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Camden, Maine 04843
(860) 707-3215

David B. Losee, Esq.
david@loseelaw.com

December 16, 2020

VIA COURIER
Michele Lumbert, Clerk
Kennebec County Superior Court
Capital Judicial Center
1 Court Street, Suite 101
Augusta, ME

Re: Upstream Watch v. Board of Environmental Protection, et al.
Docket No. AP-2020-___

Dear Ms. Lumbert:

Enclosed for filing, please find the following:

1. Civil Summary Sheet
2. Petition For Review Of Final Agency Action Pursuant To 5 M.R.S. § 11001 et. seq. and M.R.C.P. 80C Permits: MEPDES Air Emissions SLODA/NRPA.

Also enclosed is a check in the amount of the required filing fee ($175.00).

Copies of the enclosed are being served pursuant to 5 M.R.S. § 11003 (via certified mail, return receipt requested) upon the agency, parties to the agency proceeding and the attorney general.

Thank you for your assistance.

Sincerely,

/s/David B. Losee

David B. Losee

Enclosures

Copy to (w/encs.):

State of Maine
Board of Environmental Protection
17 State House Station
Augusta, ME 04333

Aaron Frey, Attorney General
State of Maine
Office of the Attorney General
6 State House Station
Augusta, ME 04333-0006

Nordic Aquafarms Inc.
c/o Joanna B. Tourangeau, Esq.
Drummond Woodsum
84 Marginal Way, Suite 600
Portland, ME 04101-2480

Maine Lobstering Union
Wayne Canning
David Black
c/o Kim Ervin Tucker, Esq., Bar No. 6969
48 Harbour Pointe Drive
Lincolnville, ME 04849

Eleanor Daniels
Donna Broderick
95 Sirota Drive
Searsmont, ME 04973

Northport Village Corporation
813 Shore Road
Northport, ME 04849

The Fish Are Okay
c/o Diane Hunt Braybrook
1 Delemos Street
Belfast, ME 04915

Lawrence Reichard
6 Congress Street #406
Belfast, ME 04915

Jeffrey R. Mabee and Judith B. Grace
c/o Kim Ervin Tucker, Esq., Bar No. 6969
48 Harbour Pointe Drive
Lincolnville, ME 04849
202-841-5439

Gulf of Maine Research Institute
c/o Donald W. Perkins, Jr., President/CEO
350 Commercial Street
Portland, ME 04101

University of New England
c/o Barry A. Costa-Pierce
11 Hills Beach Road
Biddeford, ME 04005

CURTIS THAXTER LLC 077326

VENDOR: TREASURER, STATE OF MAINE CHECK NO: 77326

OUR REF. NO.	YOUR INVOICE NUMBER	INVOICE DATE	INVOICE AMOUNT	AMOUNT PAID	DISCOUNT TAKEN
79180	Filing Fee	12/16/2020	$175.00	$175.00	$0.00

Check Date: December 16, 2020

THIS CHECK IS PROTECTED BY A VOID PANTOGRAPH, MICROPRINT SIGNATURE LINE AND A HEAT SENSITIVE PADLOCK ICON. ADDITIONAL SECURITY FEATURES ARE LISTED ON BACK.

CURTIS THAXTER LLC
ONE CANAL PLAZA
PORTLAND, MAINE 04101

KEY BANK NATIONAL ASSOCIATION
PORTLAND, MAINE

52-60/112

077326

CHECK NO.	CHECK DATE	VENDOR NO.
77326	12/16/2020	002010

PAY

One hundred seventy-five and NO/100 Dollars

CHECK AMOUNT
$175.00

TO THE ORDER OF TREASURER, STATE OF MAINE

MP

IMAGE FADES WITH HEAT
RUB PADLOCK

⑈077326⑈ ⑆011200608⑆ 002⑈7931 5⑈

CONTAINS NONPUBLIC DIGITAL INFORMATION

MAINE JUDICIAL BRANCH

This summary sheet and the information it contains do not replace or supplement the filing and service of pleadings or other papers as required by the Maine Rules or by law. This form is required for the Clerk of Court to initiate or update the civil docket. The information on this summary sheet is subject to the requirements of M. R. Civ. P. 11.

I. COUNTY OF FILING OR DISTRICT COURT JURISDICTION *("X" the appropriate box and enter the County or location)*

- [x] Superior Court County: Kennebec
- [ ] District Court Location (city/town): _____

II. NATURE OF THE FILING

- [x] Initial Complaint
- [ ] Third-Party Complaint
- [ ] Cross-Claim or Counterclaim
- [ ] **Reinstated or Reopened case: Docket Number:** _____

If filing a second or subsequent Money Judgment Disclosure, give the docket number of the first disclosure.)

Initial Complaint: A complaint filed as an original proceeding. A filing fee is required.
Third-Party Complaint: An original defendant's action against a third party that was not part of the original proceeding. A filing fee is required.
Cross-Claim: An original defendant's claim against another original defendant. No additional fee is required.
Counterclaim: An original defendant's claim against an opposing party. No additional fee is required.
Reinstated or Reopened Case: Money Judgment Disclosures or post-judgment motions.

III. [ ] **REAL ESTATE OR TITLE TO REAL ESTATE IS INVOLVED**

IV. MOST DEFINITIVE NATURE OF ACTION
("X" in ONE box. If the case fits more than one nature of action, select the one that best describes the cause of action.)

GENERAL CIVIL

Personal Injury Torts
- [ ] Property Negligence
- [ ] Auto Negligence
- [ ] Medical Malpractice
- [ ] Product Liability
- [ ] Assault/Battery
- [ ] Domestic Tort
- [ ] Other Negligence
- [ ] Other Personal Injury Tort

Non-Personal Injury Torts
- [ ] Libel/Defamation
- [ ] Auto Negligence
- [ ] Other Negligence
- [ ] Other Non-Personal Injury Tort

Contract
- [ ] Contract

Declaratory/Equitable Relief
- [ ] General Injunctive Relief
- [ ] Declaratory Judgment
- [ ] Other Equitable Relief

Constitutional/Civil Rights
- [ ] Constitutional/Civil Rights

Statutory Actions
- [ ] Unfair Trade Practice
- [ ] Freedom of Access
- [ ] Other Statutory Action

Miscellaneous Civil
- [ ] Drug Forfeiture
- [ ] Other Forfeiture/Property Libel
- [ ] Land Use Enforcement (80K)
- [ ] Administrative Warrant
- [ ] HIV Testing
- [ ] Arbitration Awards
- [ ] Appointment of Receiver
- [ ] Shareholders' Derivative Action
- [ ] Foreign Deposition
- [ ] Pre-Action Discovery
- [ ] Common Law Habeas Corpus
- [ ] Prisoners Transfers
- [ ] Foreign Judgments
- [ ] Minor Settlements
- [ ] Other Civil

REAL ESTATE

Title Actions
- [ ] Quiet Title
- [ ] Eminent Domain
- [ ] Easement
- [ ] Boundary

Foreclosures
- [ ] Foreclosure (Diversion eligible)
- [ ] Foreclosure (ADR exempt)
- [ ] Foreclosure (Other)

Miscellaneous Real Estate
- [ ] Equitable Remedy
- [ ] Mechanics Lien
- [ ] Partition
- [ ] Adverse Possession
- [ ] Nuisance
- [ ] Abandoned Road
- [ ] Trespass
- [ ] Other Real Estate

SPECIAL ACTIONS
- [ ] Money Judgment Disclosure

APPEALS (ADR EXEMPT)
- [ ] Governmental Body (80B)
- [x] Administrative Agency (80C)
- [ ] Other Appeal

CHILD PROTECTIVE CUSTODY
- [ ] Non-DHHS Protective Custody

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V. M.R. Civ. P. 16B ALTERNATIVE DISPUTE RESOLUTION (ADR)

☒ I certify that pursuant to M.R. Civ. P. 16B(b), this case is exempt from a required ADR process because *("X" one box below):*

- ☒ It falls within an exemption listed above (it is an appeal or an action for non-payment of a note in a secured transaction).
- ☐ The plaintiff or defendant is incarcerated in a local, state, or federal facility.
- ☐ The parties have participated in a statutory pre-litigation screening panel process with (*name of panel chair*) _____ that concluded on (*date of panel finding - mm/dd/yyyy*) _____.
- ☐ The parties have participated in a formal ADR process with (*name of neutral*) _____ on (*date – mm/dd/yyyy*) _____.
- ☐ The plaintiff's likely damages will not exceed $30,000, and the plaintiff requests an exemption.
- ☐ The action does not include ADR pursuant to M.R. Civ. P. 16(a)(1).
- ☐ There is other good cause for an exemption and the plaintiff has filed a motion for exemption.

VI. PARTY AND ATTORNEY CONTACT INFORMATION

If you need additional space, list additional parties on an attachment and note "see attachment" in the appropriate section.

Please note: If a party is a government agency, use the full agency name or the standard abbreviation. If the party is an official within a government agency, identify the agency first and then the official, giving both name and title.

(a) PLAINTIFF(S)

("X" the box below to indicate the party type associated with the filing)

☒ Plaintiff(s)
☐ Third-Party Plaintiff(s)
☐ Counterclaim Plaintiff(s)
☐ Cross-Claim Plaintiff(s)

Is the plaintiff a prisoner in a local, state, or federal facility? ☐ Yes ☒ No

Name (*first, middle initial, last*): Upstream Watch
Mailing address (*include county*): 67 Perkins Road
Belfast, ME 04040
Telephone:
Email: agrant7108@gmail.com

Name (*first, middle initial, last*):
Mailing address (*include county*):
Telephone:
Email:

(b) ATTORNEY(S) FOR PLAINTIFF(S)

If there are multiple attorneys, indicate the lead attorney. *If all counsel do not represent ALL plaintiffs, specify which plaintiff(s) the listed attorney(s) represents.*

Name and bar number: David B. Losee, Bar No. 6500
Firm name: David B. Losee, LLC
Mailing Address: 7 Highland Avenue
Camden, ME 04843
Telephone: 860-707-3215
Email: david@loseelaw.com

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Language Services: For language assistance and interpreters, contact a court clerk or interpreters@courts.maine.gov.

Name and bar number: _____
Firm name: _____
Mailing Address: _____
_____
Telephone: _____
Email: _____

(c) DEFENDANT(S)

("X" the box below to indicate the party type associated with the filing)

☒ Defendant(s)
☐ Third-Party Defendant(s)
☐ Counterclaim Defendant(s)
☐ Cross-Claim Defendant(s)

Is the defendant a prisoner in a local, state, or federal facility? ☐ Yes ☒ No

Name (*first, middle initial, last*): State of Maine Board of Environmental Protection
Mailing address (*include county*): 17 State House Station
Augusta, ME 04333
Telephone: _____
Email: _____

Name (*first, middle initial, last*): _____
Mailing address (*include county*): _____
_____
Telephone: _____
Email: _____

(d) ATTORNEY(S) FOR DEFENDANT(S)

If there are multiple attorneys, indicate the lead attorney. *If all counsel do not represent ALL defendants, specify which defendant(s) the listed attorney(s) represents.*

Name and bar number: Aaron Frey, Attorney General
Firm name: Office of the Attorney General, State of Maine
Mailing Address: 6 State House Station
Augusta, ME 04333-0006
Telephone: 207-626-8800
Email: _____

Name and bar number: _____
Firm name: _____
Mailing Address: _____
_____
Telephone: _____
Email: _____

(e) PARTIES IN INTEREST

Name (*first, middle initial, last*): See attached Addendum
Mailing address (*include county*):

Telephone:
Email:

Name (*first, middle initial, last*):
Mailing address (*include county*):

Telephone:
Email:

(f) ATTORNEY(S)

If there are multiple attorneys, indicate the lead attorney. *If all counsel do not represent ALL parties in interest, specify which parties in interest the listed attorney(s) represents.*

Name and bar number: See attached Addendum
Firm name:
Mailing Address:

Telephone:
Email:

Name and bar number:
Firm name:
Mailing Address:

Telephone:
Email:

VII. RELATED CASE(S) IF ANY

Case name: None
Docket Number:
Assigned Judge/Justice:

Date (*mm/dd/yyyy*): December 16, 2020

▶ /s/David B. Losee
Signature of Plaintiff or Lead Attorney of Record

David B. Losee, Bar No. 6500
Printed Name of Plaintiff or Attorney

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STATE OF MAINE
KENNEBEC ss.

SUPERIOR COURT
CIVIL ACTION
DOCKET NO. AP-2020-

UPSTREAM WATCH, Petitioner, v. BOARD OF ENVIRONMENTAL PROTECTION, Respondent, NORDIC AQUAFARMS INC., THE FISH ARE OKAY, MAINE LOBSTERING UNION, WAYNE CANNING and DAVID BLACK, JEFFREY R. MABEE and JUDITH B. GRACE, ELEANOR DANIELS and DONNA BRODERICK, NORTHPORT VILLAGE CORPORATION, LAWRENCE REICHARD, GULF OF MAINE RESEARCH INSTITUTE, and UNIVERSITY OF NEW ENGLAND, Parties-In-Interest.	)	PETITION FOR REVIEW OF FINAL AGENCY ACTION PURSUANT TO 5 M.R.S. § 11001 et. seq. and M.R.C.P. 80C PERMITS: MEPDES AIR EMISSIONS SLODA/NRPA

Petitioner Upstream Watch ("Upstream" and "Petitioner"), by and through its counsel, David B. Losee, Esq., seeks review of the final agency action of the State of Maine Board of Environmental Protection ("BEP" and "Respondent") to grant of licenses to Nordic Aquafarms Inc. under the Maine adaptation of the National Pollution Discharge Elimination System (MPDES), the Maine adaptation of the Federal Clean Air Act, the Site Location of Development Act (SLODA) and the Natural Resources Protection Act (NRPA), all of which became Final Agency Action on November 19, 2020 (collectively, "Final Agency Action").

