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207-338-0751

Hon. Robert S. Duchesne, Presiding Officer  
Maine Board of Environmental Protection  
17 State House Station  
Augusta, ME 04330

File No:

A-14-781-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-N  
W-009200-6F-A-N

RE: Additional comments on the Nitrogen Discharge

To the Presiding Officer and Board of Environmental Protection:

Thank you for the opportunity to provide follow-up comments with respect to the 85% removal efficiency in the testimony and the 21 mg/L limit as opposed to the 23 mg/L limit. Any adjustments to the nutrient loading, percent removals, and new promises of outlet concentrations as compared to the record is of extreme interest to Bayside. For perspective, below are two of the four dilution figures labelled Figure 5 on page 8 of a memo in Nordic's proposed discharge application. Please note that on the left plume figure below the tidal spread modeled is nearing its maximum but the lightest blue area, **the area of least dilution, is literally in our mooring field and in front of our wharf.**

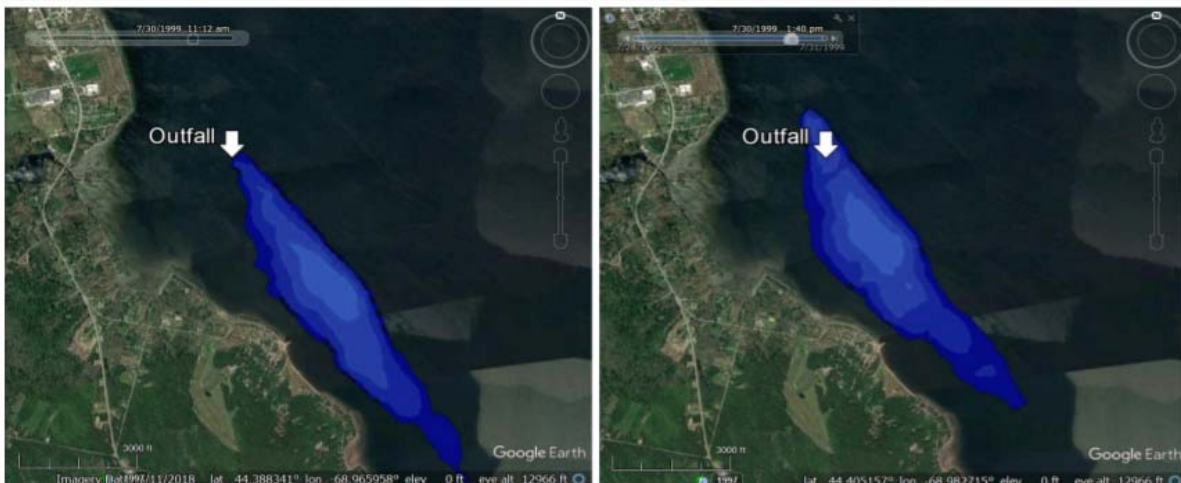


Figure 5. Snapshots of plume dilution throughout a typical tidal cycle. high slack (upper left), mid-ebb (upper right), low slack (lower left), mid-flood (lower right).

In the second figure above, the plume is now actually “pulling back”, from a dilution perspective, back towards the outfall, as the tide has started to oscillate back in the other direction. This continuous discharge means we would have multiple cycles of minimal dilution oscillating back and forth within our mooring field before it gets anywhere near “open water” discharge.

The Applicant has estimated this cycle, but has no field data to confirm it, and did not run the model long enough to confirm their estimated 14-day averaging period.

The Applicant’s modeling is insufficient to conservatively satisfy the anti-degradation rules and requirements. This dilution factor, combined with background conditions, the lack of desire by the Applicant during testimony to agree to more than 85% removal efficiency, and the new lower limit of 21 mg/L that leaves zero room for assumption or modeling variability, are significant concerns. We believe that these concerns have not been sufficiently addressed by the Applicant.

After the most recent comments by Nordic and the recent 21st Procedural Order, the NVC is providing these additional comments with references to the existing record. As quoted in item 4 in the BEP’s 21st Procedural Order, there is reference to Simon Dunn’s testimony on Day 3 on page 404-05, it states that:

***“...Simon Dunn, stated on the record that the removal rate for nitrogen was expected to be 85% rather than 99%.”***

This typographical error was in the application forms in their original application, and it was unfortunately erroneously carried forward to the draft conditions, because this applicant has not updated its applications as it has modified them.

