STATE OF MAINE
BOARD OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION
AUGUSTA, ME 04333

IN THE MATTER OF

BLACK BEAR HYDRO PARTNERS, LLC Ellsworth, Mariaville, Waltham, Fletchers Landing, Hancock County ELLSWORTH HYDROELECTRIC PROJECT #L-13256-33-M-Z (appeal)	WATER QUALITY CERTIFICATION FINDINGS OF FACT AND ORDER ON APPEAL

Pursuant to the provisions of 38 M.R.S. § 341-D and 06-096 C.M.R. ch. 2, *Rule Concerning the Processing of Applications and Other Administrative Matters* (last amended June 9, 2018) (Chapter 2), the Board of Environmental Protection (Board) has considered the appeal of BLACK BEAR HYDRO PARTNERS, LLC (BBHP) of the Order of the Commissioner of the Department of Environmental Protection (Department) denying BBHP's application for water quality certification for the continued operation of the Ellsworth Hydroelectric Project, along with the underlying record, the supplemental evidence admitted, the responses to the appeal, and other related materials on file. Based on the record evidence the Board FINDS THE FOLLOWING FACTS:

1. PROJECT DESCRIPTION:

BBHP owns and operates the existing Ellsworth Hydroelectric Project, Project P-2727 (the Project or Ellsworth Project), which is located on the Union River in the towns of Ellsworth, Mariaville, Waltham, and Fletchers Landing, Hancock County, Maine, and is licensed by the Federal Energy Regulatory Commission (FERC) under the Federal Power Act. The Project has a generating capacity of 8,900 kilowatts (kW) and is operated to provide electricity for public consumption.

The Project currently consists of two dams, Graham Lake Dam and Ellsworth Dam, and their respective impoundments, Graham Lake and Leonard Lake. Graham Lake Dam includes a downstream fish passage facility; the Ellsworth Dam includes a vertical slot fishway and fish trap to provide upstream fish passage and a facility for commercial harvest of river herring, and a downstream fish passage feature. Each dam also contains appurtenant features, including cranes, trash racks and other equipment necessary for day-to-day operations and maintenance.

The two dams were constructed by the Bar Harbor and Union River Power Company. The lower Ellsworth Dam was completed in 1907 and forms both a small, freshwater riverine impoundment (Leonard Lake) and the upper limit of tidal influence in the Union River, and thus serves as a physical barrier separating the fresh water portions of the Union River from the tidewater. The Project's upper dam, Graham Lake Dam, forms a

larger impoundment (Graham Lake) and was completed in 1924 as a storage reservoir, replacing the Brimmers Bridge earthen dam following its failure during a flood in 1923.

The Project was initially licensed by FERC in 1977 and was relicensed by FERC in 1987 to Bangor Hydroelectric Company for continued operations. That 1987 FERC license expired in 2018 and BBHP has continued operating the Project under an annual FERC license. BBHP has filed an application for a new FERC license, which is currently pending before FERC.

2. PROCEDURAL HISTORY:

Section 401 of the Clean Water Act requires that an applicant for a federal license for an activity that may result in a discharge into navigable waters of the United States, such as BBHP's operation of the Project, obtain a certification that the activity will comply with applicable State water quality standards and any other appropriate requirement of State law. BBHP submitted such a water quality certification (WQC) application to the Department on April 9, 2018, which established a statutory 1-year deadline of April 8, 2019, for the Department to complete its certification review and issue its decision. 33 U.S.C. § 1341(a)(1).

On March 21, 2019, BBHP, of its own accord and in response to a November 2018 draft Environmental Assessment by FERC and comments from resource agencies and others, withdrew its WQC application and, also on March 21, 2019, filed a new and substantially different WQC application with new application fees. BBHP's new March 21, 2019 WQC application requested Department review of a substantially different drawdown regime and revised downstream minimum flows for the Graham Lake impoundment, as detailed in BBHP's new WQC application. This new and substantially different WQC application was accepted for processing on April 2, 2019, and established a new 1-year statutory deadline of March 20, 2020, for the Department to complete its certification review and issue its WQC decision.

In its new March 21, 2019 WQC application, BBHP proposed to continue operation of the Ellsworth Project using natural flow augmented with water stored in the Graham Lake impoundment. No changes were proposed for management of water levels and flows at Leonard Lake; water levels in Graham Lake were proposed to be limited to between elevation 104.2 feet and 98.5 feet, a drawdown of 5.7 feet. BBHP proposed to release a continuous minimum flow of 105 cubic feet per second (cfs) from January 1 to March 31, a continuous minimum flow of 125 cfs from April 1 to April 30, a continuous minimum flow of 250 cfs from May 1 to June 30, and a continuous minimum flow of 125 cfs from July 1 to December 31, annually from the Graham Lake Dam and the Ellsworth Dam. BBHP proposed to install upstream eel passage facilities at both the Ellsworth and Graham Lake dams, and also proposed to relocate the Graham Lake canoe portage within two years of the effective date of a new FERC license.

The Department received timely written comments on BBHP's new WQC application from various entities, including Downeast Salmon Federation (DSF), Friends Of Graham Lake (FOGL), the Passamaquoddy Tribe, and Schoodic Riverkeepers among others. In addition, on July 9, 2019, the Department held a public meeting in Ellsworth to receive comment on the new WQC application for the Project. On March 9, 2020 the Department issued a draft of the WQC to BBHP and to DSF. Comments on the draft order were received from DSF, FOGL, and the Passamaquoddy Tribe. No comments on the draft order were received from BBHP.

By Department Order #L-13256-33-L-N issued on March 19, 2020 (the WQC Order), the Commissioner denied WQC for the continued operation of the Ellsworth Project, based on his findings that: the Class GPA waters of Graham Lake would not meet the narrative classification standards for the designated use of habitat for fish and other aquatic life due to the impact of the proposed annual drawdown on the lake's benthic macroinvertebrate community and, further, that habitat in Graham Lake cannot be characterized as natural; the Union River below Graham Lake Dam (but upstream of the riverine impoundment Leonard Lake) does not maintain the resident biological community and, therefore, does not meet narrative classification standards for Class B waters, due to the impact on the benthic macroinvertebrate community from water discharged at the Graham Lake Dam; and Leonard Lake, a Class B riverine impoundment, does not meet or exceed the Class B numeric water quality standard for dissolved oxygen.

On April 17, 2020, BBHP filed a timely appeal of the WQC Order with the Board and requested a public hearing on the issues raised in its appeal. As discussed further below, the Board Chair received several filings regarding a number of exhibits proposed as supplemental evidence in this appeal proceeding, including proposed supplemental evidence from BBHP identified in its April 17, 2020 appeal and from DSF set forth in its letter dated June 26, 2020. On September 30, 2020, the Board Chair issued a ruling on these requests that, as discussed further below, admitted some but not all of the BBHP's and DSF's proposed supplemental evidence, and that set an initial deadline of October 20, 2020, for responses to BBHP's appeal.

On October 6, 2020, counsel for DSF requested an extension of the deadline for filing responses to the appeal, which the Board Chair granted in a ruling dated October 7, 2020, that extended the deadline to November 4, 2020. DSF, Friends of Graham Lake, the Passamaquoddy Tribe at Pleasant Point and Indian Township, Maine, and Schoodic Riverkeepers each filed timely responses to BBHP's appeal.

As further discussed below, several additional record-based filings were also submitted to and addressed by the Board Chair between October and December 2020.

3. BURDEN OF PROOF AND BOARD APPEAL REQUIREMENTS AND AUTHORITY

The Department's rule Chapter 2 provides that an applicant for a license, which includes certifications such as the one requested by BBHP in its WQC application for the

Ellsworth Project, has the burden of proof to affirmatively demonstrate to the Department that each of the licensing criteria in statute or rule has been met. Ch. 2, § 11(F).

Pursuant to Chapter 2, § 24(B), a written notice of appeal to the Board of a final license decision of the Commissioner, which includes final certifications such as the WQC Order here, must include, but need not be limited to, evidence demonstrating the appellant's standing as an aggrieved person, the findings, conclusions or conditions objected to or believed to be in error, the basis of the objection or challenge, and the remedy sought.

When reviewing an appeal, and pursuant to 38 M.R.S. § 341-D(4), the Board is not bound by the Commissioner's findings of fact or conclusions of law but may adopt, modify or reserve findings of fact or conclusions of law established by the Commissioner. Any changes made by the Board must be based upon the Board's review of the record, any supplemental evidence admitted by the Board and any hearing held by the Board. The Board may hold a hearing on an appeal in its discretion. 38 M.R.S. § 341-D(4); Ch. 2, § 24(A).

The process and standards governing the proposal and admission of supplemental evidence are addressed in Chapter 2, § 24(C)-(D).

4. SUPPLEMENTAL EVIDENCE AND OTHER RECORD-BASED FILINGS

As noted above, both BBHP and DSF proposed supplemental evidence and submitted various other filings to the Board Chair regarding the Department's record.

A. Supplemental Evidence Proposed by BBHP and DSF

As reflected in a letter from the Board's Executive Analyst dated June 11, 2020, Department staff determined that eight of BBHP's 14 exhibits to its appeal were not part of the Department's administrative record, thus requiring a ruling from the Board Chair on their admissibility. By letter dated June 26, 2020, DSF commented on the admissibility of BBHP's proposed supplemental evidence and offered its own proposed supplemental evidence. BBHP subsequently commented on the admissibility of DSF's proposed supplement evidence.

The Board Chair's September 30, 2020 letter ruling addressed these materials and the proposed supplemental evidence and, among other things, admitted the following: Affidavit of Kelly A. Maloney dated April 16, 2020 (BBHP's Exhibit 6 to its appeal); Affidavit of Frank H. Dunlap dated April 16, 2020 (BBHP's Exhibit 8); Affidavit of Brett Ciccotelli dated June 24, 2020, regarding a March 28, 2018 workshop in Ellsworth (DSF Exhibit);Video/audio recordings of the March 28, 2018 workshop (DSF Exhibit); and Department email correspondence dated March 20, 2020 (DSF Exhibit).

