BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

In re:	)
	)
Greater Lawrence Sanitary District	)
	)
Permit No. MA0100447	)
	)

PETITION FOR REVIEW OF
GREATER LAWRENCE SANITARY DISTRICT'S
NPDES PERMIT ISSUED BY REGION 1

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I. INTRODUCTION

The Greater Lawrence Sanitary District ("GLSD"), consisting of the environmental justice community of Lawrence, the Massachusetts municipalities of Methuen, Andover, North Andover, and Dracut, and Salem, New Hampshire, operates a wastewater treatment facility (the "facility") that discharges effluent into the Merrimack River. The 117-mile long Merrimack River is the fourth largest river basin in New England and discharges into the Gulf of Maine. The facility is located about 17 miles from the tidal estuary, and the segment where the facility discharges is characterized by cold temperatures, good aesthetic quality, and "hydraulics that flush the river rapidly and re-oxygenate it frequently." The Massachusetts Department of Environmental Protection ("MassDEP") has designated the river as a Class B waterbody and includes designated uses as aquatic life, fish consumption, primary contact (swimming), secondary contact (boating), and aesthetics. There have never been any issues with eutrophication affecting these uses in this segment of the river or downstream.

Region 1 (the "Region") of the Environmental Protection Agency ("EPA") and the MassDEP issued a final National Pollutant Discharge Elimination System ("NPDES") permit to GLSD on September 25, 2019. **Attachment 1**. The final permit includes for the first time a discharge limit on phosphorus, a nutrient that in sufficient quantities coupled with other seasonal factors can cause eutrophication, meaning the unnatural stimulation of dense and excessive plant growth. GLSD submits this petition for review because the Region committed clear error in setting this limit for at least these reasons:

First, the Region has not shown that the phosphorus limit is necessary because this segment of the river or downstream is not impaired for eutrophication or that phosphorus "causes

or contributes" to it. Accordingly, there is no violation of the applicable state water quality standard and no basis to limit phosphorus in the final permit.

Second, even if there were some evidence of eutrophication, the Region erred in setting the instream numeric target for the state nutrient water quality criteria at 0.1 mg/L based on the EPA's 1986 "Quality Criteria for Water" guidance known as the "Gold Book," rather than relying on site specific data showing a healthy river at phosphorus levels above this threshold.

Third, the Region relied on incorrect and unreliable data and made errors in calculating the river's low flow conditions (known as "7Q10") and dilution factor underlying the determination of whether GLSD's discharge had the "reasonable potential" to exceed the in-stream water quality target and in setting the applicable NPDES discharge limit.

Fourth, if the limit were to remain, the Region erred in removing the compliance schedule included in the Draft Permit.

GLSD also challenges the Region's use of incorrect data, as described above, to establish a residual chlorine discharge limit.

II. PERMIT CONDITIONS FOR REVIEW

Pursuant to 40 C.F.R. § 124.19(a), GLSD petitions for review of the conditions of Permit No. MA0100447 (the "permit" or "final permit").

Any contested permit conditions and any uncontested conditions that are not severable from contested conditions are stayed pending final agency action. 40 C.F.R. §§ 124.16(a)(2)(i), 124.60(b). Specifically, the effluent limits for phosphorus and total residual chlorine in part I.A.1 of the permit are stayed.

III. FACTUAL AND STATUTORY BACKGROUND

A. Factual Background

i. *The Facility*

The Massachusetts Legislature established GLSD in 1968 to operate a system of sewage collection and disposal facilities in response to 1963 studies of the Merrimack River that recommended cleaning the river by building regional treatment facilities. Today, GLSD owns and operates a wastewater treatment facility (the "facility") and interceptor system, including five combined sewer outfalls ("CSOs"). The system is a combined sewer in Lawrence, it is a separate system in Andover, Methuen, North Andover, Dracut, and Salem, New Hampshire with a total population of about 250,000 people.

Figure 1
Facility Image

The entire population of Lawrence and about a third of the population of Methuen live in Environmental Justice block groups as defined by the Massachusetts Executive Office of Energy

and Environmental Affairs. The communities of Andover, North Andover, and Dracut also contain populations in environmental justice block groups.[1]

The facility has a design flow of 52 million gallons per day (MGD) and receives an average daily flow of 30 MGD from its six municipalities.

GLSD's prior NPDES permit, issued in August 2005, expired in August 2010. GLSD timely applied for renewal, so its permit has been administratively continued under 40 C.F.R. § 122.6(A).

ii. ***The Receiving Waters***

The Merrimack River begins in New Hampshire near the Town of Franklin. It flows south for about 78 miles in New Hampshire, then turns northeast near the border of Massachusetts for another 50 miles before discharging into the Gulf of Maine in Newburyport. Downstream from Haverhill, Massachusetts, the River is tidally influenced.[2]

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[1] *See Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs,* dated Jan. 31, 2017 *available at:* https://www.mass.gov/files/documents/2017/11/29/2017-environmental-justice-policy_0.pdf.

[2] *See Merrimack River Watershed Assessment Study Final Phase I Report*, dated Sept. 2006, at § 2-3 ("Phase I Report"), **Attachment 2.**

Figure 2
Merrimack River Watershed[3]

The river watershed covers about 5,000 square miles, traversing several terrains before arriving at the estuarine coastal basin. *See Phase I Report* at § 2.3.

The facility discharges its fully treated effluent to Segment MA 84A-04 via WWTF Outfall #001. Combined sewer overflows are discharged at outfalls # 002, 003, 004, and 005 to Segment MA84A-04 of the river, and to Spicket River Segment MA 84A-10 via CSO #006:

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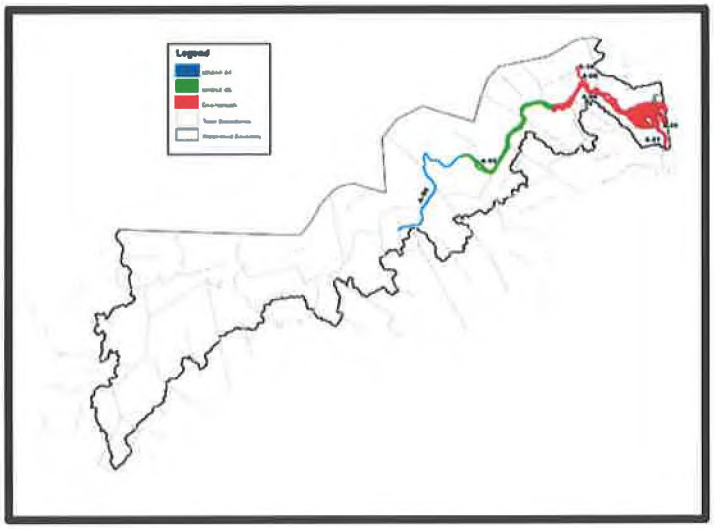
[3]*Phase I Report* at ix.

Figure 3
Merrimack River Segment MA 84A-04 and Downstream[4]



This segment is a Class B waterbody. As such, MassDEP designated its uses as including aquatic life, fish consumption, primary contact (swimming), secondary contact (boating), and aesthetics. *See* 2014 Massachusetts Integrative Waters List, excerpts of which are attached as **Attachment 3**. The most recent MassDEP water quality report assessing this segment describes it as "aesthetically pleasing."[5]

iii. ***The Draft Permit***

EPA and MassDEP issued a draft NPDES Permit on June 7, 2019. As applicable here, the permit contained a total phosphorus limit of 0.53 mg/L (p. 4) and a total residual chlorine limit of 130 µg/L (p. 3).

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[4] This figure is derived from the 2004 Merrimack River Watershed 2004 Water Quality Assessment Report Figures 1 and 3.

[5] MASS. DEP'T OF ENVTL. PROT., MERRIMACK RIVER BASIN 1999 WATER QUALITY ASSESSMENT REPORT (1999) *available at:* https://www.mass.gov/lists/water-quality-assessment-reports-merrimack-through-weymouth-weir-watersheds#merrimack-river-basin---1999-

On June 13, 2019, GLSD submitted a request to EPA to extend the public comment period by four months to allow GLSD to provide significant additional sampling data reflecting the current conditions of the River. EPA agreed to extend the public comment period to July 23, 2019 and said that data submitted after this date would still be considered part of the Administrative Record. *See Response to Comments,* ("RTC") 8 at 40, n.16.

iv. ***GLSD Comments***

GLSD timely submitted comments on July 23, 2019. **Attachment 4**. Its consultant, Osprey Owl Environmental, LLC, also submitted comments. RTC at p. 3. GLSD supplemented its comments with sampling results taken in July and August, which the Region has confirmed are in the Record. RTC 8 at 40, n.16.

In its comments, GLSD raised several issues. As relevant here, GLSD disputed the need for the phosphorus limit, the calculation of the residual chlorine limit, and the Region's use of incorrect calculations and unreliable and arbitrarily selected data. To briefly summarize:

- **7Q10 Calculation**—GLSD commented on several errors in EPA's calculation of the 7Q10 low flow statistic and its use in determining available dilution when calculating effluent discharge limits, including for phosphorus and residual chlorine. Comment 3 & 8. State regulations require the dilution value to be based on the known or estimated lowest average flow for seven consecutive days with a recurrence interval of once in ten years, known as the "7Q10" low flow rate. *See In re Upper Blackstone Water Pollution Abatement District*, 14 E.A.D. 577, 637 (EAB 2010) (citing 314 C.M.R § 4.03(3)). GLSD noted that the data the Region relied on was incorrect.

- **Phosphorus Limit**— GLSD also commented on EPA's inclusion of an unnecessary effluent discharge concentration limit for phosphorus of 0.53 mg/L. GLSD commented that there was no evidence of nutrient-related impairment in Section MA84A-04 and thus there was no violation of the Massachusetts Narrative Surface Water Quality Standards for Nutrients, 314 C.M.R. § 4.05(5)(c).

GLSD's comments are described in more detail in the Argument Section below.

v. ***The Region's Permit Decision and Response to Comments***

The Region and MassDEP issued the final NPDES Permit No. 0100447 on September 25, 2019 (the "permit"). The permit contained a determination that phosphorus must be controlled from the facility with a monthly average mass loading effluent limitation of 240 lb/day during April 1 through October 31, instead of a concentration limit of 0.53 mg/L.[6] It also declined to change the residual chlorine limit.

vi. ***Applicable Data and Evidence***

This petition involves several data and evidence that the Region relied on or discounted in reaching its determination. This includes data the Region claims it reviewed during the permitting process, such as "the CDM Smith studies", available ambient data, the State's 303(d) list and the Discharge Monitoring Report ("DMR") data submitted by GLSD. RTC 8 at 37.

a) <u>The Army Corps Report/CDM Smith Studies</u>

In 2000, Congress directed the Army Corps of Engineers to conduct a comprehensive study of the water resource needs of the Merrimack River basin in Massachusetts and New

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[6] The Region claims that 240 lb/day is "equivalent to a concentration of 0.55 mg/L at the design flow of 52 MGD and equivalent to 1.65 mg/L at the lowest monthly average flow of 17.4 MGD." (RTC 8 at 44).