Petitioner challenges Respondent's Final Agency Action pursuant to 5 M.R.S. §§ 11001-11008, et seq., and Rule 80C of the Maine Rules of Civil Procedure ("Rule 80C") and for its Petition required by 5 M.R.S. § 11002(2) states as follows:

PARTIES

1. Petitioner is a Maine not-for-profit corporation with a principal place of business at 67 Perkins Road, Belfast, County of Waldo, State of Maine. Petitioner intervened as a party in the administrative process identified below.

2. Upon information and belief, Nordic Aquafarms Inc. ("Nordic") is a Delaware corporation registered to do business in the State of Maine with an office in the City of Belfast, County of Waldo, State of Maine.

3. Upon information and belief, party-in-interest The Fish Are Okay is a not-for-profit corporation with a place of business in the City of Belfast, County of Waldo, State of Maine.

4. Upon information and belief, party-in-interest the Northport Village Corporation is a municipal corporation situated in the Town of Northport, County of Waldo, State of Maine.

5. Upon information and belief, parties-in-interest Wayne Canning, David Black, Jeffrey R. Mabee, Judith B. Grace and Lawrence Reichard are natural persons, residents and/or doing business in the City of Belfast, County of Waldo, State of Maine.

6. Upon information and belief, parties-in-interest Eleanor Daniels and Donna Broderick are residents of Searsmont, County of Waldo, State of Maine.

7. Upon information and belief, party-in-interest Maine Lobstering Union is a cooperative corporation, organized and doing business in the State of Maine.

8. Upon information and belief, party-in-interest the Gulf of Maine Research Institute is a non-profit corporation, organized under the laws of the State of Maine with its principal place of business at 350 Commercial Street, Portland, County of Cumberland, State of Maine.

9. Upon information and belief, party-in-interest the University of New England is a private higher education university organized under the laws of the State of Maine with its principal place of business at 11 Hills Beach Road, Biddeford, County of York, State of Maine.

JURISDICTION AND VENUE

10. The location of the project for which Nordic sought permits is situated in Waldo County, State of Maine.

11. Final Agency Action by the Respondent Maine Board of Environmental Protection is subject to review under 5 M.R.S. § 11001(1).

12. Under 06-096 C.M.R. Chapter 3, Section 2(J) of the Maine Department of Environmental Protection Rules, Upstream is a successful intervenor in the license application process of Nordic and has standing to seek review by this Court.

13. As the Maine Board of Environmental Protection has its principal office in Kennebec County, venue is proper in Kennebec County. 5 M.R.S. § 11002(1).

PROCEDURAL HISTORY AND BACKGROUND

14. In the spring of 2018, Nordic publicly announced its desire to construct a five-hundred million-dollar land-based salmon farm and processing factory in Belfast, County of Waldo, Maine, primarily on land owned by the Belfast Water District on the west side of U.S. Route 1, in the south part of the City of Belfast almost on the Northport Town Line. Adjacent land would be leased and/or acquired by Nordic from neighboring property owners.

15. The proposed development will be constructed in two phases. Phase 1 would consist of the following:

1. Module 1 Building –112,223SF
2. Module 2 Building –112,223SF
3. Module 3 Building –112,223SF
4. Smolt 1 Building –53,947SF
5. Water/Wastewater Treatment Plant –20,056 SF
6. Processing Building –24,096 SF
7. Central Utility Plant –18,998 SF
8. Office/Maintenance Building –8,936 SF
9. Gate House –298 SF

16. Phase 2 would consist of the following:

1. Module 4 Building –112,223SF
2. Module 5 Building –112,223SF
3. Module 6 Building –112,223SF
4. Smolt 2 Building –53,947SF
5. Visitor Center –2,188 square

17. Because the on-site soils are unsuitable and clay-like, Nordic determined and planned to remove the entire forest and the underlying native soil over a 37-acre area with a total depth of anywhere from 20 feet to 50 feet, and to replace that soil with different soil brought to the site from another location, as yet undisclosed.

18. The proposed salmon farm and fish slaughterhouse would require access to the ocean, in particular to Penobscot Bay, on the east side of U.S. Route 1, in order to install into Penobscot Bay two 30" saltwater intake pipes and one 36" wastewater discharge pipe.

19. Upon information and belief, the upland east of U.S. Route 1 selected by Nordic for installation of the pipes is owned by Janet Eckrote and Richard Eckrote (the "Eckrote land").

20. Ownership of the intertidal land abutting the Eckrote land is the subject of a lawsuit pending in the Waldo County Superior Court styled; *Jeffrey R. Mabee and Judith R. Grace v. Nordic Aquafarms Inc. et al*, Maine Superior Court, Waldo County, Docket No. RE-2019-18.

21. On or about October 19, 2018, Nordic filed with the Maine Department of Environmental Protection (DEP) applications for:

a. A wastewater discharge permit under the Federal Clean Water Act, permitting authority for which has been delegated to the State of Maine DEP by the United States Environment Protection Act ("USEPA")(the "MPDES permit") and a Waste Discharge License. The proposed discharge would allow Nordic to discharge into Penobscot Bay at a depth of 34 feet, 7,700,000 gallons of waste water from its fish rearing tanks and slaughterhouse.

b. An air emissions license to permit air pollution emissions from the operation of eight diesel generators under the Clean Air Act (and under SLODA).

c. Approval to construct, operate and maintain a land-based aquaculture facility under 38 M.R.S.A §§ 480(A)-480(Z), 06-096 C.M.R. c. 310-342, 38 M.R.S.A §§ 481-490 et. seq. and 06-096 C.M.R. c. 342-500:

i. Site Location of Development Act,

ii. Natural Resources Protection Act,

iii. Freshwater Wetland Alteration

iv. Stream Alteration

v. Significant Wildlife Habitat, and

vi. Water Quality Certification.

22. On Motion by Upstream Watch and others, or about June 20, 2019 the BEP voted:

a. To assume licensing authority over the applications;

b. To conduct a Hearing on "the proposed project;"

c. To grant requests to be designated Intervenors of:

i. Maine Lobstering Union, Wayne Canning and David Black;

ii. Upstream Watch;

iii. Jeffrey R. Mabee and Judith R. Grace;

iv. Eleanor Daniels and Donna Broderick;

v. Northport Village Corporation;

vi. The Fish Are Okay;

vii. Lawrence Reichard;

viii. Gulf of Maine Research Institute; and

ix. University of New England.

23. Over the next several months and right up to November 19, 2020, DEP staff asked questions and sought additional information from Nordic, following which, often but not always, Nordic supplemented its application materials and the materials so supplemented were often but not always responsive.

24. On or about December 13, 2019, Upstream Watch filed pre-filed testimony, pursuant to DEP's hearing rules, of John A. Krueger and Gary V. Gulezian. The testimony included the following conclusions:

a. A lack of significant four season monitoring in the bay and a contradiction in background nitrogen levels included in the Application demonstrates the need for a better understanding of the receiving waters.

b. Newer technologies exist for wastewater treatment and are being tested around the planet. Aquamaof, Superior Fresh and Sustainable Blue are examples.

c. Some use vertical hydroponics/aquaponics that run hydraulically (a water driven system rather than a pumped vertical effluent, with low energy use). There are others which use electric driven pumps to pump water up and believe that numerous small tanks are the way to go. Another option are [sic] airlift fixed media recirculating systems to provide a minimal liquid discharge to zero liquid discharge, with the use of micro-algae as the primary denitrification reactor.

d. Prior to the issuance of any permit, the applicant should be required to carefully evaluate these zero discharge technologies and to demonstrate why they are not preferable to the older technology proposed by applicant.

25. The BEP conducted a series of "pre-hearing" meetings from August 15, 2019 through January 9, 2020, during which time the DEP staff's requests for information continued.

26. From February 11, 2020 through February 14, 2020, BEP conducted a public hearing under 06-096 C.M.R. c. 2 of the DEP rules, which hearing was followed by briefs of Nordic and the intervenors.

27. Upon information and belief, prior to May 20, 2020, DEP staff reviewed the materials in the record regarding each permit application and prepared memoranda containing draft orders and draft permits. Those memoranda were distributed to Nordic and to the intervenors, including Upstream, on Friday, May 15, 2020.

28. Between May 15, 2020 and May 20,2020, at the request of Nordic, DEP staff materially altered the record to bring Nordic's application into compliance, as fully explained below.

29. The Intervenors were invited to "comment" on the memoranda on or before June 12, 2020.

30. The BEP conducted deliberation sessions with DEP staff on October 29 and November 12, 2020, and on November 19, 2020, the BEP voted unanimously and without substantive discussion on the record to approve the Orders and Permits as presented by the DEP staff.

Issues Raised in this Review of Agency Action

I. BEP committed an error of law, abused its discretion and/or made findings unsupported by record evidence when it improperly failed to consider zero discharge technology presented by the Intervenors in pre-filed testimony, which should be the basis for zero discharge effluent limitations, and in so doing violated the express requirement of the Maine Clean Water Act to consider existing technology.

31. DEP and the BEP issued the permit to Nordic Aquafarms pursuant to the Maine Clean Water Act (the "Act"), 38 M.R.S. § 414, and DEP regulations, 38 M.R.S. § 414-A(3).

32. DEP failed to consider the treatment technology identified in the pre-filed testimony of Upstream Watch's experts, which produces little to no discharge of pollutants.

33. The Act, 38 M.R.S. § 414-A(1)(D), requires DEP to "consider existing state of technology," in setting limits for the discharge of pollutants. DEP did not do so. DEP thus

violated the Act, and the decisions of DEP and the BEP in issuing the permit were not in accordance with law. The decisions were also unsupported by substantial evidence and were an abuse of discretion.

34. 38 M.R.S. § 414-A(1)(D) states in relevant part:

> If no applicable standards exit for a specific activity or discharge, the department must establish limits on a case-by-case basis using best professional judgment, after consultation with the applicant and other interested parties of record. In determining best practicable treatment for each category or class, the department shall consider the existing state of technology, the effectiveness of the available alternatives for control of the type of discharge and the economic feasibility of such alternatives.

35. The draft and final Fact Sheets issued by DEP staff with the Nordic Permit and attached to the BEP's Order, recite compliance with DEP and EPA requirements for technology-based effluent limits, but they make no mention of any consideration of the zero discharge technology presented by the Intervenors.

36. There is no evidence that the BEP considered the existing state of technology, or its effectiveness and economic feasibility.

37. BEP's unexplained failure to recognize and consider the significant of zero discharge technology in active and profitable use, and the BEP's decision to uphold the Permit, are decisions that are an abuse of discretion, not in accordance with law, and unsupported by substantial evidence.

38. Among other relief, Upstream Watch respectfully requests the Court remand the Permit to BEP, direct the BEP to order DEP staff consider the technology identified in the pre-filed testimony, and any other available alternatives for control of the type of discharge proposed by Nordic, and if the technology is effective and economically feasible, to base the permit's

effluent limits on such technology. The Court should require that, if achieved by existing technology, the permits' limits should be zero.

II. BEP committed an error of law, abused its discretion and/or made findings unsupported by record evidence when after the record had closed it allowed an alteration to the record.

39. Petitioner repeats and realleges the material allegations in paragraphs 1 through 38 of this Petition as if fully set forth herein.

40. The record before the BEP closed on February 18, 2020.

41. The waters of Penobscot Bay where the discharge is proposed to occur is classified as "SB" water quality, the second highest water quality ranking.

42. On May 15, 2020, a MPDES Staff memo revealed DEP's calculation that Nordic's proposed nitrogen discharge was too high to maintain the "SB" water quality standard in Penobscot Bay and therefore staff recommended denial of the MPDES permit. A true copy of the May 15, 2020 memo is attached as Exhibit 1.

43. Upon information and belief, sometime between May 15, 2020 and May 20, 2020, a representative of Nordic called Gregg Wood, a DEP staff person, and requested that a number be changed so that the calculations would make it seem like Nordic's nitrogen discharge would not degrade the water quality in Penobscot Bay. Mr. Wood did so. DEP staff presented their memoranda to the members of the BEP for review on May 20, 2020.

44. The change was made without notice to parties, without explanation, without the proponent being placed under oath, without benefit of cross examination and without an opportunity for rebuttal testimony, as was the case for each and every scintilla of evidence offered in this case prior to May, 2020 and as was required by the rules established by the

Presiding Officer at the first pre-hearing conference and by the Department Rules, 06-096 C.M.R. c. 3, § 16.

45. Immediately, Upstream emailed DEP staff to request a copy of Mr. Wood's calculations. Upstream was told there were none available but would be in a few days. To the date hereof, Upstream has not seen the calculations.

46. On or about May 21, 2020, Upstream asked DEP staff the following, in writing:

a. On or about May 18, 2020, who from Nordic called DEP?

i. Who received the call?

ii. Who else from DEP was involved with the call?

iii. Who else from DEP was consulted or told about the call?

iv. Who at DEP approved the change in the memo?

v. What "recalculations" were performed by anyone at DEP?

vi. Did anyone at DEP review those calculations before the memo was changed?

vii. Was the Nordic speaker under oath?

viii. Did Nordic submit its new numbers, calculations, request or anything else under oath?

b. DEP responded in September, 4 months later, by providing a few emails, none of which were responsive.

c. On or about May 26, 2020, Upstream moved the BEP to strike the evidence entered by Gregg Wood as aforesaid, but on June 2, 2020 BEP denied Upstream's motion.