Please note that Item 5 from the 21st Procedural Order states:

***“Department staff has examined the table in Nordic’s application and confirmed that the reversal of the removal percentages is a typographical error and is not the result of a mathematical error in the table or the application materials. The reversal of the percentages does not affect the substance of the license limits or any conditions in the draft proposed Order.”***

Whether or not BEP feels that the error had any significance on DEP’s review of the application, or the calculations DEP made, is immaterial to the information as presented in the draft for public review and comments for 30-days per EPA NPDES and Maine’s MEPDES requirements.

A member of the public should not have to provide a FOAA request or review many pages of additional supporting materials to provide comments on a discharge application. They should only have to review two things: the application for discharge and the draft findings of facts and conditions for that discharge. In this application both contain this error and, as a result, the draft findings with the proper information must be reposted.. Typographical errors are possible, but that does not justify skipping the correction and reposting requirements. The NVC understands that the BEP does not plan to repost the draft finding of fact and conditions, but we do hope these comments are considered as part of any new draft or final permit.

If one examines the correction of the percentages to 85%, this action creates a clear contradiction between the draft limits in the fact sheet and the limits the Applicant requested AND was willing to commit to achieving in the testimony (see page 404 lines 24 to page 405 line 25 on the third day of testimony):

***MR. WOOD: That's my question too. If I remember in your application the 23 milligrams per liter for total nitrogen being discharged represents a 99 percent removal; is that correct?***

*SIMON DUNN: 85, I believe.*

*MR. WOOD: 85. Your column is off a little bit, but 85 percent. What would it -- what would it take either internally or black box on the end, if you will, to reduce that number say to 90, 95 percent?*

*SIMON DUNN: Given the space constraints inside for the grass there really isn't room to incorporate more up there, so any additional treatment needs to be in the wastewater treatment plant. I have a good confidence that I think that we'll actually end up bringing that down further, but this is subject to -- we need to be very certain with this ongoing dialogue to make sure that we can actually do that within that building footprint because obviously we can't expand on that.*

*EDWARD COTTER: What I'd like to add is that the numbers that we've represented in our application are numbers that we are -- we hold in a high, high confidence. We are also, as Simon alluded to, working on additional systems that we feel confident internally will improve our numbers but not to the point where we're confident putting in writing on something that we're going to get held to. But that said, I will offer to buy anybody a cup of coffee if we can't do better than that."*

So essentially, there IS a mathematical error. With everything else in the record set, and calculations that confirmed a willingness to commit to the 23 mg/L concentration and a maximum of 85% removal, then there has to be a mathematical error (or changes in assumptions outside of the record) if the limit is then lowered to 21 mg/L after the record is closed. **The percent removal now must either possibly EXCEED THE 85% removal rate, or other information assumed for the record must have changed.** The record still must be based upon some fixed assumptions that had to occur when the record was open. If limits are changed after the fact, then by default, the assumptions HAVE TO CHANGE.

Unfortunately, with this Applicant's approach to provide only a minimal amount of information to the record, comments and clarifications on how these changes affect the record cannot be made without reopening the record and holding a formal follow-up hearing, or a formal anti-degradation hearing. The BEP has denied our repeated requests for any additional hearings, but by agreeing to a new lower limit, and refusing to accept a higher removal percentage a few minutes before the deadline closed for formal comments, the Applicant then either indirectly changed their testimony assumptions, or they indirectly declared that they can achieve more than 85% removal.

Given that it is now confirmed via the Applicant that the intent was for a promise of no more than 85% removal for nitrogen in their application, it could not be any clearer that the record is flawed, and the permit must be denied.

It is extremely important to the NVC that any permit based upon hypothetical modeling should include depth stratification or meteorological factors with actual flow and background data collection in both the outfall location and the expected plume location (in our mooring field). It is important that limits for daily discharge concentrations required be lower than those the Applicant requested in the record.