Hampshire. *See Phase I Report,* § 1.1. The overall purpose of the study is to develop a comprehensive Watershed Management Plan for the Merrimack River that would guide investments in the environmental resources and infrastructure of the River, aimed at achieving water quality and flow conditions that support beneficial uses. *See id.* at §2.2.

The study was undertaken in three phases over 15 years. *See Phase III Report,* ***Attachment 5***, at i. Phase I of the study, conducted between 2002 and 2006, focused on the Lower Merrimack River (including Segment MA84A-04), particularly on bacteria impairments and the tradeoff between combined sewer overflow abatement and nonpoint source reduction. This first phase also included baseline monitoring for nutrients and dissolved oxygen. Phase II of the study conducted between 2008 and 2018 focused on the Upper Merrimack River. Phase III, conducted between 2014 and 2019, focused on the Lower Merrimack to account for updated CSO, stormwater, and wastewater treatment plant conditions since the original Phase I study, looking at both nutrient and bacteria-related sensitivities, as well as sensitivities to climate conditions. All three phases consisted of water quality monitoring, simulation modeling, and a comprehensive stakeholder-driven assessment of existing and potential future river conditions. *See generally id.*

Phase III of the Army Corps Study collected total phosphorus and dissolved oxygen samples immediately upstream of where GLSD discharges to the River to help determine ambient conditions and causal relationships in the River. *See id.* The study included ambient upstream phosphorus and dissolved oxygen data during dry, wet, and transitioning conditions, all collected under an EPA-approved quality assurance project plan ("QAPP"). *See* **Attachment 6** *Merrimack River Watershed Assessment Study - Phase III Final Monitoring Data Report*, dated August 2017 ("*Monitoring Report*") at § 1.2. The study also analyzed phosphorus and dissolved

oxygen downstream of the GLSD discharge to assess the eutrophic potential of the river. Between 2014 and 2019, the study collected 60 data points for phosphorus and dissolved oxygen downstream of the GLSD discharge point. Of those, 20 were dry weather data points downstream of the GLSD discharge point. The 20 dry weather discharge data points show dissolved oxygen always above 9 mg/L, well above the state water quality minimum standard of 5 mg/L. When all 60 data points are included, total phosphorus ranged from 0.03 to 0.18 mg/L, while dissolved oxygen ranged from 5.9 mg/L to 10.3 mg/L. Notably, the lowest dissolved oxygen levels occurred during wet weather. *See generally id.*

The Phase I of the study, covering the years 2003-2005, included three dry weather surveys, including total phosphorus and dissolved oxygen, and 24 data points at eight stations downstream of the GLSD discharge. *See 2006 Monitoring Report* at § 2.5. In two of the dry weather surveys, dissolved oxygen remained above 8 mg/L at all eight downstream stations, and above 6 mg/L in the third survey. *See id.* at § 2.5.2. Total phosphorus, at the highest levels downstream of GLSD during dry weather surveys in 2003 were 0.1, 0.075, and 0.09 mg/L. *See id.* at § 3.5.

From the Phase I to the Phase III study, the data collected by CDM Smith for the Army Corps have generally suggested an overall increase in dissolved oxygen (or at a minimum, no consistent decline) and an overall decline in total phosphorus (or no consistent increase), showing no trend toward eutrophication and, in fact, an overall increase in the health of the Merrimack River. In fact, the Phase III Report, at page viii finds:

> Indicators of water quality risks, such as levels of phosphorus and chlorophyll-a could suggest, when taken out of context, that the river is at risk of use impairment because these values sometimes exceed guidance levels that are used to assess river health state-wide. **However, the monitoring and modeling in this study over the past 15 years have shown that the unique hydrology**

and hydraulics of this river flush it rapidly, re-oxygenate it frequently, and absorb the byproducts of urbanization that might render other small rivers in this region impaired.[7]

b) Effluent Concentration Data

Under the prior permit, GLSD collected sampling data for its effluent, including sampling for phosphorus, even though there was no phosphorus limit in the permit. In early conversations with the Region about the proposed draft permit, GLSD learned that the Region intended to use these sampling results from 2014 – 2018 as the basis for determining an effluent limit for phosphorus. In these discussions, GLSD informed the Region that it believed that prior sampling data was likely to be significantly inaccurate due to contamination from its then sampling procedures. In particular, GLSD and Osprey Owl noted concerns that algae and a fine slime layer containing trace amounts of contaminants including phosphorus from prior continually collected samples would coat sample suction tubing, the pump hose, and the 10-liter composite carboy jug, causing the phosphorus results to be overstated. *See* **Attachment 8, *Osprey Owl*** Comment 69.

To address this concern, GLSD contracted with Osprey Owl to develop and implement a clean sampling program to analyze effluent water quality from the facility. *See* Attachment 8 Comment 6. Osprey Owl reviewed GLSD's current sampling practices and developed clean sampling protocols and a QAPP. *Id.*[8] In particular, the clean sampling process included:

- Cleaning the PVC piping and changing the suction tubing before taking a NPDES reportable sample;

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[7] (Emphasis added). The data and interpretations noted in the Army Corps Study are those published by the Army Corps's consultant, CDM Smith. The Army Corps has not yet published its own interpretation.

[8] GLSD included the QAPP as Attachment 3 to its comments.

- Installing new peristaltic pump hose before taking a NPDES reportable sample;
- Drawing a sample of certified total phosphorus clean diluent water through the sample hose and pump hose and collect directly into a 'clean sample' container to be analyzed for total phosphorus; and
- Inserting a clean plastic bag liner in the 10-liter carboy each time a sample was taken.

Comment 69. GLSD included the sample results between May and June 2019 in its comments and subsequently submitted sample results for July and August 2019. RTC 8 at p. 40. As discussed below, the clean sampling results differed substantially from GLSD's prior samples.

c) The 2014 Massachusetts Integrated List of Waters Report/303(d) List

The Region, in February 2016, approved the 2014 MassDEP Integrated List of Waters providing the condition of Massachusetts Waters under Sections 305(b), 314 and 303(d) of the Clean Water Act (the "303(d) List"). The 303(d) List does not list Segment MA84A-04 as impaired for dissolved oxygen or eutrophication, and although it does identify phosphorus as an "impairment cause," it does not identify the designated use impairment. This contrasts with other individual segments of the Merrimack River that are identified under "impairment cause" as "nutrient/eutrophication biological indicators."

MassDEP made this designation of phosphorus as an "impairment cause" based on the Merrimack River Watershed 2004 Water Quality Assessment Report (the "2004 Report"), **Attachment 9**. The 2004 Report states that Segment 84A-04 was evaluated for aquatic life, primary and secondary contact, and fish consumption. *See* 2004 Report at 34-35. The report states that fish consumption and aesthetics in this segment "were not assessed," noting "this waterbody does not have a site-specific fish consumption advisory and "insufficient data were

available to assess the Aesthetics." Although the 2004 Report noted occasionally elevated total phosphorus and chlorophyll-a concentrations in this segment, it does not conclude that Aquatic Life Use is impaired. *See* 2004 Report at 34.

d) Massachusetts Guidance for Stream Assessment of Excessive Phosphorus

Massachusetts has published detailed requirements and methods used when assessing a waterbody as "impaired." in the "Massachusetts Consolidated Assessment and Listing Methodology Guidance Manual" ("CALM").[9]

The CALM Guidance Manual specifically provides that nutrient enrichment (high phosphorus levels) is insufficient to determine a waterway as impaired for nutrients, in isolation of other response indicators such as low dissolved oxygen, visual algal blooms, pH, and other indicators. Specifically:

> Nutrient enrichment is not considered to be problematic when biological response indicator data are below threshold values for primary producer data, even if nutrient concentrations exceed their recommended criteria. CALM p. 39.

Appendix C of the CALM document also states: "Total phosphorus concentration data alone are not used to determine impairment due to nutrient enrichment; rather, they are used to corroborate indicator data and can help to identify potential sources."

Further, Appendix C requires that impairment must first be documented and supported by indicators other than phosphorus, before any assessment of phosphorus levels in the waterway are conducted. Massachusetts specifically requires clear evidence of eutrophication, over several

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[9] MASS. EXEC. OFFICE OF ENERGY AND ENVTL. AFFAIRS, MASSACHUSETTS CONSOLIDATED ASSESSMENT AND LISTING METHODOLOGY *available at*: https://www.mass.gov/files/documents/2018/05/07/2018calm.pdf (2018)

assessment visits, before any consideration of evaluating whether the levels of phosphorus in the waterway are deemed to be excessive. Only after finding impairment does CALM Guidance recommend considering EPA's Gold Book criteria.

Once there is clear evidence of eutrophication "two or more times," then in-stream phosphorus data should be evaluated. CALM at C6. But the CALM document again cautions against jumping to conclusions that phosphorus levels need to be controlled even under these circumstances, by describing the use of the 10% Rule, meaning that up to 10% of the sample data often should exceed the applicable criterion before making an impairment decision. CALM at G6.

B. The Clean Water Act

Congress passed the Clean Water Act ("CWA") seeking to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). To achieve this goal, Congress established the National Pollutant Discharge Elimination System ("NPDES") program, which authorized EPA to issue permits for the discharge of pollutants from point sources into the waters of the United States, subject to certain conditions. *See* 33 U.S.C. § 1342.

The CWA and 40 C.F.R § 131 establish the framework for determining water quality standards. *See* 33 U.S.C. § 1313. Wherever attainable, water quality standards should protect water quality that provides for the protection and propagation of fish, shellfish and wildlife, and recreation in and on the water. *See* 33 U.S.C. § 1251. Water quality standards are developed by the individual state and approved by EPA.

When developing water quality standards, the regulatory authority first must classify the waterbody based on the expected uses of the waterbodies, called "designated uses." *See* 40 C.F.R. § 131.10(a). The state must then develop water quality standards that support the

designated uses of each waterbody. States must adopt water quality criteria using sound scientific rationale and to include sufficient parameters or constituents to protect the designated uses. *See* 40 C.F.R. § 131.11(a). Although states must adopt numeric criteria for toxic (priority) pollutants, the CWA does not that require states adopt numeric criteria for nutrients, such as phosphorus.

i. ***Nutrients***

Phosphorus and nitrogen are essential nutrients for healthy plant and animal growth within aquatic systems and provide for a balanced ecosystem. These nutrients do not impact human health and are not harmful—indeed are helpful—to the environment at low levels. Excessive quantities of phosphorus over a growing season can lead to eutrophication, "a process in which the addition of nutrients (largely nitrogen and phosphorus) to water bodies stimulates algal growth, which can lead to low dissolved oxygen and loss of submerged aquatic vegetation, degrading the health of the aquatic habit." *See In re Town of Newmarket, New Hampshire,* 16 E.A.D. 182, 190 (EAB 2013) ("*Newmarket*"). Eutrophication can impair the designated uses of that waterbody. When designated uses are impaired, appropriate limitations on point and non-point sources must be implemented to address the identified cause of the impairment. If eutrophication causes the impairment, the cause of the eutrophication must be determined. Causes of eutrophication include excessive phosphorus or nitrogen, sunlight, or low stream velocity.