B. Submissions by Department Staff

On October 16, 2020, Department staff submitted to the Board two staff memoranda regarding the classification of Leonard Lake in response to issues raised on appeal and supplemental evidence offered by BBHP and DSF. On October 19, 2020, the Board Chair accepted the two staff memoranda into the record.

C. Additional Submissions by BBHP and DSF regarding the Record

By letter dated October 28, 2020, BBHP notified the Board Chair of the filing of a Freedom of Access Act (FOAA) request submitted to the Department through counsel that same day for information involving the October 16, 2020 Department staff memoranda. Also on October 28, 2020, BBHP counsel wrote the Board Chair requesting confirmation of whether the Department's administrative record contained a number of identified documents, including documents produced in response to prior FOAA requests by BBHP and various legislative history materials.

On November 3, 2020, DSF filed its response to BBHP's appeal, citing 33 exhibits, some of which are not in the Department's record. By letter dated December 10, 2020, DSF counsel wrote the Board Chair in response to an expected ruling on BBHP's October 28, 2020 submissions and DSF's response to the appeal. This December 10, 2020 DSF letter addressed the exhibits cited in its response to the appeal and made arguments regarding the Board's consideration of the exhibits. On December 17, 2020, BBHP counsel wrote the Board Chair objecting to certain exhibits to DSF's response to its appeal. By letter dated December 18, 2020, DSF responded to BBHP's objection to DSF's exhibits.

By letter dated December 18, 2020, BBHP wrote the Board Chair objecting to the portion of his September 30, 2020 ruling declining to admit certain BBHP exhibits as supplemental evidence.

On December 28, 2020, the Board Chair issued a letter ruling addressing these issues, including: 1) BBHP's October 28, 2020, letter regarding the contents of the Department's record on appeal; 2) BBHP's October 28, 2020, information request regarding the two Department staff memoranda dated October 16, 2020; 3) certain non-record exhibits and other information filed with DSF's November 3, 2020 response to the appeal; and 4) BBHP's December 18, 2020 letter raising additional argument regarding certain exhibits to its appeal that had been disallowed by the Board Chair's September 30, 2020 letter ruling. The Board Chair's December 28, 2020 letter ruling on these issues was further clarified by letter dated January 5, 2021.

5. STANDING:

Department rule Chapter 2, § 24 provides that final license decisions of the Commissioner may be appealed to the Board by persons who have standing as aggrieved persons. Aggrieved persons are defined in Chapter 2, § 1(B) as "any person whom the

Board determines may suffer particularized injury as a result of a licensing or other decision. The Board will interpret and apply the term 'aggrieved person', whenever it appears in statute or rule, consistent with Maine state court decisions that address judicial standing requirements for appeals of final agency action." BBHP meets this definition as the applicant whose WQC was denied, which BBHP believes will have a significant impact on its ability to obtain a new FERC license for the Ellsworth Project.

The Board finds that BBHP is an aggrieved person as defined in Chapter 2, § 1(B) and may bring this appeal before the Board.

6. BASIS FOR APPEAL AND REMEDY SOUGHT:

As the appellant, BBHP raises the following three issues in its appeal:

- BBHP challenges the WQC Order's findings that the Union River below Graham Lake Dam between Graham Lake Dam and Leonard Lake will not meet applicable Class B habitat and aquatic life criteria. In particular, BBHP contends that such findings are incorrect and arbitrary and capricious because they do not appropriately consider the information provided to the Department or the proposed operating conditions of the Ellsworth Project;

- BBHP similarly challenges the Commissioner's findings that Graham Lake will not meet applicable GPA habitat and aquatic life criteria, contending that such findings are incorrect and arbitrary and capricious because they do not appropriately consider the information provided to the Department or the proposed operating conditions of the Project; and

- BBHP asserts that the requirement in the WQC Order that Leonard Lake meet Class B numeric standards rather than Class GPA standards is not supported by Maine law or the Department's course of conduct and is erroneous and arbitrary and capricious.

As a remedy, BBHP requests in its appeal that the Board hold a public hearing on the issues raised in the appeal, withdraw the WQC Order, and issue WQC findings that 1) Leonard Lake meets GPA water quality standards and 2) the Union River between Graham Lake and Leonard Lake meets Class B aquatic life and habitat criteria.[1]

[1] The Board notes that Section VI of BBHP's appeal addressing remedy does not request that the Board make any findings regarding Graham Lake, including that Graham Lake meets the applicable GPA water quality standards. However, in light of the totality of the appeal and the arguments made, the Board views this as an unintended oversight and interprets the appeal as including such a request. The Board also notes that in the WQC Order denying certification, the Commissioner found it unnecessary, in light of the WQC denial on several other grounds, to reach any conclusion on the adequacy of fish passage at the Project dams under the State's water quality laws. Because the Board affirms the WQC Order denying certification, it is unnecessary to remand to the Commissioner or otherwise address fish passage.

7. RESPONSE TO REQUEST FOR A PUBLIC HEARING:

As part of its appeal, BBHP requests that the Board hold a public hearing regarding the issues raised on appeal. The Board's determination of whether to hold such a requested hearing on an appeal is discretionary. Ch. 2, § 24(A); 38 M.R.S. 341-D(4).

Pursuant to Chapter 2, § 24(B)(4), if a hearing is requested, the appellant must provide an offer of proof regarding the testimony and other evidence that would be presented at the hearing. The offer of proof must consist of a statement of the substance of the evidence, its relevance to the issues on appeal, and whether any expert or technical witnesses would testify.

In its appeal, BBHP states that it anticipates presenting evidence on the history of the classification of Leonard Lake by the Department[2] and technical information regarding studies conducted for assessment of the benthic macroinvertebrate communities in Graham Lake and the Union River between Graham Lake and Leonard Lake. BBHP Appeal at 12. BBHP adds that such evidence would be in the form of record documents, supplemental documentary evidence, and testimony of experts and witnesses based on the record or supplemental evidence, and unspecified other relevant information. BBHP Appeal at 13. BBHP does not provide any further detail; it does not identify any particular experts or technical or other witnesses, or describe the substance of any expected testimony or the relevance of such testimony to the issues on appeal. The Board finds that BBHP's appeal does not set forth a sufficient offer of proof to meet the requirements of Chapter 2, § 24(B)(4), which alone warrants denial of BBHP's hearing request.

In any event, BBHP's WQC application at issue here was pending with the Department's record open for approximately a year, during which time any person, including BBHP, could have submitted evidence on the issues now raised by BBHP. This followed another approximately year-long process in 2018 on BBHP's prior WQC application, again during which evidence could have been submitted to the Department by BBHP or others. In addition, although not required, on July 9, 2019, the Department held a public meeting in Ellsworth to provide an overview of the project and to receive comment on the WQC application. At that public meeting, members of the public had the opportunity to (and did) submit comments to the Department that became part of the record. The Department offered to include BBHP staff in the public meeting but the offer was declined. Moreover, as noted above, there have been multiple filings by BBHP and others during this Board appeal proceeding regarding the admission of proposed supplemental evidence and clarification of the contents of the Department's existing record. *See* Section 4 above.

The Board finds that BBHP, the other participants, and the public have had ample opportunity to review the new WQC application, submit evidence and comments, and

[2] Maine surface waters are classified by statutes, not by the Department. The Department's interpretation of such classification statutes is discussed further below.

present other information and argument to the Department. The Board further finds that the record is adequately developed with regard to the statutory criteria and all issues on appeal, and a hearing is not warranted for the Board's understanding of the evidence. For each of these reasons, the Board denies BBHP's request to hold a hearing on the appeal.

8. DISCUSSION AND RESPONSE TO APPEAL:

A. Union River below Graham Lake Dam – Aquatic Life and Habitat

The Department concluded in the WQC Order that the Union River immediately below the Graham Lake Dam does not meet applicable Class B aquatic life standards and that, based on its professional expertise and judgment, the proposed operation of the Graham Lake Dam resulting in a 5.7-foot drawdown of Graham Lake, will cause or contribute to the failure of the Union River downstream of the dam to meet the applicable Class B standards. WQC Order at 25-26. BBHP argues the Department should exercise its professional judgment to find that the Union River below the Graham Lake Dam meets Class B water quality standards and that the Department did not properly evaluate the effect of the proposed drawdown of the Graham Lake on the water quality in the Union River. The Board rejects these arguments, as further discussed below.

1. Applicable Water Quality Standards and Framework for Evaluating Water Quality

The Union River, from the outlet of Graham Lake to tidewater, is classified as a Class B water body. 38 M.R.S. § 467(18)(A)(1). Class B waters must be of such quality that they are suitable for, among other things, the designated use of habitat for fish and other aquatic life, and the habitat must be characterized as unimpaired. 38 M.R.S. § 465(3)(A). Unimpaired means without a diminished capacity to support aquatic life. 38 M.R.S. § 466(11). Discharges to Class B waters may not cause adverse impact to aquatic life in that the receiving waters must be of sufficient quality to support all aquatic species indigenous to the receiving water without detrimental changes in the resident biological community. 38 M.R.S. § 465(3)(C). The resident biological community means aquatic life expected to exist in a habitat which is free from the influence of the discharge of any pollutant. This shall be established by accepted biomonitoring techniques. 38 M.R.S. § 466(10).

Accepted biomonitoring techniques with respect to rivers are established in Department rule, 06-096 C.M.R. ch. 579, *Classification Attainment Evaluation Using Biological Criteria for Rivers and Streams* (effective May 27, 2003) (Chapter 579). As stated in the summary of Chapter 579:

> Criteria to quantify aquatic life standards for Classes AA, A, B and C waters are defined in this chapter. The benthic macroinvertebrate community is used as a surrogate to determine conformance with statutory aquatic life standards, related statutory definitions, and statutory

> provisions for the implementation of biological water quality criteria, that are provided in Maine's standards for classification of fresh surface waters. Methods described in this chapter will be used to make decisions about classification attainment.