47. As required by [06-096 CMR c. 3, §§ 5(D), 16(A)], DEP must include in its administrative record any documents relating to Nordic's communications with DEP staff, including any communications requesting or explaining the requested change in the calculations.

48. The record will show that the DEP staff's change in its calculations was not supported by substantial evidence. DEP has nothing to include in the record that would demonstrate a legitimate, rational basis for changing its calculations. On the contrary, pre-filed testimony in the record from Upstream's expert witnesses John Krueger and Gary Gulezian establish the potentially catastrophic effect of the proposed discharge on Upper Penobscot Bay, and the almost complete lack of data from actual monitoring of the Bay, which led the witnesses to conclude the existing evidence cannot support issuance of a discharge permit.

49. Petitioner's experts are expected to testify to the unacceptable impacts shown by existing calculations, and to recommend further monitoring of conditions in the Bay. Petitioner's witnesses will testify that existing data is insufficient to support with reasonable scientific confidence Nordic's calculations of the transport and impacts of pollution from its proposed discharge.

50. DEP's actions constituted:

a. A violation of due process;

b. A violation of 06-096 C.M.R. c. 3, § 16;

c. A violation of the procedural rule established by the Presiding Officer at the First Pre-Hearing Conference as memorialized in the Presiding Officer's First Procedural Order;

d. A violation of equal protection of the laws, because during the pendency of the applications there were eight instances in which various parties other than Nordic offered evidence that was denied by the Presiding Officer because the record was closed; and

e. constituted an error of law, abuse of discretion and findings unsupported by evidence in the record.

III. BEP committed an error of law, abused its discretion and/or made findings unsupported by record evidence when it found Nordic's applications to be complete.

51. Petitioner repeats and realleges the material allegations in paragraphs 1 through 50 of this Petition as if fully set forth herein.

52. The applications are incomplete. Nordic failed or refused to submit the information mandated by the application requirements as to Nordic's MPDES discharge permit.

As To Nordic's MPDES Discharge Permit

53. Nordic failed to provide the contents and concentration levels of its proposed discharge into Penobscot Bay.

54. Nordic failed to perform competent studies to determine the flows, currents, winds, tides, and thermal impacts of the Penobscot Bay receiving water at different strata within the Bay near the point of discharge, without which no competent analysis of the impact of the proposed discharge is possible.

SLODA Requirements: Freshwater Requests
As To Groundwater

55. Nordic has not quantified its freshwater needs essential to maintain operations and support a financially-competitive rate of fish growth. Without knowing this number, it is impossible to determine whether freshwater sources are sufficient.

56. Estimated yields from proposed freshwater sources are not verified:

a. Maximum anticipated yield from freshwater sources are:

i. 3 onsite production wells, 455 gallons per minute (gpm),

ii. Surface water from lower reservoir, 70 gpm (not quantified in permit) and/or inflows from Little River, 250 gpm,

iii. Belfast Water District (BWD), 500 gpm, for total maximum sustainable estimated yields of 1,275 gpm.

On-site Production Wells

iv. Nordic projects that the 3 on-site production wells will pump water from an aquifer below the Nordic site.

v. Nordic claims that it can obtain 455 gallons per minute from a series of new on-site groundwater wells that it installed.

vi. Nordic's claim is based on a model that is, in turn, based on the results of a 72-hour pump test conducted on the new on-site wells.

vii. The 72-hour pump tests were conducted on the land unaltered by the proposed stormwater drainage system.

viii. The aquifer from which the wells pump is recharged by rainwater.

ix. Nordic's stormwater drainage system will remove 70% of the rainwater falling on the site.

x. Nordic's stormwater drainage system will divert water running on to the site from off-site into perimeter drains and thence to the Little River down gradient from the site where it will be unavailable to the well pumps.

xi. The water so removed cannot recharge the aquifer from which the wells draw.

xii. This stormwater withdrawal and diversion was not considered when Nordic modelled its on-site well yields.

xiii. Therefore, the correct amount of water that will be available once the stormwater drains are installed must be less than 455 gallons per minute.

xiv. No one knows what that number will be, but it cannot be 455 gallons per minute.

57. Nordic has experienced saltwater intrusion into one of its test wells.

58. Nordic did not address the potential effects of ground water use compromised by saltwater intrusion, other than to assert that since Nordic could use salt contaminated water in its process, contaminating the aquifer with saltwater was somehow acceptable.

59. Withdrawal of the specified quantities of water from onsite wells will result in substantial drawdown in the aquifer.

60. Nordic models are insufficient to predict long-term consequences of this extraction on water level and water quality because Nordic modeled only for supply, not for impact on neighboring homeowners' wells. Nordic admits that existing water supply wells of neighboring homeowners would likely suffer a 10-12-foot drop.

As To Surface Water

61. Surface water availability from the reservoir and the Little River could be affected by groundwater withdrawals that will occur, but these have not been measured and are not factored into Nordic's calculations.

62. Nordic failed to provide proper information needed to design a monitoring program regarding water levels and resultant impacts on water quality in private wells.

As To Water From The Belfast Water District

63. Nordic has not studied the Goose river aquifer, Belfast's only source of water, to demonstrate that the supply of water from that source is adequate, nor has Nordic supplied to the BEP or to the DEP staff, both of which requested it, existing water availability data regarding the Goose River aquifer.

64. Petitioner requests the Court allow Petitioner to supplement the administrative record by allowing testimony and the addition of records heretofore not included by Nordic that will show:

a. With its application, Nordic submitted a Capacity Evaluation by A. E. Hodsdson Engineers, dated February 27, 2018, that provided maps and a study of the well array that serves the City of Belfast.

b. Nordic asked the DEP, the BEP, and the public, including petitioners to rely on that report.

c. That report neglected to reveal that in the middle of the cluster of wells serving the City of Belfast is an old, closed landfill and an active solid waste transfer station.

d. The report neglected to reveal that as of 1994, landfill leachate had traveled from the landfill site 460 feet toward the Goose River aquifer in which the wells are drilled.

e. The report neglected to reveal that since 1994, no testing has been done to see if, in the intervening quarter century, the landfill leachate plume has reached that part of the aquifer from which well withdrawal has occurred.

f. The report neglected to reveal that no water quality testing has been done to ascertain if the Belfast wells are contaminated buy landfill leachate.

g. The report neglected to reveal that there has been no study to test the intake reach or "Cone of Depression" formed or, in the case of the well nearest to the landfill, the cone of depression that will be formed when the well is turned on to accommodate Nordic's needs. A "Cone of Depression" is a conical shaped area in the subsurface from which a well can extract water. This Cone will vary depending on depth, subsurface material, size of the well casing, size of the pump and the pumping regimen employed by the operator. Knowing the reach of the Cone of Depression is necessary to predict what will be drawn into the well water when the pump is engaged. In the case of the Belfast wells and the nearby landfill, whether the leachate from the bottom of the landfill will be induced into the wells by pumping made necessary to the needs of Nordic.

h. This information is important to the citizens of Belfast, with or without Nordic.

i. With the permission of the Court, petitioner will present evidence regarding the above.

65. Nordic has not considered the impact of exercise of the authority of the Belfast Water District to curtail water sales to non-essential customers in time of drought or emergency.

66. Nordic's contract with the Belfast Water District is in place for only the first six years and the facility, Nordic claims, will last for at least 30 years.

67. Nordic has not provided estimates of freshwater use for construction, including dust control and a proposed onsite concrete plant.

68. The BEP does not have sufficient evidence to make a positive finding given Nordic's failure to quantify its freshwater needs or supply:

As to Financial Capability

69. The information provided by Nordic is not adequate to determine whether estimates are "accurate and complete," or realistic as required by the rule.

70. Nordic failed or refused to provide evidence of adequate financial capacity to complete the project, as 96-096 C.M.R. Chapter 373 of the site rules require.

71. The BEP does not have sufficient evidence to make a positive finding given Nordic's failure to quantify its freshwater needs or supply:

a. Cost estimates: Nordic did not provide "accurate and complete cost estimates of the development, including all proposed phases."

b. Nordic did not provide a time schedule for construction of all phases proposed.

c. Nordic did not provide documentation or evidence of funds: the applicant must provide a Letter of Commitment or a Letter of Intent to Fund.

72. Nordic has not and did not in the BEP proceedings provide:

a. cash equity commitment;

b. a formal financial plan in the normally accepted form; or

c. a Commitment Letter or Letter of Intent to Fund all as required by 06-096 C.M.R. c. 373, § 2(B)(3);

d. a time schedule for construction of either of the proposed phases;

e. estimates for sewers, water supply, utilities, pollution abatement, or landscaping;

f. the final corporate structure or linkage to the applicant of any financing institution, including the parent organization that is proposed to raise funds for the project.

Nordic has indicated that its project will operate as a Maine limited liability company. Nordic has not provided evidence of the creation of the limited liability company.

g. Nordic's project is not a typical "phased" development since Nordic has stated that completing only Phase 1 of the project is not financially feasible, and the viability of "Phase 1" is dependent on the completion of "Phase 2." The Permit Conditions assigned by BEP do not require Nordic to submit adequate evidence for meaningful review of phase 2.

73. Nordic's "cost estimates" supplied in its application and to date did not and do not meet what is required by the rule.

74. Where provided at all, significant costs are combined to become meaningless, such as the cost of 10 large buildings combined with "process equipment," and roads combined with "site finishes." The rule mandates a proper level of detail, without which no analysis is possible.

As To Thermal Impact
(Meeting The Temperative Limits Provided Under Tidal Water Thermal Discharges)
(06-096 C.M.R. c. 582)

75. Nordic provided insufficient data to verify that the state Tidal Water Thermal Discharge Standard of Chapter 582 can be met.

76. Nordic measured water temperature at the surface of Penobscot Bay in June, the warmest possible time of year water temperature, whereas the discharge and thus the water impacted by the discharge is at 34 feet below the surface where obviously the water is colder. This is misleading and fails to comply with the statute.

77. There is insufficient data to verify that the state Tidal Water Thermal Discharge Standard can be met. NAF is using unverified models. The NAF discharge temperature must be

verified with additional data collected over several seasons and take into account anomalies in the currents and wind, and sub-circulations within the Bay.

IV. BEP committed an error of law, abused its discretion and/or made findings unsupported by record evidence when it converted application requirements that Nordic had the burden of proof to show were met into after-the-fact permit conditions.

78. Petitioner repeats and realleges the material allegations in paragraphs 1 through 72 of this Petition as if fully set forth herein.

79. By allowing the application process to proceed in the face of information required by the rules to be submitted as part of the application, but missing from the application, the BEP violated DEP rules requiring a complete application.

80. BEP and DEP processed applications that could not be supported by substantial evidence because that evidence was not supplied in Nordic's application.

81. The BEP allowed material application requirements to be addressed after the permits were awarded, by making those application requirements into after-the-fact and sometimes post-completion of the project, permit conditions. Examples include but are not limited to:

a. A dye test to determine the rate and direction of flow of water in Penobscot Bay in order to determine the ability of the Bay to dissipate or absorb the Nordic pollutants.

b. Aquifer drawdown reducing the supply of available water for local property owners.

c. Possible, but still undefined recourse for owners of local domestic and agricultural wells when Nordic permanently draws down their wells.

d. Remediation and/or abatement of saltwater intrusion into the aquifer in which local homeowners try to maintain wells, domestic and agricultural.

e. Setting a 21 mg/L nitrogen standard as an MPDES permit condition with no evidence Nordic can possibly achieve it.

f. Thermal impact evaluation in violation of 06-096 C.M.R. c. 582.

g. A revised Water Resources Management Plan submitted for review and approval after award of the permit but prior to the start of construction.

h. After the fact, somehow, by test wells, demonstrate that withdrawal of ground water will not substantially lower the found water table and cause saltwater intrusion. Nordic is required to address this as a permit condition, including testing to provide more sophisticated modeling that could provide a more confident prediction of effects on nearby groundwater resources.

82. By converting application requirements into after-the-fact permit conditions, BEP acknowledges that Nordic's application is incomplete in each of the above respects. Any BEP grant of a permit with an application that is materially incomplete creates a permit that, by that fact, is not supported by substantial evidence and thus is awarded contrary to law.

V. BEP committed an error of law, abused its discretion and/or made findings unsupported by record evidence when it misapplied the standards applicable to the issuance of an air permit (A-1146-71-A-N)).

83. Petitioner repeats and realleges the material allegations in paragraphs 1 through 82 of this Petition as if fully set forth herein

84. Nordic sought a "Major Source".

85. Nordic attempted to qualify as a minor source by using a "synthetic minor", to wit, a voluntary constraint on its fuel use. In doing so, it failed or refused to:

a. Disclose the other emissions sources on site including but not limited to:

i. The fish processing plant

ii. The wastewater treatment plant

iii. The huge fish "grow-out" tank buildings

iv. The office building

v. Emissions form multi-year construction activities, including approximately 45,000 truck loads

vi. The on-site cement plant

vii. Disclosure of any obligations it may have or may be negotiating with Central Maine Power (CMP) regarding producing power on demand when needed by CMP without regard to self-imposed constraints.

b. Without knowing the other emission sources and analyzing Nordic's output it is not possible to know if the generator emissions applied for will cause an exceedance of any air pollution standard, and therefor whether Nordic should have been required to apply for a permit as a Major Source of Air Pollution.

c. Nordic originally represented to the BEP that its power plant was for "Peak Shaving", and then it was for "Emergency Generation", but in fact, it will be available for "On-call Power' for CMP, meaning that Nordic does not have control over the use of its power plant and cannot limit its fuel consumption to its promised amount because CMP can demand power beyond the limitations voluntarily suggested by Nordic.

d. Without assurances that CMP could not call for Nordic to generate power according to CMP's needs, Nordic cannot assure DEP that it can voluntarily restrict its fuel use which restriction is what may qualify Nordic's emission as a "Minor Source" of air pollution,

and therefore a "minor source" permit is invalid and Nordic must apply for a permit as a Major Source.

