STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BOARD OF ENVIRONMENTAL PROTECTION

	IN THE MATTER OF
	:
NORDIC AQUAFARMS, INC.	:APPLICATIONS FOR AIR EMISSION,
Belfast and Northport	:SITE LOCATION OF DEVELOPMENT,
Waldo County, Maine	:NATURAL RESOURCES PROTECTION
	:ACT, and MAIN POLLUTANT
	:DISCHARGE ELIMINATION SYSTEM
	:(MEPDES)/WASTE DISCHARGE
A-1146-71-A-N	:LICENSE
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	:
ME20002771	

TESTIMONY/EXHIBIT Reichard 1 TESTIMONY
OF Lawrence Reichard

Maine Board of Environmental Protection Discharge Permit Application Testimony: Nordic Aquafarms

Lawrence Reichard

Greetings. My name is Lawrence Reichard. I am a freelance journalist. I have been a resident of Belfast for more than five years, and I have lived in Midcoast Maine for most of the last 35 years.

For the purposes of my testimony, I wish address the issues of Nordic Aquafarms' water use and financial capacity as these issues pertain to Nordic's proposed Belfast fish factory.

First I wish to address the issue of financial capacity.

Nordic Aquafarms has reportedly raised only about $70 million of the $500 million it needs to build its proposed facility, and there is reason to believe Nordic Aquafarms may have difficulty raising the rest. As exhibits I am submitting to you two articles from Nordic salmonbusiness.com in which banks and insurance companies express leeriness of land-based aquaculture. These are but two of numerous such articles that have appeared in aquaculture trade journals.

I first call your attention to a January 15, 2019 article entitled "Banks skeptical about financing land-based fish farms: Must have a better overview of the overall risk." The entirety of the article can be found below.

The article states that: "Norwegian banks..are still very skeptical about whether this is something to focus on in (sic)...Aquaculture manager at (Norwegian) Sparebank 1 SR-Bank, Rune Søvdsnes said that they (Sparebank) currently fund post-smolt facilities on shore, but believe it's too early before they are become (sic) interested in, and willing to, contribute to funding for land-based facilities...Full-scale farming of salmon on land is still in a relatively early phase. The biological risk is currently both significant and unresolved. And we must remember that there are still major challenges for the post-smolt facilities that have been built...We must see competitive land-based fish production is in the long term proves to be competitive (sic) – on both the cost and risk side – before even considering financing this type of plant."

The article quotes Vegard Helland, executive vice president of business Sparebank 1 SMN, who says that developers "must demonstrate extremely good expertise."

As demonstrated below, Nordic Aquafarms has woefully little expertise. Its Chief Operating Officer has only an undergraduate degree, has no published books or articles, and has no experience operating any fish farm, let alone one bigger than has ever before been attempted. In announcing his hiring, Nordic Aquafarms cited his qualifications as having lived in Florida, having helped his father build a log cabin, and having worked as a lab assistant. This is not reassuring.

Sparebank Executive Vice President Helland goes on to say, "Farming is volatile stuff. If you start with larger projects on land and it works, then we will see prices drop." Helland says Sparebank believes the lowest production costs still exist "in the sea" - as opposed to on land - and Sparebank is uncertain whether land-based fish production in Norway will pay off at all.

Hardly a solid investment.

Insurance companies are equally leery.

In a March 5, 2019 article, salmonbusiness.com quotes Geir Myre, the foremost aquaculture expert at XL Caitlin, the world's biggest aquaculture insurer, as saying insurance for land-based aquaculture is "a money losing project." (The entirety of the article can be found below.)

Myre goes on to say, "This has so far been a loss making project for us." The article says: "Myre pointed to a number of risk factors related to water quality, biology, crew, technological risk, genetics and hydraulics."

Hardly a solid investment. And does Nordic Aquafarms even have insurance for its proposed Belfast project? Does it intend to get insurance? If so, where? Has it secured solid commitments for insurance coverage? If not, the above clearly demonstrates that Nordic Aquafarms may have considerable difficulty in obtaining such insurance.

And what would happen if Nordic Aquafarms is unable or unwilling to obtain insurance? Will the taxpayers of Belfast and the state of Maine be left to their own devices to clean up a huge and potentially contaminated industrial infrastructure and a potentially contaminated Belfast Bay?

And what will happen if Nordic is unable to obtain enough financing to complete construction? Will Nordic Aquafarms cut and run, after having destroyed dozens of acres of woods, wetlands and the wildlife habitat of threatened species such as the bobolinks bird?

Nordic Aquafarms has been repeatedly pressed in its public information meetings to secure a bond to ensure that Belfast and Maine taxpayers will not be left holding the bag if something goes wrong with its proposed project, but so far the company has declined to make such a commitment. Nordic's apparent unwillingness to secure such a bond indicates either a reckless disregard for the financial capacity of Belfast and state of Maine taxpayers, or a weak financial capacity on the part of Nordic Aquafarms.

If banks and insurance companies are unwilling to touch much smaller land-based fish farms, why would they be willing to deal with a much bigger project, thus exposing themselves to much greater financial loss?