Chapter 579 addresses how benthic macroinvertebrate samples must be collected and the process for analyzing these samples using the linear discriminant model to evaluate whether the sampled river or stream is in attainment. The selection of sampling sites, as well as data collection and processing, must be in conformance with the Department's Methods for Biological Sampling and Analysis of Maine's Rivers and Streams. Ch. 579, § 3(A). Chapter 579 also establishes that where there is documented evidence of conditions that could result in uncharacteristic findings, allowances may be made to account for those situations by adjusting the classification attainment decision through use of professional judgement. Ch. 579, § 3(G). Where samples meet the minimum requirements for use of the linear discriminant model, but conditions are found that are atypical to the derivation of the model, professional judgement may be used to adjust the model outcome. Factors that may allow adjustment to the model outcome include habitat factors, such as lake outlets from waters classified GPA (the lake outlet effect). Ch. 579, § 3(G)(1). Where professional judgment may be used when evaluating water quality in rivers and streams, Chapter 579 bounds the limits of this judgment. For example, professional judgment may be used to raise a model classification from nonattainment of any class to attainment of Class C, or from a model classification of attainment in one class (e.g., Class C) to attainment in the next higher class (e.g., Class B).[3] Ch. 579, § 3(G)(1)(a). Chapter 579 does not provide for the use of professional judgment to increase a classification from nonattainment to attainment for Class B, a jump of two classifications.

2. BBHP's Sampling of the Benthic Macroinvertebrate Community in the Union River

BBHP collected benthic macroinvertebrate samples in the Union River downstream of the Graham Lake Dam in 2014, 2015, and 2019 to determine whether Class B aquatic life and habitat standards are met in the river within 1,000 feet of the Graham Lake Dam. Samples were collected in accordance with approved methods, organisms were categorized, and data submitted to the Department. The Department then applied the linear discriminant model, consistent with Chapter 579.

In 2014, model results showed nonattainment for Class B standards, as well as nonattainment for the lower, Class C standards. In 2015, the study was repeated, with benthic macroinvertebrate samples collected in the vicinity of the Graham Lake Dam, as well as further downstream more than one mile from the dam at a location approximately

[3] Classification attainment evaluation means an assessment to determine whether the aquatic life standards of a specified class are achieved. Classification attainment evaluations are performed by the Department and reported in the Department's biennial assessment report to the Legislature or may be required of an applicant for waste discharge license or water quality certificate as defined in Chapter 579.

1,000 feet upstream of the railroad bridge. Results of the sample collected in the vicinity of the Graham Lake Dam were similar to the sample collected in 2014, and the linear discriminant model result again showed nonattainment of both Class B and the lower, Class C standards. Results of the linear discriminant model indicate that the second 2015 sample collected farther downstream of the dam (upstream of the railroad bridge) was found to contain many more organisms than the sample collected near the dam, but the generic richness – or different kinds of organisms – was very low. The model results showed that water quality at this second location was consistent with the aquatic life water quality standards for Class C waters.

The 2015 sampling location just upstream of the railroad bridge, at more than one mile from the Graham Lake Dam, was beyond the influence of the effect of the outlet of Graham Lake. Even taking into account the lake outlet effect for both the 2014 and 2015 samples collected in the vicinity of the Graham Lake Dam, the Department's professional judgment may only be used to increase the classification one class, from nonattainment to attainment for Class C – not two classes from nonattainment to attainment for Class B.

In 2019, a third benthic macroinvertebrate sample was collected by BBHP in the vicinity of the Graham Lake Dam, in accordance with Methods for Biological Sampling and Analysis of Maine's Rivers and Streams, and the linear discriminant model was applied. On January 20, 2020, the day before the Department ran the 2019 sample results through linear discriminant model, BBHP provided the Department a memorandum prepared by BBHP's consultant titled "Update on the Aquatic Live Assessment Union River below Graham Lake Dam." The consultant had collected the benthic macroinvertebrate sample in the river and conducted his own analysis. In the memorandum he concluded:

> Based on these preliminary results I would expect the DEP linear discriminant model to return a prediction that the aquatic life does not attain any water class standards (non-attainment). However, if a [C]lass C result is returned, then the argument can be made that the dam is acting like a natural lake outlet and high quality food (seston) from the lake is causing the filter-feeders to dominate the community. DEP has agreed with this thinking in the past at numerous dams.

On January 21, 2020, the Department ran the model with the 2019 sample and, consistent with the 2014 and 2015 samples, the model results showed the river is in nonattainment for Class B standards, as well as the lower, Class C standards.

On January 30, 2020, BBHP submitted its final report, prepared by its own consultant, titled "2019 Macroinvertebrate Sampling Study Downstream of Graham Lake Dam, Ellsworth Maine FERC No. 2727" (Union River BMI Study). The report discusses and analyzes the sample collected in 2019 and following this analysis concludes:

> Therefore, [it] is my professional opinion that the community sample downstream of Graham Lake Dam on the Union River does not attain [C]lass B aquatic life standards.

Union River BMI Study at 6.

3. Consideration of Issues Raised by BBHP on Appeal

In its appeal, BBHP advances two arguments why the Department should have found the Union River in attainment for the Class B aquatic life and habitat standards: 1) the Department should have exercised its professional judgment to find attainment of applicable Class B standards; and 2) the Department failed to consider whether the Union River would be in attainment of Class B standards under proposed operations, including the proposed drawdown of Graham Lake. The Board finds that both of these arguments are unsupported and without merit.

a. The Union River is not in attainment of Class B standards even with the discretionary exercise of the Department's professional judgment.

BBHP first argues that the Department erred by not finding the Union River meets Class C standards and then applying its professional judgment to find the river meets the next higher, Class B standards. But in making this argument, BBHP acknowledges that all three benthic macroinvertebrate studies analyzed using the linear discriminant model "showed that the Union River at the outlet of Graham Lake did not meet Class C standards." BBHP Appeal at 9. BBHP also acknowledges that in instances where there is a lake outlet effect "professional judgment can be used to raise a finding by *one class* at sites downstream of lake outlets." BBHP Appeal at 9 (emphasis added).

But an increase from nonattainment for any class (i.e., the situation here) to attainment for Class B requires an increase of *two* classes: first, that the water body meets Class C standards (the lowest statutory classification) and second, that the water body meets the next higher, more stringent Class B standards. Such a two-class increase is effectively what BBHP argues should occur. According to BBHP, the river was close to attainment for Class C and would have been in attainment for Class C if only a few more stoneflies had been present in the samples. Thus, BBHP argues, the Department should ignore that result (nonattainment for any class) and treat the river as in attainment for Class C, and then further exercise its professional judgment to raise the finding yet another class, from attainment for Class C to attainment for Class B.

The Board agrees that if the sampling results were different the Department might have had the discretion to reach a different conclusion, but this can be said by any applicant when data do not support findings it would prefer. Here, the data do not support a finding that the Union River meets the Class B standards for aquatic life and habitat, even with the exercise of professional judgment.

What BBHP does not discuss in arguing that just a few more stoneflies would have resulted in attainment for Class C is that stoneflies are a species sensitive to environmental pollutants and their absence is not a random occurrence but is an important indicator of water quality. Further, not only were stoneflies absent, but few mayflies were present; mayflies also are a sensitive species and their relative low abundance, along with the absence of stoneflies, is indicative of changes to the resident biological community.[4] This assessment is echoed in BBHP's own report. Union River BMI Study at 7 ("The community structure and function found downstream of the Graham Lake Dam: specifically, the lack of stoneflies and the small number of mayflies, indicates that there have been changes to the resident biological community."). In fact, mayflies represented only 1% of the total individuals present, which were mostly (87%) comprised of filter-feeding species known to be more tolerant of poor water quality.

The Board finds the argument by BBHP that the Union River actually meets Class C standards and then should be adjusted upward, based on professional judgment, from attainment to Class C to attainment for Class B is not supported by the data, the applicable Department rules, or past practice of the Department in its experienced application of professional judgment. The benthic macroinvertebrate community is a well-established surrogate for the broader resident biological community and assessment of the benthic macroinvertebrate community is a well-established method for evaluating conformance with the statutory aquatic life and habitat standard. This is reflected, for example, in Chapter 579. The benthic macroinvertebrate sampling and associated data collected in three separate years, most recently in 2019, demonstrate the Union River is not in attainment for any class, including the lowest Class C. The absence of stoneflies, which BBHP attempts to characterize as insignificant, is in fact a meaningful indicator of water quality and cannot and should not be simply ignored. The Board further finds that adjustment of the attainment classification of the Union River, based on professional judgement, from nonattainment for any class to attainment for Class B, an increase of two classification steps, in unsupported by the record and inconsistent with Chapter 579, § 3(G)(1). The Board finds no error in the Department's analysis, findings of fact, or conclusions with respect to the Union River not meeting Class B aquatic life and habitat standards.

b. BBHP failed to demonstrate the Union River would be in attainment of Class B Standards under the Project's proposed operations, including the proposed drawdown of Graham Lake.

In its second argument, BBHP asserts that the Department erred in not considering the effect of reducing the drawdown in Graham Lake on the benthic macroinvertebrate community downstream of the Graham Lake Dam. BBHP points to the proposed operating regime, limiting the drawdown to 5.7 feet between elevations 98.5 and 104.2 feet, and argues this should benefit benthic macroinvertebrate community by reducing

[4] Davies, S.P., F. Drummond, D.L. Courtemanch, L. Tsomides, and T.J. Danielson. 2016. Biological Water Quality Standards to Achieve Biological Condition Goals in Maine Rivers and Streams: Science and Policy. Maine Agricultural and Forest Experiment Station Technical Bulletin 208.

turbidity discharged from the Graham Lake Dam. In support of this argument, BBHP points to FERC's Final Environmental Assessment (July 2019) (the EA) and a general discussion in the EA about potential benefits of a reduced drawdown of 5.7 feet. BBHP Appeal at 10-11. This general discussion, however, does not discuss State water quality standards with any specificity, and amounts to little more than a statement of unknown possibility. The EA does not demonstrate (or even purport to demonstrate) or find that a 5.7-foot drawdown will meet applicable State water quality standards.