MPDES PERMIT (ME0002771)
W009200-6F-A-N

86. Nordic sought to discharge 7.7 million gallons of wastewater from its fish rearing/fish processing plant and slaughterhouse into Penobscot Bay every day.

87. Although the waste will be treated, there will remain constituents of concern at various concentrations in the discharge.

88. One constituent of concern is nitrogen. The nitrogen concentration in the discharge must not lower the water quality classification from "SB":

a. Penobscot Bay has a water quality classification of "SB", the second highest classification as defined in 38 M.R.S. § 465-B. In order to preserve the SB classification, discharges may not consume more than 20% of the assimilative capacity of the Bay for the constituent in question.

b. Early in the application process, Nordic calculated that its nitrogen concentration would be 23 mg/L and that that concentration was fixed. Nordic asserted that its nitrogen concentration was appropriate because, although the dilution ratio to which the discharge was exposed would change over time and distance, the "steady state" dilution ratio, the ratio we have to "live with", and thus the appropriate dilution ratio to anticipate, would be 300:1.

c. Nordic witnesses testified under oath and submitted calculations, under oath, that 300:1 was the correct steady state ratio and should be used to calculate the impact of the discharge.

d. DEP staff performed the usual and proper calculations using Nordic's figure, the 300:1 dilution ratio, and concluded that the proposed discharge would clearly fail to

meet the antidegradation requirements necessary to retain the SB water quality in Penobscot Bay and the permit, as applied for, must be denied.

e. On or about March 18, 2020, Nordic personnel called Mr. Gregg Wood of the DEP staff to ask him to change the dilution ratio from 300:1 to 530:1, a number that makes Nordic's discharge almost compliant.

f. On May 20, 2020, Mr. Gregg Wood presented to the BEP in contravention of his memo, announced the change in the dilution ratio made at the request of Nordic, and recommended approval. No engineering change had been accomplished. The proposed discharge was exactly the same before and after the call from Nordic to Mr. Wood. The number 530:1 was apparently selected from Nordic's dilution graph at a point that was temporary and was not steady state.

89. As a result, BEP has permitted a nitrogen discharge that fails to protect the SB water quality classification of Penobscot Bay in violation of 38 M.R.S. § 464, et. seq.

DISPURSION CALCULATION

90. Nordic proposes to discharge 7.7 million gallons of wastewater per day into Penobscot Bay.

91. Nordic presented a model to demonstrate the fate and transport of the 7.7 million gallons per day of discharged material to assure the BEP that the waste would not harm the beaches, cause algal blooms, destroy eelgrass, or degrade the water quality in Penobscot Bay.

92. The model was not supported by reasonable or competent data collected over sufficient time to prove the model was reliable.

93. In order to try to show dispersion of the pollution Nordic proposed to discharge, BEP allowed Nordic to demonstrate by modelling, the tides in Penobscot Bay. Nordic did not

offer or attempt to field verify their model for necessary credibility nor did BEP require the applicant to model, field verify and assess Penobscot Bay's currents, flow and thermal effects without which any analysis is not complete. This unverified modelling demonstrates again, a lack of substantial evidence to support the permit findings.

94. Instead, the BEP imposed a permit condition that Nordic conduct dye tests to determine flow and dispersion characteristics in Penobscot Bay, at different depths, to show the fate of the pollution, within two (2) years after completion of the proposed half billion-dollar project. If the dye test shows a problem with the 7.7 million gallon per day discharge, nothing can be done. The project will have been built. The BEP directed that dye testing must be accomplished. Therefore, dye testing must be necessary to determine if the Bay is able to absorb the pollution insult imposed by Nordic. If dye testing is necessary and dye testing is not performed prior to the issuance of the permit, the permit obviously was granted without substantial evidence of the Bay's ability to absorb Nordic's pollution.

95. Although Nordic had over a year to perform the dye tests, instead, it chose to request a permit condition allowing it to perform the dye tests after construction of the project when it would be too late to correct illegal levels of pollution.

96. Nordic still shows no inclination to perform thermal testing without which any dispersion study is incomplete and flawed.

OTHER MPDES OMISSIONS
FISH FOOD

97. Another "constituent of concern" is the food to be fed to the fish.

98. In spite of repeated requests from DEP staff, BEP, the Belfast Planning Board and the public, Nordic refuses to reveal what food it will use.

99. Residue from the food will be in the wastewater either from food that is uneaten or from food waste excreted by the fish.

100. Without knowing what food will be used by Nordic it is not possible to know what waste water treatment will be needed, to estimate the effectiveness of that treatment or to be alert to the residual chemicals or viruses that will be discharged untreated.

101. The proposed treatment system cannot therefore be based on "substantial evidence" but must be based on conjecture which is a capricious act.

VIRUSES

102. A further "constituent of concern" is viruses. Nordic will employ a .04 milligram screen which will slow down the wastewater outflow considerably and probably arrest bacteria, but not viruses. Nordic suggests it will use ultraviolet light to kill the viruses, but the effectiveness of ultraviolet light is uncertain, at best. Nordic failed to verify the effectiveness of UV light to eradicate viruses. Thus, any finding that the discharge is benign lacks substantial evidence in support thereof.

VI. BEP committed an error of law, abused its discretion and/or made findings unsupported by record evidence when it failed to require a MPDES Permit for Nordic's Sludge Dewatering Project.

103. Petitioner repeats and realleges the material allegations in paragraphs 1 through 102 of this petition as if fully set forth herein.

104. On or about March 2, 2020, at a public hearing conducted by the Maine Department of Marine Resources, Nordic revealed that it intended to dredge a portion of Penobscot Bay in order to lay its pipes into the ocean floor. The dredge spoils were to be loaded onto a barge that would do two things: it would transport the spoils 5.5 miles to Searsport, and it would dewater the soils, discharging the spoils water into Penobscot Bay.

105. Upstream asserted that in order to discharge water from its dredge spoils into Penobscot Bay, a "water of the United States" it needed an MPDES permit for which Nordic has not even applied.

106. BEP denied Upstream's claim and declined to require the additional MPDES permit, without which any discharge to the "Waters of the United States" is unlawful.

VII. BEP committed an error of law, abused its discretion and/or made findings unsupported by record evidence when it improperly found Nordic had sufficient Title Right or Interest to seek permits.

107. Pursuant to department rules, 06-096 C.M.R. c. 2, § 11(D), prior to acceptance of an application, an applicant must demonstrate to the department's satisfaction sufficient title, right or interest (TRI) in all of the property that is proposed for development or use. An applicant must maintain sufficient TR I throughout the entire application processing. Evidence of TRI may include deeds, easements, option agreements, and any other such evidence the department deems acceptable to demonstrate sufficient TR I.

108. In a pending action before the Waldo Superior Court titled *Jeffrey R. Mabee and Judith B. Grace v. Nordic Aquafarms Inc., et al.,* Docket No. RE-2019-18, Upstream believes that the Superior Court will find that Janet Eckrote and Richard Eckrote do not own the intertidal land seaward of their upland property, and that the Eckrote never did. Upstream will ask this Court to vacate all of the permits awarded to Nordic on November 19, 2020 as improvidently granted.

WHEREFORE, pursuant to 5 M.R.S. § 11007(4) Petitioner respectfully requests that the Court find that each of the referenced decisions of the Board of Environmental Protection, including findings, inferences, conclusions contained therein are:

(1) In violation of constitutional or statutory provisions;

(2) In excess of the statutory authority of the agency;

(3) Made upon unlawful procedure;

(4) Affected by bias or error of law;

(5) Unsupported by substantial evidence on the whole record; and/or

(6) Arbitrary or capricious or characterized by abuse of discretion

and revoke the approvals granted to Nordic, and declare each of them null and void, grant such other relief as is just and proper, and award Petitioner its costs.

Dated: December 16, 2020

/s/ David B. Losee

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STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JANET T. MILLS
GOVERNOR

GERALD D. REID
COMMISSIONER

MEMORANDUM

TO: Board of Environmental Protection

FROM: Gerald D. Reid, Commissioner
Kevin Martin, Compliance & Procedures Specialist, Office of the Commissioner
Gregg Wood, Director, Division of Water Quality Management

RE: Nordic Aquafarms, Inc. – Application for a Maine Pollutant Discharge Elimination System (MEPDES) Permit

DATE: May 20 & 21, 2020 Board Meeting – Deliberative Session

Introduction. Nordic AquaFarms Inc. (Nordic or applicant) submitted an application to the Maine Department of Environmental Protection (Department) on October 19, 2018, seeking coverage for a proposed discharge of treated waste water under a combination Maine Pollutant Discharge Elimination System (MEPDES) permit/Maine Waste Discharge License (WDL). The Department determined the application to be complete for processing on November 9, 2018. Nordic is seeking a permit/license to discharge a monthly average flow of 7.7 million gallons per day (MGD) of treated process waste water to Belfast Bay. The applicant is proposing to convey any sanitary waste water generated at the proposed facility to the City of Belfast's waste water treatment facility that is permitted by the Department via MEPDES permit #ME0101532/WDL #W000569.

Nordic is proposing to rear and process up to 33,000 metric tons of Atlantic salmon in a recirculating aquaculture system (RAS) located in the City of Belfast. The applicant is proposing to treat the waste water generated at the facility in an advanced biological treatment system via drum filtration, aerobic moving bed bio-reactors (MBBR), chemical precipitation, micro-filtration in membrane bio-reactors (MBR), sludge dewatering and ultraviolet disinfection prior to discharge. The proposal is to discharge the treated waste water via an outfall pipe measuring 36 inches in diameter with a multi-port diffuser discharging at 11.5 meters below mean low water approximately 3,600 feet off of the shoreline.

Statutory and Regulatory References.

- Pollution Control Law, 38 M.R.S. §§ 411 through 424-B, 451;
- Water Classification Program, 38 M.R.S. §§ 464 through 470;
- Department regulations adopted pursuant to the above laws, including Chapters 520-525, 530, 579, 582, 584 and 587.

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Licensing criteria evaluation by subject

1. **Temperature**

- Licensing criteria - No discharge of pollutants shall cause the monthly mean of the daily maximum ambient temperatures in any tidal body of water, as measured outside the mixing zone, to be raised more than 4 degrees Fahrenheit nor more than 1.5 degrees Fahrenheit from June 1 to September 1.

- The applicant is proposing to discharge at 15°C (59.0°F) to 18°C (64.4°F) on a year round basis.

- **Based on Department staff's review and analysis to date, the proposed dischasrge, if permitted would fall below, and thus meet the non-summer licensing criteria as the temperature difference (ΔT) is 3.0°F < 4°F.**

- **Based on Department staff's review and analysis to date, the proposed dischasrge, if permitted would fall below, and thus meet the summer licensing criteria as the temperature difference (ΔT) 1.4°F < 1.5°F.**

See Attachment A of this memorandum for a more in-depth discussion on temperature.

2. **Dilution**

- Licensing criteria - For discharges to the ocean, dilution must be calculated as near-field or initial dilution, or that dilution available as the effluent plume rises from the point of discharge to its trapping level, at mean low water level and slack tide for the acute exposure analysis, and at mean tide for the chronic exposure analysis using appropriate models determined by the Department such as MERGE, CORMIX or another predictive model. There are no established licensing criteria for determining far-field dilution. Therefore, far-field dilution factors are determined based on a best professional judgment.

- The applicant has modeled the proposed discharge and determined the near-field acute dilution factor is 10:1, the near-field chronic dilution factor is 15:1 and the far-field dilution factor is 300:1.

The Department staff has reviewed the applicant's modeling efforts and believes the proposed near-field and far-field dilution factors for the proposed discharge are based on a sound scientific rationale and if the discharge is permitted, would meet the licensing criteria established in Maine law, §451 and 06-096 CMR Chapter 530.

See Attachment B of this memorandum for a more in-depth discussion on dilution.

3. **Biochemical oxygen demand (BOD_5) and total suspended solids (TSS)**

   - Licensing criteria - The dissolved oxygen content of Class SB waters may not be less than 85% of saturation. The discharge is subject to effluent limitations that require application of the best practicable treatment (BPT). The Department has determined BPT to be 30 mg/L as a monthly average and 50 mg/L as a daily maximum. The Department shall issue a license for the discharge of pollutants only if it finds that the discharge either by itself or in combination with other dischargers will not lower the classified body of water below such classification.

   - At optimal efficiencies of the waste water treatment facility, the permittee is proposing to discharge BOD and TSS at concentrations of 6 mg/L respectively. This represents a 99% removal rate of BOD and TSS.

   - **Based on its review and analysis to date, the Department staff believes BPT based limitations for BOD_5 and TSS of 30 mg/L as a monthly average and 50 mg/L as a daily maximum would meet the dissolved oxygen licensing criteria of 85% saturation and the anti-degradation provision in that the discharge, if permitted, will not cause or contribute to failure of the receiving water to meet the standards of its assigned classification.**

   See Attachment C of this memorandum for a more in-depth discussion on BOD_5 and TSS.

4. **Effluent limitations and ambient water quality monitoring**

   - Licensing criteria - Department rules establish procedures and criteria for setting technology-based effluent limitations in waste discharge licenses. Included are general provisions regarding establishing effluent limits, test procedures, units of measurement, and categories of pollutants. If the technology based limitations are not stringent enough to meet the classification standards assigned to the waterbody, more stringent limitations referred to as water quality based limitations are required.

