

DMR's Assessment with Appendices

TO: **Beth Callahan**, Project Manager,
Dept. of Environmental Protection (DEP),
Bureau of Land and Water Quality Control - Augusta

FROM: Department of Marine Resources (DMR)

SUBJECT: Addendum Comments on impacts to fishing activity during construction of intake and discharge pipes and haul route for transport of excavated material

PROJECT: DEP Application #: 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

Applicant: Nordic Aquafarms
Location: Belfast
Type of Project: Construction of Intake and Discharge pipes

The above proposed project has been carefully reviewed and considered by DMR personnel. The following are DMR's comments:

Nordic Aquafarms, Inc. is proposing to develop a land based recirculating aquaculture system (RAS) to raise Atlantic salmon in Belfast Maine. This facility will require the construction of two 30-inch intake pipes draw in seawater from Belfast Bay. A single 36-inch discharge pipe will discharge in 35 to 36 feet of water. The discharge pipe will have 12-inch diameter flexible duckbill diffuser valves and spaced 50 feet apart.

At approximately 38 feet of mean low water depth the pipes will be laid directly on the sea floor. The pipes laid directly on the seafloor will be anchored with concrete pipe collars spaced every 15 feet on center. The total direct impact to the marine floor by the pipes and concrete anchors is 6703 square feet. These structures will be buried for a portion of their length, and then will emerge to a height between two to nine feet above the sea floor.

The proposed construction time window is November through March. The inter-tidal and shallow sub-tidal section where the pipes will be buried would take place in the November through the December period. All excavated material will be placed on a flat-top barge barges with concrete barriers and silt barriers to contain material as it is de-watered. It is expected to take 2-3 weeks to complete the inter-tidal construction work, and construction of the pipeline will be conducted 7 days a week. A silt barrier will be employed along the trench to minimize the turbidity of excavated material outside the trench construction area.

The submerged section of the buried pipes will be done from a spud barge with an excavator, and a clam-shell crane dredge will be utilized at deeper depths until approximately the 36 foot mean low water depth. Excavated material will be placed on flat-top barges with concrete barriers and silt barriers to contain material as it is de-watered.

Marine barge hauling operations will take place during daylight hours. The haul route will be a straight line from the Little River construction location to Mack Point Terminal in

Searsport approximately 5.5 miles away and the haul trip should take approximately one hour. A total of approximately 100 to 120 trips will be made to Mack Point, with each trip moving approximately 100 cubic yards of material. Approximately 20,000 cubic yards of material will be removed and the excess material will be disposed of at a licensed upland disposal site. The remaining material will be suitable for replacement back into the trench.

All barge transport activities will take place during daylight hours. At night, the barge will be anchored either at the construction site or off Mack Point in Searsport, depending on weather and timeline of construction activities. Anchorage will adhere to Coast Guard regulations to anchoring and lighting of commercial vessels.

DMR held a public meeting to take comments on the impact to commercial fishing activities in the construction site and along the proposed haul route on March 2, 2020. DMR heard from numerous individuals both at the public meeting and by written comment. One commenter, a shellfish aquaculture operator who holds a lease from DMR, expressed concerns about potential impacts to her nearby lease site, but these comments pertained to the discharge from the pipes rather than their construction and siting. Four individuals, all of whom are DMR-licensed commercial fishermen, provided relevant comments on impacts to fishing activities due to the construction activities and the haul route of the barge. Relevant written comments submitted for the record are attached for inclusion in the DEP record.

These individuals expressed concerns about issues beyond the scope of the hearing, including potential reduction in landings due to physical and biochemical changes of the marine environment resulting from the discharge through the pipelines and potential impacts to fishery resources due to concerns about possible resuspension of mercury during construction of the pipelines. Concerns regarding the impact of this project on spawning of cod and haddock were also mentioned though there is no active groundfish fishery in the area. DMR has already provided comment to DEP on potential impact to marine resources and the marine environment, and those comments remain an accurate representation of the Department's assessment of the overall project's impacts on resources and habitat within its jurisdiction. The comments that follow detail the relevant comments received through this public hearing and comment period, and DMR's assessment of the overall impact to fishing activity from the construction of the pipelines and the associated haul route to dispose of excavated material.

DMR recommends the use of a closed bucket dredge, where practicable for excavation activity in the sub-tidal to minimize the re-suspension of the sediments. This will minimize any potential impacts to shellfish and other marine species within the direct project location, including nearby aquaculture facilities. The use of turbidity curtains around the barge and excavation site will minimize impact to the nearshore marine environment.

Two fishermen expressed concerns with the haul route and anchoring of the barge interrupting fishing activities and possible gear loss. Fishermen in this area utilize traps while fishing for both lobster and crab throughout late summer and early fall months, and a directed crab fishery persists through the winter months. The exposed section of the pipes will pose a navigational hazard and entanglement risk to fishing gear if not adequately

marked. Traps are connected to a surface buoy by a vertical endline through the water column, and this line, as well as potential groundlines, if multiple traps are connected to the same endline, may become inadvertently entangled in these pipes. This impact can be mitigated with adequate measures to ensure fishermen are aware of their location, but adequate buffering to reduce the risk of entanglement also will increase the loss of available fishing area. We strongly encourage marking for navigational safety and to avoid entanglement, and would recommend marking requirements be determined in consultation with the United States Coast Guard.

While this area is not noted for high landings in the lobster fishery, compared to other parts of Penobscot Bay, the lobster fishery is territorial in nature; this area remains an important resource to local harvesters who are limited in their ability to move into other parts of the bay. For this reason, any loss of fishing bottom will have some impact on local fishermen. There were no specific comments about the particular location of the pipelines; rather, the concerns expressed were more about the general loss of fishing area. An area around Verona Island, down the Stockton Springs shore and across to Castine has already been closed by DMR to lobster and crab fishing due to mercury contamination in the area. This closure has impacted local fishermen by forcing them to move further down into the bay and has reduced the footprint of their winter crab fishery. While the pipeline area alone is not a significant area, it represents an additional area of exclusion in a discrete part of the bay.

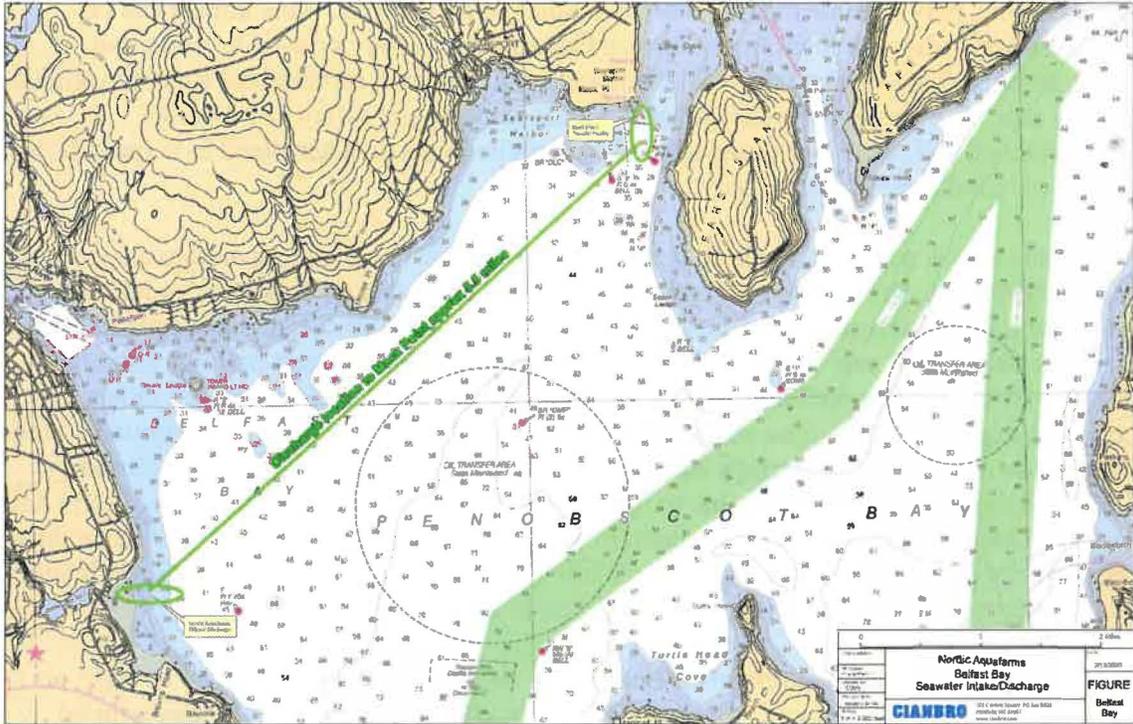
At the hearing, fishermen expressed concerns that some barge companies tend to “lay” on tow cable off Moose Point and “tear up” the bottom and entangle gear. The Department believes these interruptions will be manageable, and gear loss largely avoidable with appropriate notice and monitoring of the barge’s adherence to the noticed haul route. The DMR is not aware of any mobile gear fishing activity occurring in this area in recent years and received no comments on fishing activity related to the use of mobile gear.

In order to mitigate fishermen’s concerns, DMR requests the contractor conduct outreach via written notice thirty days in advance of the project start date to the local Lobster Zone Council, and coordinate with DMR staff who will send email notification to all Zone D members.¹ Notice should include specific nautical bearings of the haul route and width for the safe travel of the spoils barge to avoid entanglement with fishing gear. DMR further requests the anchorage of the barge at either the construction site or at a safe location off Mack Point, and the anchorages be included in the notice. DMR also requests the construction company contracted by Nordic Aquafarm equip their barge with a VMS (Vessel Monitoring System) to track its transit activity along the haul route, and provide a mechanism by which area fishermen may seek compensation for lost gear should the barge deviate from the specified haul route.

¹ Lobster Zone D Council membership contact information can be found at:

<http://www.maine.gov/dmr/council/lobsterzonecouncils/addresses.pdf>

DMR can assist with an email notification to all Zone D members. The contractor should provide information to Sarah Cotnoir, sarah.cotnoir@maine.gov.