The Board is unaware of any information or analysis submitted by BBHP as part of its WQC application in which BBHP attempts to demonstrate, notwithstanding the present classification of nonattainment, that the Union River will meet Class B standards under the proposed drawdown of 5.7 feet. The absence of any such information in BBHP's WQC application was identified by the Department in the WQC Order[5] and, notably, BBHP points to no such analysis in its appeal. Instead, based on the possibility for water quality improvements associated with a smaller drawdown noted by FERC, BBHP argues it was incumbent on the Department to create record information through some form of unspecified analysis of a future 5.7-foot drawdown – an analysis BBHP elected not to do – and evaluate the likely impact on the water quality in the Union River. This argument is counter to well established administrative practice and would relieve an applicant of the responsibility to demonstrate that its proposal meets the applicable standards – here State water quality standards.[6] As noted above, the burden of proof rests with BBHP to affirmatively demonstrate that its proposed operation of the Project as a whole, including the operation of the Graham Lake Dam and proposed drawdowns of Graham Lake, will meet State water quality standards. *See* Ch. 2, § 11(F). The Board finds BBHP has not carried this burden before the Commissioner or on this appeal. Nor has BBHP pointed to any evidence in its appeal indicating it has even tried to evaluate how a proposed 5.7-foot drawdown, as opposed to existing operations, will impact the benthic macroinvertebrate community or broader resident biological community.

Finally, as part of its argument that the Department erred in not finding the Union River will attain Class B standards under a 5.7-foot drawdown, BBHP hedges and suggests that

[5] "The Applicant [BBHP] did not address whether, and if so, how, a drawdown smaller than the existing drawdown under which the benthic macroinvertebrate surveys were conducted could affect the benthic macroinvertebrate community in the river." WQC Order at 26, fn. 15.

[6] The Board notes the long-term average water level in Graham Lake during the timeframe of the 2019 benthic macroinvertebrate study, when samplers were deployed on August 9, 2019, and retrieved on September 6, 2019, was between 98.5 feet and 100.5 feet, and not the currently licensed full drawdown of 10.8 feet. Thus, water level and flow conditions at the time of the 2019 sampling that showed nonattainment (between 97.0 feet and 99.0 feet) were close to the operating conditions that could reasonably be expected to be present with a 5.7-foot drawdown as part of the Graham Lake Dam's proposed operating regime. Additionally, in its WQC application, March 21, 2019, addendum, BBHP outlined its proposed operating range for Graham Lake water levels and proposed to increase the seasonal minimum flow by 20 cfs during late summer when water levels would be at their lowest. This increase in minimum flows could have the effect of increasing turbid discharges, not decreasing them.

any uncertainty about impacts to aquatic life and habitat in the river could be addressed through a condition of a WQC. BBHP asserts: "Further, the Department is fully able to condition a WQC to require monitoring measures to ensure that future environmental measures result in attainment of water quality criteria." BBHP Appeal at 11. Monitoring, however, allows evaluation of whether or not attainment of Class B standards is achieved. Monitoring does not ensure attainment. Further, should monitoring demonstrate continued nonattainment, BBHP has proposed no corrective action and no adaptive management plan to achieve the necessary water quality improvements.

c. Summary

In sum, the Board finds BBHP's arguments that the Department should have determined the Union River will meet applicable water quality standards unpersuasive. Based on the data collected by BBHP and presented to the Department, the Department's analysis of the data using accepted analytical methods, the applicable Department rules, and the Department's experienced application of its professional judgment, the Board finds no error in the WQC Order's conclusions that the waters of the Union River downstream of Graham Lake do not meet Class B aquatic life standards, that BBHP's Project operations, as proposed, cause or contribute to the failure of the Union River downstream of the Graham Lake Dam to meet these applicable standards of classification, and that BBHP has not submitted data or other evidence establishing otherwise. The Board affirms the findings and conclusions of the WQC Order, including those in Section 4(C), and finds and concludes that WQC was appropriately denied on this basis.

B. Graham Lake – Aquatic Life and Habitat

The Department concluded in the WQC Order that benthic macroinvertebrate study of the aquatic community in Graham Lake did not establish that the aquatic habitat meets Class C standards and that based on its professional expertise and judgment, the proposed operation of the Graham Lake Dam resulting in a 5.7-foot drawdown of Graham Lake, will cause or contribute to the failure of Graham Lake to meet these Class C standards. WQC Order at 21. BBHP argues its study supports a finding of attainment with Class C standards and that the Department unreasonably failed to exercise its professional judgment and find Graham Lake in attainment with the applicable water quality standards. BBHP also argues that the Department did not properly evaluate the effect of the proposed drawdown of Graham Lake on the water quality in the lake.

1. Applicable Water Quality Standards and Framework for Evaluating Water Quality

Graham Lake is a great pond and, therefore, a Class GPA water. 38 M.R.S. § 480-B(5); 38 M.R.S. § 467(18)(A)(1). Class GPA waters must be of such quality that they are suitable for, among other things, the designated use of habitat for fish and other aquatic life, and the habitat must be characterized as natural. 38 M.R.S. § 465-A(1)(A).

However, certain existing hydropower impoundments managed as great ponds, such as the Graham Lake impoundment, are additionally subject to 38 M.R.S. § 464(9-A), which also governs habitat and aquatic life criteria for such waters. Under Section 464(9-A), and with certain specified exceptions that are not applicable here, all hydropower projects with impoundments in existence on June 30, 1992, that remain classified as GPA after that date and that do not attain Class GPA habitat and aquatic life criteria must, at a minimum, satisfy the Class C aquatic life criteria contained in 38 M.R.S. § 465(4)(C). 38 M.R.S. § 464(9-A)(D). This applies to Graham Lake, meaning that, although the lake is classified as Class GPA, the lake must satisfy the Class C aquatic life criteria. This criteria provides, among other things, that discharges to Class C waters "may cause some changes to aquatic life, except that the receiving waters must be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community." 38 M.R.S. § 465(4)(C). "Resident biological community" is defined as the "aquatic life expected to exist in a habitat which is free from the influence of the discharge of any pollutant. This shall be established by accepted biomonitoring techniques." 38 M.R.S. § 466(10).

While the Department has rules (Chapter 579) for determining attainment with aquatic life standards for rivers and streams, no rules exist for assessing compliance with Class C standards in lakes. In the absence of such rules, the Department has conducted a case-by-case assessment of the impact of a proposed project, applying professional judgment and using natural lakes as an initial point of comparison or reference community.

While not a rule, under the Department's Hydropower Project Flow and Water Level Policy (dated February 4, 2002), maintaining 75 percent of the littoral zone in a wetted condition is presumed to protect aquatic life, with departures from this condition made on a case-by-case basis using site specific data and circumstances. *See* WQC Order at 17. In the case of Graham Lake, the Department has historically classified the lake as non-attainment for aquatic life due to the drawdown regime, because of the dewatering of the littoral zone. The Department's historic and longstanding interpretation of Class C standards, when applied to Graham Lake and other, similar impoundments, is reflected in the Department's longtime inclusion of Graham Lake on the Clean Water Act 305(b)/303(d) list of lakes impaired for aquatic life due to drawdowns.[7]

2. BBHP's Aquatic Habitat Study and Sampling of the Benthic Macroinvertebrate Community in Graham Lake

BBHP conducted an impoundment aquatic habitat study of Graham Lake in 2013, demonstrating that the littoral zone extends to a depth of approximately 11.5 feet, based on twice the Secchi disk transparency measurement. The depth of the littoral zone is analogous to the extent, or depth, of the aquatic habitat around the lake. The Department's analysis of the proposed 5.7-foot drawdown from the full pond water level

[7] Maine Department of Environmental Protection. "Integrated Water Quality Monitoring and Assessment Report." 2006-2016. https://www.maine.gov/dep/water/monitoring/305b/index.html

found that such a drawdown preserves 52.7 percent of the total available littoral area and 45.1 percent of the total available littoral volume. Thus, the data submitted by BBHP does not demonstrate that its proposed operation of the Project, including the Graham Lake drawdown, will meet the aquatic life and habitat standards for Class GPA waters.

In its appeal, BBHP does not contest the Department's finding and determination that BBHP failed to establish a rebuttable presumption that the aquatic life and habitat standards will be maintained in the Graham Lake impoundment under the proposed drawdown. Because this finding and determination is not contested, the Board discusses it no further here.

Due to the extent of the proposed drawdown at Graham Lake and the impact such a drawdown would have on the littoral zone, BBHP recognized an analysis of the benthic macroinvertebrate community in the lake would be essential in evaluating whether the proposed operation of the Graham Lake Dam satisfies State water quality standards and maintains the structure and function of the resident biological community. In 2019, BBHP collected benthic macroinvertebrate (BMI) samples in Graham Lake, in accordance with a study plan submitted to the Department, under the operating conditions that existed at that time.[8]

BBHP's consultant summarized the aquatic invertebrate investigation of Graham Lake in a one-page memo to BBHP's project manager dated January 21, 2020, indicating that the benthic community in the lake was dominated (approximately 80%) by amphipods, snails, and to a lesser extent, aquatic worms. Sensitive mayflies and caddisflies accounted for less than 10% of the overall community. The consultant noted the abundance and species richness (diversity) were relatively high in the wetland habitats, but abundance was low in cobble-gravel and sand habitats. The consultant concluded by noting he had received data associated with an earlier macroinvertebrate survey of Attean Pond and intended to include a comparison of these earlier data with Graham Lake data in a final report.