**It is the NVC's firm opinion that the Applicant really has no choice but to perform the proper data collection and analyses prior to the possibility of any final permit approval.**

Building now and demonstrating permitting threshold compliance later could be ruinous for our Historic Village. Our village, our history, our identity, and even our village nickname "Bayside" depend on the bay. The proposed project is simply too big. It would consume too many local resources, and too much

could go wrong. **The NVC is simply too close for a “permit now and demonstrate later” approach to permit approval.**

Figure 5 on the first page of this letter was cropped but the portions included are reproduced exactly as displayed in the record. It is from a memorandum dated October 2, 2020, from Nordic’s modeling expert Ransom Consulting Engineers and Scientists, and it is addressed to the Applicant, Nordic Aquafarms. In this memorandum the expert makes it very clear to the Applicant that a field study is necessary to validate the hypothetical model. The Applicant’s expert states:

***“The information presented here is based entirely upon numerical modeling with limited knowledge of the in-situ conditions at the proposed outfall site. It is important to understand that hydrodynamic modeling is not an exact science. As such, any predictions presented here should be considered only as estimates of the proposed dilution and plume behavior. Numerous assumptions and simplifications have been made in this analysis, which contribute to significant uncertainty in the modeling results. In general, these simplifications and assumptions are reasonably conservative, such that errors would tend to over-predict negative impacts. However, it is possible that predictive error could under-estimate impacts. Thus, it is recommended that a field data collection program be designed and implemented to provide site specific data for further analysis, and to validate the accuracy of model results.”***

The Applicant has provided very little nutrient background data for the discharge area and absolutely NONE within the lightest area of the plumes in the two figures, labelled Figure 5 in the Applicant’s materials. While the Applicant and DEP came to some understanding about averaging background conditions for nitrogen for two locations (BB02 and PB03) away from the shore (to supplement the data provided in the original October 2018 application as referenced in the deliberations), these may or may not represent near shore conditions of PB02 or in front of our densely populated areas. The NVC formally requested the memorandums, emails, and back-up material that lead to the changes made by the deliberation memorandum via a FOAA request on more than one occasion, but it was never provided.

The agreed upon “average” nitrogen background is less than the applicant’s sampling results from August of 2018 further away from shore, and significantly less than the results the applicant found located nearer to the shore. Therefore, **the Applicant has provided NO actual sampling results to the public record to suggest that the assumption is representative in and around our mooring field, and the background data was collected nowhere near the expected daily plume per the Applicant’s modeling.** The Applicant continues to remind us how large the bay is for overall dilution potential, but that also it is a factor with respect to background conditions. With “such a large bay”, it is NOT reasonable to expect that background conditions near the outfall are the same as they are in front of our wharf. If claims of their millions of gallons a day of discharge are a “drop in the bucket”, then the background in the plumes above may or may not be the same as the plume approaches different areas of the NVC shoreline and abutting bay. Typical nutrient run-off assumptions for areas with denser population would suggest it is more likely higher near Bayside, strictly based upon Bayside’s dense Historic District.

With the current hypothetical and minimal background data assumptions, it is plausible that the facility could exceed the 20% concentration lower threshold with a continuous discharge of the 23 mg/l commitment in the record. Also: ,

- (1) it is just as plausible based upon the lack of actual, site-specific short-term background nutrient data, in the record over varying seasons (especially near the NVC’s Historic District) that Nordic Aquafarm’s could vastly exceed the 20% threshold for an anti-degradation hearing and actually

have a significant adverse impact to the NVC, and the economic cost would far out way any “ economic benefit” a single project can justify to the state.

- (2) it is just as plausible based upon the lack of actual, site-specific short-term background bay tidal flow data in the record over varying seasons (especially near the NVC’s Historic District) that Nordic Aquafarm’s could vastly exceed the 20% threshold for an anti-degradation hearing and actually have a significant adverse impact to the NVC, and the economic cost would far out way any “ economic benefit” a single project can justify to the state.
  
- (3) it is just as plausible based upon the lack of actual, site-specific short-term background bay mixing study in the record over varying seasons (especially near the NVC’s Historic District) that Nordic Aquafarm’s could vastly exceed the temperature threshold for an anti-degradation hearing and actually have a significant adverse impact to the NVC, and the economic cost would far out way any “economic benefit” a single project can justify to the state.
  
- (4) it is just as plausible based upon the maximum commitment of 85% removal in the record and other factors (especially near the NVC’s Historic District) that Nordic Aquafarm’s could vastly exceed the 20% threshold for an anti-degradation hearing and actually have a significant impact to the NVC, and the economic cost would far out way any “ “ economic benefit” a single project can justify to the state.