Under the Massachusetts water quality criteria at 314 C.M.R § 4.05(5)(c), nutrients that do not impact designated uses are not regulated for imposition of controls at point sources in the form of water quality based effluent limitations (WQBELs). Under that narrative criteria:

> Nutrients. Unless naturally occurring, all surface waters shall be free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses and shall not exceed

> the site-specific criteria developed in a TMDL or as otherwise established by the Department pursuant to 314 CMR 4.00. Any existing point source discharge containing nutrients in concentrations that would cause or contribute to cultural eutrophication, including the excessive growth of aquatic plants or algae, in any surface water shall be provided with the most appropriate treatment as determined by the Department, including, where necessary, highest and best practical treatment (HBPT) for POTWs and BAT for non POTWs, to remove such nutrients to ensure protection of existing and designated uses. Human activities that result in the nonpoint source discharge of nutrients to any surface water may be required to be provided with cost effective and reasonable best management practices for nonpoint source control.

MassDEP regulations require that the surface water quality standard be evaluated under "critical conditions," which it has defined as the known or estimated lowest average flow for seven consecutive days with a recurrence interval of once in ten years, known as the "7Q10" low flow rate. *See Upper Blackstone*, 14 E.A.D. 577, 637 (EAB 2010) (citing 314 C.M.R. § 4.03(3)). The 7Q10 is calculated by taking the lowest 7-day average flow each year over a period and fitting the data points to calculate a low flow value that results in a 10% occurrence probability.[10]

Despite this critical conditions assessment, the regulating authority need not use only 7Q10 flow values when analyzing in-stream data to determine impairment. MassDEP's CALM, in Appendix G, expressly recommends using samples "at, or above" the 7Q10 flow. If water quality samples were taken only from times of 7Q10 flows, it would be a practical impossibility to collect enough data to make any type of water assessment, as by definition, these flows occur only once (on average) in any ten-year period.

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[10] *See* EPA Technical Support Document for Water Quality-based Toxics Control ("TSD") at D-6. *Available at*: https://www3.epa.gov/npdes/pubs/owm0264.pdf

ii. ***Determining a Discharge Limit***

"Under 33 U.S.C. § 1311(b)(1)(C), NPDES permits must include effluent limitations as *necessary* to insure compliance with State water quality standards." *Newmarket* at 204 (emphasis added). In determining that an effluent limit is necessary to meet a state narrative standard (as is the case here), and without a TMDL, the Region must undertake a four-part test. It must:

1) Find a violation of the state standard, here that cultural eutrophication is occurring that impacts the designated uses and that phosphorus "causes or contributes" to that violation;
2) If so, determine a numeric instream water quality target for phosphorus so that the state standard will no longer be violated;
3) Determine whether the discharge has a "reasonable potential" to "cause or contribute" to an exceedance of the target using a mass-balancing equation; and
4) If so, calculate an effluent limitation for the discharge that will achieve the in-stream target.

See Newmarket at 203.

IV. STANDARD OF REVIEW

The Board may grant review of a permit decision when the petitioner shows that the decision was based on: "(A) A finding of fact or conclusion of law that is clearly erroneous, or (B) An exercise of discretion or an important policy consideration that the Environmental Appeals Board should, in its discretion, review." 40 C.F.R § 124.19(a)(4)(A),(B); *accord In re Broward County, Florida*, 4 E.A.D. 705, 721 (EAB 1993).

In assessing clear error, the Board examines the administrative record that serves "as the basis for the permit to determine whether the permit issuer exercised his or her 'considered

judgment.'" *Newmarket* at 219. When the "the administrative record is unclear" on the factual basis for a determination by the Region in issuing a permit condition, the Board must remand the petition. *In re Broward County, Florida*, 4 E.A.D. at 721.

When an agency exercises discretion, it must "cogently explain why it has exercised its discretion in a given manner." *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 48 (1983); *see Ash Grove Cement Co.*, 7 E.A.D. 387, 397 (EAB 1997) ("acts of discretion must be adequately explained and justified."). An agency action may not be arbitrary and capricious. *See Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43. An action is arbitrary and capricious if:

> [T]he agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.

Id. If such deficiencies are present, "[t]he reviewing court should not attempt itself to make up for such deficiencies; [it] may not supply a reasoned basis for the agency's action that the agency itself has not given." *Id.* (citation omitted). Even on technical issues, the Region must adequately explain and support its decision, and it must be "rational in light of all the information in the record." *In re Gov't of the D.C. Mun. Separate Sewer Sys.*, 10 E.A.D. 323, 348 (EAB 2002); *In re Dominion Energy Brayton Point*, 12 E.A.D. 490, 510 (EAB 2006). The Board "will not hesitate to order a remand when a Region's decision on a technical issue is illogical or inadequately supported by the record." *In re NE Hub Partners*, 7 E.A.D. 561, 568 (EAB 1998); *see also In re Austin Powder Co.*, 6 E.A.D. 713, 719-720 (EAB 1997).

Finally, an agency must not exceed the authority granted in its authorizing statute. 5 U.S.C. § 706(2)(C); *see Iowa League of Cities v. E.P.A.*, 711 F.3d 844, 877-78 (8th Cir. 2013).

V. THRESHOLD PROCEDURAL REQUIREMENTS

GLSD satisfies the threshold requirements for petitioning for review under 40 C.F.R. § 124.19, because:

1) GLSD is the permittee and participated in the public comment process on the permit. *See* 40 C.F.R. § 124.19(a)(2);
2) The issues raised in this petition were raised during the public comment period or timely based on new data or EPA claims made during the issuance process. *See* 40 C.F.R. § 124.19(a)(2); and
3) GLSD has filed this petition within 30 days after the Regional Administrator served notice of issuance of the permit decision. *See* 40 C.F.R. § 124.19(a)(3).

VI. ARGUMENT

GLSD challenges three parts of the permit. *First*, the Region committed clear error in its imposition of a phosphorus limit. *Second*, if the current limit remains, the Region erred in removing a compliance schedule between the draft and final permits. And *third*, the Region's residual chlorine calculation is error because it relies on the same incorrect 7Q10 dilution factor as the phosphorus limit.

A. The Region Clearly Erred in Setting a Phosphorus Limit

As described above, in determining that a NPDES effluent discharge limit is necessary to meet the state water quality narrative standard for nutrients, the Region must undertake a 4-step process. It must first find a violation of the narrative standard; if so, it must then determine an in-stream numeric target threshold necessary to meet the state narrative standard; then it must find that the discharge has the "reasonable potential" to exceed the target; and if so, it must then determine what the appropriate water quality based effluent limit is. The Region erred at each step here.

i. ***The Region has not shown a violation of a state water quality standard.***

"Under 33 U.S.C. § 1311(b)(1)(C), NPDES permits must include effluent limitations as *necessary* to insure compliance with State water quality standards." *Newmarket* at 204 (emphasis added). Therefore, before assigning a numeric target in setting a limit, the Region must show a violation of the state standard. The applicable nutrient standard, at 314 C.M.R. § 4.05(5)(c), is quoted above.

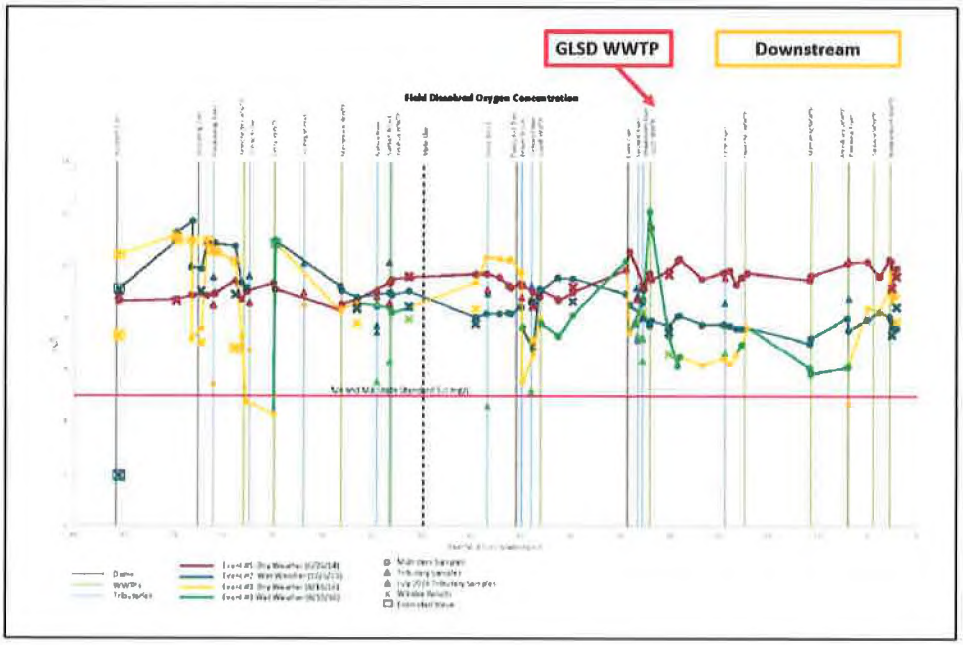
There is no TMDL for nutrients for the Merrimack River, so to find a violation of this standard, the Region must first find evidence of cultural eutrophication, and then make a finding that the established cultural eutrophication causes an "impairment of existing or designated uses"—as a Class B waterbody, these uses include aquatic life, fish consumption, primary contact (swimming), secondary contact (boating), and aesthetics. If so, the Region must then determine whether phosphorus "causes or contributes" to the existing cultural eutrophication that led to an impairment.

a) <u>The Region has not shown evidence of eutrophication or evidence that nutrients or eutrophication are affecting a designated use.</u>

In its comments, GLSD noted that "[t]he Draft Permit fails to establish what specific existing and designated uses are impaired." *See* Attachment 4 Comment 8 at 16. GLSD, mainly based on the Army Corps Study, showed that there was no violation of the state standard. Indeed, neither the Army Corps Study, nor anything else in the Record, has documented any cultural eutrophication that would lead to an impairment. For example, the Army Corps Study consistently measured dissolved oxygen levels well above the required Massachusetts minimum standard of 5.0 mg/L, refuting "any claim that aquatic life in the Merrimack River is impaired, or in danger of becoming impaired." *See id.* The Phase I Report confirms that for both dry weather and wet weather, "the river and its tributaries generally satisfy water quality standards for

dissolved oxygen in both states [Massachusetts and New Hampshire]" *See id.* (citing *Phase I Report*, §§ 4.2.4.1 - 4.2.4.2). CDM Smith, on behalf of the Army Corps, confirmed this conclusion in February 2019 using data obtained within the last five years. "Figure 3-22 of the report shows that dissolved oxygen measurements (in-situ) remain well above the threshold of 5.0 mg/L in the entire reach from the GLSD discharge to the estuary in Newburyport, and in fact is almost always above 6.0 mg/L:"

Figure 4
Figure 3-22 From Army Corps Study: Phase III Sampling Events 1 (6/25/2014), 2 (10/1/2015), and 3 (8/10/2016) Field Dissolved Oxygen Concentrations[11]



These samples include two events in dry weather conditions, on June 25, 2014 (red line) and Aug. 10, 2016 (orange line). *See id.*

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[11] The red straight line represents the Massachusetts numeric criteria for dissolved oxygen at 5.0 mg/L. The colored data plots show dissolved oxygen results at specific river locations on four dates: dry weather conditions on June 25, 2014 (red), wet weather conditions on October 1, 2015 (blue), dry weather conditions on August 10, 2016 (orange), and wet weather conditions on August 10, 2016 (green). The text boxes have been added to the Army Corps figure for clarity.