BBHP summarized the Graham Lake sampling methods and results and compared the sampling data from Graham Lake that were collected in 2019 to sampling data previously collected at Attean Pond in 2008, in a report titled, "2019 Graham Lake Macroinvertebrate Community Study," dated January 30, 2020 (the Graham Lake BMI Study). This study notes that Attean Pond is a 2,745-acre, natural lake with an unregulated water level, no shoreline development and excellent water quality. The basis for the selection of Attean Pond as a reference lake is not discussed in the Graham Lake BMI Study.

[8] In its July 30, 2019 cover letter conveying the sampling methodology the Department, BBHP stated its intent to collect BMI samples in Graham Lake twice within the August 1 to September 15 period in an attempt to sample two different lake levels. The report ultimately submitted by BBHP with the sampling results does not address any potential relationship between lake levels and the benthic macroinvertebrate community.

In the Graham Lake BMI Study, BBHP reported that mayflies and caddisflies make up 30% of the total taxa collected. In its comparison of communities collected in August 2019 samples from Graham Lake with August 2008 samples from Attean Pond, the Graham Lake cobble-gravel community is reported to be as abundant and as diverse as that of Attean Pond; however, it has fewer species and the most dominant of those represented a greater proportion of the community. Comparison of the wetland communities indicated that the total number of individuals was greater in Graham Lake than in Attean Pond, and reported that richness and diversity are similar; however, the most dominant taxon in Graham Lake represents over a third of the community and sensitive species were less represented. The Graham Lake wetland community structure analysis indicated that some species expected to be present were missing from the community but were replaced by other species. However, the comparisons of the cobble-gravel communities indicated that species richness in Graham Lake is less than samples from Attean Pond, and that the missing species were not replaced by other species. There is a greater difference between the two water bodies in the cobble-gravel habitats than the differences identified between the wetland habitats. No comparison to Attean Pond data was made for the sand habitat that was sampled in Graham Lake. Comparisons that were made between Graham Lake and Attean Pond showed some changes; wetland communities in Graham Lake were reported similar but different enough that Community Loss[9] values indicated stressed conditions, and cobble-gravel communities in Graham Lake showed greater change when compared to Attean Pond, indicating even greater stress to that community. Although the Graham Lake BMI Study states the wetland communities in Graham Lake are stressed and cobble-gravel communities are even more stressed, the study's conclusion is that "the structure and function of the community in Graham Lake aquatic communities is still maintained." Graham Lake BMI Study at 10.

In reaching this conclusion, BBHP did not include any analysis of the mussels present in Graham Lake or attempt to compare mussel data for that lake to the mussel data collected for Attean Pond.

3. Consideration of Issues Raised by BBHP on Appeal

In its appeal, BBHP advances two arguments why the Department should have found Graham Lake in attainment for Class C aquatic life and habitat criteria and, therefore, because the lake is a qualifying hydropower impoundment, satisfied the applicable Class GPA standards. First, BBHP argues the Department should have exercised its professional judgment to find the BMI data collected by BBHP demonstrate attainment. Second, BBHP argues the Department failed to consider whether Graham Lake would be in attainment of the applicable GPA standards under proposed operations, including the

[9] The Community Loss Index measures the loss of benthic taxa in samples from an experimental station compared to those found at the reference station. It also factors in the replacement of missing taxa with different taxa. The value of this index can range from 0 to infinity and increases as the test station becomes increasingly dissimilar to the reference station; therefore, lower values indicate less stressful conditions.

proposed drawdown of Graham Lake. The Board finds both of these arguments are unsupported and without merit.

a. Graham Lake is not in attainment with the applicable Class GPA standards, which minimally require satisfaction of Class C standards for this impoundment.

1. BBHP failed to establish Attean Pond as an appropriate reference lake and the previously collected data as appropriate for comparison a decade after their collection.

BHPP argues that as set out in the Graham Lake BMI Study the structure and function of the resident biological community is maintained. A central component of the Graham Lake BMI Study is the comparison of BMI data collected in Graham Lake with BMI data collected in Attean Pond. While the study describes Attean Pond, it does not address why this particular lake was selected as a reference lake or establish that the Attean Pond data serves as an appropriate baseline for comparing Graham Lake BMI survey results.

Where the drawdown in a storage impoundment does not maintain 75 percent of the littoral zone in a wetted condition, BBHP was or should have been aware of the value of identifying a reference lake that could be used for the comparison of BMI data. Establishing reference lakes for purposes of evaluating water quality as part of the State WQC process that accompanies FERC licensing of hydropower projects is a well-established practice recognized by the Department and by hydropower dam owners and operators. This is why the Attean Pond BMI survey had been conducted in the first place, a decade earlier.[10]

Apart from the Attean Pond data being available, which the Board recognizes has obvious appeal, the Board finds BBHP has not established why Attean Pond is an appropriate reference lake for Graham Lake and, even if it is, why the 2008 data remain appropriate for comparison more than a decade after they were collected. Attean Pond is located in Attean Township, Somerset County in Western Maine. This higher-elevation lake is in the headwaters of the Kennebec River drainage, located not far from the Canadian border. In contrast, Graham Lake is located in Ellsworth, Mariaville, Waltham, and Fletccher's Landing Township, Hancock County in the coastal region of the State. Graham Lake is in the Union River drainage and is considerably larger than Attean Pond. Both contain wetland habitat and cobble-gravel habitat; however, Graham Lake also contains sandy bottom habitat, while Attean Pond does not. While at a basic level there may be some similar habitats in these two distant lakes, why comparison is appropriate given that Attean Pond and Graham Lake are located in different drainages and different regions of the State is not evident to Board and has not been established by BBHP.

[10] Attean Pond had been used as a reference lake for the nearby Brassua Lake storage impoundment in conjunction with the FERC licensing of the Brassua Project and the accompanying application for WQC for that project. Brassua Lake is located downstream of Attean Pond, with the two water bodies connected by the Moose River.

Additionally, even assuming, *arguendo,* Attean Pond is an appropriate reference lake, the suitability of the 2008 data from Attean Pond in the present context is not self-evident to the Board either. For example, comparative study samples collected in the same year and under similar climate and weather patterns is preferable in order to reduce, to the extent possible, variables such as drought or excessive precipitation. None of the potential variables are addressed or acknowledged by BBHP.

The Board finds that BBHP has failed to establish, or even to attempt to establish, that Attean Pond is an appropriate reference lake for Graham Lake here. The Board further finds, even if Attean Pond is an appropriate reference, that BBHP has failed to establish, or even attempt to establish, the appropriateness of using the decade old Attean Pond data. The Graham Lake BMI Study hinges on the comparison of Graham Lake BMI data with Attean Pond BMI data and BBHP, in turn, relies on this study as the basis for its position that Graham Lake meets Class C standards. Having failed to establish Attean Pond and the previously existing data as an appropriate reference against which to compare water quality in Graham Lake, the Board finds the Graham Lake BMI Study deficient and that in relying on this report BBHP has failed to demonstrate that Graham Lake meets Class C standards. For this reason, the Board affirms the finding and conclusion in Section 4(B)(5) of the WQC Order that the benthic macroinvertebrate study of the aquatic community in the GPA classified Graham Lake did not establish that the aquatic habitat meets Class C aquatic life and habitat criteria, as provided in 38 M.R.S. § 464(9-A)(D).

2. The Graham Lake BMI Study does not demonstrate attainment of Class C standards.

Looking beyond this deficiency in BBHP's WQC application, and accepting, *arguendo*, that Attean Pond is an appropriate reference lake and that the 2008 data remain an appropriate benchmark, the Board further finds the Graham Lake BMI Study and associated underlying data do not demonstrate that Graham Lake meets Class C standards.

BBHP filed its WQC application on March 21, 2019, and supplemented this filing 10 months later on January 31, 2020, with submission of the Graham Lake BMI Study. The study included a summary of the sampling and sampling results, comparison to Attean Pond sampling results, and BBHP's conclusion that Graham Lake maintains the structure and function of the residential community. The study did not contain the underlying data collected as part of the Attean Pond survey conducted in 2008 or the underlying data files for the Graham Lake survey. The Department requested the underlying data on February 3, 2020, and continued its review of BBHP's application based on the record before it.[11]

[11] On March 10, 2020, the Department issued a draft of the WQC Order to BBHP and other interested persons, providing an opportunity for comment. The draft contained findings similar to the final WQC Order, including that BBHP had not provided underlying data limiting the Department's ability to

Department staff review of the Graham Lake BMI Study revealed that for the habitats sampled, the data provided indicated the macroinvertebrate community is fairly balanced on the abundance and variety of different taxa groups represented. Compared to the Attean Pond data the overall taxa richness for Graham Lake is 20 percent lower for wetlands and 37 percent lower for cobble-gravel substrates. The percent dominant taxa was also notably higher for Graham Lake compared with Attean Pond, indicating greater environmental stress in the Graham Lake aquatic community. J. DiFranco email re "2020-01-30Graham Lake Final Macro Report_Leeper.pdf" (Feb. 3, 2020).

Department staff also observed what was not in the Graham Lake BMI Study, noting:

> The 2019 macroinvertebrate study did not include a mussel survey as requested by the Department however, and no data for mussels were provided in the report. Mussels are an important component of a healthy aquatic community and, have a high potential to be adversely impacted by water level fluctuations including extended drawdowns. Since a mussel survey was not conducted, there are currently insufficient data to conclusively determine if the structure and function of the resident biological community in Graham Lake is maintained as required in aquatic life criteria for Class C.

J. DiFranco email re "2020-01-30Graham Lake Final Macro Report_Leeper.pdf" (Feb. 3, 2020).

With respect to the comparison of the Graham Lake BMI data with the Attean Pond data, as these data sets were aggregated, the Board notes similarities in the observations of BBHP's consultant with the observation of Department staff. BBHP's consultant notes in the Graham Lake BMI Study that the wetland communities in Graham Lake are stressed and cobble-gravel communities are even more stressed; Department staff observe

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evaluate the conclusions of Graham Lake BMI Study and analyze the raw data. BBHP did not submit comments on the draft order.