   - The applicant is proposing to accept both BPT and water quality based limitations as well as monitoring the effluent for flow, BOD, TSS, total kjeldahl nitrogen (TKN), nitrate + nitrite nitrogen, total nitrogen, total ammonia, total phosphorus and pH at frequencies ranging from 1/Week to 3/Week. In addition, the applicant is proposing to conduct annual ambient water quality monitoring at five sampling site in Belfast Bay and conduct a dye study to better define the mixing characteristics of the proposed discharge with the receiving water.

   - **Based on its review and analysis to date, the Department staff believes that the establishment of BPT and water quality based limitations where appropriate, routine effluent monitoring and ambient water quality monitoring would meet the licensing criteria if the project is permitted.**

   See Attachment D of this memorandum for a more in-depth discussion on effluent limitations and monitoring requirements.

5. **Total nitrogen**

Licensing criteria - The discharge is subject to effluent limitations that require application of the best practicable treatment. The Department will issue a license for the discharge of pollutants only if it finds that the discharge either by itself or in combination with other dischargers will not lower the classified body of water below such classification. In applying the statutory antidegradation standards and based upon its historical practice and best professional experience and judgment and its nonbinding Waste Discharge Program Guidance dated June 13, 2001, Department staff will generally consider new or increased discharge that consume 20% or more of the remaining assimilative capacity for dissolved oxygen or other water quality parameter, to be a lowering of the water quality. The Department utilizes two total nitrogen (TN) threshold values to address aquatic life use of Maine's marine waters:

- 0.45 mg/L for protection of dissolved oxygen, when eelgrass has not been historically mapped within close proximity to the discharge in question.

- 0.32 mg/L for protection of eelgrass, when historically mapped as present within close proximity to the discharge in question; and

- At optimal efficiencies of the waste water treatment facility, the applicant is proposing to discharge total nitrogen at a concentration of 23 mg/L. This represents a 99% removal rate of total nitrogen.

- **For the protection of dissolved oxygen as the environmental response indicator, based on Department staff review and analysis to date, the proposed discharge concentration of 23 mg/L would not meet the default antidegradation licensing criteria threshold of 12 mg/L at full flow if permitted. This is because a proposed discharge value of 23 mg/L would consume 38% of the remaining assimilative capacity of the receiving water.**

- **For the protection of eelgrass as the environmental response indicator, based on Department staff review and analysis to date, the proposed discharge concentration of 23 mg/L would not meet the default antidegradation licensing criteria threshold of 14 mg/L at full flow. This is because a proposed discharge value of 23 mg/L would consume 33% of the remaining assimilative capacity of the receiving water.**

- **Based on the default antidegradation licensing criteria and Department staff review and analysis to date, the limiting discharge threshold is 12 mg/L. This 12 mg/L threshold would result in the consumption of no more than 20% of the remaining assimilative capacity of the receiving water. According to the state's antidegradation policy, and based upon the Department staff's historical practice and best professional experience and judgment, consuming more than 20% of the remaining assimilative capacity of the receiving water is considered a lowering of water quality and the applicant would only be able to meet the standard if it established and the Department made the findings required by Maine law, 38 M.R.S. §464(4)(F)(5).**

See Attachment E of this memorandum for a more in-depth discussion on total nitrogen.

Attachment A

Temperature

Applicable temperature licensing criteria

06-096 CMR Chapter 582, *Regulations Relating to Temperature* states in part:

SUMMARY: These rules provide safeguards for fresh and salt water fauna in lakes and rivers of the state, by establishing instream limits on temperature resulting from thermal discharges.

and

Sub-§5, *Tidal Water Thermal Discharges states* – "No discharge of pollutants shall cause the monthly mean of the daily maximum ambient temperatures in any tidal body of water, as measured outside the mixing zone, to be raised more than 4 degrees Fahrenheit nor more than 1.5 degrees Fahrenheit from June 1 to September 1. In no event shall any discharge cause the temperature of any tidal waters to exceed 85 degrees Fahrenheit at any point outside a mixing zone established by the Board."

Department Review and Analysis of Temperature

Department staff have reviewed and analyzed the applicant's proposal from the standpoint of applicable temperature criteria and note the following:

Considering a worst-case scenario for the applicant's proposed discharge at the full flow of 7.7 MGD contemplated by the application as follows:

Using the highest discharge temperature 18°C (64.4°F). (The temperature of 18°C is the highest discharge temperature identified by the applicant in its application.)

Using the mean of the daily maximum ambient temperature – non summer 1.3°C (34.3°F), in the month of March. (Ambient temperatures are coldest in the month of March.)

Using the mean daily maximum ambient temperature - summer 10°C (50.0°F) in the month of June. (Ambient temperatures are warmest in the month of June.)

Given:

Acute near-field dilution factor 10:1 to be conservative ⇒ 9 parts ambient, 1 part effluent. An acute near-field dilution factor is most appropriate for this analysis as temperature impacts to the environment are greatest shortly after being discharged to the environment.

Effluent flow = 7.7 MGD (from the application)

Receiving water volume= 69.3 MG (calculated from the acute near-field dilution factor of 10:1)

Non-Summer (September 2 – May 31)

Ambient 34.3° F (1.3 °C)
Daily max effluent temperature of 64.4 °F (18° C)

Find the change in temperature (ΔT):

$$\frac{(64.4°F)(7.7\ MGD) + (34.3°F)(69.3\ MGD)}{77\ MGD} = 37.3°F$$

37.3°F -34.3°F = **3.0°F < 4°F** **Based on Department's staff review and analysis to date, this worst-case scenario for non-summer would be below, and thus meet the non-summer licensing criteria if permitted.**

Summer (June 1 – September 1)

Ambient 50.0 °F (10° C)
Daily max effluent temperature of 64.4 °F (18° C)

Find the change in temperature (ΔT):

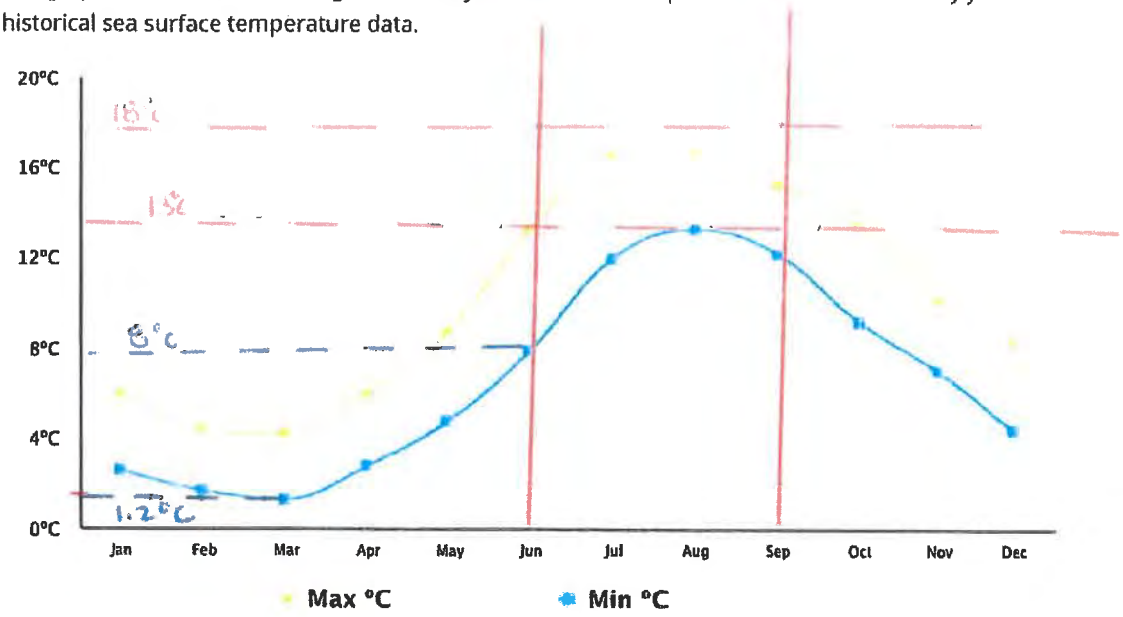
$$\frac{(64.4°F)(7.7\ MGD) + (50.0°F)(69.3\ MGD)}{77\ MGD} = 51.4°F$$

51.4°F -50.0°F = **1.4°F < 1.5°F** **Based on Department's staff review and analysis to date, this worst-case scenario for summer would be below, and thus meet the summer licensing criteria if permitted.**

ANON. 2020a. *Belfast Sea Temperatures* [Online]. 2020. Available: https://www.seatemperature.org/north-america/united-states/belfast.htm [Accessed 9th January 2020].

Monthly average max / min water temperatures

The graph below shows the range of monthly Belfast water temperature derived from many years of historical sea surface temperature data.



Attachment B

Dilution Factors

Applicable dilution licensing criteria

Maine law, 38 M.R.S. §451 *Enforcement generally* states in part:

> After adoption of any classification by the Legislature for surface waters or tidal flats or sections thereof, it is unlawful for any person, firm, corporation, municipality, association, partnership, quasi-municipal body, state agency or other legal entity to dispose of any pollutants, either alone or in conjunction with another or others, in such manner as will, after reasonable opportunity for dilution, diffusion or mixture with the receiving waters or heat transfer to the atmosphere, lower the quality of those waters below the minimum requirements of such classifications, or where mixing zones have been established by the department, so lower the quality of those waters outside such zones, notwithstanding any exemptions or licenses which may have been granted or issued under sections 413 to 414-B.
>
> The department may establish a mixing zone for any discharge at the time of application for a waste discharge license. The department shall attach a description of the mixing zone as a condition of a license issued for that discharge. After opportunity for a hearing in accordance with section 345-A, the department may establish by order a mixing zone with respect to any discharge for which a license has been issued pursuant to section 414 or for which an exemption has been granted by virtue of section 413, subsection 2.
>
> The purpose of a mixing zone is to allow a reasonable opportunity for dilution, diffusion or mixture of pollutants with the receiving waters before the receiving waters below or surrounding a discharge will be tested for classification violations. In determining the extent of any mixing zone to be established under this section, the department may require from the applicant testimony concerning the nature and rate of the discharge; the nature and rate of existing discharges to the waterway; the size of the waterway and the rate of flow therein; any relevant seasonal, climatic, tidal and natural variations in such size, flow, nature and rate; the uses of the waterways in the vicinity of the discharge, and such other and further evidence as in the department's judgment will enable it to establish a reasonable mixing zone for such discharge. An order establishing a mixing zone may provide that the extent thereof varies in order to take into account seasonal, climatic, tidal and natural variations in the size and flow of, and the nature and rate of, discharges to the waterway.

> Where no mixing zones have been established by the department, it is unlawful for any person, corporation, municipality or other legal entity to dispose of any pollutants, either alone or in conjunction with another or others, into any classified surface waters, tidal flats or sections thereof, in such manner as will, after reasonable opportunity for dilution, diffusion, mixture or heat transfer to the atmosphere, lower the quality of any significant segment of those waters, tidal flats or sections thereof, affected by such discharge, below the minimum requirements of such classification, and notwithstanding any licenses which may have been granted or issued under sections 413 to 414-B.

06-096 CMR Chapter 530 – *Surface Water Toxics Control Program,* §4(A) (calculation of dilution factors) states in part as §4(A)(2)(a):

> For discharges to the ocean, dilution must be calculated as near-field or initial dilution, or that dilution available as the effluent plume rises from the point of discharge to its trapping level, at mean low water level and slack tide for the acute exposure analysis, and at mean tide for the chronic exposure analysis using appropriate models determined by the Department such as MERGE, CORMIX or another predictive model.

Modeling for Near-field and Far-field Dilution

The United States Environmental Protection Agency (USEPA) supports the use of the CORMIX model for calculating near-field dilution factors. Page 76 of the *USEPA Technical Support For Water Quality Based Toxics Control, March 1991*, states in part

> "The first model, CORMIX may be the most useful to regulators since it is an expert system that guides the user in selecting an appropriate modeling strategy for rivers or estuaries."
>
> and:
>
> "CORMIX is a series of software elements for the analysis of a submerged buoyant or nonbuoyant discharge containing conventional or toxic pollutants and entering into stratified or unstratified watercourses, with emphasis on the geometry and dilution characteristics of the initial mixing zone."

Near-Field Dilution

Near-field dilution factors are applicable to pollutants that have the potential for an immediate adverse effect on the flora or fauna of a marine ecosystem. For example, marine organisms react to elevated levels of toxic pollutant such as total metals with hours or days of being exposed. Therefore, estimating acute and chronic dilution factors with a steady state model such as the CORMIX model is supported by Department rules and USEPA technical support documents.

In a letter dated August 14, 2019, to the Department, the applicant indicated it had utilized the CORMIX model to determine the near-field dilution factors for the proposed discharge from the Nordic facility. The input parameters included, but were not limited to, a full flow rate of 7.7 MGD that would be discharged via an outfall pipe measuring 36 inches in diameter with a multi-port diffuser discharging at 11.5 meters below mean low water approximately 3,600 feet off of the shoreline. The applicant calculated worst case near-field dilution factors of 10:1 (acute) and 15:1 (chronic).

Far field dilution

Far-field dilution factors are applicable to pollutants that have the potential for a more subtle and or systemic types of effects on the flora or fauna of a marine ecosystem, and or pollutants that exert their influence on broader time scales. For example, biochemical oxygen demand (BOD_5) decays over time and takes five days to exert its implied influence on ambient dissolved oxygen. Eutrophication associated with excessive nitrogen loadings happens on significantly broader spatial and time scales in this type of marine system, due in large part to the very dynamic nature of the bay.