In summary, adjusting any concentrations, daily limits, or loadings to minimize water quality degradation simply does not comport with Nordic’s Aquafarm’s testimony and messaging. There has been NO discussion of potential degradation above, or just under the anti-degradation threshold by this Applicant. Again, this reality is 100% based upon the record the Applicant chose to build. For example, from the transcript from the same day of the testimony, Day 3, just a few moments after the quote above, a BEP representative asked a very important question with respect to the way the Applicant has presented its potential impact to the area throughout this permitting process to not just the BEP, but the Belfast Planning Board, the ACOE, and to the public, starting on page 406, line 11 and running to page 407, line 16: “**MR. SANFORD: Is the -- is the water leaving the facility discharged into the bay area, is it cleaner than the seawater that's entering the facility?**

**EDWARD COTTER: Yeah, I'll start just because I did -- I did make a statement along those lines. When we did our initial analysis and reviewed the numbers so that we could start putting an application package together and understand our systems in the context of the bay, what we noted is that samples that we took of TS -- of water quality samples in the bay in the area of our discharge point several of the samples of TSS came out to be higher than what we are proposing as our discharge number. So from that, yes, I'm -- I can say that in that context this water will be cleaner and it will be clearer than the samples that we took at that time.**

**Now that said, I can't tell you that if I went and took a sample right now that the TSS might be much lower, it might be much higher, but, yes, we did take samples of TSS that were higher in the existing conditions than where we are. And when I say TSS that's the measurement that if you have a glass of water that you're looking at TSS is what you're looking at. So that's -- that's the context of that.**

**Regarding BOD total nitrogen and phosphorous, I think our comparisons to those background levels are in the application, our levels are slightly higher, but they do, as you know, we have stated that they do go back to background levels very quickly and we'll talk about that tomorrow.”**

Based upon this statement and other portions of the record, there has not been a discussion of water quality degradation and economic benefits. Specifically, since:

- (1) From the beginning of this project, Nordic Aquafarms has tried to claim that their discharge will actually be “...cleaner...” than the existing bay. So, their testimony and therefore the hearings to date, could not have possibly focused on the cost benefits to the State of Maine in exchange

for ANY degradation. How does one discuss the balance between degradation and economic benefit when the applicant's statement is ***"...this water will be cleaner and it will be clearer than the samples that we took..."***

- (2) Unfortunately receiving water in dead zones with no biota can also be ***"...clearer..."*** because there is no biological activity present. Clearer is not an indication of "better" or a demonstration of no adverse water quality impact.
- (3) This statement, even after the context provided, is still misleading. The context suggests less TSS makes the ocean water ***"...cleaner and...clearer..."*** which to the layman creates the impression of ultimately a "healthier" discharge. Removing natural and diverse ocean biota and replacing it with very specific and consistent fine particles, metals, viruses, and bacterial from a giant monoculture that can still pass through the fine membranes may result in less weight per volume of wastewater discharge (mg/L), but to any scientist or engineer, it is simply not any indication of ***"...cleaner..."***.
- (4) Ocean water that is teeming with microbes in balance with its surroundings will be stripped of this biota, and then discharged after being exposed to chemicals, heat, straining, residual fecal matter, residual waste food, dead fish particles, metals from the fish food, ammonia from the urine, so again, even with less on weight per time basis after filtering, it will not simply be ***"cleaner"*** with respect to the stress and degradation thousands of pounds of specific pollutants would add to the bay.
- (5) Simply straining residual material does not make it better. The Applicant has not bothered to speciate its TSS so that the true impact of the discharge can be examined, instead it decided to claim ***"...this water will be cleaner and it will be clearer..."***.
- (6) The irony in the statement above comes from an attempt to qualify the previous broad statement, (i.e. to provide context to the original ***"cleaner"*** statement) with the declaration: ***"I can't tell you that if I went and took a sample right now that the TSS might be much lower, it might be much higher"***. This declaration highlights everything that the Intervenors have been expressing throughout this permitting process with respect to data collection and the need for, not just average, but maximum conditions as well. Was the minimal samples collected in 2019 representative of average, minimum, or maximum background conditions? We cannot tell by the minimal information in the record. **For background nitrogen, the only things posted to the record are a figure of monitoring pushpin locations, a discussion of two of the six locations being used as "representative", and an average result of 0.25 mg/L.** This one background factor has a value that is more than one-half of the assimilative capacity of the limit, so as one can see the actual background and its potential for fluctuation in different areas is crucial with respect to capacity for Nordic's discharge.
- (7) This statement ***"I can't tell you that if I went and took a sample right now that the TSS might be much lower, it might be much higher"***, is extremely concerning, when combined with the applicant's unwillingness to commit to a nitrogen removal percentage higher than 85%, until moments before the draft comment period ended. Although the statement above about variability was made about TSS, it applies to all components of their discharge stream, like nutrients. The nutrient levels will vary just as the Applicant testified that the TSS levels will vary. If so, then 90% or 95% control may be needed.