On March 11, 2020, BBHP submitted the requested underlying data from the prior Attean Pond study and Graham Lake survey to the Department. The final WQC Order, dated March 19, 2020, and issued the day before the expiration of the one-year federal statutory deadline for issuance of the order, carried forward the statements that BBHP had not provided the underlying data. BBHP points out the inaccuracy of this statement in its appeal. The Board finds that BBHP is correct and that it submitted the requested underlying data after the draft order had been prepared and a week before issuance of the final WQC Order. BBHP also states in its appeal that the Attean Pond data were submitted to the Department "as part of the Brassua relicensing Initial Study Report on February 5, 2009." Reference to data submitted to the Department a decade earlier in a separate matter that is no longer pending is insufficient to allow review of those data today and ensure inclusion of those data in the record of a pending matter, especially when the referenced data are requested by the Department, as was the case here.

the information presented in the study as indicating greater environmental stress in the Graham Lake aquatic community.

Despite the undisputed stress on the aquatic community of Graham Lake, BBHP's consultant and Department staff draw different conclusions. The consultant's conclusion in the study is that Graham Lake is in attainment, while Department staff's assessment was that a determination of attainment could not be reached. This staff assessment reflects recognition of the stress to the aquatic community, assuming comparison to Attean Pond is appropriate, as well as the absence of requested mussel survey results. Consistent with the Department's Sampling Protocol for Hydropower Studies: Lakes, Ponds, and Impoundments (December 2017)[12], on June 21, 2019, the Department requested that BBHP conduct a mussel survey as part of its study of Graham Lake. Despite this request, BBHP refused to collect and submit any mussel data, stating in support of its position in its July 30, 2019 cover letter to the Department conveying its study plan, that "there are not standards or methods by which to assess or to judge the mussel community."[13]

The Board finds, however, as articulated in Department's staff comments, that mussels are an important component of a healthy aquatic community and have a high potential to be adversely impacted by water level fluctuations including extended drawdowns. Thus, an understanding of the type and abundance of mussels in Graham Lake, even in the absence of a numeric mussel standard, is valuable in assessing water quality, especially given the BMI data collected and reflected in the study reveals stress to the aquatic community.

Additionally, the Board finds the absence of any comparison of the BMI survey data collected in the sand habitat of Graham Lake to any potential reference lake (no such data were collected at BBHP's selected reference, Attean Pond) further limits the value of the Graham Lake BMI Study when evaluating water quality in that lake. Based on the above considerations, the Board finds that BBHP has failed to meet its burden with respect to these Graham Lake aquatic life and habitat issues and to demonstrate attainment of Class C standards in the lake.

In any event, with the benefit of Department staff serving as staff to the Board, and the expertise and professional judgment of staff, the Board also has evaluated the data contained in the Graham Lake BMI Study, which further supports the Board's findings and conclusion that the Graham Lake BMI Study does not demonstrate attainment of Class C standards. Based on this review, the Board finds the Graham Lake data fail to

[12] When 75 percent of an impoundment's littoral zone is not maintained in a wetted condition, this protocol provides that studies of fish and other aquatic life communities, including freshwater mussels, may be conducted to demonstrate that the project maintains structure and function of the resident biological community despite the drawdown. Mussel data, for example, were collected as part of the Attean Pond survey.

[13] Instead of a mussel survey, BBHP stated it was willing to record incidental observations of mussels in the vicinity of the selected sampling locations. No such mussel observations were reported.

demonstrate maintenance of the structure and function of the resident biological community within Graham Lake.

More specifically, BBHP, through its consultant, sampled benthic macroinvertebrates at six locations in Graham Lake. The sampling targeted three general substrates – coarse substrates (cobble-gravel), fine substrates (sand), and wetlands – with two sample locations for each substrate. Sampling took place on both August 15, 2019, and September 19, 2019, resulting in a total of 12 samples.[14] Of these twelve samples, and based on the review by and professional judgment of Department staff in their assistance to the Board:

- 3 samples show nonattainment for Class C aquatic life standards:
- 6 include insufficient data to make a class determination (typically because of low total mean abundance (<50) and/or total generic richness (<15) of the sample; and
- 3 show attainment with Class C aquatic life standards.

The table included as Appendix A to this order identify which samples fall into each of these categories and include Department staff comments indicating the basis for this assignment.

Based on the observed stress to the aquatic community in Graham Lake when compared to Attean Pond (assuming it is a proper reference pond with sufficiently current reference data), along with the absence of any comparison or assessment of the benthic macroinvertebrate community in sand habitat as part of the evaluation of structure and function of the resident biological community, the absence of any mussel data as part of this same evaluation, and the raw sampling data that were collected in Graham Lake, the Board finds the Graham Lake BMI Study is insufficient to demonstrate that Graham Lake maintains structure and function of the resident biological community in the lake or that Graham Lake meets the Class C standard for aquatic life and habitat. For each of these separate and additional reasons, the Board affirms the finding and conclusion in Section 4(B)(5) of the WQC Order that the benthic macroinvertebrate study of the aquatic community in the GPA classified Graham Lake did not establish that the aquatic habitat meets Class C aquatic life and habitat criteria, as provided in 38 M.R.S. § 464(9-A)(D).

b. BBHP failed to demonstrate Graham Lake would be in attainment of Class C aquatic life standards under the Project's proposed operations, including the proposed drawdown of Graham Lake.

The second argument BBHP advances with respect to water quality in Graham Lake is the same one it made with respect to water quality in the Union River below Graham Lake Dam. BBHP asserts the sampling it completed in Graham Lake was conducted

[14] Each sample is comprised of three replicates, except for the wetland sample site designated W-1, where one replicate was lost due to lab error. Replicates are multiple sampling devices to collect macroinvertebrates, deployed closely but not adjacent, within a habitat. This sampling method provides for collection of sufficient numbers of organisms to represent a community. Replicates are combined and mean, or average, values are calculated for analysis.

under current operating conditions and not under the proposed operating conditions with a 5.7-foot drawdown. The 5.7-foot drawdown, BBHP argues, should benefit the benthic macroinvertebrate community in the lake by reducing turbidity. BBHP states:

> Given that the BMI communities were relatively close to attainment under existing conditions, it was unreasonable, a poor exercise of professional judgment, and arbitrary and capricious for the Department not to have considered the likely benefits to those communities of [BBHP's] proposal to limit its drawdown operating range. Further, the Department is fully able to condition a WQC to require monitoring measures to ensure the future environmental measures result in attainment of water quality criteria.

BBHP Appeal at 11.

The Board is unaware of any information or analysis submitted by BBHP as part of its WQC application in which BBHP attempts to demonstrate that Graham Lake will meet the applicable water quality standards under the proposed drawdown of 5.7 feet and BBHP points to none in its appeal. The Board finds its analysis and finding made in Section 8(A)(3)(b) above when addressing this same argument in the context of the Union River are equally applicable here in the context of Graham Lake. They are incorporated here by reference and thus not restated in full. In short, however, in making this argument BBHP misplaces the burden and attempts to shift it onto the Department to demonstrate that Class C aquatic life standards will be met in Graham Lake. The Board finds this burden rests with the applicant, BBHP, and not the Department, and that BBHP has not carried its burden before the Commissioner or in this appeal. Nor has BBHP pointed to any evidence in its appeal indicating it has even tried to evaluate how a proposed 5.7-foot drawdown, as opposed to existing operations, will impact the macroinvertebrate community or broader resident biological community in Graham Lake.

Additionally, the Board finds the Department did consider the effect of reducing the drawdown on the benthic macroinvertebrate community in Graham Lake. Specifically, the Department evaluated whether 75 percent of the littoral zone would remain wetted under the proposed 5.7-foot drawdown and concluded it would not. WQC Order at 20-21. The Department also stated:

> A reduction in the Graham Lake drawdown may enhance vegetative growth and help to stabilize shorelines and may help to reduce turbidity by limiting erosion associated with extensive drawdowns. Reduced erosion may help to expand the littoral zone by allowing more light penetration a direct result of turbidity reductions. Expansion of the littoral zone will support natural expansion of the aquatic vegetation found there and provide additional littoral habitat for fish and other aquatic organisms. This possibility and the water quality implications were not addressed by [BBHP] in its submissions to the Department.

WQC Order at 20, fn.14.

Finally, and also as discussed above in Section 8(A)(3)(b) in the context of the Union River below Graham Lake, BBHP's suggestion that a monitoring condition can ensure future compliance overstates the impact and ability of monitoring. Monitoring allows evaluation of whether or not attainment is achieved. Monitoring does not ensure attainment and BBHP has not proposed corrective action or an adaptive management plan to achieve necessary water quality improvements if monitoring showed nonattainment.

c. Summary

In sum, the Board finds BBHP's arguments that the Department should have determined Graham Lake will meet the applicable water quality standards unsupported by its submissions and unpersuasive. While BBHP states it is "unclear" why the Department cannot use its professional judgment to determine Graham Lake is in attainment for Class C standards for GPA waterways, BBHP Appeal at 8, the Board finds the record does not support such a determination. The Graham Lake BMI Study, to which BBHP points in its application and appeal, heavily focuses on a comparison to data previously collected in Attean Pond without establishing that Attean Pond is an appropriate reference lake or that the decade old Attean Pond data remains appropriate for comparison. This shortcoming of the study, by itself, is sufficient basis for the Board to uphold the conclusion reached by the Commissioner in the WQC Order. In addition to this deficiency, however, the Board finds the scope of the Graham Lake BMI Study insufficient and the data collected as part of the study unsupportive of BBHP's argument that the Department should have exercised its professional judgment to find Graham Lake in attainment with the Class C aquatic life standard. Based on review of the record, informed by staff of the Department, and for the reasons set forth in this order, the Board finds, as did the Commissioner in Section 4(B)(5) of the WQC Order, that the benthic macroinvertebrate study of the aquatic community in the GPA classified Graham Lake does not establish that the aquatic habitat meets Class C aquatic life and habitat criteria, as provided in 38 M.R.S. § 464(9-A)(D), and that the proposed operation of the Project does not meet the Class GPA designated use of habitat for fish and other aquatic life in Graham Lake. The Board further finds no error in the WQC Order's conclusion, based on the professional expertise and judgment of the Department, that the proposed operations of the Graham Lake Dam resulting in a 5.7-foot drawdown of Graham Lake, will cause or contribute to the failure of Graham Lake to meet the applicable water quality standards.