Unlike the CORMIX model that is supported by Department rules and USEPA technical support documents for estimating near-field acute and chronic dilution factors, there currently are no rules or statutes that establish methodologies to model far-field dilution. Therefore, modeling personnel must use best professional judgment to select modeling tools that are most appropriate for a particular receiving water and discharge characteristics.

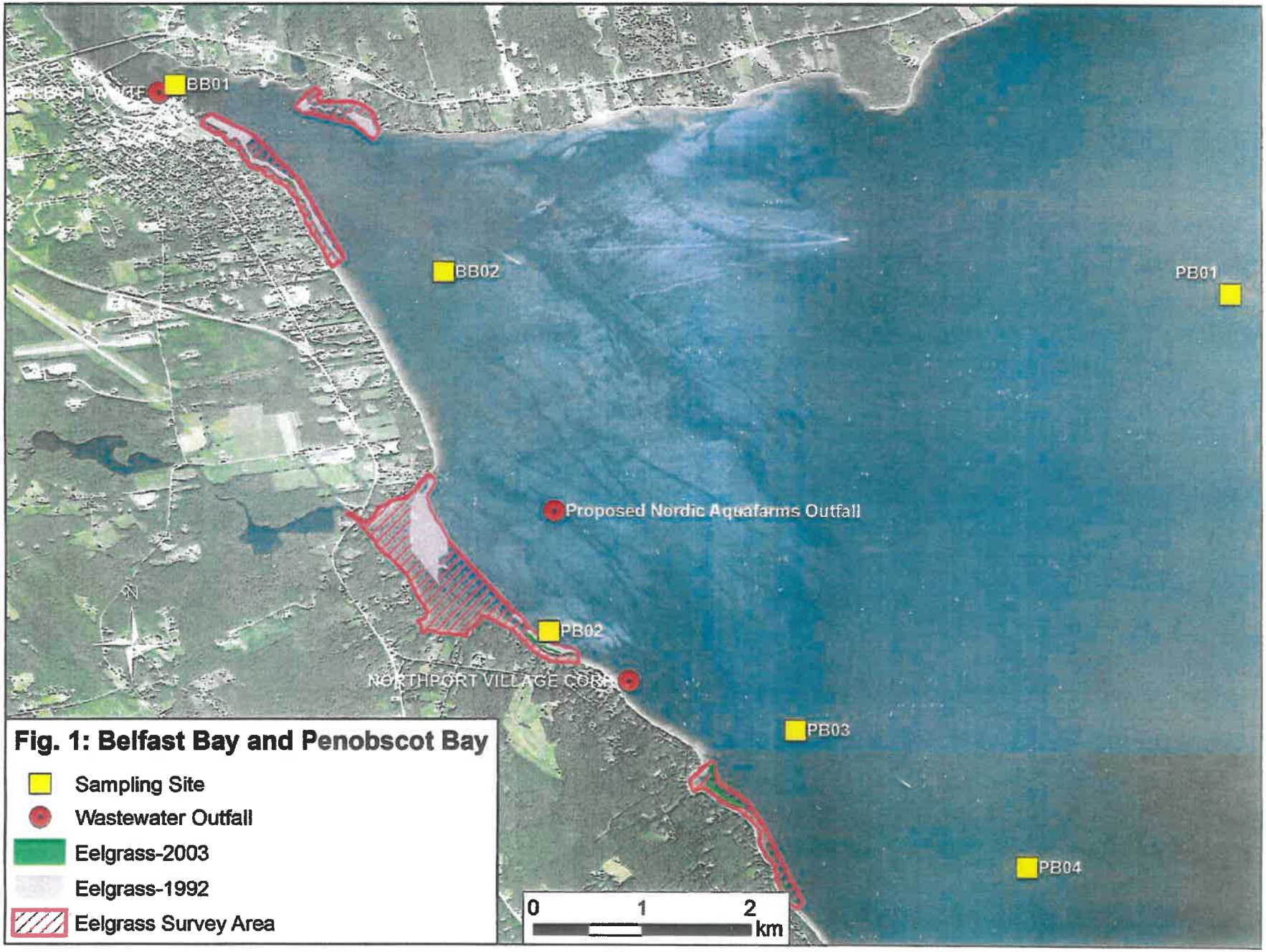
Maine law 38 M.R.S. §451 provides some guidance regarding dilution factors that may be considered by the Department: "In determining the extent of any mixing zone to be established under this section, the department may require from the applicant testimony concerning the nature and rate of the discharge; the nature and rate of existing discharges to the waterway; the size of the waterway and the rate of flow therein; any relevant seasonal, climatic, tidal and natural variations in such size, flow, nature and rate; the uses of the waterways in the vicinity of the discharge, and such other and further evidence as in the department's judgment will enable it to establish a reasonable mixing zone for such discharge."

In this proceeding, the applicant utilized a hydrodynamic model referred to as the ADvanced CIRculation (ADCIRC) model to estimate the far-field dilution factors for the proposed discharge to Belfast Bay. The ADCIRC model was originally developed for coastal flood hazard studies in the larger Penobscot Bay and has many of the dynamic physical attributes of the bay already built into the model. The applicant evaluated a particle tracking output from the model to evaluate the far field dilution factor in close proximity to the proposed discharge over 4 tide cycles (two days) and determined that a far-field dilution factor for

assessing impacts to dissolved oxygen is 300:1. For potential impacts to the closest eelgrass bed located 4 kilometers (2.5 miles) to the southwest of the proposed discharge along the southern shore of Northport as mapped by the Department (see Department sampling station PB02 on the attached aerial photograph entitled *Fig.1: Belfast Bay and Penobscot Bay)*, the dilution factor of 1,000:1 was based on the Department's best professional judgment.

Department staff's review and analysis of the applicant's modeling to date

The Department staff has reviewed the applicant's modeling efforts and believes that the proposed near-field and far-field dilution factors utilized for the proposed discharge are based on a sound scientific rationale and would, if the discharge is permitted, meet the dilution licensing criteria established in Maine law, §451 and 06-096 CMR Chapter 530.


BB01
BB02
PB01
Proposed Nordic Aquafarms Outfall
PB02
NORTHPORT VILLAGE CORP
PB03
PB04
N
0
1
2
km
Fig. 1: Belfast Bay and Penobscot Bay
Sampling Site
Wastewater Outfall
Eelgrass-2003
Eelgrass-1992
Eelgrass Survey Area

Attachment C

Biochemical Oxygen Demand (BOD_5) & Total Suspended Solids (TSS)

Applicable BOD and TSS Licensing criteria

Maine law 38 M.R.S.§469, *Classifications of estuarine and marine waters*, states that all estuarine and marine waters lying within the boundaries of coastal counties of the State of Maine and that are not otherwise classified are Class SB waters.

Maine law 38 M.R.S. §465-B, *Standards for classification of estuarine and marine waters*, states in part "2. Class SB waters. Class SB waters shall be the 2nd highest classification." Subsection 465-B(2)(b) further states in part; "The dissolved oxygen content of Class SB waters may not be less than 85% of saturation." Subsection 465-B(2)(C) further state in part; "Discharges to Class SB waters may not cause adverse impact to estuarine and marine life in that the receiving waters must be of sufficient quality to support all estuarine and marine species indigenous to the receiving water without detrimental changes in the resident biological community."

Maine law 38 M.R.S. §464 *Classification of Maine Waters,* states in part as follows:

> 38 M.R.S. §464 (F)(3): "The department may only issue a discharge license pursuant to section 414-A or approve water quality certification pursuant to the Federal Water Pollution Control Act, Section 401, Public Law 92-500, as amended, if the standards of classification of the water body and the requirements of this paragraph are met. The department may issue a discharge license or approve water quality certification for a project affecting a water body in which the standards of classification are not met if the project does not cause or contribute to the failure of the water body to meet the standards of classification."
>
> 38 M.R.S. §464 (C): "Where natural conditions, including, but not limited to, marshes, bogs and abnormal concentrations of wildlife cause the dissolved oxygen or other water quality criteria to fall below the minimum standards specified in sections 465, 465-A and 465-B, those waters shall not be considered to be failing to attain their classification because of those natural conditions."

Maine law 38 M.R.S. §414-A(1)(D), *Conditions of licenses,* states in part (emphasis added):

> "The discharge will be subject to effluent limitations that require application of the best practicable treatment. "Effluent limitations" means any restriction or prohibition including, but not limited to, effluent limitations, standards of performance for new sources, toxic effluent standards and other discharge criteria regulating rates, quantities and concentrations of physical, chemical, biological and other constituents that are discharged directly or indirectly into waters of the State. "Best practicable treatment" means the methods of reduction, treatment, control and handling of pollutants, including process methods, and the application of best conventional pollutant control technology or best available technology economically achievable, for a category or class of discharge sources that the department determines are best calculated to protect and improve the quality of the receiving water and that are

consistent with the requirements of the Federal Water Pollution Control Act, as amended, and published in 40 Code of Federal Regulations. If no applicable standards exist for a specific activity or discharge, the department must establish limits on a case-by-case basis using best professional judgment, after consultation with the applicant and other interested parties of record. In determining best practicable treatment for each category or class, the department shall consider the existing state of technology, the effectiveness of the available alternatives for control of the type of discharge and the economic feasibility of such alternatives."

Department Staff Discussion

BOD_5 is a measurement of dissolved oxygen that is used by aerobic microorganisms when decomposing organic matter in water. Elevated BOD discharged into a receiving water can cause the ambient dissolved oxygen to be depleted. TSS are solids in water that can be trapped by a filter. Elevated levels of TSS can settle to the bottom of receiving water and impact the resident biological community.

Currently there are no state or federally promulgated best practicable treatment (BPT) numeric standards for BOD_5 and TSS for land based recirculating aquaculture system (RAS) facilities. In 2002, the United States Environmental Protection Agency (USEPA) promulgated standards for RAS facilities based on narrative best management practices (BMPs) controls but opted not to establish numerical standards for BOD_5 and TSS. However, the Department has in other instances been more stringent than the federally promulgated standards and has established numeric limitations for both parameters. The Department has issued MEPDES permits for other RAS facilities establishing monthly average and daily maximum concentration limits of 30 mg/L and 50 mg/L respectively, for BOD_5 and TSS based on Department best professional judgment (BPJ) of BPT for RAS facilities. These limits were based on BPT recommendations included in USEPA's 2002 proposed draft National Effluent Guidelines for TSS for re-circulated fish hatchery wastewater receiving a secondary level of treatment and the Department's long-standing view of the relationship with and significance of BOD_5. For the proposed discharge from the proposed Nordic facility, mass limits would be calculated based on the monthly average flow limit of 7.7 MGD, the applicable concentration limit used by the Department based on BPJ and a conversion factor of 8.34 lbs/gal for water.

The limits would be calculated as follows:

Monthly average: (7.7 MGD)(30 mg/L)(8.34 lbs/gal) = 1,926 lbs/day

Daily maximum: (7.7 MGD)(50 mg/L)(8.34 lbs/gal) = 3,211 lbs/day

The Department staff has modeled the impact of the BPT discharge levels calculated above for BOD_5 and TSS on the ambient dissolved oxygen and believe that, based on its review and analysis to date, the proposed discharge, if permitted, would not have a discernable influence on ambient dissolved oxygen. The proposed discharge of BOD_5 at 30 mg/L has the potential to increase ambient BOD_5 concentrations by up to 0.1 mg/L, based on a far-field dilution factor of 300:1 (30 mg/L/300 = 0.1 mg/L). BOD is exerted at an approximate rate of 20% per day, which would suggest a relative influence on dissolved oxygen of approximately 0.02 mg/L (0.1 mg/L/5 = 0.02 mg/L). This degree of influence is significantly less than what could be measured within a reliable degree of accuracy. Dissolved oxygen monitoring instrumentation is only accurate to with plus or minus 0.1 mg/L.

According to data collected by the applicant and included in their MEPDES permit application and data collected by the Department in the summer of 2019, there are areas of naturally occurring dissolved oxygen levels that do not attain the Class SB 85% saturation standard. The discharge pipe as proposed would, if permitted, discharge at approximately 11.5 meters below the mean low water mark and would be fitted with a multiport diffuser designed to enhance mixing with the receiving water. The discharge would tend to be buoyant due to the fresh water component of the discharge. The pycnocline is the area of separation between two different densities of water due to changes in salinity and temperature gradients. Areas above the pycnocline tend to be better mixed due to wave action and water below the pycnocline tend to be hydraulically isolated due to greater density. The Department's water quality modelling engineer and marine biologist have assessed this situation and based on their review and analysis to date, believe the impact to the naturally occurring area of dissolved oxygen saturation levels of less than 85% is not measurable given the buoyance of the proposed discharge.

It is noted Nordic's application for a MEPDES permit indicates that if the maximum efficiencies of the proposed waste water treatment facility are realized, the proposed discharge concentration of BOD_5 and TSS may be as low 6 mg/L, representing a 99% removal rate for both parameters.

Based on Department staff's review and analysis to date, the establishment of BPT based limitations for BOD_5 and TSS would, if permitted, meet the dissolved oxygen standard licensing criteria of 85% saturation and the anti-degradation provision in that the discharge would not cause or contribute to failure of the receiving water to meet the standards of its assigned classification.

Attachment D

Effluent Monitoring and Ambient Water Quality Monitoring

Applicable licensing criteria

06-096 Chapter 525, *Effluent Guidelines and Standards* states in part:

> SUMMARY: "This rule establishes procedures and criteria for setting technology-based effluent limitations in waste discharge licenses. Included are general provisions regarding establishing effluent limits, test procedures, units of measurement, and categories of pollutants."