Finally, DMR notes that in relation to its previous comments on impacts to the marine environment and marine resources, it is the agency's understanding that the U.S. Army Corps of Engineers intends to permit this project in accordance with its usual dredging standards, and will determine appropriate sediment analysis needed in accordance with that process. DMR is satisfied that this process will be adequate to resolve our concern.

Denis-Marc Nault
 DMR Environmental Coordinator
 Date: April 7, 2020

Rebuttal Testimony

Statement of David Black
JANUARY 16, 2020

My name is David Black, a resident of Belfast Maine, and a lobster fisherman working from Belfast Harbor for 56 years.

Please include the information in this statement as part of the discussion on applications before you regarding the Nordic Aquafarms proposal to construct multiple pipelines into Upper Penobscot Bay in Belfast and Northport for the purpose of providing the intake of seawater and the discharge of effluents from the RAS facility proposed by Nordic Aquafarms to be located in Belfast, Maine.

As a local lobster fisherman, I derive a significant portion of my annual income from the area beneath and adjacent to the proposed location of the Nordic Aquafarms pipeline. Therefore, I feel I have considerable local knowledge of the area and I feel obligated to use this opportunity to share some of that knowledge with you. I am sure that upon your total review of local information regarding this project many concerns will arise concerning the environmental dangers and consequences of this proposed pipeline.

HISTORY

Belfast Bay has a long productive history of fishing which has been diminished over time due to many municipal and industrial pollution sources. These pollution sources include decades of raw municipal sewage disposal from many points around the bay, untreated chicken waste from area poultry plants, fish waste from a long operating fish canning factory as well as mercury contamination in the bay from a facility on the Penobscot River. Add to these several dredging projects in Belfast, Searsport and other ports and you begin to see the degree of pollution this bay has suffered in the past.

I will discuss these pollution concerns separately:

Municipal Sewage

When I was young, raw sewage was a common sight in the bay. In recent decades, the municipal sewage outfalls around the Bay have mostly been identified and corrected. The result has been lower fecal coliform levels and increased availability of clean shellfish resources.

Industrial Waste

During the 20th century there were 2 poultry processing plants and 1 fish canning factory in Belfast that dumped untreated chicken waste and some fish waste through large pipelines directly into Belfast Harbor. The Harbor was so fouled with this effluent that Belfast Harbor was listed in the U.S. Coast Pilot publication as a harbor to avoid when cruising the Coast of Maine. After the closures of these factories, and the elimination of these discharge pipes, the bay is cleaner and more appealing to the public and is becoming a destination for many visitors to "Vacationland". However, I can tell you that today the remnants of those discharges remain in the sediment on the bottom of the bay. I believe it will take many a lifetime for this area to completely clean itself.

Dredging

In my experience, whenever there was a dredging project at Mack Point in Searsport Harbor, the lobster catch in the area slowed for several years until the environment recovered. Additionally, when Belfast Harbor was dredged in 2003, it took a decade for the environment to recover according to a letter from a prominent Lobster fishermen's Association to the U.S. Army Corps of Engineers dated May 4, 2013. Please note that the most recent attempt to dredge Searsport Harbor was cancelled due to environmental concerns.

Mercury Contamination

Mercury contamination in the bay from decades of unconfined industrial mercury pools in the Penobscot River being moved downriver by the current has resulted in 13 square miles at the mouth of the Penobscot River being closed to all lobster and crab fishing due to methyl mercury contamination in these shellfish. Further studies by the federal court that is reviewing the source of that pollution have identified buried mercury in other areas of the bay and specifically in the area of the proposed Nordic Aquafarms pipeline.

IMPACTS OF THIS PROJECT

Can we now feel comfortable with a new pipeline proposal by Nordic Aquafarms to be constructed in Belfast Bay based upon this history? Each of the aforementioned sources of pollution were the result of projects permitted by the State of Maine and the Federal government over long periods of time.

I can think of several reasons to be very cautious with this project and they are as follows:

- This proposed pipeline is to be located just over a mile from a recent and very controversial failed attempt to dredge Searsport Harbor.
- Dredging and blasting resulting from this project will produce the same impact as other dredging projects in the area.
- The construction and operation of this pipeline is directly in an area identified as containing buried mercury that would be continuously impacted releasing mercury to be ingested by sea life resulting in further closures of lobster and crab fishing areas where I make my living.

CONCERNS

This project proposes discharging 7.7 million gallons of brackish and warm water into the bay every day! I was told by the project engineer for this RAS facility that this volume of water equals nearly 50 percent of the total water volume of this RAS facility being discharged daily. There is presently a RAS system located in Franklin, Maine which is run by the University of Maine. The operator of that facility has stated that they discharge only 10 percent of the total water volume daily, a significant difference from what Nordic is proposing. This is water that would be heated to between 5 degrees Fahrenheit and 30 degrees Fahrenheit above the ambient temperature of seawater from the bay (depending on the time of year) combined with ground water from wells. It is very unreasonable to assume that this water which has been described by the applicant as cleaner than the water being pumped into the facility from the bay, should be discarded so soon after mixing and heating. This does not sound like a RAS

facility at all but rather a flow thru system. It is my opinion that the discharge of this warm and brackish water will cause lobsters to leave the area for more saline and temperate conditions. This concern alone will cause great economic hardship for myself and other local fishermen.

- The chief technical officer for Nordic Aquafarms explained to me one day in his office that all discharge water from this facility will be run through a 0.4 micron filter before reentering the bay. Again, at the RAS system run by the University of Maine the minimum water filter is 30 microns, almost 80 times larger than the filters being proposed by Nordic! The manager of that facility stated that filters finer than 30 microns would clog quickly and be of no value.

- Nordic Aquafarms has submitted technical data with their applications stating that lobsters are absent from this area of the bay. According to DMR statistics, the total annual landings of lobsters for Waldo County have nearly doubled in the past decade. The proposed location of this pipeline is where this reported resource exists and thrives.

- The present design of the pipeline indicates an elevated structure secured by chains and anchors. These anchors are proposed to be attached in the silty bottom sediment directly in an area of methane pockets which have been determined by state geologists to be unstable.

-Traditionally this very area of the Bay has been an occasional anchorage area for ocean going ships that for various reasons choose not to anchor closer to the port of Searsport.

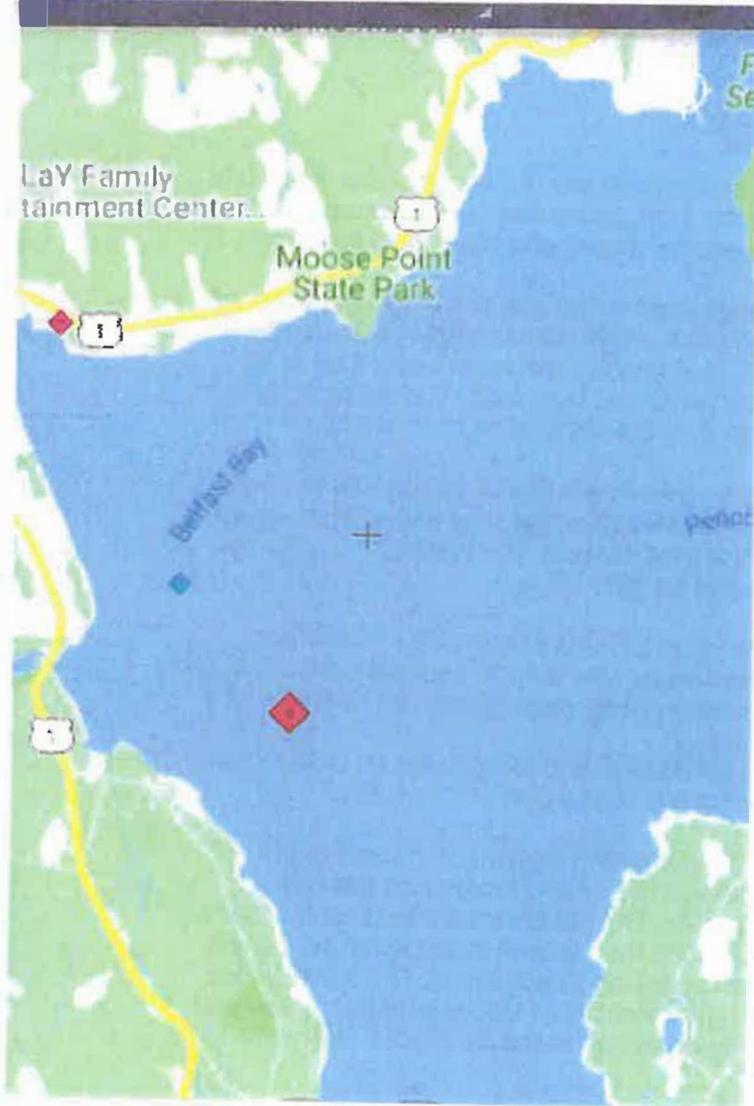
As a fisherman working on this bay for 56 years, I have become a mentor for some of the younger fishermen that are hoping to have opportunities to live and prosper on this bay , similar to those which I have enjoyed for much of my life. The old timers always told me that it was my responsibility to leave this bay in better condition than when I found it, for the benefit of the next generations, and that is exactly why I am speaking to you today. The construction of this pipeline will do nothing to improve the health and viability of Upper Penobscot Bay and will only serve to diminish the quality of life presently essential for the survival of its' many inhabitants.

Please exercise your responsibilities as representatives of the people of Maine and understand that a better solution for the treatment of waste water from RAS aquaculture must be found other than this out of sight and out of mind pipeline. Your vote in opposition to this project is in order.