The Board finds and concludes that, in addition to the failure of the Union River below Graham Lake Dam to meet applicable water quality standards as discussed in Section 8(A), the WQC also was appropriately denied in the WQC Order on the basis discussed in this Section 8(B).

C. Union River (Leonard Lake) – Classification and Dissolved Oxygen

BBHP asserts that the Department's requirement that Leonard Lake meet Class B numeric standards for dissolved oxygen rather than GPA standards is not supported by Maine law or the Department's course of conduct and is, therefore, incorrect, arbitrary, and capricious. BBHP Appeal at 3-7. BBHP argues that historically and throughout the entirety of the relicensing process, the Department considered Leonard Lake to be a Class GPA waterbody, but that in the WQC Order, the Department claims that Leonard Lake is a Class B waterbody, part of the Union River as classified pursuant to 38 M.R.S. § 467(18)(A)(1). BBHP contends that the Department must interpret the provisions of 38 M.R.S. §§ 465-A, 467, 468 and 636 as mandating that portions of the Union River identified as Leonard Lake be classified as Class GPA, rather than Class B.

Determining the classification of Leonard Lake involves the interplay of classification statutes, including portions of 38 M.R.S. § 465-A (Standards for the classification of lakes and ponds) and 38 M.R.S. § 467 (Classification of major river basins). Title 38, section 465-A states:

> The department shall have one standard for the classification both of great ponds and of natural lakes and ponds less than 10 acres in size. Impoundments of rivers that are defined as great ponds pursuant to section 480-B are classified as GPA or as specifically provided in sections 467 and 468.

Title 38, section 467(18) provides the relevant text with respect to the classification of the relevant portions of the Union River:

> **18. Union River Basin.**
>
> A. Union River, main stem.
>
> (1) From the outlet of Graham Lake to tidewater - Class B.

BBHP bases its argument on statutory interpretation. According to BBHP, because Lake Leonard meets the definition of a great pond in 38 M.R.S. § 480-B(5), and because 38 MRS § 465-A states that, "impoundments of rivers that are defined as great ponds pursuant to section 480-B are classified as GPA *or as specifically provided* in sections 467 and 468" (emphasis added), Lake Leonard must be considered as a Class GPA waterbody unless it is explicitly included or excluded by sections 467 or 468. BBHP compares certain subsections of section 467 involving other waterbodies that include language, such as "including all impoundments," or explicitly excludes certain impoundments, in order to contrast those subsections with the language applicable to the Union River, which lacks such an explicit provision. BBHP argues that the use or non-use of such language is evidence of clear legislative intent as to whether particular impoundments ought to be considered GPA or under their relevant riverine classification.

A response submitted by DSF disagrees with BBHP's interpretation and instead argues that in some instances the Legislature specifies lakes, ponds, or impoundments within a

river basin in a different way by consciously describing the geographic boundaries of those classifications. DSF Response at 50-65. Accordingly, as DSF argues, the Legislature treats each river basin and segments thereof individually and sometimes uses language such as "to the confluence with. . ." and ". . . from the outlet of" to geographically define around and either include an otherwise Class GPA lake, pond, or impoundment or exclude such a waterbody from the relevant riverine classification. DSF Response at 58-61. DSF provides several examples elsewhere in 38 M.R.S. § 467 where such language is utilized to specifically exclude a lake, pond, or impoundment from the riverine classification in this manner, and compares those provisions to the relevant language for the Union River, 38 M.R.S. § 467(18)(A)(1), which contains no such geographic exclusion. DSF Response at 52, 58-61. DSF adds that former geographic boundaries between Class B and Class C classifications in the main stem of the Union River, in combination with the fact that the Ellsworth Dam serves as the physical demarcation between the Union River and the tidewater, provide further evidence that Lake Leonard was consciously intended to be included within the Class B riverine classification, which geographically extends to the tidewater (i.e., to the Ellsworth Dam impounding Leonard Lake) without exclusion, when the current language in 38 M.R.S. § 467(18)(A)(1) was drafted. DSF Response at 51-53. DSF also asserts that classifying Leonard Lake as a riverine Class B water body is consistent with the Department's prior WQC for the Project issued in 1987 pursuant to then-riverine Class C standards, which also include a dissolved oxygen requirement. DSF Response at 45, 46-47.

As noted, the legal question of Leonard Lake's classification involves the interplay of the statute governing the classification of lakes and ponds, 38 M.R.S. § 465-A, and the provisions governing the riverine classification of the Union River, 38 M.R.S. § 467(18)(A)(1). In particular, the interplay involves the phrase "or as specifically provided" in 38 M.R.S. § 467, and whether the language in 38 M.R.S. § 467(18)(A)(1), which extends to the tidewater and Ellsworth Dam without exclusion, specifically provides for a riverine classification, or whether Lake Leonard defaults to Class GPA. As discussed below, the Board agrees with the interpretation of the Commissioner in the WQC Order, as well as the points raised by DSF in its response, and independently finds that 38 M.R.S. § 467(18)(A)(1) specifically provides for a riverine classification of Leonard Lake as a Class B water body, such that Leonard Lake does not default to a Class GPA water body.

Definitions for the word "specifically" vary but are generally characterized as meaning more exact or possessing a precise quality.[15] But as the competing statutory arguments by BBHP and DSF reflect, and as the different ways the Legislature has used language to either include or exclude lakes, ponds, or impoundments in riverine classifications demonstrate, there is no prescribed method of "specifically" providing for a riverine classification. The Board also agrees that each river basin and segment thereof should be

[15]E.g., the word "specifically" is defined in the Merriam-Webster Dictionary as, "in a specific manner: in a definite and exact way: with precision." Merriam-Webster.com Dictionary, Merriam-Webster, https://www.merriam-webster.com/dictionary/specifically (accessed April 7, 2021).

analyzed individually to determine its classification. This is especially important when, as here, the specific geography plays an active role in the analysis.

In analyzing the Union River and Leonard Lake individually, and considering the specific language used by the Legislature in 38 M.R.S. § 467(18)(A)(1) in the context of the particular geography, including the impoundment of Leonard Lake by the Ellsworth Dam, which also serves to separate the impoundment of Union River waters from the tidewater, the Board interprets the applicable statutes as classifying Leonard Lake as a riverine Class B water body rather than Class GPA. The Board finds persuasive the physical demarcation of tidewater immediately below the impounding Ellsworth Dam and the lack of any basis to separate portions formerly classified as Class C should the impoundment not be included. For example, there is no language in 38 M.R.S. § 467(18)(A)(1) such as "to the confluence with Leonard Lake" that would indicate an intent to exclude Leonard Lake from the riverine classification that otherwise specifically addresses the portion of the Union River that stretches through Leonard Lake and to Ellsworth Dam and the tidewater.

The Board also finds its interpretation of Leonard Lake as a riverine Class B water body consistent with the history of the classification of this portion of the Union River. *See* DSF Response at 43-48, 51-53. The language and the aforementioned geographic indicators suggest that at one time, the Legislature intended the impoundment and waters immediately upstream to be subject to more lenient but still riverine Class C standards subject to dissolved oxygen standards. But those portions, in conformance with the goals of the classification system, have been unified into a single Class B standard downstream of Graham Lake to tidewater. There is nothing in the history or text of 38 M.R.S. § 467(18)(A)(1) that suggests that the classification of Leonard Lake was intended to be changed from a riverine classification to a non-riverine Class GPA no longer subject to any of the riverine dissolved oxygen standards. Accordingly, the Board not only finds the Department's interpretation was reasonable, it finds that the appropriate classification for applicable portions of the Union River is Class B.

Because the Board reviewed the relevant statutory language and came to its own independent findings of facts and legal conclusions regarding its meaning, the Board finds little relevance in BBHP's claims regarding the Department's course of conduct regarding prior interpretations. To the extent the Board must address those issues on appeal, there is evidence in the record and the Board finds that BBHP was aware the Department historically considered the waterbody as Class B and in fact BBHP acknowledged this status in early pre-application submissions. There is also evidence in the record and the Board finds that any inconsistency in the Department's historical interpretation of the classification of Leonard Lake possibly created by any statement from Department staff was corrected well in advance of the WQC Order, and at least as early as early as July 9, 2019, and that BBHP was on notice of such correction. There is no evidence in the record that BBHP was induced to act by such a statement and the Board finds that reliance on any erroneous statements made by Department staff to be unreasonable. A temporary mistake regarding a change in interpretation, since corrected,

does not render prior and current interpretations in error, nor provide any justification to BBHP for any unreasonable reliance on such statements. The Board finds claims to the contrary without merit.

Finally, the Board notes BBHP collected and submitted as part of its WQC application dissolved oxygen data collected in Leonard Lake. The Commissioner found and concluded in the WQC Order that based on those data the Project water in Leonard Lake does not meet applicable Class B water quality standards under current operating conditions. The Commissioner further found and concluded that BBHP did not submit evidence demonstrating the dissolved oxygen would be improved under the proposed operation of the Project. Further, based on its professional expertise and judgment, the Department found that the BBHP's operations, as proposed, including the presence of the Ellsworth Dam and the impoundment of Leonard Lake, cause or contribute to the failure of Leonard Lake to meet the applicable standards of the classification. With respect to the dissolved oxygen standard, the only issue presented on appeal is whether the riverine impoundment Leonard Lake is a Class B water. Having concluded it is, the Board affirms the findings and conclusions of the WQC Order, including those in Section 4(D)(1)-(4) regarding Leonard Lake. The Board finds and concludes that, in addition to the failure of the Union River below Graham Lake Dam to meet applicable water quality standards as discussed in Section 8(A), and the failure of Graham Lake to meet applicable water quality standards as discussed in Section 8(B), WQC also was also appropriately denied on this basis.