If the technology-based limitations in Chapter 525 are not stringent enough to meet the classification standards assigned to the waterbody, more stringent limitations referred to as water quality based limitations are required.

Maine law 38 M.R.S. §414-A. *Conditions of licenses,* states in part:

"1. Generally. The Department shall issue a license for the discharge of pollutants only if it finds that:

> A. The discharge either by itself or in combination with other dischargers will not lower the classified body of water below such classification."

Department Staff Discussion of Effluent Monitoring

With the exception of testing requirements for whole effluent toxicity testing (WET), analytical chemistry and priority pollutants, specified in 06-096 CMR, Chapter 530, *Surface Waters Toxics Control Program*, there currently are no statutes or rules that dictate the monitoring frequencies for parameters that are specifically regulated in a MEPDES permit. Monitoring frequencies are determined based on use of best professional judgment, considering effluent characteristics, ambient water quality conditions, whether the permit limitations are technology or water quality based, and if there is a reasonable potential for the discharge to exceed applicable water quality standards. The monitoring frequencies can range from 1/Day to 1/Year.

In general, each permitted facility is assigned a Department compliance inspector that is responsible for oversight of permitted facilities. Compliance inspectors conduct a minimum of one comprehensive facility compliance inspection annually. MEPDES permits establish numeric limitations and or routine monitoring requirements for pollutants of concern and parameters that are required to be limited by state or federal laws and rules/regulations. Permittees are required to electronically submit the results of the monitoring required by the permit to the Department

compliance inspector at a frequency of 1/Month. The monthly reports are referred to as Discharge Monitoring Reports (DMRs). The Department's compliance staff review the DMRs for accuracy, completeness and compliance with the terms and conditions of the discharge permit. All DMR data are entered into United States Environmental Protection Agency (USEPA) compliance tracking system referred to as the Integrated Compliance Information System (ICIS) which is accessible by the public. Reported non-compliance for all permittees is discussed each month by a committee of Department personnel including permitting, compliance and enforcement staff, to determine the most appropriate course of action to bring the facility back into compliance with the permit. Chronic or significant non-compliance may result in a formal enforcement action by the Department.

Though the state of Maine has been authorized to administer the delegated MEPDES program in Maine since January 12, 2001, the USEPA has oversight of the MEPDES program and may take action on issues relating to permitting, compliance or enforcement actions if it disagrees with the state's action or lack thereof, to administer the requirements of the Clean Water Act.

Department Staff Discussion of Ambient Water Quality Monitoring

Ambient water quality monitoring is sometimes required in MEPDES permits to verify the assumptions made in modelling decisions or to obtain a more robust data set of ambient water quality conditions. Nordic hired a contractor to conduct ambient water quality sampling at four sampling sites on two days in August 2018 and one day in September of 2018. Samples were collected from two proposed intake stations on August 23-24, 2018, and from two proposed discharge stations on September 7, 2018, along with an additional water sample collected on September 7, 2018, from a location on the Little River below the reservoir dam. In-situ water column profile measurements with a data sonde were collected for temperature, turbidity, pH, depth, dissolved oxygen (mg/L and % saturation) salinity and specific conductance. Water samples were collected and sent to a certified laboratory and were analyzed for total suspended solids (TSS), ammonia as nitrogen, nitrate/nitrite nitrogen, total nitrogen, TKN nitrogen, total phosphorus, chemical oxygen demand (COD) and biochemical oxygen demand (BOD). It is noted the sampling events were conducted shortly after rainfall events resulting in the total nitrogen data being influenced by storm water runoff.

With the exception of the Little River Reservoir sampling station, the four sampling stations are within approximately 0.3 miles apart from one another. See the attached aerial photograph entitled *Figure 1. Sampling stations map*, by Normandeau Associates Inc. and attached to this document.

The Department conducted four sampling events (approximately every three weeks) between June and September 2019 (on alternating ebb and flood tides) at six sampling locations in Belfast Bay and Penobscot Bay ranging from 1.2 miles to 4.3 miles apart to get a larger view of ambient water quality conditions of the bays. The Department collected data via sondes and water quality samples for all the same parameters as Normandeau Associates did in 2018. See the location of the Department's sampling sites in the attached aerial photograph entitled, *Fig 1: Belfast Bay and Penobscot Bay*.

For the Nordic facility proposal, there was no objection from any party at the Board of Environmental Protection (BEP) hearings held from February 11–14, 2020, as to the idea of gathering additional ambient water quality data prior to any discharge from the proposed facility given the limited data sets collected to date. Ambient water quality monitoring before and after a proposed new discharge goes on-line is common in the issuance of MEPDES permits. If a permit were to be granted, ongoing monitoring would enable the Department, permittee and interested parties to better understand the dynamics of the receiving water and verify (or refute) assumptions made in modeling efforts and verify that the proposed discharge will not cause or contribute to a violation of the standards assigned to its classification.

NORMANDEAU ASSOCIATES
Environmental Consultants

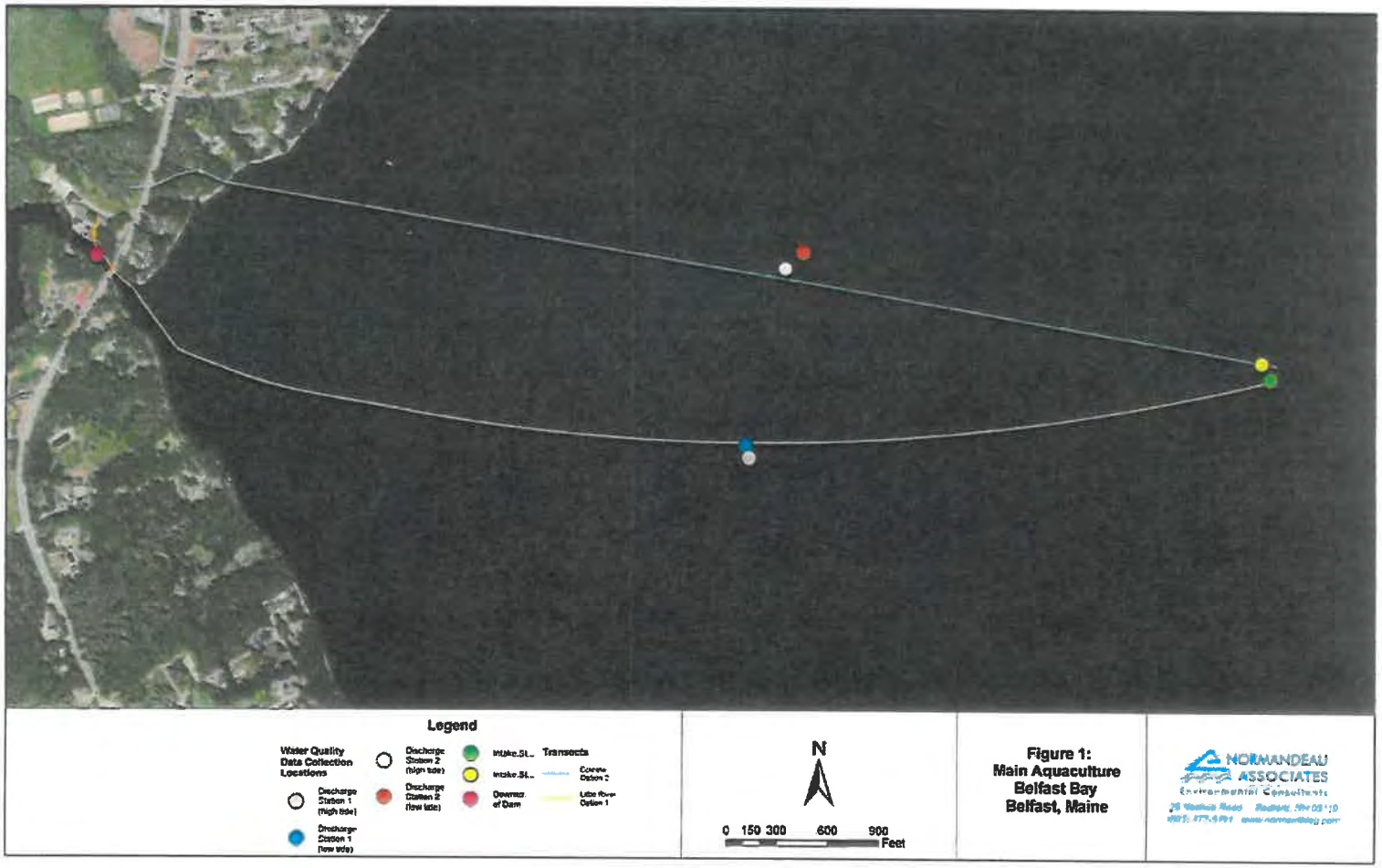


Figure 1. Sampling stations map

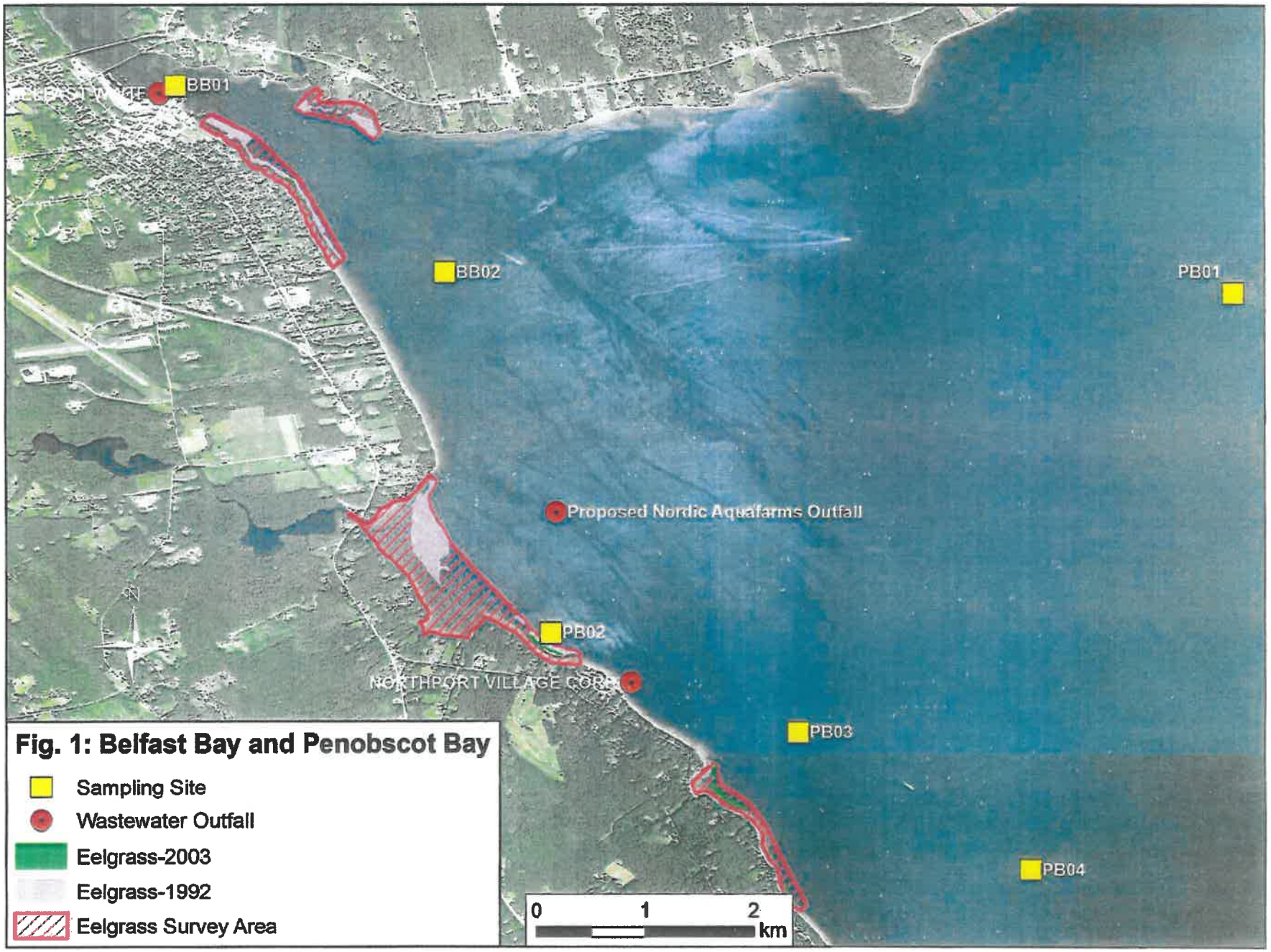


Fig. 1: Belfast Bay and Penobscot Bay

- Sampling Site
- Wastewater Outfall
- Eelgrass-2003
- Eelgrass-1992
- Eelgrass Survey Area

Attachment E

Total Nitrogen

Applicable nitrogen licensing criteria

Maine law 38 M.R.S. §464. *Classification of Maine Waters,* states in part as follows:

"4. General provisions. The classification system for surface waters established by this article shall be subject to the following provisions." 38, M.R.S. §464(4)(F) further states in part: "F. The antidegradation policy of the State is governed by the following provisions."

38 M.R.S. §464(4)(F)(3) states:

> "3. The department may only issue a discharge license pursuant to section 414-A or approve water quality certification pursuant to the Federal Water Pollution Control Act, Section 401, Public Law 92-500, as amended, if the standards of classification of the water body and the requirements of this paragraph are met. The department may issue a discharge license or approve water quality certification for a project affecting a water body in which the standards of classification are not met if the project does not cause or contribute to the failure of the water body to meet the standards of classification."