I CERTIFY THAT UNDER PENALTY OF PERJURY THAT THE FOREGOING STATEMENT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Respectfully submitted


David Black



MG/MLU 3

Statement of David Black
February 12, 2020

Mr. Duchesne, presiding officer, members of the Maine Board of Environmental Protection and staff, my name is David Black. I am a seventh generation inhabitant of this area, a resident and taxpayer of Belfast, Maine USA, and a lobster fisherman working in Upper Penobscot Bay for 56 years.

Please include the information in this statement as part of the discussion on applications before you regarding the Nordic Aquafarms proposal to construct multiple pipelines into Upper Penobscot Bay in Belfast and Northport for the purpose of providing the intake of seawater and the discharge of effluents from an RAS facility proposed by Nordic Aquafarms to be located in Belfast, Maine.

As a local lobster fisherman, I derive a significant portion of my annual income from the area beneath and adjacent to the proposed location of the Nordic Aquafarms pipeline. Therefore, I feel I have considerable local knowledge of the area and I feel obligated to use this opportunity to share some of that knowledge with you. I am sure that upon your total review of local information regarding this project many concerns will arise concerning the environmental dangers and consequences of this proposed pipeline.

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Pipeline

In the year 2000, a sewer line was removed from the Belfast footbridge, and it was relocated and extended East to West across the bottom of Belfast Harbor. This project stopped the summer migration of lobsters into the river which previously had produced very productive fishing for some. The lobster resource in this area never recovered.

Mercury Contamination

Mercury contamination in the bay from decades of unconfined industrial mercury pools in the Penobscot River being moved downriver by the current, has resulted in 13 square miles at the mouth of the Penobscot River being closed to all lobster and crab fishing due to methyl mercury contamination in these shellfish (the Nordic site is less than 6 miles directly downstream from that closed area). Further studies by the federal court that is reviewing the source of that pollution have identified buried mercury in other areas of the bay and specifically in the area of the proposed Nordic Aquafarms pipeline.

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Can we now feel comfortable with a new pipeline proposal by Nordic Aquafarms to be constructed in Belfast Bay based upon this history? Each of the aforementioned sources of pollution were the result of projects permitted by the State of Maine and the Federal government over long periods of time.

I can think of several reasons to be very cautious with this project and they are as follows:

- This proposed pipeline is to be located just over a mile from a recent and very controversial attempt to dredge Searsport Harbor which failed due to environmental concerns.
- Dredging and blasting resulting from this project will produce the same impact as other dredging projects in the area.
- The construction and operation of this pipeline, 6 miles downstream of the area closed due to mercury contamination, is directly in another area identified as containing buried mercury that would be continuously impacted by this project, releasing mercury to be ingested by sea life resulting in further closures of lobster and crab fishing areas where I make my living.

CONCERNS

This project proposes discharging 7.7 million gallons of brackish and warm water into the bay every day! I was told by the project engineer for this project that this large volume of water equals nearly 50 percent of the total water volume of this RAS facility being discharged daily. There is presently an RAS system located in Franklin, Maine which is run by the University of Maine. The operator of that facility has stated that they discharge only 10 percent of the total water volume daily, a significant difference from what Nordic is proposing. This is water that would be heated to between 5 degrees Fahrenheit and 30 degrees Fahrenheit above the ambient temperature of seawater from the bay (depending on the time of year) combined with ground water from wells which will unquestionably lower the salinity of the discharge water.

It is very unreasonable to assume that this water which has been described by the applicant as cleaner than the water being pumped into the facility from the bay, should be discarded so soon after mixing and heating. This does not sound like an RAS facility at all, but rather a flow thru system. It is my opinion that the discharge of this warm and brackish water into Penobscot Bay will cause lobsters to leave the area for more saline and temperate conditions. This concern alone will cause great economic hardship for myself and other local fishermen.

- The chief technical officer for Nordic Aquafarms explained to me one day in his office that all discharge water from this facility will be run through a 0.4 micron filter (now 0.04 microns) before reentering the bay. Again, at the RAS system run by the University of Maine the minimum water filter is 40 microns, about 100 times larger (or 1000 times larger depending on which filter you are talking about) than the filters being proposed by Nordic! The manager of that facility stated that filters finer than 40 microns would clog quickly and be of no value.

- Nordic Aquafarms has submitted technical data with their applications stating that lobsters are absent from this area of the bay. According to DMR statistics, the total annual landings of lobsters for Waldo County have nearly doubled in the past decade. The proposed location of this pipeline is where this reported resource exists and thrives.

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-Traditionally this very area of the Bay has been an occasional anchorage area for ocean going ships that for various reasons choose not to anchor closer to the port of Searsport.

As a fisherman working on this bay for 56 years, I have become a mentor for some of the younger fishermen that are hoping to have opportunities to live and prosper on this bay , similar to those which I have enjoyed for much of my life. The old timers always told me that it was my responsibility to leave this bay in better condition than when I found it, for the benefit of the next generations, and that is exactly why I am speaking to you today. The construction of this pipeline will do nothing to improve the health and viability of Upper Penobscot Bay and will only serve to diminish the quality of life presently essential for the survival of its' many inhabitants.

Please exercise your responsibilities as representatives of the people of Maine and understand that a better solution for the treatment of waste water from RAS aquaculture must be found other than Nordics' out of sight and out of mind pipeline. Your vote in opposition to this project is in order.

Thank you for listening.

I CERTIFY THAT UNDER PENALTY OF PERJURY THAT THE FOREGOING STATEMENT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Respectfully submitted

David Black

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to whom this may concern
at D. M. R.

This note is in regard
to Nordic aque forms intake
and discharge pipe and the
effect it may have to the ^{lobster} fishing
in the Northport, Belfast area.

The bay has been the clearest
that it's ever been for many
years.

Dredging and digging for the
Nordic intake and discharge pipes
will disrupt the mercury that
is buried at the great time
which would probably close down
the rest of the upper Penobscot Bay
for all fishing.

Penobscot Bay is spawning ground
for Codfish and haddock, this
area also has lobster, Crabs, clams,
shrimp scallops and many other
species. Also there is muskell
1000 south of the proposed
intake and discharge pipes.

Recommended by Dr. Pettigrew, who's
a professor at the University of Maine,
that an environmental test of the

upper Penobscot bay for the
current, tide, salinity, nitrate levels
etc. a year long test from the
ocean bottom to the surface which
should cover Belfast, Northeast and
Harboro areas.

The fishermen in zone D district II
are hopeful that the D.M.R. will
make the recommendation so
that the lobster and crab fishing
will be preserved and not
harmful and the fishing continues
as good as it is now for
future generations.

STATEMENT OF WAYNE CANNING

My name is Wayne Canning and I am the District 11 representative for the State of Maine Zone D Lobster Management Policy Council. I represent 100 lobster fishermen in this area. ~~(Attached is list of names and commercial lobster license numbers of all fishermen that I represent in Zone D, District 11).~~ The purpose of this statement is to provide concerns and facts to the Maine Board of Environmental Protection regarding the licensing request for intake and discharge pipes proposed by Nordic Aquafarms for their RAS project located in Belfast and Northport.

While every fisherman in Zone D and in Penobscot Bay would be adversely impacted by this project, those individuals in my District, District 11, would be impacted the most. As I discuss this project with fishermen regularly, it is very clear that a majority of the fishermen working in the area of this proposed pipe are very concerned and opposed to this project.

Local fishermen have the best knowledge of the conditions in the bay, and have seen the impacts of other similar projects which have caused great harm to the environment in Upper Penobscot Bay. Examples follow:

- Periodic dredging at Mack point in Searsport causes lobster production to decline in areas close to the projects.
- The dredging of Belfast Harbor in 2003 caused a sharp decline lobster production that lasted for a decade. ~~(See attached letter from DELA).~~
- The placement of a sewer pipeline across Belfast Harbor in the year 2000 stopped lobster migration into the inner harbor and up the river. This area had previously been very productive lobster fishing, and has never returned to its earlier production.

The Nordic Aquafarms pipeline as proposed will affect lobster fishing in Upper Penobscot Bay in the following ways:

- Dredging and blasting for construction of this pipeline will cause lobsters to avoid the area the same as it does in any other dredging project.
- Buried mercury is a known contaminant in the bottom sediment in this area. This mercury contaminated sediment, found to be in this locations during the federal court's Penobscot River Mercury Study, will obviously be disturbed not only by dredging and blasting, but by the continuous operation of this pipeline.
- The Penobscot River is now closed to all lobster and crab fishing as far South as Stockton Harbor due to methyl mercury contamination found in samples of the lobsters and crabs taken from that area. This contamination was caused by buried mercury in the river being dislodged solely by river currents. When that area was closed, several fishermen including myself were displaced and can no longer fish there. **WE DO NOT WANT THE SAME THING TO HAPPEN IN BELFAST BAY BECAUSE OF THE NORDIC AQUAFARMS PIPELINE, IT'S CONSTRUCTION AND IT'S OPERATION.**
- As any fisherman can tell you, lobsters are very sensitive to even slight changes in the environment. This project proposes to dump enormous amounts of brackish and warm water (15°-18° Celcius; 59°-64.4° Fahrenheit) into a small area of Belfast Bay. This alone will cause lobsters and crabs to move away and not return to the area. Many fishermen will be displaced by the impacts of this project. Due to the very territorial nature of the lobstering society, it is almost impossible to relocate your fishing business to someone else's area. Many conflicts would arise.
- Interestingly, this pipeline is located just over 1 mile from the proposed dump site for the Searsport Harbor Improvement Dredge Project that resulted in huge controversy and was finally canceled because it would have caused so much destruction to the environment. **THE NORDIC AQUAFARMS PROJECT SHOULD NOT BE APPROVED FOR VERY SIMILAR REASONS.**

Lobster landings in this area have doubled in the last decade when there has been no disruption of the bottom sediments. (see State landings data for Waldo County). Nordic Aquafarms' claims that this area has few lobsters is simply false. While landings in this area are lower than other areas of the state, it is a

very important industry for Waldo County. Remember that this is a very small area, and up to 100 fishermen make a living here year in and year out. The lobster landings by these 100 fishermen are worth 3 to 5 times the amount of those landings to the local Midcoast economy according to the Maine Lobster Institute. This is a significant economic contribution to the Maine economy that will be lost if this project is allowed to proceed.

