is my professional opinion, that this project as proposed will have a significant impact on infrastructure and noise beyond the boundaries of the municipality within which the development is to be located.

42. As a result of this analysis of the available information and my testimony, it is my professional opinion, that the proponent has not provided adequate information in the permit application suggesting it would produce noise beyond the boundaries of the municipality within the Town of Northport and therefore must resubmit its applications with proper notice to the Town of Northport.

43. Based upon my opinion and my residency in Northport, this written testimony is also a formal request that the Commissioner, or in this case the Board of Environmental Protection, provide infrastructure and noise limits and conditions, and require pre-permit compliance demonstrations that the proposed facility can meet these limits and conditions to protect Northport's interests including, but not limited to, the bypass road construction, construction traffic, construction noise, operation noise, and long-term traffic concerns.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____ Date:

Printed Name:
Title:

Parties Assisting:

Name:	Address:	Signature: _____
Name:	Address:	Signature: _____