Based on the above findings, the Board concludes that:

1. BBHP filed a timely appeal.

2. The Board will not hold a public hearing on this appeal.

3. BBHP failed to demonstrate that the Union River immediately downstream of the Graham Lake Dam will meet the Class B aquatic life standards under the proposed operation of the Project, including a 5.7-foot drawdown of Graham Lake.

4. BBHP failed to demonstrate that Graham Lake will meet the Class C aquatic life and habitat standards, as provided in 38 M.R.S. § 464(9-A)(D), under the proposed operation of the Project, and, therefore, failed to demonstrate that Graham Lake will meet the Class GPA designated use of habitat for fish and other aquatic life under the proposed operation of the Project, including a 5.7-foot drawdown of Graham Lake.

5. The Lake Leonard impoundment within the Union River is Class B and BBHP failed to demonstrate that this section of the Union River will meet the applicable Class B dissolved oxygen standard.

THEREFORE, the Board AFFIRMS the Department Order denying the application of BLACK BEAR HYDRO PAERNERS, LLC for water quality certification of the ELLSWORTH HYDORELECTRIC PROJECT in ELLSWORTH, Maine and DENIES the appeal of the APPELLANT.

All other findings and conclusions of Department Order #L-13256-33-L-N not addressed by this order on appeal are incorporated herein.

DONE AND DATED AT AUGUSTA, MAINE, THIS 3rd DAY OF June, 2021

BOARD OF ENVIRONMENTAL PROTECTION

By:_____
Mark C. Draper, Chair

Appendix A:
Summary of Graham Lake BMI Survey Data

DEP Sample ID	Station	Date Sampled	Habitat Type	Class Determination[1]	Comments
KQ-0819-333	GRAHAM LAKE (AB1)	8/15/2019	wetland	C	The sample is dominated by snails (Amnicola, 36%) and amphipods (Hyallela, 28%). Non-insect relative abundance is 70.5% which is relatively high. Total mean abundance is 187, and total generic richness is 34. EOT richness (the number of mayfly, dragonfly/damselfly and caddisfly taxa) is 8, with a number of sensitive taxa present. EOT (Ephemeroptera, Odonata, Tricoptera)[2] relative richness is 24% and EOT relative abundance is 15.8%. Based on the data provided, structure and function of the resident biological are maintained, therefore the sample meets aquatic life criteria for Class C.
KQ-0919-333	GRAHAM LAKE (AB1)	9/19/2019	wetland	NA	Data for replicate 2 were not provided to the Department due to a lab accident, therefore results are based on 2 of 3 replicates. Total generic richness (18) is low in comparison to total mean abundance (432). Dominant taxa are amphipods (Hyalella, 50.46%) and snails (Amnicola, 33.10%), which together comprise a large proportion of the community. Non-insect relative abundance is very high (92.6%), and is an indicator of community stress. EOT richness is 8, with low relative abundance of these taxa in the sample (5.7%, all EOT taxa combined). The Shannon-Wiener diversity index is also very low (1.981). Based on the data provided, structure and function of the resident biological community are not maintained, therefore the sample does not meet aquatic life criteria for Class C.
KQ-0819-334	GRAHAM LAKE (AB2)	8/15/2019	wetland	NA	Total mean abundance in this sample is excessively high (8,784 individuals), with hyper-dominance of snails (Amnicola, 41.74%) and amphipods (Hyalella, 37.52%). Aquatic worms (Oligochaetes, 4.86), while a relatively smaller percent of the community than snails and amphipods, are still the third most dominant taxa with a mean abundance of 426.67 individuals. Non-insect relative abundance is very high (86.3%). Generic richness is relatively low (27), especially considering the abnormally high total abundance. EOT richness is also fairly low (6 taxa), and EOT relative abundance is very low (5.9). The resident biological community shows signs of significant stress, and structure and function are not maintained. Therefore, aquatic life criteria for Class C are not met.

DEP Sample ID	Station	Date Sampled	Habitat Type	Class Determination[1]	Comments
KQ-0919-334	GRAHAM LAKE (AB2)	9/19/2019	wetland	I	Total generic richness for this sample is very low (12) in relation to total mean abundance (535). The Shannon-Weiner Diversity Index is also very low (1.814). The assemblage is unusual in that no midge larvae (Chironomids) are present, since they are typically an important component of the macroinvertebrate community. EOT richness is also relatively low (6 taxa), however EOT relative abundance (30.3%) and relative richness (50%) are fairly high. The community shows mixed signals relevant to anthropogenic stress, and there are insufficient data for a conclusive determination due to low generic richness. Therefore, the class is Indeterminate.
SB-0819-335	GRAHAM LAKE (CG1)	8/15/2019	cobble-gravel	I	Both total mean abundance (42) and total generic richness (13) are very low. The top 3 dominant taxa are snails (Amnicola, 62.2), amphipods (Hyalella, 13.39%) and aquatic worms (Oligochaetes, 9.45%). Five mayfly taxa and 2 caddisfly taxa are present, but with very low mean abundance (mayflies = 4, caddisflies = 1). No Odonates are present (dragonflies and damselflies). There are insufficient data for a conclusive determination due to low total mean abundance and total generic richness, therefore the class is Indeterminate.
SB-0919-335	GRAHAM LAKE (CG1)	9/19/2019	cobble-gravel	I	Both total mean abundance (40) and total generic richness (13) are very low in this sample. Two mayfly taxa and 3 caddisfly taxa are present, but with low mean abundance (mayflies = 14, caddisflies = 2). No Odonates are present. There are insufficient data for a conclusive determination due to low total mean abundance and total generic richness, therefore the class is Indeterminate.
SB-0819-336	GRAHAM LAKE (CG2)	8/15/2019	cobble-gravel	I	Both total mean abundance (24) and total generic richness (14) are very low. Aquatic worms (Oligochaetes, 37.5%) comprise the greatest proportion of the community, however mean abundance is only 9 individuals. There are 3 mayfly and 4 caddisfly taxa present, all with very low mean abundance. No Odonates are present in the sample. There are insufficient data for a conclusive determination due to low total mean abundance and total generic richness, therefore the class is Indeterminate.
SB-0919-336	GRAHAM LAKE (CG2)	9/19/2019	cobble-gravel	I	Total mean abundance (47) and total generic richness (15) are very low. Amphipods (Hyalella, 23.57%), aquatic worms (Oligochaetes, 20.71%) and snails (Amnicola, 13.57%) are the most abundant taxa in the sample. EOT richness is only 4 (3 mayflies, 1 caddisfly and no Odonates), all with very low mean abundance. There are insufficient data for a conclusive

DEP Sample ID	Station	Date Sampled	Habitat Type	Class Determination[1]	Comments
					determination due to low total mean abundance and total generic richness, therefore the class is Indeterminate.
SB-0819-337	GRAHAM LAKE (S1)	8/15/2019	sand	C	Total mean abundance (58) and generic richness (18) are low. The 3 most abundant taxa are snails (Amnicola), a midge (Tanytarsus), and aquatic worms (Oligochaetes), however mean abundance of these taxa is still low. One mayfly taxon and 4 caddisfly genera are present, 3 of which are quite sensitive taxa. Overall the sample maintains structure and function of the resident biological community, therefore Class C aquatic life criteria are met.
SB-0919-337	GRAHAM LAKE (S1)	9/19/2019	sand	C	Total mean abundance (72) and generic richness (22) are relatively low. EOT taxa richness is 8 (4 mayflies, 1 Odonate and 3 caddisflies), with a relative abundance 38.1%. The most abundant taxon is the intermediate-tolerance mayfly Eurylophella (16.74%). No taxa appear hyper-dominant. The sample maintains structure and function of the resident biological community, therefore Class C aquatic life criteria are met.
SB-0819-338	GRAHAM LAKE (S2)	8/15/2019	sand	NA	Total mean abundance (80) and generic richness (19) are relatively low. Dominant taxa in the sample are aquatic worms (45.23%) and snails (Amnicola, 29.88%). EOT richness is very low (3), as is EOT relative abundance (4.4%). There are 2 mayfly taxa and 1 caddisfly taxon present, all with very low mean abundance. No Odonates are present. Relative abundance of non-insects is very high (84.6%). These results indicate that structure and function of the resident biological community are not maintained, therefore the sample does not meet aquatic life criteria for Class C.
SB-0919-338	GRAHAM LAKE (S2)	9/19/2019	sand	I	Total mean abundance (11 individuals) and total generic richness (8 taxa) are extremely low. There are insufficient data for a conclusive determination due to extremely low total mean abundance and total generic richness, therefore the class is Indeterminate.

Notes:

[1] Final determinations are based on professional judgement, informed by narrative aquatic life criteria for Class C, as sampling methods used for impoundment characterization do not conform to requirements of the Biomonitoring Program statistical models. C means attainment of Class C; NA means non-attainment of any class, indicating that the sample did not meet the minimum criteria for Class C; I means

indeterminate, indicating that a final determination could not be made based on the aquatic community collected, typically due to low total mean abundance (less than 50 organisms present) and/or low total generic richness (less than 15 species present) in the sample (average of the replicates).

[2] EOT is a metric that includes Ephemoeroptera, Odonata and Trichoptera (commonly known as mayflies, dragonflies/damselflies, and caddisflies) and is analogous to the EPT (Ephemeroptera, Plecoptera (Stoneflies) and Tricoptera) metric specified in the Methods for Biological Sampling and Analysis of Maine's Rivers and Streams (DEP LW0387-C2014). In some habitats, especially wetlands, there are typically very few or no stoneflies present even under natural conditions since they typically prefer cold, well-oxygenated flowing water.