Additionally, there are several local fishermen who fish for crabs in the winter months that would be adversely impacted by this project - as would the other local businesses that then sell the catch these lobstermen bring in.

Underwater pipelines have been the root and cause of many environmental disasters over time, and this project will be no different. The few jobs that may be created by this pipeline on the mainland will be more than offset by the displaced fishermen and lost jobs of the fishermen in my District. The ripple effect in the restaurant and tourism industries will also be significant.

Sincerely,
Wayne Canning
Zone D District 11 representative



Farmed salmon discharges questioned

BELFAST - The Nordic Aquaculture project public hearings progress with some speculation that intake and out flow pipelines may cause some environmental concerns for city and state agencies. Nordic anticipates a daily outflow of 7.7 million gallons of brackish water into the Bay. The water would be 2/3 salt, 1/3 fresh, and range from 3-12 degrees warmer than the receiving water. The mouth of the outflow pipe would be 2/3 mile out, in 32 feet of water, directly in line with Bayside Village and Lincolnville Beach. In Nordic's dispersal modeling, they estimate it takes two weeks on average for discharge to move out of the Bay to deep ocean currents. This means there could be in excess of 1 billion gallons of discharge collecting near the outflow at any given time.

Filtration is expected to remove 99% of particulate matter and 86% of soluble nitrogen. However, anticipated particulate density after filtration is higher than what is currently in the Bay with 14% of soluble nitrogen that cannot be filtered will amount to 1,600 lbs per day. On an average day, the Belfast Water Treatment plant discharges between 100-130 lbs of soluble nitrogen. Nordic would discharge 12-16 times more nitrogen than the City of Belfast. Additionally Nordic would discharge 6 pounds of phosphorous daily impacting bay water present standards.

Compared to Holtra-Chem's daily discharge of mercury to the Penobscot River in the past decades with subsequent retention of this poison in the bay, an argument pro and con for Nordic's plan has had discussion brewing locally in reports by area newspapers and on social media. *Source: Penbay Pilot*

Comments

**DMR Public Hearing Regarding Fishing Industry Impacts of Proposed Project for
Nordic Aquafarms Inc. in Belfast, Maine**

Date: March 2, 2020

TO: Sarah Cotnoir
Maine Department of Marine Resources
21 State House Station
Augusta, Maine 04333

FROM: Dianne Kopec, PhD
479 Beechwood Ave.
Old Town, ME 04468
dkopec@maine.edu
207-827-1027

I am writing to discuss background information on mercury contamination in Penobscot Bay relevant to the proposed Nordic Aquafarms, Inc. project in Belfast, Maine. Between 2007 and 2014 I was the Staff Biologist for the Penobscot River Mercury Study (PRMS), a court-ordered study that examined mercury contamination, from the former HoltraChem chlor-alkali plant in Orrington, Maine, in the lower Penobscot River and Penobscot Bay. In the 2013 PRMS Phase II report summarizing our findings I was the lead author on Chapters 14 and 16 documenting mercury contamination in the lobster, fish, shellfish, invertebrates, and birds of the aquatic and terrestrial food webs impacted by the HoltraChem discharges, and co-author of an additional 14 chapters. I also authored three peer-reviewed journal articles on our findings and co-authored an additional five journal articles.

Existing data on the concentration of mercury in the nearshore sediment south of Belfast should be considered when reviewing the planned dredging operations associated with construction of the intake and discharge pipes from the proposed Nordic Aquafarms plant in Belfast. Between 2006 and 2012 the Penobscot River Mercury Study (PRMS) examined mercury contamination in the lower Penobscot River and Penobscot Bay from the former HoltraChem chlor-alkali plant in Orrington, Maine. Sediment core samples were collected in 2009 from multiple sites in Penobscot Bay and the river (Yeager 2013). The sediment cores were analyzed for total mercury in 1 to 2 cm slices from the surface down to a depth of 40 cm, then in 5 cm slices to a depth of 90 cm, providing a thorough account of the mercury concentrations at the chosen sample sites.

Included in the 2009 sediment work were cores from three sites sampled approximately 2 km north of the proposed Nordic Aquafarms (NAF) pipeline dredging area. Those cores, listed below in Table 1, provide sediment mercury concentrations from the surface sediment down to

a depth of 90 cm for the nearshore area south of Belfast. Core o8A is close to shore, core o8C is approximately 1 km offshore and core 7A is roughly 4 km offshore.

Table 1. Total mercury (Hg) concentrations in sediment sampled in the nearshore area south of Belfast in 2009.

Core #	Surface Sediment Hg 0 – 3 cm; mean (ng/g dw)	Deep Peak sediment depth (cm)	Deep Peak Hg (ng/g dw)
ES o8A o9V	347	15-16	495
ES o8C o9V	299	15-16	370
ES o7A o9V	304	6-7	346

Several findings given in Table 1 are important to note. The surface sediment mercury concentrations from the three sites were over six times greater than background sediment mercury concentrations for estuaries along the central Maine coast, reported by Bodaly (2013) as 25 – 50 ng/g dw. Further, the peak sediment mercury concentrations were not at the surface, but rather at a depth of 6 to 15 cm.

Surface sediment concentrations are most relevant to mercury contamination of biota, unless the sediment is disturbed. Most sediment mercury is in the inorganic form which has limited accumulation in organisms. Mercury in surface sediment is exposed to methylating bacteria in an environment amenable to transforming the inorganic mercury into organic methyl mercury, which is highly bioavailable, and which biomagnifies in aquatic food webs. If the sediments are disturbed and mixed, then the inorganic mercury sitting in the deeper sediment can also be methylated and enter the food web. Mercury concentrations in surface sediment are directly related to mercury concentrations in benthic foraging marine organisms.

The Penobscot River Mercury Study also examined mercury in lobster, and other shellfish, fish, and bird species. Mercury concentrations in lobster sampled to the south of Belfast were two to four times lower than found in lobster from the DME lobster closure zone near the mouth of the Penobscot River. Lobster were sampled in 2008, 2009 and 2010 in the area of Kellys Cove, south of Belfast, as part of Phase II of the study. Lobster from the Kellys Cove area had the lowest mercury concentration in tail muscle found in any of the northern Penobscot Bay sample sites (average of 100 ng/g ww, adjusted for carapace length, Kopec and others 2019), though still double the mercury concentrations in tail muscle from lobster sampled in Frenchman Bay in 2017, outside of the aquatic influence of the HoltraChem discharges (median mercury concentration 39 ng/g ww; Amec Foster Wheeler 2017). The mercury concentrations in lobster tail sampled from the current DMR lobster closure zone averaged 200 to 400 ng/g ww (Kopec and others 2019), two to four times greater than found in lobster from Kellys Cove.

Similarly, surface sediment concentrations (0 – 3 cm) in the south Belfast area were, on average, half of the average surface sediment concentration found in the DMR lobster closure zone (11 sites, average total mercury concentration 679 ng/g dw, 0-3 cm). However, within the lobster closure zone, surface sediment concentrations ranged from 332 to 916 ng/g dw (Yeager

2013). This wide range in surface mercury concentrations reflects variation in sediment characteristics and deposition patterns, and current and circulation patterns within Penobscot Bay. Note that the lower end of the range of surface sediment mercury concentrations in the lobster closure zone is equivalent to the surface sediment concentrations reported for the sampled area given in Table 1, north of the proposed NAF pipeline dredging operation. No data are available on the actual sediment mercury concentrations along the proposed route of the NAF pipelines.

It is important to conduct thorough sediment core analyses of the specific area proposed for dredging to install the NAF intake and discharge pipelines. This work should follow the coring and analytical methods used in the Penobscot River Mercury Study in order to generate an accurate description of the sediment mercury concentrations at all relevant depths. Cores should be sectioned for mercury analysis in 1 cm slices to a depth of 20 cm, then in 2 cm slices to a depth of 40 cm, then in 5 cm slices to a depth of 90 cm. This method will ensure a full characterization of the distribution of mercury in the sediment underlying the proposed pipeline route and allow the regulatory agencies to make informed decisions on any risks to biota associated with the proposed dredging and how best to dispose of any dredge spoils.

There are many economic and environmental advantages to land-based aquafarms, but like all new operations the preparatory work must be thorough and site-specific to ensure that unintended harm to the broader environment does not occur. Please contact me if you have any questions.