Next I wish to address the issue of water use. This proposed project will use vast amounts of fresh water. According to Nordic's own figures, it will use 630,000,000 gallons of water per year from our aquifer and watershed.

Nordic Aquafarms has never built nor operated a project this big, and we simply don't know how much water Nordic's operation could end up using. None of Nordic's other facilities is more than one fifth the size of what it is proposing for Belfast.

When Nordic Aquafarms publicly announced this project, and for months thereafter, Belfast was repeatedly assured that its aquifer and watershed could easily handle the load that Nordic proposed. But that has been proven untrue by Nordic's own test wells, and now Nordic seeks to draw more water from Belfast's municipal water system.

In September 2018 I interviewed Professor Are Nyland in his office at the University of Bergen, in Bergen, Norway. Professor Nyland is an aquaculture expert and has been teaching at the University of Bergen for more than 30 years. In my interview with him, Professor Nyland expressed skepticism about figures provided by aquaculture companies. Professor Nyland said a good rule of thumb is to take any figure given by an aquaculture company – such as water use - and add 50%.

Nordic's water-use figures are based on a highly questionable assumption that everything will go as planned. This is unrealistic. No project this size ever goes as planned.

In the above-cited March 5, 2019 salmonbusiness.com article XL Caitlin insurance executive Geir Myre is quoted as saying in regard to land-based aquaculture, "There are many small things that can go wrong." In the same article, Mr. Myre went on to say, "We (XL Caitlin) are not 100 percent negative (on RAS)." This is not reassuring.

In September 2018, I interviewed Bent Urup, perhaps the world's foremost expert in landbased aquaculture, in his office in Fredrikstad, Denmark. Mr. Urup designed, built and owned Nordic Aquafarms' two fish factories in Denmark. He sold a controlling interest in one of them to Nordic, and the other one he sold outright to Nordic.

In my interview with him, Mr. Urup was emphatic that things do in fact go wrong with land-based fish factories. He emphasized that RAS-style land-based fish farms such as Nordic's are extremely complex operations. Urup said it is not enough to respond to problems – one must be able to anticipate problems before they happen. In Urup's words, one must be able to see around corners.

Having worked closely with Nordic Aquafarms, Mr. Urup is familiar with the company, and he expressed a dim view of Nordic's ability to anticipate problems and its ability to run a project as big and complicated as Nordic's Belfast project. Urup said he had been closely following Nordic's Belfast hirings, and he said they simply weren't capable of running such a large, complex operation.

Mr. Urup also expressed reservations about the oval design Nordic is proposing in Belfast. Mr. Urup said the oval design – as opposed to a more conventional circular RAS design – would invite bacteria to form on the long sides of the oval.

I recorded the entirety of my interview with Mr. Urup, and would be happy to share it with the BEP.

When things go wrong, things such as outbreaks of bacteria or disease, fish tanks must be drained, cleaned and refilled. By Nordic's own statements, these will be the biggest fish tanks in the world, and it will take a lot of water to fill them. This large amount of water is not figured into Nordic's unrealistic water-use figures.

But it's worse than that. Our environment is changing fast. The climate crisis is bearing down on us at an alarming rate. And with the climate crisis, we simply don't know how our aquifers and watersheds will perform in the future.

Scientists can make models and projections, but ultimately we don't know how the climate crisis will play out. Ultimately the only predictable thing about the climate crisis is its unpredictability.

With that in mind, I would like to share with you a statement provided to me by one of the climate scientists with whom I have communicated. This is a brief excerpt from an email I received from Dr. Mark Gold, UCLA Associate Vice Chancellor for Environment and Sustainability:

Here is where the climate question comes in: precipitation may or may not change dramatically due to climate change. If precipitation increases, then the inputs to the aquifer could go up. If your area becomes more susceptible to drought, then the inputs will reduce and the proposed groundwater pumping could lead to overdraft of the aquifer or even subsidence of the properties above the aquifer. In the long run, aquifer capacity could be severely reduced.

We've seen this all over the world, most notably in California in our San Joaquin Valley. The other area where climate comes in is for agricultural and urban water supplies. If surface water supplies get reduced due to climate change, drought or increased demands, then that can lead to greater reliance on groundwater which then leads to overdraft, subsidence, etc.

In recent years Maine has in fact experienced drought. Fortunately this drought has not been severe. But that may change, and we would be reckless to gamble with our water supply.

The climate crisis is descending on us with frightening speed. I urge you to help provide the foresight and leadership that is so urgently needed by Maine, the United States and indeed the entire world. I urge you to fulfill the the duty and responsibility bestowed upon you to protect Maine's precious and vital resources. At some point and at some place, human beings must start taking the climate crisis seriously. I urge you to make that time now and make that place here.

I have done extensive research on other aspects of Nordic Aquafarms, its existing operations in Norway and Denmark, and its proposed Belfast project, and I would be happy to answer any questions you might have on my testimony or any of these other areas.