GLSD's comments also noted that there is no documented impairment to recreational uses or aesthetics, stating that in the "approximately 13-year period of active field work supporting the [Army Corps] Study, field crews did not report algae blooms in the river or estuary." *See* Comment 8 at p. 17. This is true even though chlorophyll-a levels at times exceeded generalized guidance levels for US rivers without regard to any site-specific analysis that would be required here. Without this evidence, there is no indication that "the river is impaired by nutrients for other uses beyond aquatic habitat, such as recreation or aesthetic value." *See id.* And therefore, the Region has not shown that a limit is necessary as required by the Clean Water Act. *Newmarket* at 204.

(i) The Region's Response to Comments are Clear Error

The Region, in response to comments, makes three unavailing arguments.

Comparison to Other Cases—*First*, the Region summarily "observes that its overall approaches to establish both phosphorus and nitrogen effluent limitations in NPDES permits have been extensively adjudicated over the past fifteen years, and they have been found to be reasonable and upheld by both the Environmental Appeals Board and the United States Court of Appeals for the First Circuit." RTC 8 at 34-35 (citing *In re City of Taunton Dep't of Pub. Works*, 17 E.A.D. 105 (EAB 2016), *aff'd*, 895 F.3d 120 (1st Cir. 2018), *In re Upper Blackstone Water Pollution Abatement Dist. v. EPA*, 14 E.A.D. 577 (EAB 2010), *petition denied*, 690 F.3d 9 (1st Cir. 2012), *Newmarket, and In re City of Attleboro MA Wastewater Treatment Plant*, 14 E.A.D. 398 (EAB 2009) ("*Attleboro*"). These cases do not support the Region's decision-making. Perhaps the most significant is that the receiving waters at issue in those cases had substantial—indeed undisputed—evidence of impairment. For example:

- *Newmarket*—The treatment plant discharges into the Lamprey River, which feeds into Great Bay, New Hampshire. There was a general consensus that use

impairments existed in the Great Bay, and "the Region assessed the available scientific evidence and determined that the Lamprey River and the Great Bay exhibit multiple symptoms of cultural eutrophication, including eelgrass loss and increased algal growth." *Newmarket* at 200. The state also identified the river as impaired for "dissolved oxygen, as indicated by chlorophyll a, nitrogen, and instream dissolved oxygen monitoring and biological and aquatic community integrity." *Newmarket* at 199.

- *Attleboro*—The treatment plant discharges into the Ten Mile River in Massachusetts. That river is "studded by several impoundments," including a pond and reservoir and is listed as an impaired body due to, among other things, nutrients, low dissolved oxygen, and noxious aquatic plants. *Attleboro* at 402. The Region characterized the receiving waters as having "severe existing eutrophic conditions." *Attleboro* at 409.
- *Upper Blackstone*—The facility discharges into the Blackstone River in Massachusetts. The Region determined that the river "is currently impaired by excessive phosphorus loadings resulting in violations of minimum dissolved oxygen criteria, high levels of chlorophyll a, and high levels of macrophyte and periphyton growth." *Upper Blackstone,* 14 E.A.D. at 629 (emphasis added). Indeed, during a low flow condition one summer, the Region observed the vegetation as "extremely abundant, covering virtually the entire river bottom … Slight turbidity in the water column was noted during sampling. A luxuriant algal community was also observed …." *Upper Blackstone,* 14 E.A.D. at 630. The Region determined that these conditions, "combined with the fact that the

District's discharges dominate the Blackstone River's flow," made a limit necessary. *Upper Blackstone,* 14 E.A.D. at 630.

- *Taunton*—The facility discharges into the Taunton River in Massachusetts, which then flows to Mount Hope Bay. Segments downstream of the discharge were impaired for dissolved oxygen and pathogens, and the Bay is impaired for nitrogen, dissolved oxygen, and algae, among others. *In re City of Taunton Department of Public Works,* 17 E.A.D. 105, 117-18 (EAB 2016). The Region found that the receiving waters suffered from "cultural eutrophication due to nitrogen overenrichment" and the dissolved oxygen levels were consistently below the 5.0 mg/L state standard. *Taunton,* 17 E.A.D. at 133-34.

The Merrimack River—including the portions affected by GLSD's discharge—are a far cry from these waterbodies. GLSD's discharge does not "dominate the flow"; there is no evidence of eutrophication or turbidity; and dissolved oxygen has always remained at consistently high levels. The Region tacitly acknowledges this: nowhere does it say eutrophication is occurring, at most saying that the river is "*at risk* of cultural eutrophication" RTC 8 at 35 (emphasis added) and that the GLSD discharge is a "contributing source of *potential* eutrophication. RTC 8 at 36 (emphasis added). Even if true—which GLSD disputes—a "potential" violation of the state standard is not enough to show that a discharge limit is necessary under the statute or that there is a current impairment. 314 C.M.R. § 4.05(5)(c). As the Region acknowledges, it must issue permits under current conditions (RTC 8 at 39)—and those conditions reveal that a limit is not currently needed.

Evidence of Impairment—*Second,* the Region asserts that it "clearly identified the impairment status of the receiving water" because it noted that "GLSD discharges to Segment

84A-04 of the Merrimack River" and that Massachusetts 303(d) List identifies the segment as "impaired for total phosphorus." RTC 8 at 36. The Region's response misses the point. GLSD commented that the Region had not shown that the segment or downstream suffered from an impairment, not whether it was on the 303(d) List for phosphorus. Its response still omits any evidence that the segment suffers from eutrophication or a nutrient-related impairment of any of the designated uses under the state standard, which is required under the Massachusetts narrative criteria before imposing limitations on points sources such as GLSD. Notably, the 303(d) List also does not list this segment or downstream as impaired for eutrophication.

That the 303(d) List includes phosphorus as an "impairment cause" for this segment—without more—is not enough to show impairment. That designation is based on a 2004 study, a period that the Region elsewhere claims is "too old to be useful." RTC 8 at 36. Given that Massachusetts has only a narrative standard for phosphorus, neither the state nor EPA have provided any evidence of how phosphorus contributes to eutrophication or impairment of any use, or explained what numeric threshold (if any) was used to list this reach of the Merrimack on the 303(d) List. Given the lack of other indicators, it seems MassDEP designated this segment as an impairment cause for phosphorus only because a sample of ambient conditions found phosphorus above the Gold Book's 0.1 mg/L threshold. Using this "impairment cause" as the only basis to set a limit turns the Region's analysis on its head: Under 314 C.M.R. § 4.05(5)(c), the Region must first determine that cultural eutrophication is present, and then must determine that the existing cultural eutrophication is impacting an existing or designated use. If these conditions are met, that segment is impaired and it would follow that a numeric effluent limitation may be appropriate. Here, the Region does the opposite: it set a numeric limit to determine that the segment is impaired, then used the same limit as the numeric target for the

standard, and (unsurprisingly) found that the target was exceeded. This logic is circular and is an abuse of discretion. *See Rahman v. Napolitano*, 814 F. Supp. 2d 1098, 1109 (W.D. Wash. 2011) (An agency's circular reasoning "does not provide a rational explanation for the agency's action and constitutes an abuse of discretion"); *Kelly v. United States*, 34 F. Supp. 2d 8, 13-14 (D.D.C. 1998) (A board's circular reasoning is not a factual finding and is thus a failure to "examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made.") (quoting *State Farm*, 463 U.S. at 43).

Dismissal of Army Corps Study—*Third*, the Region inappropriately discards almost everything from the Army Corps Study by claiming that samples from 2003 were "deemed too old to be useful," and wet weather samples "may not be applicable for establishing reasonable potential during dry weather under 7Q10 conditions." RTC 8 at 36. The Region therefore excluded everything CDM Smith did except for testing in June 2014, which the Region said "is not sufficiently representative to confirm or refute the nutrient-related impairment status in the receiving water." RTC 8 at 36-37.

This reasoning is arbitrary and capricious. The Region does not say why the 2003 data is too old. In fact, it relies on the *exact same data* in support of its phosphorus limit: The 303(d) determination that phosphorus is an "impairment indictor" in the 2004 Report is based on CDM Smith's 2003 data from the Army Corps study. Why the Region can simultaneously use this data to claim impairment and dismiss it as "too old to be useful" is arbitrary and not the result of reasoned decision-making. RTC 8 at 36.

Equally arbitrary is the decision to exclude any tests taken under "wet weather" conditions. The Region routinely relied on data from wet weather conditions elsewhere. For example, the 2017 data it relied on in determining the upstream ambient condition included at

least one non-dry weather event: The 6th sample the Region used was taken on October 11, 2017—there were 0.37 inches of rain the day before and 0.55 inches in the 7 days before.[12] The Army Corps study would not have considered this a dry weather event. (Monitoring Report, at 2-32). Similarly, GLSD's clean sampling data that the Region relied on in assessing water quality was taken when the daily flow was 7-13 times the 7Q10 flow, and it disclosed that "[n]one of the samples were collected during a low flow period." *See* Comment 6 at 8. And as for the Army Corp's wet weather sampling in October 2015 that the Region excluded, the 2015 test was conducted after a heavy rainstorm where "CSOs were activated in all five major communities . . . ." (Monitoring Report at 2-24). If anything, such CSO discharges and other nutrient runoff during such an event would overstate phosphorus levels. So too with the August 2016 combined dry and wet testing, which CDM Smith had the "benefit of being able to compare dry and wet conditions during the same timeframe, and possibly better understand cause-and-effect relationships within the watershed." *Id.* at 2-32. These are important data points that the Region should have considered. The Region has provided no explanation for why it finds wet weather data reliable only when it benefits its view.