References:

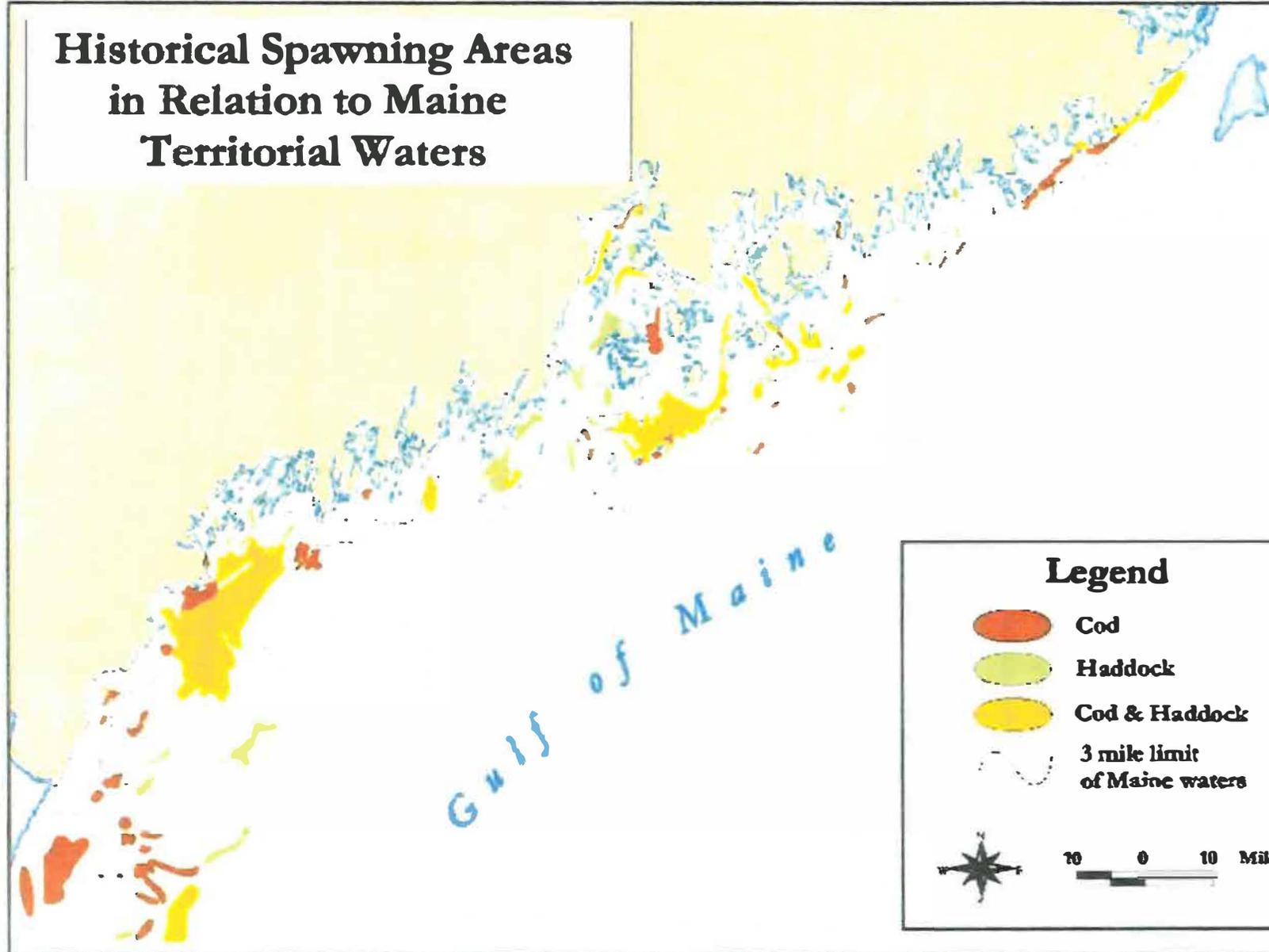
Amec Foster Wheeler 2017 . 2017 Biota Monitoring Report. Penobscot River Phase III Engineering Study. Prepared for U.S. District Court. Project No. 3616166052.

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Historical Spawning Areas in Relation to Maine Territorial Waters



Legend

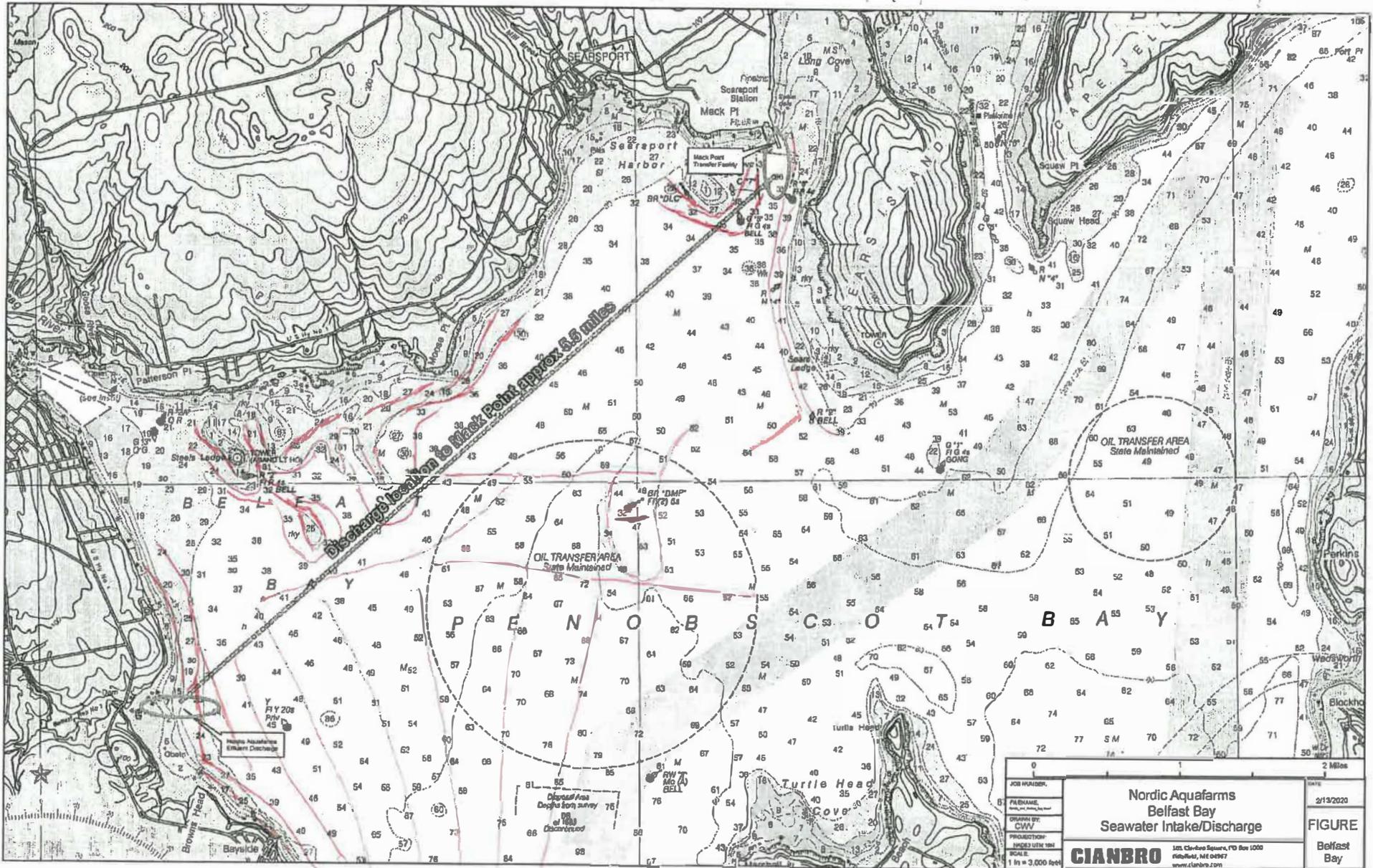
-  Cod
-  Haddock
-  Cod & Haddock
-  3 mile limit of Maine waters



10 0 10 Miles

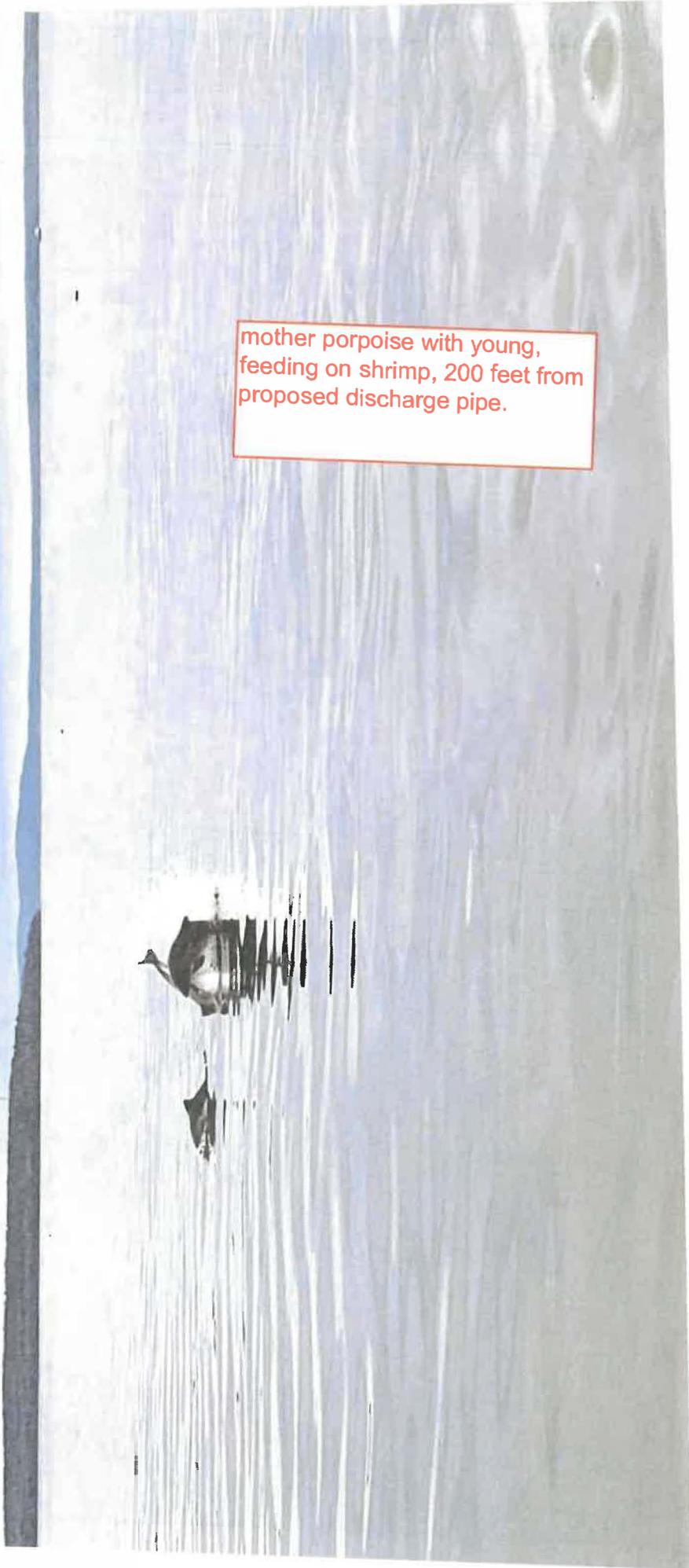
135 traps + 12 = Traps

Nov - mid April



Red Lines = Lobster Traps

mother porpoise with young,
feeding on shrimp, 200 feet from
proposed discharge pipe.