Thank you,

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December 13, 2019

Salmonbusiness.com:

Banks skeptical about financing land-based fish farms: "Must have a better overview of the overall risks"

News by Andreas Witzøe

15 January 2019

"As a bank, we must have a better overview of the overall risks before we consider financing full-scale food fish farms in addition to the current traditional aquaculture," said Rune Søvdsnes, aquaculture manager at SR-Bank.

More and more people are planning large food fishing facilities on land in Norway. This week, SalmonBusiness was able to reveal that serial entrepreneur Geir Nordahl-Pedersen is planning three land fish farms with a total capacity of over 100,000 tonnes of salmon.However the entrepreneur didn't want to divulge anything about how the plant is financed.

There are big plans in the Nordic country. In southeastern Norway, Nordic Aquafarms are gearing up for their Fredrikstad facilty. In Western Norway in Møre og Romsdal, Salmon Evolution has been granted a license for a land-based salmon farm, which could become Europe's largest.

Norwegian banks, on the other hand, are still very skeptical about whether this is something to focus on in. DNB has previously stated that it will not contribute with funding at such facilities in Norway, but has stated that they interested facilities outside of Norway.

The risk is significant and unresolved

Aquaculture manager at Sparebank 1 SR-Bank, Rune Søvdsnes, said that they currently fund post-smolt facilities on shore, but believe it's too early before they are become interested in, and willing to, contribute to funding for land-based facilities.

"We are following developments, but for the time being, the bank only finances post-smolt facilities on land. Full-scale farming of salmon on land is still in a relatively early phase. The biological risk is currently both significant and unresolved. And we must remember that there are still major challenges for the post-smolt facilities that have been built," said Søvdsnes.

Søvdsnes believes it's important to have a better overview of the overall risk involved before they consider financing full-scale food fish farms in addition to what they finance today with traditional aquaculture.

"We must see (how) competitive land-based fish production is in the long term proves to be competitive (in relation to its current forms in the sea) both – on the cost *and* risk side- before even considering financing this type of plant," said Søvdsnes.

Requires significant equity and extreme competence from the developer
Vegard Helland, executive vice president of business Sparebank 1 SMN, said that, like Sparebank 1 SR-Bank, they contribute funding to post-smolt facilities onshore.

"Regionally, there have been no projects in the field of fish farming that have been aimed at us, nor have we wanted to contribute in such. In order for us to contribute with financing, the developer must set a considerable amount of equity, and not least, must demonstrate extremely good expertise," said Helland.

He believes the risks, in addition to the obvious biological risks in a relatively untested technology, are too large.

"Farming is volatile stuff, if you start with larger projects on land and it works, then we will soon see prices drop, but' we can risk not getting anything in return for what we have financed," said Helland.

He added that they believe the lowest production costs still exist in the sea and are uncertain whether lan-based fish production in Norway will pay off at all.

"If you farm in land, you must save costs on transport, and then it needs to be closer to the markets. As a bank, we have been involved in farming ever since the start and have a good overview of what works," he concluded.

salmonbusiness.com:

Aquaculture insurer on RAS: "Less than 2% premium, but over 5% of the losses"

News by Aslak Berge

5 March 2019

RAS insurance is a money losing project, explained AXA XL Catlin's global head of aquaculture insurance Geir Myre.

Land-based recirculating aquaculture systems, known as RAS, is the preferred form of growth in the aquaculture industry. Production of large smolt, in ever larger vessels and plants, helps to reduce production time in the sea – and exposure to salmon lice. At the same time, plans for new land-based salmon farms appear almost weekly on new markets.

The facilities must be insured, but do not appear as dream objects for an insurance company, at least not on a stand-alone basis.

Project
"(RAS has) less than 2% premium, but over 5% of the losses. This has so far been a loss making project for us." That is what Geir Myre, global head of aquaculture insurance at insurance company AXA XL Catlin, said during a presentation during the North Atlantic Seafood Conference in Bergen on Tuesday.

Myre pointed to a number of risk factors related to water quality, biology, crew, technological risk, genetics and hydraulics.

Need expertise
"This is our insurance risk," he said. "There are many small things that can go wrong. We need more expertise in place before we can assure it or if we are going to insure it."

Myre pointed out that there are now plans to erect RAS plants with standing biomass of up to 45,000 tonnes of salmon.

"It is too much for one insurance company. Then we must have a consortium," he pointed out.

Few providers

"But don't get me wrong – we are not 100 percent negative. We want more facts on the table. We must investigate this and become more familiar with it," emphasised Myre.

There is no flow of players who are engaged in biomass insurance in this segment.

"If you come with a RAS facility as a stand alone case, I will be surprised if you have more than two who can offer insurance. We are the only global player," he added.

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: December 13, 2019

Printed Name: Lawrence Reichard

Title: Mr.

Parties Assisting:

Name: Ruth Ann Burke Address: 17 SHS, Augusta Signature:

Name: Address: Signature:_____

Ruth Ann Burke
Notary Public, State of Maine
My Commission Expires February 21, 2022