While the single data set alone in 2014 might not be enough to determine the health of the river, this data is more than what the Region provided to show that the river is suffering from cultural eutrophication. Instead, the Region attacked each data point in isolation, using flawed reasoning to discard each one. RTC 8 at 36-37. But the weight of the evidence—high flushing, consistently positive dissolved oxygen results over a 13-year sampling period during several conditions, and a lack of observed vegetation, turbidity or other site-specific indicators that

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[12] U.S. CLIMATE DATA, https://www.usclimatedata.com/climate/lawrence/massachusetts/united-states/usma0210/2017/10

might suggest eutrophication—shows that this segment is not impaired. "Monitoring data and modeling results conducted in the Merrimack River Watershed Assessment Study suggest that the study reach is not impaired with respect to dissolved oxygen." *See* Phase III Report, § 7-3.

b) The Region has not shown that phosphorus "causes or contributes" to an impairment

In finding a violation of the state standard, the Region must also show that phosphorus would "cause or contribute" to the existing cultural eutrophication. 314 C.M.R. § 4.05(5)(c). Throughout its comments, GLSD noted a lack of any kind of causal analysis between phosphorus levels and an impairment, including a lack of documented evidence of algal blooms or dissolved oxygen levels below 5.0 mg/L, and whether any perceived eutrophication is naturally occurring, due to non-point sources, or something else. *See* Comment 8 at 26, 28. The Region makes two flawed arguments in response:

First, the Region claims that "the reasonable potential analysis in the Fact Sheet specifically addresses the reasonable potential for GLSD's *discharge* to cause or contribute to a violation of water quality standards." RTC 8 at 36. This summary assertion does no such thing. At most the reasonable potential analysis considered (incorrectly) whether GLSD's discharge would cause ambient downstream phosphorus levels to exceed the Gold Book threshold of 0.1 mg/L. The analysis makes no attempt to determine what might be causing the "potential" for eutrophication. It says nothing about flow, temperature, dissolved oxygen, visual evidence of algae, sunlight, non-point sources, or any of the other factors that might cause or contribute to eutrophication. "Courts do not defer to an agency's conclusory or unsupported suppositions." *Nat'l Shooting Sports Found., Inc. v. Jones*, 716 F.3d 200, 214 (D.C. Cir. 2013). In providing reasoned decision-making, "conclusory statements will not do; an agency's statement must be

one of *reasoning*." *Amerijet Intern., Inc. v. Pistole*, 753 F.3d 1343, 1350 (D.C. Cir. 2014) (internal quotation omitted).

Second, the Region asserts that it need not make a "conclusive demonstration of cause and effect" or "cause-and-effect proof between a pollutant discharge and an existing water quality impairment before establishing a numeric in-stream target" or before imposing an effluent limitation. RTC 8 at 37. Even if there were "an existing water quality impairment" (which there is not), the Region overstates its discretion. Fundamentally, the CWA requires the Region to show that a limit is "necessary" before setting a numeric target defining a state criterion. *Newmarket* at 204. While the Region need not make a "conclusive demonstration of cause and effect," there must be at least *some* correlative relationship between the impairment and the pollutant in the receiving water. For example, in *Taunton*, the Region applied a reference-based approach to determine the relationship between the pollutant (nitrogen) and the eutrophication impairment. It identified dissolved oxygen as a "critical indicator" for impaired eutrophic conditions, then tested 22 locations in the receiving water, finding a strong relationship between elevated nitrogen levels and low dissolved oxygen. The Region then set the allowable ambient concentration at the highest nitrogen level where the corresponding dissolved oxygen was above the numeric 5.0 mg/L threshold.

The Region similarly established a causal relationship in *Newmarket*. There, the Region relied on a numeric criterion set by the state of New Hampshire using a "stressor-response" analysis, whereby site-specific data was used to "estimate a relationship between nutrient concentrations and a response measure that is directly or indirectly related to a designated use of the waterbody." *Newmarket* at 216.

The Region made no such causal analysis here. At most, the Region claims that there is a general relationship between phosphorus and eutrophication, but it makes no attempt to determine the relationship in the Merrimack, nor does the Region provide any evidence that the Merrimack is subject to cultural eutrophication before deciding that a numeric standard is necessary. Had it done so, it would have found that there is no such current relationship, as CDM Smith did on behalf of the Army Corps: "the monitoring and modeling in this study over the past 15 years have shown that the unique hydrology and hydraulics of this river flush it rapidly, re-oxygenate it frequently, and absorb the byproducts of urbanization that might render other small rivers in this region impaired." *Phase III Report* at viii. As just one of many examples, CDM Smith took samples in the applicable segment where the ambient phosphorus concentration was 0.17 mg/L and the corresponding dissolved oxygen was well above the state 5.0 mg/L numeric criteria. This indicates that there is no current relationship between phosphorus and an impairment in this segment or of the Merrimack or downstream (or at a minimum that the 0.1 mg/L numeric target set in the final permit is unnecessary to comply with the state narrative standard). The Region made no attempt to refute CDM Smith's conclusions or to show the needed relationship.

ii. ***The Region erred in selecting an instream water quality target of 0.1 mg/L based on the Gold Book guidance, rather than using site specific criteria***

Assuming a threshold showing of a violation of the state narrative standard, the Region must then perform a three-step analysis in setting a limit: "(1) translate the State's narrative water quality standard into a numeric instream water quality target; (2) determine whether the discharge . . . has a 'reasonable potential' to cause or contribute to an exceedance of that instream water quality target; and (3) if so, calculate the numeric permit effluent limitation that is

necessary to achieve the instream water quality target." *Newmarket* at 203. Here, the Region set the numeric target at what the Region claims is the Gold Book "recommended" 0.1 mg/L.

GLSD's comments objected to the use of 0.1 mg/L for two primary reasons.

GLSD first noted that the Gold Book does not present a national criterion for phosphorus. *See* Comment 8 at 27. What the Region relies on therefore is a value mentioned in one literature citation—from 1973—in the Gold Book. *See* Attachment 1, Comment 27 submitted by the MWRA at 68. That is not a section 304(a) criterion, it is not a national standard determined by a rulemaking after notice of comment, and it is inconsistent with the Gold Book itself. The Gold Book is clear that phosphorus has varying effects depending on the site-specific conditions: "phosphorus conditions critical to noxious plant growth vary and nuisance growths may result from a particular concentration of phosphate in one geographical area but not in another." *See* Comment 8 at 27 (quoting Gold Book at 243). The Gold Book continues:

> [T]he majority of the Nation's eutrophication problems are associated with lakes or reservoirs and currently there are more data to support the establishment of a limiting phosphorus level in those waters than in streams or rivers that do not directly impact such waters. There are natural conditions also that would dictate the consideration of either a more or less stringent phosphorus level. Eutrophication problems may occur in waters where the phosphorus concentration is less than that indicated above and, obviously, such waters would need more stringent nutrient limits. Likewise, there are those waters within the Nation where phosphorus is not now a limiting nutrient and where the need for phosphorus limits is substantially diminished.

See id. (quoting Gold Book at 247). The Gold Book requires a site-specific analysis, which the Region simply did not do.

GLSD then stated that river conditions (as discussed above) and the available site-specific data showed that the 0.1 mg/L threshold was overprescriptive. GLSD mainly relied on the Army Corps study and CDM Smith's analysis, which showed that even though phosphorus

levels "downstream of GLSD sometimes (but not always)" exceeded the 0.1 mg/L threshold, there was no resulting "dissolved oxygen impairment or documented detrimental algae blooms, which are the ultimate measure of use attainment or impairment." *See* Comment 8 at 27. GLSD also noted the high flow rate of the river and the short travel time before GLSD's discharge reached downstream segments (from Haverhill to Newburyport) that the Region does not view is impaired. *See id.* at 30. GLSD then said that if a numeric target were necessary, it should be set at 0.17 mg/L, the highest ambient phosphorus level CDM Smith sampled where the dissolved oxygen level was above the state numeric dissolved oxygen target of 5.0 mg/L. *See id.* at 28.

a) The Region's Incorrect Responses to Comments

In response, the Region makes four erroneous assertions.

First, the Region summarily asserts that it "accounts for site-specific facts and circumstances surrounding the discharge and receiving waters in arriving at the permit result." RTC 8 at p. 39. But nowhere does it say which facts and circumstances it accounts for or how. The Region's assertion is particularly confusing given that it discarded the abundant site-specific facts gathered by CDM Smith, as discussed above, or summarily dismissed the travel time evidence by stating that GLSD's continual discharge "has the *potential* to result in a continuous excursion of the target total phosphorus concentration and a eutrophic response, and the "eutrophication *can* occur in a matter of hours," implicitly acknowledging that this "potential" that "can occur" is not actually happening now. *See* RTC 8 at 40 (emphasis added). These statements do not show a current violation of the state narrative standard and are too conclusory to be the product of reasoned judgment. *See Amerijet*, 753 F.3d at 1350.

Second, the Region asserts that GLSD's proposed 0.17 mg/L limit is "*far* less stringent and unproven." RTC 8 at 39. While GLSD's weight of the evidence approach is admittedly less stringent than the Region's overprescriptive approach, it is hardly unproven. The proposed limit

is based on extensive site-specific data showing that healthy conditions exist on *this* river at the proposed limit. It is much like the reference condition approach (where the Region describes the characteristics of the waterbody least impacted by human activities) the Region applied in *Taunton*: the Region identified a location in the downstream estuary that met the state's dissolved oxygen numeric criteria, then set the target at the nitrogen levels at that location. *See Taunton,* 17 E.A.D. at 133-34.

In fact, of the other three cases the Region cites in support of "its overall approaches to establishing both phosphorus and nitrogen effluent limitations," none resemble the approach the Region took here. For example, in *Newmarket*, the Region established the instream water quality target using a proposed State criterion, not the Gold Book. *Newmarket* at 204. That criterion was supported by substantial evidence, including peer reviews and site-specific data analysis. For example, the state report used low dissolved oxygen levels and loss of eelgrass habitat in setting the numeric criteria and was based on "quite a pile of local measurements made ay many sites during a 9-year period." *Newmarket* at 206-207.

The Region's response to comments in that proceeding also detailed the extensive work the state of New Hampshire did in setting the limit, including receiving input from a technical advisory committee, peer reviews, the state's weight-of-the-evidence approach, and "the vast quantity of site-specific data available and utilized in the analyses." *Id.* at 210.

The Region did none of those things here. There were no peer reviews. No local measurements. No weight of the evidence approaches, and no local eutrophication models. The most the Region can claim is that "there is no evidence to suggest that phosphorus is 'not now a limiting nutrient.'" RTC 8 at 38. That is a far cry from the rigorous approach taken in *Newmarket* and it certainly does not show that a limit is necessary as required by the CWA.

The analysis is the same in *Attleboro* and *Upper Blackstone* (which, as noted above, involved far more substantial evidence of eutrophication). Both cases upheld the 0.1 mg/L numeric target, but in those cases the determination was supported by a review of "additional site-specific data, including local water studies . . . ." *See Upper Blackstone*, 690 F.3d at 31; *Attleboro,* 14 E.A.D. at 417. Here, the Region claims it reviewed "the CDM Smith studies, available ambient data, the State's 303(d) list and the Discharge Monitoring Report ("DMR") data submitted by GLSD," then somehow concluded that there was not "sufficient evidence to justify a deviation from the Gold Book recommended threshold of 0.1 mg/L within the receiving water." RTC 8 at 37. But it does not say what from the data supported its conclusion (none of it does), and then it does something impermissible: it starts from the conclusion that the Gold Book is necessary then claims it looked to see why it would not be. It cannot do that. EPA must specifically find that a limit is necessary, not say a limit is necessary because it could not think of a reason why it would not be. That logic is error. *See Motor Vehicle Mfrs.,* 463 U.S. at 43 ("agency must articulate a rational connection between the facts found and the choice made.")