186 Northport Avenue
Belfast, Maine 04915
March 4, 2020

Ms. Meredith Mendelson
Deputy Commissioner
Maine Department of Marine Resources
21 State House Station
Augusta, Maine 04333

RE: Nordic Aquafarms

Dear Ms. Mendelson,

On March 2, 2020 I attended the DMR public hearing held in Belfast to offer comment on the possible impacts on commercial fishing by the Nordic Aquafarms RAS project and its pipelines. At that time, I presented both verbal, as well as written testimony to the DMR. Please consider this letter as part of that commentary regarding the dredging portion of the project, and the associated haul route for dredge spoils that will be generated. This project will have a direct impact upon my lobster fishing business within the bounds of Belfast, Northport, Searsport, and potentially the town of Islesboro.

I am a lobster fisherman homeported in Belfast, and I have fished in this area almost continuously since 1964, with the exception of time spent serving my country with the U.S. Navy in the 1970's. This is my home, and this is where I make my living. It would not be feasible for me to relocate myself to another area because of a large foreign company, who has no concept for the local traditions of the lobster industry in Maine, and who wants me out of their way. Their only goal is to push their way into this area by taking land and destroying resources along the way while exhibiting a total disregard for anyone else's existence. This approach is certain to destroy the spectacular gift that is Penobscot Bay.

According to information presented at the DMR hearing, in the event that proper permits are issued, this dredging project and disposal of spoils will take place between November and April of some future year. In past years, I have fished in the area of this project from May until the end of December (see attached plotter printout showing the location of my fishing effort in the area). The overlap between my fishing "season" and this dredging and disposal project occurs in November and December which in recent years have become more productive months due to an increase in the water temperature of the bay. This change in water temperature has resulted in a later out migration of lobsters than was evident in past years and decades. The environment in this area of Penobscot Bay is changing very rapidly.

The dredging part of this project and the fact that dredge spoils will be removed from a trench, temporarily stored on the bottom adjacent to that trench, and then redeposited in the area as cover material is very disturbing. Please review the letter to the Maine BEP dated January 24, 2020 (attached) in which the author Mr. Denis-Marc Nault stated that " DMR requests suitable sediment testing along the proposed pipes for potential contaminants". Also please see Penobscot River Mercury Study chart (attached). This dredging project alone could very well result in the closure of this area to lobster and crab fishing. Let me remind you that your agency has already closed a 13 square mile area at the mouth of the Penobscot River to

lobster and crab fishing due to mercury contamination. That is an area only 5 miles from the Nordic Aquafarms site that I can no longer access for fishing, and for which there will never be compensation.

Additionally, the disposal route between the dredge site and Mack Point Seaport passes directly through my lobster gear (see attached disposal route chart) at a time when I am enjoying my most productive fall fishing. Since I fish my lobster gear in 2 trap trawls (pairs), each time I lose just one buoy to tug and barge traffic, which is the exact method of transportation being proposed for this project, the result is a loss in equity of over \$300 to my business. I can not tolerate any losses of this nature. Furthermore, I cannot fish in any other territory.

Before any permits for this project are issued, I implore you to demand that the applicant complete a comprehensive **Environmental Impact Statement** of the entire area of Penobscot Bay which may be impacted by this project.

Finally, since I am now one of the senior fishermen in the bay, I have become a mentor for the younger fishermen. The old timers always told me to leave this bay better than it was when I found it, and I intend to do just that, and it is your responsibility to do the same.

In conclusion, do not approve any permits for dredging, or pipeline construction in this area of Penobscot Bay.

LEAVE THIS BAY BETTER THAN IT WAS WHEN YOU FOUND IT! I INSIST

Sincerely,

A handwritten signature in black ink, appearing to read 'David F. Black', written in a cursive style.

David F. Black

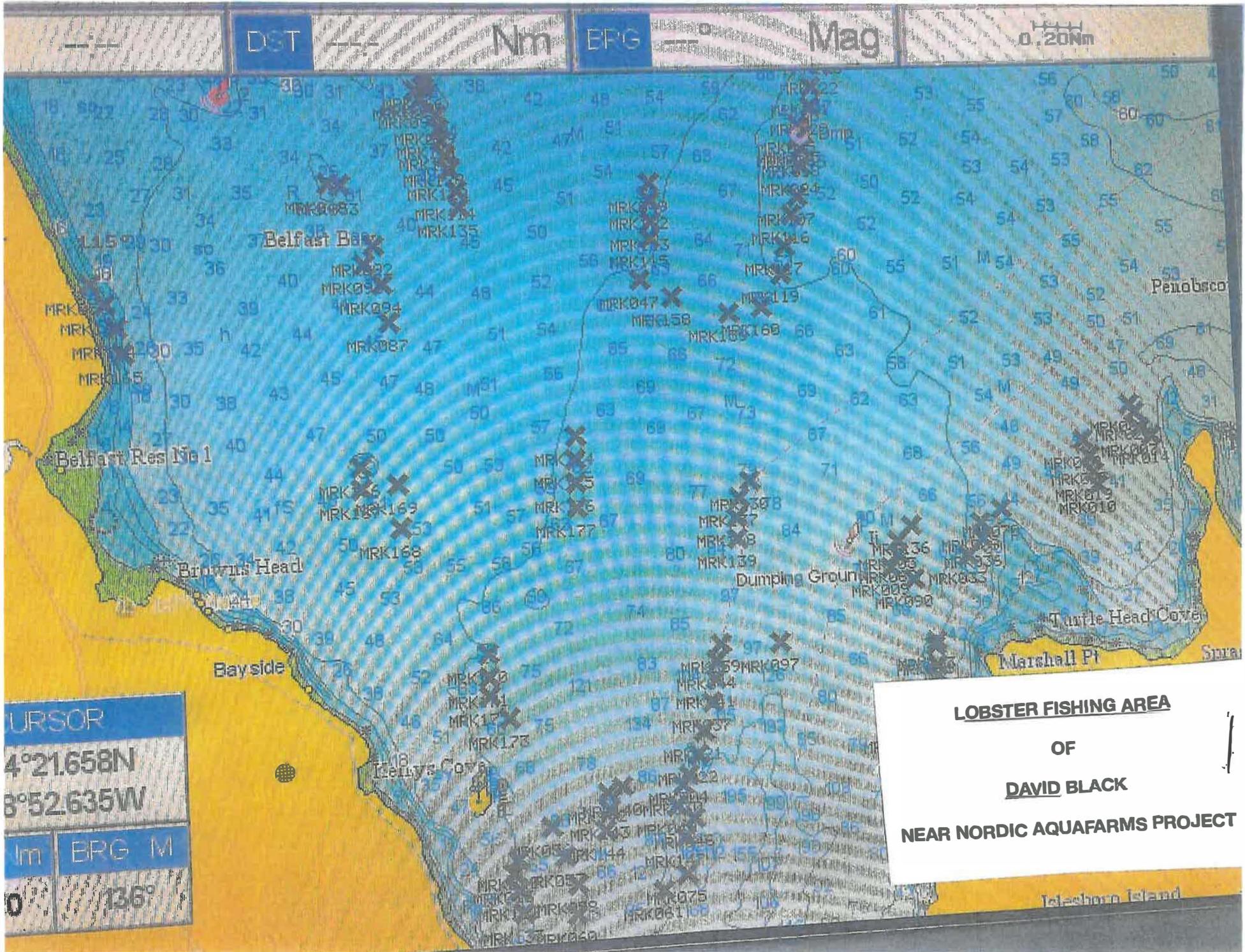
DST

Nm

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CURSOR
 4°21.658N
 8°52.635W

Im	ERG	M
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LOBSTER FISHING AREA
 OF
DAVID BLACK
 NEAR NORDIC AQUAFARMS PROJECT