38 M.R.S. §464(f)(5) states:

> "5. The department may only issue a discharge license pursuant to section 414-A or approve water quality certification pursuant to the United States Clean Water Act, Section 401, Public Law 92-500, as amended, which would result in lowering the existing quality of any water body after making a finding, following opportunity for public participation, that the action is necessary to achieve important economic or social benefits to the State and when the action is in conformance with subparagraph (3). That finding must be made following procedures established by rule of the board."

Maine law 38 M.R.S. §414-A. *Conditions of licenses,* states in part as follows:

"1. Generally. The Department shall issue a license for a discharge of pollutants only if it finds that:" 38 M.R.S. §414-A(D) states (emphasis added):

> "D. The discharge will be subject to effluent limitations that require application of the best practicable treatment. "Effluent limitations" means any restriction or prohibition including, but not limited to, effluent limitations, standards of performance for new sources, toxic effluent standards and other discharge criteria regulating rates, quantities and concentrations of physical, chemical, biological and other constituents that are discharged directly or indirectly into waters of the State. "Best practicable treatment" means the methods of reduction, treatment, control and handling of pollutants, including process methods, and the

application of best conventional pollutant control technology or best available technology economically achievable, for a category or class of discharge sources that the department determines are best calculated to protect and improve the quality of the receiving water and that are consistent with the requirements of the Federal Water Pollution Control Act, as amended, and published in 40 Code of Federal Regulations. If no applicable standards exist for a specific activity or discharge, the department must establish limits on a case-by-case basis using best professional judgment, after consultation with the applicant and other interested parties of record. In determining best practicable treatment for each category or class, the department shall consider the existing state of technology, the effectiveness of the available alternatives for control of the type of discharge and the economic feasibility of such alternatives."

Department Staff Discussion of Total Nitrogen

Nitrogen is generally the limiting nutrient for primary productivity in marine waters. Discharges of excess quantities of immediately bioavailable nitrogen can cause algal blooms in the receiving waters, which can lead to negative impacts to dissolved oxygen levels. Immediately bioavailable nitrogen typically consists of dissolved inorganic forms, including nitrate (NO_3^-), nitrite (NO_2^-), and ammonium (NH_4^+). Total kjeldahl nitrogen (TKN) is the sum of organic nitrogen, ammonia (NH_3), and ammonium (NH_4^+). To calculate Total Nitrogen (TN), the concentrations of nitrate and nitrite are determined and added to TKN. With the exception of ammonia, nitrogen is not acutely toxic; thus, at this time, the Department considers a far-field dilution model to be most appropriate when evaluating the more systemic types of influences associated with nitrogen in the marine environment.

Currently there are no state or federally promulgated best practicable treatment (BPT) standards for land-based recirculating aquaculture system (RAS) facilities and the State of Maine has not promulgated numeric ambient water quality criteria for total nitrogen. Since 2015, on a case-by-case basis, Maine DEP staff have been completing reasonable potential analyses (RP) upon renewal of wastewater discharge licenses for those facilities that discharge nitrogen directly to marine waters of the state. To date, the Department's RP assessments have generally utilized two total nitrogen (TN) threshold values to address aquatic life use of Maine's marine waters that the Department staff believe are appropriate here:

- 0.32 mg/L for protection of eelgrass, when historically mapped as present within close proximity to the discharge in question; and

- 0.45 mg/L for protection of dissolved oxygen, when eelgrass has not been historically mapped within close proximity to the discharge in question.

Maine DEP's definition of "close proximity" has been eelgrass located approximately 0.5 km from the wastewater outfall, or as informed by best professional judgement (BPJ) based on known eelgrass resources. The TN threshold value currently used in Maine's marine wastewater permits for protection of eelgrass was a concentration used regionally by United States Environmental Protection Agency (USEPA) permitting staff. The USEPA decision to use 0.32 mg/L was due to its numerical midpoint between 0.34 mg/L, a concentration deemed protective of eelgrass by the Massachusetts Estuary Project, and 0.30 mg/L, an average concentration from the lower Piscataqua River where Maine DEP observed epiphytic growth on eelgrass that resulted in a 2012 impaired waters listing due to eelgrass loss. The TN threshold value used for dissolved oxygen originates from a New Hampshire Department of Environmental Services (NH DES) guidance document for the Great Bay estuary (NH DES 2009), and was utilized in an EPA-issued wastewater discharge license in the Taunton River estuary in Massachusetts (EPA 2015).

Despite historically mapped eelgrass (1992 and 2003) beds as close to the proposed discharge as 0.5 kilometers (0.3 miles), based on a 2019 summer Department survey, the nearest eelgrass to the proposed discharge is currently approximately 4 kilometers (2.5 miles) to the southwest along the southerly shore of Northport. Given the absence of mapped eelgrass in close proximity to the proposed discharge and the moderately high light attenuation occurring in the water column as measured at nearby eelgrass habitat based on suspended solids and dissolved organic matter, the Department is utilizing a critical nitrogen threshold value of 0.45 mg/L and a far-field dilution factor of 300:1 to evaluate the impact of the proposed discharge on dissolved oxygen in the vicinity of the proposed discharge location. For the closest eelgrass bed, the Department is utilizing a critical nitrogen threshold value of 0.32 mg/L and a dilution factor of 1000:1 to evaluate the impact on the eelgrass bed. Both environment response indicators are being evaluated for total nitrogen given the geographic differences in the dilution factors associated with each environmental response indicator. The Department staff utilizes a weight of evidence approach to determine attainment of water quality standards and places a greater weight on ambient water chemistry and biological data, including dissolved oxygen, pH, and chlorophyll *a* to determine whether the discharge, if permitted, will cause or contribute to violations of water quality.

Department Staff Discussion of Antidegradation

The State of Maine's antidegradation policy states that water quality that exceeds the minimum applicable standards will be managed by the Department for the environmental, economic and social benefit of the State. *See* 38 M.R.S. §§414-A(1)(C), 464(4)(F)(5). Where a new or increased discharge is proposed, the Department will determine whether the discharge will result in a lowering of existing water quality. For purposes of evaluating and applying the statutory antidegradation standard, the Department staff generally considers the following case-by-case basis consistent with its historical practice and best experience and judgment as reflected in its nonbinding Waste Discharge Program Guidance dated June 13, 2001:

- "New discharge" means a discharge that does not now exist or that is not currently licensed.

- "Increased discharge" means a discharge that would add one or more new pollutants to an existing effluent, increase existing levels of pollutants in an effluent, or cause an effluent to exceed one or more of its current licensed discharge flow or effluent limits, after the application of applicable best practicable treatment technology, as defined at 38 MRSA § 414-A(1)(D), or new source performance standards to the discharge.

- "Existing water quality" means the water quality that would exist under critical water quality conditions. Critical water quality conditions include, but are not limited to, conditions of low flow, high water temperature, maximum loading from point source and non-point source discharges, and conditions of acute and chronic effluent toxicity.

In making a determination as to whether a new or increased discharge will result in a lowering of existing water quality pursuant to the statutory standard, the Department staff generally considers the following case-by-case basis consistent with its historical practice and best experience and judgment as reflected in its nonbinding Waste Discharge Program Guidance dated June 13, 2001:

- The predicted change in ambient water quality, concentrations of chemical pollutants, or mass loading of pollutants under critical water quality conditions.

- The predicted consumption of the remaining assimilative capacity of the receiving water. The remaining assimilative capacity is the increment of existing water quality above the minimum standards of the assigned classification under critical water quality conditions.

- The predicted change in the ability of the receiving water to support aquatic life and to meet applicable aquatic life and habitat criteria.

- The possible additive or synergistic effects of the discharge in combination with other existing discharges.

- The cumulative lowering over time of water quality resulting from the proposed discharge in combination with previously approved discharges.

Based on the above considerations, the Department staff generally makes a case-by-case determination as to whether a new or increased discharge will result in a lowering of existing water quality. However, where the new or increased discharge will consume 20% or more of the remaining assimilative capacity for dissolved oxygen or other water quality parameter, the resulting lowering of water quality will generally be considered by Department staff to be lowered based upon the Department staff's historical practice and best experience and judgment.

Where the Department determines that a new or increased discharge will result in a lowering of existing water quality, the Department will then determine whether the lowering of water quality is necessary to achieve important economic or social benefits to the State. *See* 38 M.R.S. §§414-A(1)(C), 464(4)(F)(5). In making this determination pursuant to the statutory standard, the Department staff generally considers the following on a case-by-case basis consistent with its historical practice and best experience and judgment as reflected in its nonbinding Waste Discharge Program Guidance dated June 13, 2001:

- Whether the lowering of water quality is necessary to accommodate new or increased commercial activity or industrial production while providing that (1) the discharge consistently complies with applicable effluent limitations requiring application of best practicable treatment or new source performance standards and (2) any existing treatment facility is appropriate and is optimally maintained.

- The economic and social benefits that would result from the lowering of water quality. These benefits may include, but are not limited to, increases in employment, increases in local or regional income or purchasing power, increases in the community tax base, correction of an environmental or public health problem or nuisance situation (e.g., removal of overboard discharges or failing or substandard septic systems) and improved community stability. In the case of a lowering of water quality due to community growth, benefits may include an assessment of the economic and social consequences that would result if the new or increased discharge and the resulting lowering of water quality were not approved.

- The technical availability, economic feasibility, and environmental effectiveness of alternatives that could reduce or eliminate the lowering of water quality. Alternatives may include, but are not limited to, alternative discharge locations, non-discharging alternatives, alternative methods of production, improved process controls, waste water minimization technologies, improved waste water treatment facility operation and maintenance, alternative waste water treatment methodologies, and advanced treatment beyond applicable technology requirements.

Department Staff Discussion of the Remaining Assimilative Capacity

Between June and September of 2019, the Department staff conducted four ambient water quality monitoring events at six sites in Belfast Bay and Penobscot Bay to determine ambient concentrations of total nitrogen in addition to many other parameters. See the attached map for the location of the sampling sites. To establish "existing water quality" for the purposes of evaluating the impact of nitrogen being discharged from the proposed Nordic facility, the Department staff considered averaged data from sampling sites BB02 and PB03 to be most representative of existing water quality conditions at the proposed outfall location. The Department staff has taken an arithmetic mean of the surface total nitrogen values obtained in 2019 and calculated and utilized a background concentration of 0.25 mg/L as representative of Belfast Bay. Therefore, the total nitrogen discharge threshold that will not consume more than 20% of the remaining assimilative capacity can be calculated as follows:

Department Staff Analysis of Dissolved Oxygen as the Environmental Response Indicator

Given:

Critical water quality threshold - 0.45 mg/L
Background concentration – 0.25 mg/l
Applicant's proposed discharge concentration of total nitrogen – 23 mg/L
Far field factor: 300:1 (calculated by the applicant)

Find: Proposed effluent limitation

0.45 mg/L – 0.25 mg/L = 0.20 mg/l (remaining assimilative capacity)

(0.20 mg/L) (0.2) = 0.040 mg/L (20% of the remaining assimilative capacity)

(300)(0.040 mg/L) = 12 mg/L

(7.7 MGD)(8.34 lbs/gal)(12 mg/L) = 770 lbs/day. (This is the figure that Department staff believes, based upon its review and analysis to date, is the limit that would avoid the need to make supported findings pursuant to 38 M.R.S. §464(4)(F)(5).

Based on the Department staff's review and analysis to date, the proposed discharge concentration of 23 mg/L would not meet the default antidegradation licensing criteria threshold of 12 mg/L at full flow. This is because, in the Department staff's view based on its review and analysis to date, the proposed discharge value of 23 mg/L would consume 38% of the remaining assimilative capacity of the receiving water. According to the state's antidegradation policy, and the staff's historical practice and best professional experience and judgment, this would be considered a lowering of water quality and the applicant would only be able to meet the standard if it established and the Department made the findings required by 38 M.R.S. §464(4)(F)(5).

Department Staff Analysis of Eelgrass as the Environmental Response Indicator

Given:

Critical water quality threshold - 0.32 mg/L
Background concentration – 0.25 mg/l
Applicant's proposed discharge concentration – 23 mg/L
Dilution factor: 1,000:1 (at location of the Northport eelgrass bed, DEP station PB02)

Find: Proposed effluent limitation

0.32 mg/L – 0.25 mg/L = 0.07 mg/l (remaining assimilative capacity)

(0.07 mg/L) (0.2) = 0.014 mg/L (20% of the remaining assimilative capacity)

(1,000)(0.014 mg/L) = 14 mg/L

(7.7 MGD)(8.34 lbs/gal)(14 mg/L) = 899 lbs/day. (This is the figure that Department staff believes, based upon its review and analysis to date, is the limit that would avoid the need to make supported findings pursuant to 38 M.R.S. §464(4)(F)(5).

Based on the Department staff's review and analysis to date, the proposed discharge concentration of 23 mg/L would not meet the default antidegradation licensing criteria threshold of 14 mg/L at full flow. This is because, in the Department staff's view based on its review and analysis to date, the proposed discharge value of 23 mg/L would consume 33% of the remaining assimilative capacity of the receiving water. . According to the state's antidegradation policy, and the staff's historical practice and best professional experience and judgment, this would be considered a lowering of water quality and the applicant would only be able to meet the standard if it established and the Department made the findings required by 38 M.R.S. §464(4)(F)(5).

Therefore, if a permit were to be granted, and absent supported findings contemplated by 38 M.R.S. §464(4)(F)(5), the most stringent discharge concentration that would protect both dissolved oxygen and eelgrass as the environmental response indicators would be 12 mg/L based on the dissolved oxygen analysis at a full flow of 7.7 MGD.