Third, and similarly, the Region claims that GLSD's proposed 0.17 mg/L limit based on the Army Corps study cannot be considered because those samples occurred during wet weather sampling. "EPA contends that inferences made about the impact of elevated phosphorus concentrations on dissolved oxygen during wet weather are not applicable to the reasonable potential analysis which assumes dry weather under 7Q10 conditions." RTC 8 at 39. This is the first and only time the Region discards wet weather results. For example, it used wet weather samples from GLSD's discharge from 2014 – 2018 in setting ambient conditions, and nearly all of the clean samples from this summer occurred within 72 hours of a wet weather event. The Region had no problem using wet weather tests then, nor should it have: unlike metals testing

where toxicity rises under low flow conditions, the relationship between phosphorus and oxygen in a free-flowing river with short residence time under dry or wet conditions is much less important. It is the amount of phosphorus during the growing season and other seasonal factors that matter most. Indeed, the sampling results from CDM Smith suggest that dissolved oxygen results tended to be *lower* during wet weather events, eliminating any concern that wet weather events are not indicative of critical conditions. The CDM Smith reports suggest that stormwater can be a significant contributor of pollutants to the river. Increased volumes of phosphorus from nonpoint sources (and combined sewer overflows, or "CSOs") during rain events can contribute to elevated levels of phosphorus and biochemical oxygen demand in the river.[13] This may help explain why there were higher phosphorus levels and lower dissolved oxygen levels during CDM Smith's recent wet-weather surveys than the dry-weather surveys. Even with the additional phosphorus loads from nonpoint sources and CSOs during wet weather, the CDM Smith monitoring data shows that dissolved oxygen remains consistently above the state water quality standard.

EPA guidance and past practice also supports consideration of wet weather sampling results. For example, EPA's Watershed Academy Web provides recommended monitoring practice examples suggesting that a monitoring program designed to collect both dry- and wet-weather stream samples provides a clearer picture of the relative pollutant contributions of continuous point source and nonpoint source impacts.[14] And the Region has also relied on wet-weather water quality data in the development of nutrient TMDLs, with no concern that these

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13 Phase III Report at 5-5 and Figure 5-1. ("Nonpoint sources, including stormwater, can be a significant source of nutrients and bacteria to the Merrimack River and its tributaries.").

14. U.S. DEP'T OF ENVTL. PROT, WATERSHED ACADEMY WEB: OVERVIEW OF WATERSHED MONITORING, https://cfpub.epa.gov/watertrain/moduleFrame.cfm?parent_object_id=981.

results "may not be applicable for establishing reasonable potential during dry weather under 7Q10 conditions."[15] *See* RTC 8 at 36. The Charles River TMDL, determined that both wet and dry data samples were relevant, and that the differences in their values were insignificant. As a result, the TMDL combined wet and dry samples together. This disregard of the Army Corps sample is especially problematic knowing that there is not one sample supporting the Region's 0.1 mg/L numeric target.

Fourth, the Region asserts that "establishing a permit limit for phosphorus does not depend on whether the receiving water is impaired for dissolved oxygen; rather, a permit limit is based on the reasonable potential analysis described in the Fact Sheet." RTC 8 at p. 38. The Region's argument is counterintuitive. Under the Massachusetts water quality criteria, establishing a limit for phosphorus may be necessary when cultural eutrophication is present, and nutrients are determined to be the cause. Dissolved oxygen is a critical indicator of eutrophication, which was acknowledged in all four cases the Region cites in support of its approach, especially *Taunton*. That there is no lack of dissolved oxygen in the Merrimack River, even when the Gold Book threshold is exceeded, is strong evidence that the Gold Book should not be applied here. If the "reasonable potential analysis described in the Fact Sheet" does not account for the dissolved oxygen levels, it suggests that the reasonable potential analysis described in the Fact Sheet is not necessary to protect water quality. Indeed, the Region claims its analysis "turn-on" site specific information. RTC 8 at 39. But in reality, this and the

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[15] *E.g.*, Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River, Massachusetts, CN 272.0; Total Maximum Daily Load for Nutrients In the Lower Charles River Basin, Massachusetts, CN 301.0; Assabet River Total Maximum Daily Load for Total Phosphorus, Report Number: MA82B-01-2004-01, Control Number CN 201.0.

Region's other comments reveal that the only information it relied on is the phosphorus level. That is not enough under the Clean Water Act. *See Newmarket* at 203.

iii. ***The Region clearly erred by relying on incorrect and unreliable data in determining that the discharge has a reasonable potential to cause or contribute to an exceedance of the water quality target***

Even if the Region had correctly met the first two steps of the test, the Region still clearly erred in its reasonable potential determination. The Region applied this calculation:

$$C_r = \frac{C_d * Q_d + C_s * Q_s}{Q_d + Q_s}$$

Where:

C_r = downstream phosphorus concentration in the Merrimack River (mg/L)
Q_d = design flow of treatment plant (52 MGD = 80.5 cfs)
C_d = 95th percentile of effluent phosphorus concentrations discharged from the facility during the growing season (0.814 mg/L)
Q_s = 7Q10 flow of Merrimack River upstream of the discharge (871 cfs = 562.7 MGD)
C_s = median phosphorus concentration in the Merrimack River at sampling station MO18 (0.052 mg/L)
Q_r = flow in the river downstream of the discharge (80.5 + 871 = 951.5 cfs)

$$C_r = \frac{[(871 \text{ cfs})(0.052 \text{ mg/L}) + (80.5 \text{ cfs})(0.814 \text{ mg/L})]}{951.5 \text{ cfs}}$$

C_r = 0.116 mg/L

But the data it relied on was clear error in two respects.

a) The Region used an incorrect 7-day low flow data set of an arbitrarily selected period in calculating the 7Q10 flow levels

The Region relied on incorrect data in determining the 7Q10 low flow values used in the Region's reasonable potential analysis. In its response to Comment 3, the Region claims it used data from United States Geological Survey ("USGS") gage station (#0110000) located in Lowell between 1989 and 2017 and provided it in Table1. 1995 had the lowest low flow value on the table:

Figure 5
1995 data as Shown on Table 1 from Region Response to Comment 3

Year	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Average (CFS)	Ln of Average
1995	427	455	485	493	493	618	618	512.714286	6.239719

Using this data, the Region found the applicable 7Q10 is 832 cfs. RTC 3 at p. 9-11.

But this data is incorrect, as GLSD said in its comments. According to Richard Verdi, the Chief, Hydrologic Surveillance and Surface Water Investigations at the USGS Hydraulic Science Center, there are several errors in the Region's table. For example, Mr. Verdi compared the Region's table to official USGS data for 1995 (which had the lowest flow value in the sample) and found:

> days 2, 3, and 4 all match USGS minimum instantaneous recorded data. Days 1, 5, 6, and 7 are not the minimum, maximum, or mean for those days. The values listed for days 5 and 6 are recorded values during those days, but are not the minimum, maximum, or mean. Finally, the values listed for days 1 and 7 are not recorded values, nor are they minimum, maximum, or mean.[16]

According to USGS, this is the correct data from the Lowell station for 1995:

Figure 6
Actual USGS 1995 Data[17]

Year	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Average (CFS)	Ln of Average
1995	728	609	520	533	507	623	550	581.42857	6.365488

The Region's response to Comment 3 also stated that it used a methodology described in a user manual[18] for a legacy computer program ("DFlow") developed in 1990. But this program

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[16] Email from R. Verdi to C. Spero (Oct. 24. 2019). *See **Attachment 10.***

[17] https://waterdata.usgs.gov/nwis/uv?site_no=01100000

[18] ROSSMAN, L. A., U.S. DEP'T ENVTL. PROT., EPA-600-8-90-051 (NTIS 90-225616) 1990

is outdated: EPA's 2018 Handbook for NPDES Permit Writers[19] recommends using USGS's SWToolbox software program to replace legacy programs, including DFlow. Using the correct data and USGS's SWToolbox software program, the table below summarizes results of 7Q10 flows for USGS gage (#01100000) and dilution factors for the Facility: The analysis result output files are included in Attachment 10.

Figure 7
Corrected Flows and Dilution Factors

Dataset Period	Length of the Dataset (years)	7Q10 Flow (CFS)	Dilution Factor
2004-2018	15	993.26	13.94
1989-2017*	29	837.03	11.91
1924-2018	95	907.33	12.82

*Dataset period EPA randomly picked for 7Q10 analysis

An agency's decision must be based on correct data. *See Alloy Piping Products, Inc. v. Kanzen Tetsu Sdn. Bhd.*, 334 F.3d 1284, 1291-92 (Fed. Cir. 2003) ("The failure of Commerce to correct an error made by the respondent that was apparent or should have been apparent to Commerce would be arbitrary and capricious."). The Region's failure to do so here is clear error.

Along with the actual data values being incorrect, GLSD commented that the 7Q10 flow data should be based on the entire 95 years of available data to reduce the uncertainty in the statistical sample. *See* Attachment 4 Comment 3. In response, the Region claimed it relied on 29 years (1989 – 2017) "to account for changing climatic conditions, in addition to recent hydrological changes in the watershed; a model incorporating data from over 30 years ago is likely to be less representative of current conditions." RTC 3 at 10.

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[19] US EPA, Office of Water, Low Flow Statistics Tools, A How-To Handbook for NPDES Permit Writers, EPA-833-B-18-001, October 2018.

The use of exactly 29 years—not more or less—is an abuse of discretion. In prior permits issued for the Merrimack, the Region used at least 65 years of data. For example, in assessing the 7Q10 in the permit issued to Manchester, New Hampshire, in 2015, the Region used data from 1941-2006 (65 years). And for the permit issued to the facility in Winnipesaukee, New Hampshire, in 2016, the Region used data from 1943 to 2014 (71 years). The Region's comments do not acknowledge this past practice or explain its current departure. *See F.C.C. v. Fox Television Stations, Inc.*, 556 U.S. 502, 517 (2009) ("An agency may not . . . depart from a prior policy *sub silentio* . . . [and] must show that there are good reasons for the new policy."). It simply summarily refers to "changing climatic conditions" and "recent hydrological changes in the watershed" without explaining what they are or how they compared to earlier conditions. If the Region had done so, it would have seen that the recent 7Q10 conditions are far higher than what it used in the final permit.