- (8) The Applicant testified that it will be hard to reach 90% or 95% nitrogen control with the physical space available at this site, **so essentially by agreeing to this new lower limit there is a new unknown financial commitment that must be made available in the record.**
- (9) Lastly, for the Applicant to suggest per their testimony that any additional control necessary above 85% will be handled in the wastewater plant building is completely insufficient with respect to satisfying their burden of proof for permitting. **The “wastewater treatment building” is not just a wastewater treatment building.**
- (10) Unfortunately, the Applicant chose NOT to provide any equipment cutsheets or layouts of the wastewater treatment building that must house many, many processes, even after request for information was made by DEP. There was no equipment layout information in the record that demonstrates that the proposed equipment will fit, or that any additional equipment could simply be “added on”. In this building, with very limited space, the Applicant has claimed the following activities will somehow be housed:
- a. ocean water pretreatment processes,
  - b. processes for groundwater pretreatment,
  - c. processes for surface water pretreatment,
  - d. processes for city water pretreatment,
  - e. sludge storage and handling,
  - f. redundant pumping systems for 7+ million gallons per day of discharge,
  - g. redundant pumping systems for 5+ million gallons per day of fresh ocean water,
  - h. redundant pumping systems for 2+ million gallons per day of freshwater, and
  - i. then, ultimately, the wastewater treatment process.

It is extremely expensive to install this equipment in tight areas and any additional nitrogen removal will add more costs. **There has been no discussion about the actual water and wastewater equipment to be installed, its dimensions, how it could function at maximum efficiency at all times in this area, how the different codes for these different specific processes will be addressed, and cost for an optimal or potential now suboptimal layout in this building in the record, so the permit simply must be denied.**

**Again, as the NVC has stated repeatedly, the NVC is not “for” or “against” this project or this Applicant,** but we are NOT for skipping the antidegradation hearing process and also for allowing the Applicant to agree to “accept” or “deny” changes during the comment review process to theoretically improve potential removal efficiencies to a facility discharge limit results in essentially EXACTLY at the hearing limit threshold. On multiple occasions the NVC requested that the DEP not simply reinterpret the testimony as presented by the Applicant, and hold the required anti-degradation hearings, but the BEP has made it clear that there will be no additional testimony or hearings beyond these comments.

Please note that with the current draft findings of facts and conditions, no hearing granted, and concentration estimates now of 21 mg/L and a loading 1,348 pounds per day that are not in the record, if these limits are included in the Conditions, then the conditions must be **an ENFORCEABLE DAILY MAXIMUM LIMITS of 21 mg/L and a pounds per maximum day limit for total nitrogen that is directly proportional to their discharge flow rate for that day ratioed to the ultimate daily maximum limit of 1,348 pound per day.** And the Applicant must demonstrate future compliance with this limit immediately upon start-up. DEP must include a condition for Trial and error with higher allowable

concentrations now to get there later does not verify their technology testimony, or confirm their agreement to a concentration that is lower than the testimony, and more importantly does not protect our bay.

Please remember that this Applicant chose to permit the entire facility at this time and therefore MUST demonstrate compliance with the technology proposed for the entire facility from Day 1. Since the Applicant has provided insufficient information to the record to demonstrate that it can meet this newly proposed limit, and since final discharge flows will not be established for 10 or more years, , the DEP and the public may not know whether this facility can possibly meet the newly proposed limit that justified no hearing required for more than 10 years, if the concentration is not an enforceable daily maximum limit from Day 1.

If it is determined at any time, that the facility cannot meet the 21 mg/L on a daily basis, then the anti-degradation hearing actually WAS REQUIRED, and the permit process will have been proven to be flawed, and the facility will need to be shut down immediately. If the 21 mg/L is not a MAXIMUM DAILY LIMIT in the conditions, then mathematically the permit conditions are flawed, the permit process is flawed, and the permit must be denied.

Again, we thank you for an opportunity to comment on this typographical error and the concerns it creates.

Sincerely,



John Spritz, President

Northport Village Corporation