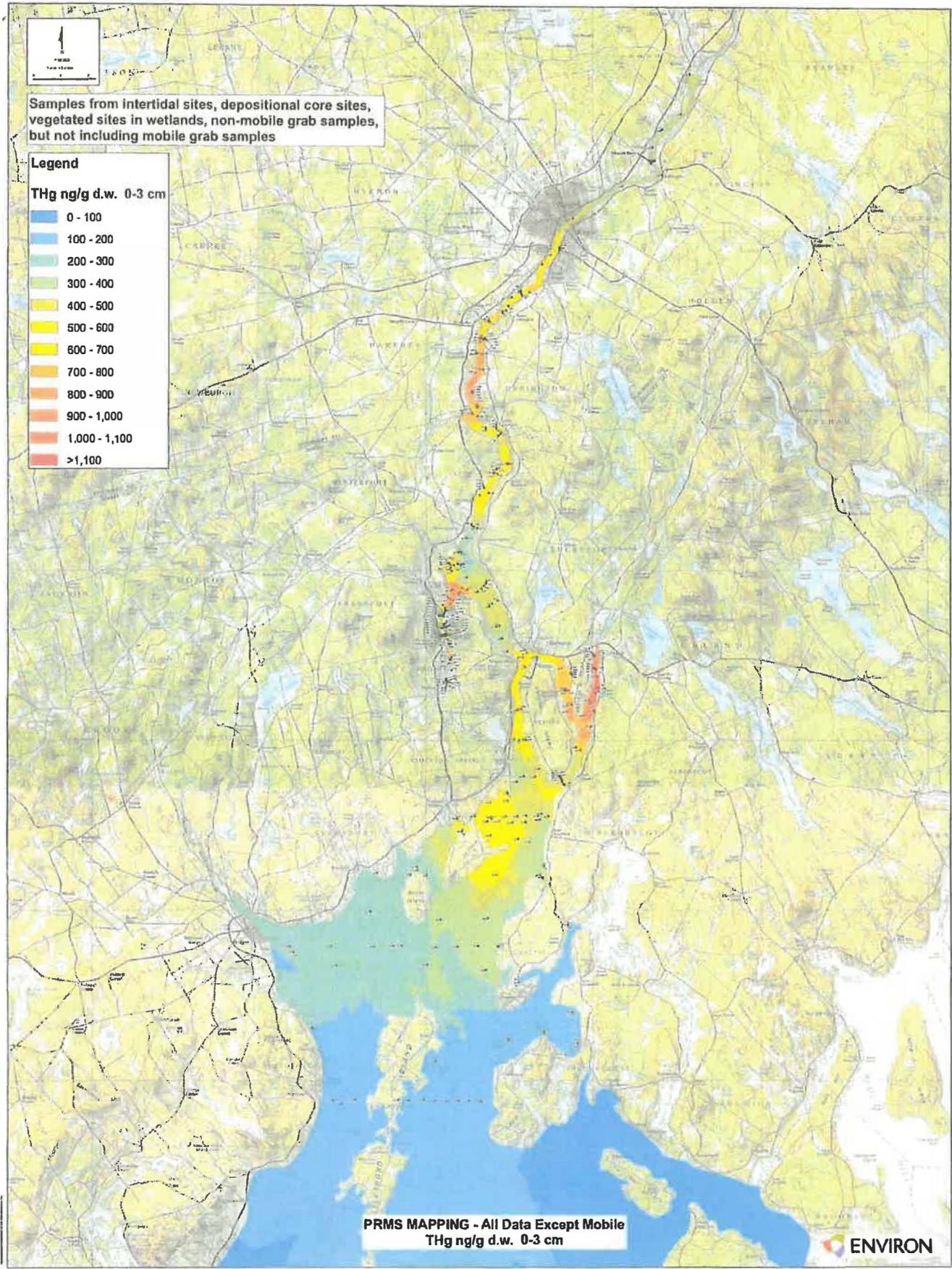


Samples from intertidal sites, depositional core sites, vegetated sites in wetlands, non-mobile grab samples, but not including mobile grab samples

Legend

THg ng/g d.w. 0-3 cm

0 - 100
100 - 200
200 - 300
300 - 400
400 - 500
500 - 600
600 - 700
700 - 800
800 - 900
900 - 1,000
1,000 - 1,100
>1,100



PRMS MAPPING - All Data Except Mobile
THg ng/g d.w. 0-3 cm



TO: **Beth Callahan, Project Manager**
Dept. of Environmental Protection,
Bureau of Land and Water Quality Control - Portland

FROM: Department of Marine Resources (DMR)

DEP Number: L-
Applicant: Nordic Aquafarms
Location: Belfast
Type of Project: Construction of Intake and Discharge pipes

The above proposed project has been carefully reviewed and considered by DMR personnel. The following are DMR's comments:

Nordic Aquafarms, Inc. is proposing to develop a land based recirculating aquaculture system (RAS) to raise Atlantic salmon in Belfast Maine. This facility will require the construction of intake and discharge pipes to operate the RAS facility. Seawater will be taking from and discharged to Belfast Bay. The two 30-inch intake pipes will be approximately 6000 feet long and draw in fresh seawater at approximately 70 feet of depth. The proposed intake pipes will be approximately 8 feet off the sea floor at its terminus. The single 36-inch discharge pipe will be approximately 3300 feet long and discharge in approximately 35 to 36 feet of water. The discharge pipe will have 12-inch diameter flexible duckbill diffuser valves. These wastewater diffuser valves will be spaced 50 feet apart.

The intake and discharge pipes will be buried across the inter-tidal and shallow sub-tidal to a maximum depth of 10 feet with a minimum of 5 feet of cover. The cover material in the trench will be the excavated marine sediments suitable for backfill directly on the pipes. All excess material will be loaded onto trucks and disposed of at an upland facility. A total of approximately 36,000 cubic yards of material will be excavated over approximately 108,000 square feet (2.4 acres).

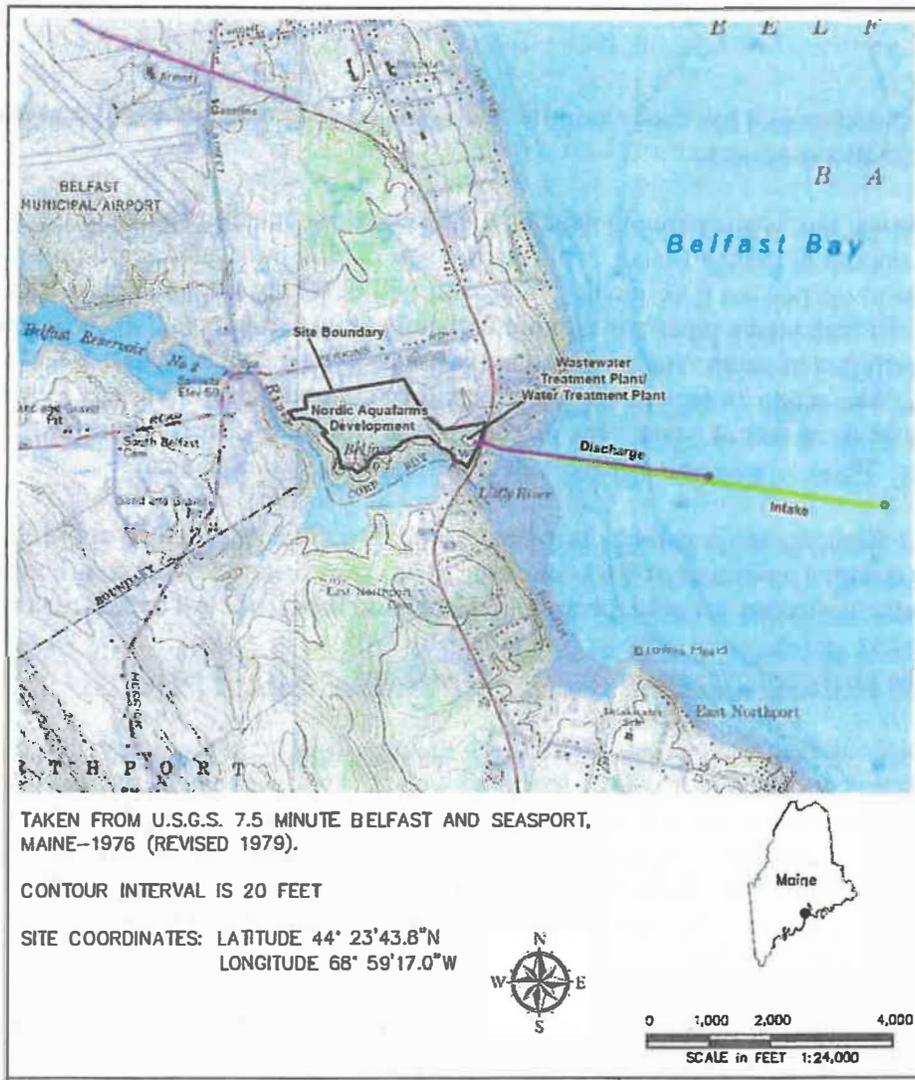
At approximately 38 feet of mean low water depth the pipes will be laid directly on the sea floor. The pipes laid directly on the seafloor will be anchored with concrete pipe collars spaced every 15 feet on center. Every sixth concrete anchor and at any bend will require additional pile anchoring and an approved marine helical anchoring system. Three different types of concrete pipe collars will be employed as the pipeline transitions from three to two and then down to one pipe. The total direct impact to the marine floor by the concrete anchors is 6,549 square feet. However, a much large area will be a direct loss to fishing activity.

The proposed construction time window is November through March. The inter-tidal and shallow sub-tidal section where the pipes will be buried would take place in the November through the December period. A 10-foot-wide open cut trench with side cast of material is proposed for the approximately 300-foot section across the inter-tidal. The trench will remain open for several tide cycles to allow washing of materials. The pipes will be installed by a float and sink method and backfilled as installed. It is expected to take 2-3 weeks to complete the inter-tidal construction work. Silt barrier will be employed along the trench and excavated material.

The submerged section the buried pipes will be done from a spud barge with and excavator for approximately 750 feet. A clam-shell crane dredge from the spud barge will be utilized at deeper depths

until approximately the 36 foot mean low water depth. The trench will be 8- 10 feet deep and approximately 16 feet wide. Dredge material will be side cast. Turbidity curtains will surround the immediate excavation and side cast locations for the temporary dredge spoils.

The RAS facility discharged wastewater will have a median temperature of 15-18 C and 20-25 ppt salinity year-round. All other effluent concentrations are similar or below the City of Belfast Wastewater discharge effluent.



Fisheries and Industry Impacts

The proposed RAS discharge pipe will be located within an area Prohibited to shellfish harvesting under the authority of 12 M.R.S.A. § 6172. Techno Post. There is limited shellfish resource present within the intertidal area. No significant shellfish resources are present along the proposed pipeline. Soft-shell

clams *Mya arenaria* are mapped in the general location but Normandeau Associates found no *Mya* present (Appendix 7a Natural Resources Report p19). Several species of marine worms were found but none of commercial value. With the use of silt curtains and the proposed work window there would be little to no long-term impact to bivalve or marine worms within the construction or general area.