Had the Region wanted to account for "recent hydrological changes in the watershed," it would have limited its review to the 15 years, the minimum number of years EPA's Handbook for NPDES Permit Writers[20] recommends for a 7Q10 analysis. Using USGS' SWToolbox program and the most recent 15 years (2004 – 2018) of this dataset, the 7Q10 is 993.260 cfs, leading to a dilution factor of 13.94 based on the following EPA-approved calculation methodology:[21]

$$Flow\ factor\ for\ USGS\ \#01100000 = \frac{993.260\ \text{cfs}}{4{,}412\ \text{square miles}} \approx 0.2251 \frac{cfs}{sq.mi}$$

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[20] U.S. DEP'T ENVTL. PROT., EPA 833-B-18-001, LOW FLOW STATISTICS TOOLS, A HOW-TO HANDBOOK FOR NPDES PERMIT (Oct. 2018)

[21] *See* **Attachment 11** for the data in support.

Because the drainage area upstream of the GLSD effluent discharge outfall is about 4,625.83 square miles, excluding 214 square miles attributed to Boston and Worcester, the 7Q10 flow at the outfall should be 1,041.4 cfs or 672.7 MGD.

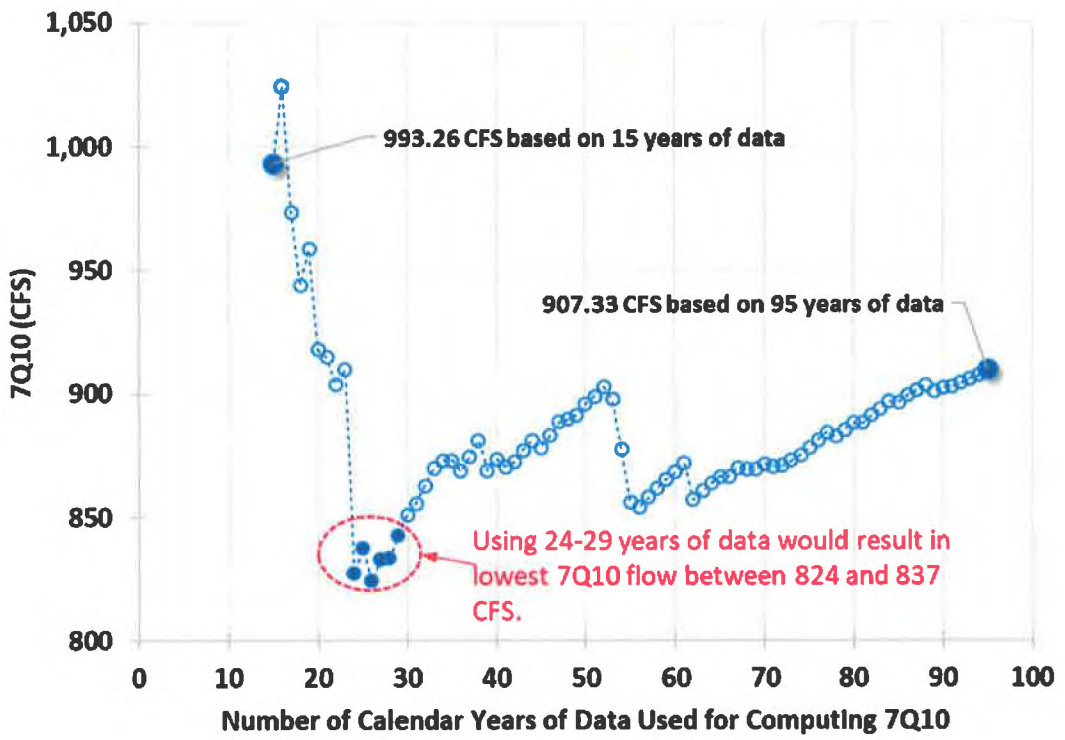
Using a 7Q10 flow of 672.7 MGD in the receiving water upstream of the discharge (Q_s,) and the Facility's design flow of 52 MGD (Q_d,), the resulting dilution factor (DF) is 14.13 as shown below:

$$DF = (Q_s + Q_d)/Q_d = (672.7 \text{ MGD} + 52 \text{ MGD})/52 \text{ MGD} = 13.94$$

This amount is closer to the 13.37 figure GLSD suggested in its comments based on 95 years of data. *See* Comment 3 at 2-3. This similarity also shows that using longer historical data better reflects current conditions with a higher degree of scientific certainty.

What does not reflect current conditions is using exactly 29 years of data (1989 – 2017). This sample excludes the high flow year of 2018 and includes 1995, one of the lowest years on record. It is no coincidence that this exact number results in one of the lowest 7Q10 figures:

Figure 8
7Q10 Figures Over 15 - 95 years of data



While the Region has discretion in selecting applicable data to rely on, that discretion is not unlimited. It may not cherry-pick data to arrive at a predetermined outcome or that does not reflect the intended goal. *See Am. Radio Relay League, Inc. v. F.C.C.*, 524 F.3d 227, 237 (D.C. Cir. 2008) ("there is no APA precedent allowing an agency to cherry-pick a study on which it has chosen to rely in part") (citing *Solite Corp. v. E.P.A.*, 952 F.2d 473, 500 (D.C. Cir. 1991)). But given the unusually low outcome, the lack of explanation for why the Region chose exactly 29 years, or what "recent hydrological changes in the watershed" it is seeking to address, the Region abused its discretion.

b) The Region used unreliable effluent data in determining the phosphorus concentrations discharged from the facility.

The Region also used unreliable data when analyzing the phosphorus concentration in GLSD's effluent. The Region relied on data submitted between 2014 and 2018, but this data is unreliable in setting a nutrient limit:

First, the DMR dataset submitted between 2014 and 2018 was collected before GLSD implemented a Clean Sampling Program. A review of GLSD's sampling collection practices reveals that some of the DMR samples are likely to have been contaminated during the sampling and preparation process. This was evidenced by comparing the DMR dataset (2014 to 2018) with GLSD's clean sample dataset (June – September 2019). Statistical analysis suggested the clean sample data significantly differs from the DMR dataset for the growing season. The statistical analysis of the datasets are included in **Attachment 12**.

Second, the effluent datasets used for the Region's analysis consists of DMR data representing average monthly discharge during the growing season. But the average monthly discharge was represented by only a single sample for each month. Under the EPA TSD, the reason for calculating a 95th percentile value of the average monthly dataset is to calculate maximum monthly discharge conditions. There are 35 samples taken during growing season of 2014 to 2018. The highest two values (July 28, 2015 and Aug. 22, 2017) significantly influenced the determination of the 95th percentile discharge. Therefore, the 95th percentile value used for the reasonable potential analysis is not representative of the maximum monthly condition, instead it is an indication of a maximum daily discharge condition, which is typically higher than maximum monthly condition.

The Region cannot rely on incorrect and unsuitable data to calculate reasonable potential. While "an agency need not revise its action every time new data or a new model is announced....

when an agency acknowledges that its data are either outdated or inaccurate, it should, at the very least, analyze the new data or explain why it nevertheless chose to rely on the older data." *See Dow AgroSciences LLC v. National Marine Fisheries Service*, 707 F.3d 462, 473 (4th Cir. 2013). "Where an agency has relied on incorrect or inaccurate data or has not made a reasonable effort to ensure that appropriate data was relied upon, its decision is arbitrary and capricious and should be overturned." *Resolute Forest Products, Inc. v. U.S. Department of Agriculture,* 187 F. Supp. 3d 100, 123 (D.D.C. 2016) (citing *Native Vill. Of Point Hope v. Jewell,* 740 F.3d 489, 502-03 (9th Cir. 2014)). The Region itself acknowledges that "it is important for EPA to use a dataset that is accurate and representative of the receiving waters." RTC 8 at 40.

As discussed above, GLSD instituted a new clean sampling program to analyze GLSD's effluent sampling results and outlined new protocols in a QAPP that it included with its comments. (Comment 6, Attachment 3, p. 31.). As applicable for phosphorus, the techniques avoided contamination by strictly following clean sampling protocols based on EPA guidance. *See supra Section III(A)(vi)(b)*; note 8 and accompanying text.

This new data (in Attachments 4 and 5, as well as in July and August 2019), suggests that the ambient phosphorus levels are lower than the samples relied on by the Region in calculating the limit in the Draft Permit. (Comment 6 Attachment 3 p. 31):

Figure 9
DMR v. Clean Sample Comparison (mg/L)[22]

	DMR Data	Clean Sample Data
Average	**0.389**	**0.241**
95th Percentile	**0.854**	**0.450**

[22] **Attachment 13** summarizes each sample and resulting phosphorus result.

These differing results are strong evidence that the prior samples relied on by the Region are inaccurate and not representative of the average monthly discharges. EPA therefore should have discarded them.

The Region raises three objections to discarding the prior data in its comments. RTC 8 at 40. It first claims that the new "data does not clearly invalidate the effluent data used in the Fact Sheet" in part because GLSD did not show there was contamination in the hosing for prior samples. *Id.* The Region puts an impossible standard on GLSD: it cannot analyze hosing over a prior 5-year period and definitively determine that there was contamination present at the time. What GLSD did instead was perform clean sampling over a 5-month period and compare the results. That the results are different is strong evidence of prior contamination.

The Region next claims that the clean sampling techniques are "not a treatment process improvement that would affect the amount of phosphorus being discharged from the facility." *Id.* While true, this argument misses the point. The clean sample techniques more accurately show the amount of phosphorus being discharged from the facility and that prior discharges likely contained less phosphorus than the samples suggested. That there were no process changes suggests that it is the sampling techniques that caused the differing results.

Finally, the Region claims that its data used in "the Fact Sheet appears to be representative of the discharge over a much larger timeframe (5 years) compared to the clean sampling data submitted over the past 3 months" [5 months, including the July and August results]. *See id.* This is a red herring. More samples taken over a longer period are not "more

representative of the discharge" if they are contaminated and unreliable. Given the new and more representative data taken under proper protocols, this old data must be discarded.[23]

c) Recalculating the Likelihood for Reasonable Potential

After correcting the 7Q10 flow levels and the phosphorus discharged from the facility, the reasonable potential analysis is conducted as follows:

$$C_r = \frac{C_d * Q_d + C_s * Q_s}{Q_d + Q_s}$$

Where:

Cr = downstream phosphorus concentration in the Merrimack River (mg/L)
Qd = design flow of treatment plant (52 MGD = 80.5 cfs)
Cd = 95th percentile of effluent phosphorus concentrations discharged from the facility during the growing season (0.450 mg/L)
*Qs = 7Q10 flow of Merrimack River upstream of the discharge (*1,041.4 *cfs* = 672.7 *MGD)*
Cs = median phosphorus concentration in the Merrimack River at sampling station MO18 (0.052 mg/L)
Qr = flow in the river downstream of the discharge (80.5 + 1,041.4 = 1,121.9 cfs)

$$C_r = \frac{\mathbf{1,041.4\ cfs} * 0.052\frac{mg}{L} + 80.5\ cfs * \mathbf{0.450\frac{mg}{L}}}{1{,}041.4\ cfs + 80.5\ cfs}$$

Cr = 0.081 mg/L

When the downstream concentration (Cr) is less than the numeric target, then no cause or reasonable exists to violate the numeric water quality standard, and therefore no basis exists to impose water quality based effluent limitations. As shown above, the resulting Cr value of 0.081

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[23] The Region also erred by failing to account for changes to the ambient conditions due to phosphorus controls being or soon-to-being implemented in upstream facilities. (Comment 8 at 28). In response, the Region claims that it is not expecting any significant future reductions and, in any event, it is not required to account for future conditions." RTC 8 at 39-40. This is an unexplained departure from the Region's past precedent, such as *Taunton*, where the Region did "take into account reductions in nitrogen discharges at other wastewater treatment plants in setting the City's nitrogen limit." *Taunton, 17 E.A.D.* at 161.

mg/L is less than EPA's instream numeric target of 0.10 mg/L, and there no basis exists for the imposition of any phosphorus limitation.

iv. ***The Region Erred in calculating the permit effluent limitation***

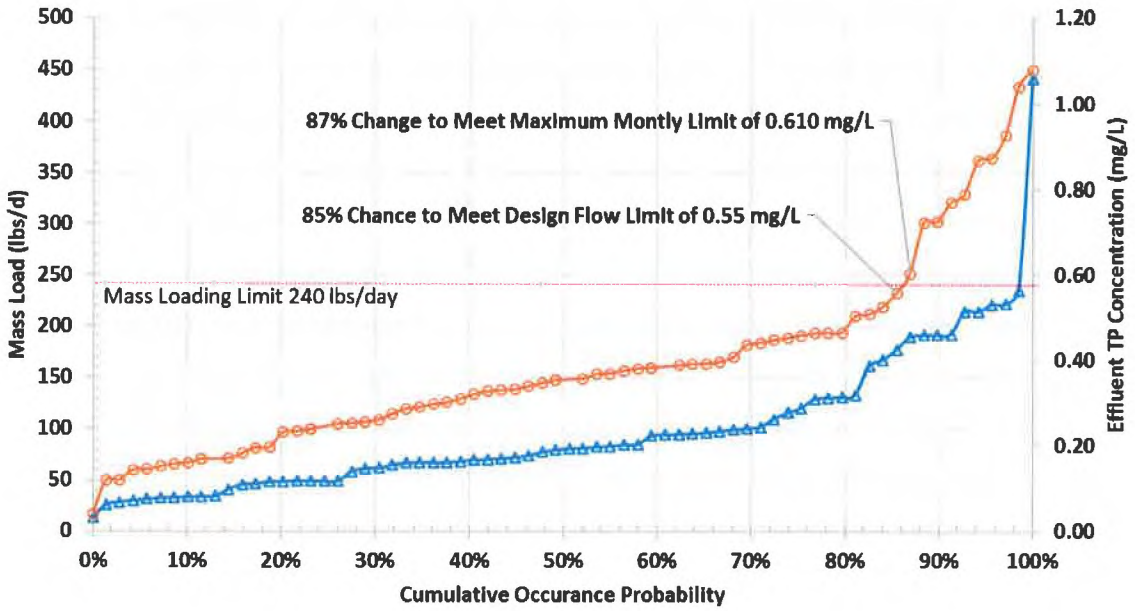
If the Region satisfied the above steps (which GLSD contests), the final step in setting a limit is determining the specific numeric figure that is "necessary to achieve" the applicable water quality criteria. 40 C.F.R. § 122.44(d)(1). Here, the Region set a mass-based monthly average phosphorus limit of 240 lb/day. This is error for the same reasons as EPA's reasonable potential analysis: the Region used incorrect USGS data and an arbitrary number of years in determining the 7Q10 flow and used unreliable data in determining the facility's effluent phosphorus calculation. (See previous section). Accounting for these corrections, the discharge limit should be 312.7 lb/day using the mass-based equation the Region used in setting the permit limit. ***See*** **Attachment 14.**

B. If the current phosphorus limit remains, the Region erred in removing a compliance schedule for GLSD to comply.

In the Draft Permit, the Region included a phosphorus limit of 0.53 mg/L and gave GLSD "a compliance schedule whereby the limit takes effect one year from the effective date of the permit." *See* Draft Permit Section I.H.2. In the Final Permit, the Region set the new limit at 240 lb/day and removed the compliance schedule, claiming that "no compliance schedule is necessary or allowable" because GLSD "is in consistent compliance with the effluent limit." (RTC 11) (If true, it questions whether the Region's discharge currently is causing or contributing to a violation of the state water quality standard). The Region bases this claim on its assertion that from 2014 through 2018, "GLSD would have met the 240 lb/day mass-based limit each month, with a maximum load of 195 lb/day." *See id.*

This is error for two reasons. *First*, the Region is factually incorrect that the maximum load was 195 lb/day. There are at least five months during this five-year period where GLSD exceeded 195 lb/day, including one that well exceeded the current proposed limit:

Figure 10
Examples in which GLSD's Discharge Exceeded the Newly Proposed Limit



This figure summarizes GLSD's total phosphorus discharges based on effluent concentration data from 2014 to 2019.[24] The cumulative occurrence probability of past effluent data represents GLSD's ability (or chance) of meeting the proposed limit under the facility's current processing conditions without an upgrade. Although the limit is a mass loading limit, the facility's phosphorus removal performance is typically evaluated based on influent and effluent

[24] As noted in Section III(A)(vi)(b) above, data from 2014 -2018 likely overstates the facility's actual effluent discharge due to the likelihood that the samples were contaminated. If the Board agrees that this data is unreliable, then GLSD's discharge will not have the reasonable potential to exceed the Region's target criteria under the Region's methodology. But if this data can be considered in the reasonable potential calculation, it should also be considered here in determining whether the facility needs an implementation schedule.

concentrations. That is, to meet a mass loading limit, the facility's removal capacity is depended on it ability to meet the effluent concentration (0.55 mg/L) under the average daily design flow conditions (52 mgd). Based on the most recent performance results as shown in Figure x, there is only 85% chance that GLSD will be able to meet this limit under its design flow conditions. To assess the facility's likelihood of noncompliance under current flow conditions, GLSD calculated the maximum monthly flow during the growing season from 2014 to 2019 to be 47.3 mgd. This would result a maximum monthly TP concentration limit of 0.61 mg/L. As shown in Figure 10, the facility can meet this limit only 87% of time. This suggests that the current facility is at risk of noncompliance with the newly proposed limit and would need an upgrade.

Second, and more fundamentally, just because GLSD had met the limit in the past does not mean that the facility is designed to meet the limit now. The facility is not. Once finalized, this limit is binding and enforceable. Failure to comply could subject the facility to an enforcement action or a citizen suit. GLSD would need to make several upgrades to the facility to ensure compliance with this limit going forward, including upgrade of existing secondary process to advanced biological phosphorus removal process or addition of tertiary process as well as improvement to solid handling and digestion process to handle the additional chemical sludges from phosphorus removal processes. This limit could impose unwarranted large financial burden to GLSD and its member communities. Based on EPA's compilation of cost data for nutrient removal upgrade, it could cost up to $190 million (ADF 28 mgd x $6.71 million/mgd).[25] It is unreasonable to demand immediate compliance with a new discharge without giving the facility any opportunity to make the upgrades needed to ensure compliance.

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[25] U.S. DEP'T ENVTL PROT., OFFICE OF WATER, EPA 820-F-15-096, A COMPILATION OF COST DATA ASSOCIATED WITH THE IMPACTS AND CONTROL OF NUTRIENT POLLUTION (May 2015).

Those take time to find the right solution, secure financing and complete design, permit and construction—at least 9 years[26]:

- Engineering analysis and alternatives study (Year 2 from permit issuance).
- Secure approvals and future funding commitment, complete design, and prepare the request for proposals (Year 3).
- Advertise bids for improvements necessary to achieve consistent compliance for the total phosphorus effluent limitation, select contractor, and award project (Year 4).
- Complete construction and implement improvements (Year 7).
- Evaluate performance and request extension to compliance schedule, if necessary (Year 8).
- Achieve compliance (Year 9).

Further, the mass-based effluent limit in the final permit, is little different than the concentration-based limit proposed in the draft permit (for which a compliance schedule was offered), with the Region claiming it "is equivalent to a concentration of 0.55 mg/L at the design flow of 52 MGD." Ultimately, the facility will need to undergo the same upgrade to meet the mass- based limit at 240 /bs/day as it would to meet a concentration limit of 0.55 mg/L at design flow. There is little difference in cost, time and upgrade specification necessary to achieve a concentration of 0.53 as proposed in the draft permit, and 0.55 mg/L, which is the effective concentration necessary to achieve 240 lbs/day at design flow. The Region has provided no valid justification for why a compliance schedule was included to meet 0.53 mg/L in the draft

[26] Because the Region removed the compliance schedule in the final permit, GLSD did not have the chance to submit comments on this decision. Therefore, the Board may consider this new information.

permit, but not included in the final permit to meet an effective concentration of 0.55 mg/L at full design.

C. The residual chlorine calculation uses the same incorrect 7Q10 dilution factor as the phosphorus limit

In its comments, GLSD noted that the Region calculated the total residual chlorine limit with the incorrect dilution factor. *See* RTC 4 at 12. The Region made no changes in the Final Permit. *See id.*

This is error for the same reasons as described in the phosphorus reasonable potential analysis: The 7Q10 dilution factor is based on incorrect USGS data. *See supra* Section VI(A)(iv). Once corrected, the resulting limit is:

$$\begin{aligned} Chronic\ limit &= \text{Chronic criteria} \times \text{diluation factor} \\ &= 11\mu g/L \times 13.94 = 153\ \mu g/L \end{aligned}$$

$$\begin{aligned} Acute\ limit &= \text{Acute criteria} \times \text{diluation factor} \\ &= 19\mu g/L \times 14.13 = 265\ \mu g/L \end{aligned}$$

VII. CONCLUSION

For these reasons, GLSD respectfully seeks Board review of GLSD's final NPDES permit. After such review, GLSD requests a remand of the permit to the Region with an order to issue an amended NPDES permit.

Respectfully submitted,

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Dated: October 25, 2019

REQUEST FOR ORAL ARGUMENT

Petitioner, GLSD, respectfully requests oral argument before the Environmental Appeals Board on its petition for review of NPDES Permit No. MA0100447 because it believes oral argument will be of assistance to the Board.

STATEMENT OF COMPLIANCE WITH THE WORD/PAGE LIMITATION

In accordance with 40 C.F.R. § 124.19(d)(1)(iv) & (d)(3), I hereby certify that this Petition does not exceed 14,000 words. Not including the transmittal letter, caption, table of contents, table of authorities, figures, signature block, table of attachments, statement of compliance with the word limitation, and certification of service, this Petition contains 13,976 words.

Matthew J. Connolly

TABLE OF ATTACHMENTS

CERTIFICATE OF SERVICE

I hereby certify that on October 25, 2019 a copy of the foregoing Petition for Review was served on Respondent and the co-permittees identified below by U.S. first-class mail:

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