Lobster fishing activity is present within the Belfast Bay general area. During the proposed construction window and at depth along the pipeline, lobsters would not be present due to water temperatures and natural migration to deeper offshore locations. Effluent temperatures and salinities do not appear to be of a concern. "Numerous studies have quantified temperature thresholds for *H. americanus* that suggest conditions optimal for recruitment are between 12 and 18°C (ASMFC, 2015), below which eggs are less likely to hatch (Annis, 2005; Annis et al., 2013; MacKenzie, 1988) and above which juveniles and adults tend to actively avoid (Crossin et al., 1998). Temperatures above 20°C induce physiological stress across all *H. americanus* life stages (Dove et al., 2005; Glenn et al., 2007; Powers et al., 2004; Steenbergen et al., 1978; summarized in ASMFC, 2015). ASMFC (2015) found that both juvenile indices, such as young-of-year abundance, and recruit size showed a strong, positive correlation to the number of days between 12 and 18°C, but a strong, negative correlation to days above 20°C. Warmer waters have also been linked to increased incidence of epizootic shell disease (Glenn & Pugh, 2006)." Rheuban et al 2017.

Adult lobsters have shown a preference for the high salinity environment (20-25 ppt). Lobsters moved away from their shelters as an avoidance response starting around ~18 ppt and undertook bigger movement to avoid salinities around 12 ppt. It was also found that adult females seemed to be the most sensitive to changes in salinity. *Summary of Jury et al., 1994*

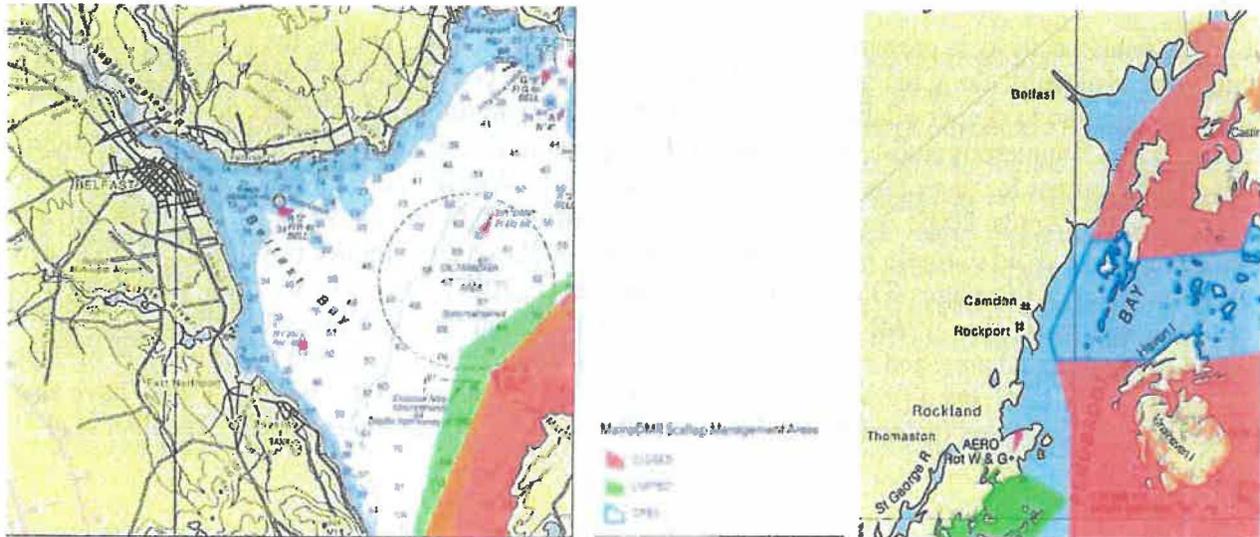
Reported lobster landings for the combined towns of Northport, Belfast and Searsport are considered confidential. There are less than three harvesters and/or dealers present in each of the landing ports. The landings data can only be reported on a County wide level. The landings for Waldo county are: (including Ports of Searsport, Belfast, Islesboro, Lincolnville and Stockton Springs) are;

Year	COMMON NAME	Pounds	Value	Active Harvesters	Total Trips
2017	lobster american	791,731	\$3,168,086	67	2,204
2018	lobster american	747,969	\$3,018,605	59	1,774

The construction of the pipeline and effluent discharge should have little or no long-term impact to the Lobster Industry landings or biology. The physical structure setting on the bottom should also have little impact to the movement of lobsters. However, there could be potential concerns with setting of fishing gear directly on or beside the pipeline. The diffusers, intakes and concrete anchoring collar structures could cause entanglement of traps and possible loss of gear. DMR would recommend the accurate marking of the intakes and diffuser locations and the length of the exposed pipeline.

The Scallop fishery in the proposed pipeline area is located within DMR Scallop Zone 1. The area is open for scallop harvest. However, there are no recent historical landings or known harvest activities in the area of the proposed pipeline or the general Belfast Bay area. (Personal communications, DMR Scallop Coordinator, Maine Marine Patrol). The effluent discharge for temperature and salinity does not appear to be of concern to juvenile or adult Scallops. The general Belfast Bay area would not be considered a natural spawning location. (Mullen, 1986 Species Profile; Life Histories and Environmental Requirements of Coastal Fish and Invertebrates (North Atlantic) Sea Scallop)

Maine Department of Marine Resources Scallop Zone Map



Atlantic Salmon immigration and emigration are not of a concern during the construction time period. “Maine’s Atlantic salmon exhibit two run timings that are in part influenced by genetic factors. “Early run” adults enter fresh water between May and mid-July, and “late-run” adults enter fresh water later in the summer.” (National Research Council (US) Committee on Atlantic Salmon in Maine. Genetic Status of Atlantic Salmon in Maine: Interim Report from the Committee on Atlantic Salmon in Maine. Washington (DC): National Academies Press (US); 2002. 2, Biology and Evolution of Atlantic Salmon). The primary route of passage for salmon is along the eastern side of Islesboro. This side of the Penobscot Bay is wider and deeper with higher current flows. Acoustic tracking of smolts showed seaward migration behavior preference. (Campbell, H.A., Watts, M.E., Dwyer, R.G., Franklin, C.E. 2012. V-Track: software for analyzing and visualizing animal movement from acoustic telemetry detections. *Marine and Freshwater Research*, 63:815–820 DOI:10.1071/MF12194.)

Short-nose and Atlantic Sturgeon presence at the proposed pipeline during construction is also unlikely. Short-nose move down river in the spring to the lower Penobscot Estuary for spawning. The Penobscot Estuary is defined as the head of the tide at the Veazie Dam to the Southernmost tip of Verona Island. It is greater than 12 miles from the proposed pipeline and the southern tip of Verona Island. There are no recorded reports of short-nose present in the area of the pipeline. (Fernandes et. al. Seasonal Distribution and Movements of Shortnose Sturgeon and Atlantic Sturgeon in the Penobscot River Estuary, Maine. *Transactions of the American Fisheries Society* 139:1436–1449, 2010). “Atlantic Sturgeon were rarely seen in the freshwater sections of the Penobscot River during the expected spawning season of late May through mid-June. Also, spawning has not been documented in the Penobscot River in 7 years of egg and early-life-stage sampling efforts.” (Altenritter, M. E. 2015. Shortnose Sturgeon (*Acipenser brevirostrum*) in the Gulf of Maine: local population dynamics and metapopulation implications. Doctoral dissertation. University of Maine, Orono). Atlantic Sturgeon are likely using the Penobscot estuary for foraging based on their very specific summer use. (Altenritter and Zydlewski 2017 Atlantic Sturgeon Use of the Penobscot River and Marine Movements within and

beyond the Gulf of Maine Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science 9:216–230)

This project, as proposed, should not result in significant adverse impacts to marine resources, recreation, navigation, or riparian access. Traditional fishing access could be a concern for lobster, crab and scallop fishing due to intake and discharge structures. These structures will be between 2 – 9 feet above the sea floor and would pose as a trap for fishing gear to become entangled upon. It is possible that an exclusion zone along the pipeline will need to be established. The loss of fishing bottom would be approximately 149,000 square feet or 3.4 acres. This calculation is based on Department of Conservation Submerged Land Lease of 40 feet wide by the length of the exposed pipeline of 3,725 feet. DMR would request the accurate marking of the entire length of the exposed pipeline along with the intake and diffuser locations. The accurate recording of the pipeline to the Coast Guard and NOAA Marine Navigation Charts. Further, DMR requests suitable sediment testing along the proposed pipes for potential contaminants. The collection and sampling should meet ACOE standards for testing on marine sediments.



Denis-Marc Nault
DMR Environmental Coordinator
Date: January 24, 2020

DMR cited and reference literature - Nordic Aquafarm

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(continued)

<https://www.penobscotmercurystudy.com/information-repository>

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US Army Corps of Engineers, Disposal Area Monitoring System (DAMOS) Contributions 181-191, July 2011, CD

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Bertocci, Cynthia S

From: Lawrence Moffet <moffet23@gmail.com>
Sent: Monday, March 02, 2020 3:54 PM
To: rulemaking, DMR
Subject: Re: Written comment

EXTERNAL: This email originated from outside of the State of Maine Mail System. Do not click links or open attachments unless you recognize the sender and know the content is safe.

I am a longtime lobster fisherman. I am very concerned about the juvenile codfish that I catch in my lobster traps. We have taken dams out and restored the Penobscot watershed. We still have Codfish spawning in the bay. We are used to thinking about two systems, the river and the bay. They now are one system with the river herring beginning to feed the spawning groundfish. I am most concerned about the nitrogen and other chemicals being discharged so close to historic groundfish spawning areas. Thank you for considering this. Lawrence Moffet

On Mon, Mar 2, 2020, 3:41 PM rulemaking, DMR <DMR.rulemaking@maine.gov> wrote:

Hello,

Written comments, sent via email, are being accepted through March 2, 2020. Email comments should be sent to this account.

Thanks,

Amanda

Amanda Ellis

Resource Management Coordinator

Maine Department of Marine Resources

21 State House Station

Augusta, ME 04333-0021

(207) 624-6573

From: Lawrence Moffet <moffet23@gmail.com>
Sent: Monday, March 02, 2020 9:18 AM

To: rulemaking, DMR <DMR.rulemaking@maine.gov>

Subject: Written comment

EXTERNAL: This email originated from outside of the State of Maine Mail System. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Is there an opportunity to make email comments to the DMR on the proposed Nordic Aquafarm project?