

TO: New York State Department of Environmental Conservation
FROM: Cayuga Lake Monitoring Partnership
DATE: June 29, 2021
RE: Comments on the draft Total Maximum Daily Load for Phosphorus in Cayuga Lake

The Cayuga Lake Monitoring Partnership (MP) was created in 2006 between the Tompkins County Water Resources Council (TC WRC) and Cornell University. It has since grown to include researchers and stakeholders throughout the Cayuga Lake watershed. Our goal is to improve our understanding of the health of Cayuga Lake, its natural processes, potential issues, monitoring needs, and best management practices for the watershed.

Science:

In 2008, we prepared a monitoring plan for the southern end of the lake and submitted that to New York State Department of Environmental Conservation (DEC). Ultimately, many of the items suggested in that monitoring plan were included in the work done for the Cayuga Lake Modeling (CLM) project.

The MP was included on the technical advisory committee (TAC) for the CLM project.

The MP was also represented in development of New York State's 2018 Cayuga Lake Harmful Algal Bloom Action Plan, which is heavily referenced in the draft Total Maximum Daily Load for Phosphorus in Cayuga Lake (dTMDL).

MP and DEC relationship:

Jeff Meyers, retired director of DEC's Bureau of Lake Monitoring and Assessment, participated in monthly MP meetings from 2013 to 2016, during which time he built relationships and exchanged knowledge with local stakeholders. Those relationships directly resulted in delisting of the southern end of Cayuga Lake as impaired by pathogens through the receipt of monitoring data from the Community Science Institute and Ithaca Area Wastewater Treatment Facility. DEC staff have continued to participate in the MP monthly meetings providing regular updates and listening to feedback from local stakeholders.

Focus of Comments:

It is from this long history of direct engagement with DEC that the MP provides the following comments, both in this letter and the Comments Document (enclosed), on the dTMDL.

1. The MP has repeatedly questioned the basis for the listing of the southern end of Cayuga Lake for a phosphorus impairment. Over the years, the scientific backing for delisting has only increased, yet DEC dismisses or disregards these comments. Relevant comments from past years are attached to this letter and highlighted as still relevant and still unaddressed. We request DEC provide thoughtful feedback on these comments that is consistent with the results of the many publications that came from the CLM project.

2. The MP supports and seconds the comments provided by the TC WRC and Cayuga Lake Watershed Intermunicipal Organization in their letters. Three main items from those letters are highlighted here:
 - *De-listing of the southern end of Cayuga Lake as impaired by phosphorus is the only action supported by data,*
 - *A Nine Element Plan would better serve the watershed, address multiple threats, and can be developed using the existing modeling and water quality monitoring work done as part of the CML project, and*
 - *Watershed Rules and Regulations (WRRs) would be a more effective regulatory mechanism than a TMDL as WRRs can be enforced and will address documented threats with measurable outcomes.*
3. The enclosed 31-page Comments Document represents the combined comments of members of the MP, it is not an exhaustive list of comments but rather a list of the most obvious and serious issues in the dTMDL.
4. This letter highlights **monitoring**, an area largely ignored in the dTMDL.

What to monitor, limitations of single numeric nutrient criteria

The “Water Quality Study of the Finger Lakes: Part A: Synoptic Water Quality Investigation” (Callinan 2001a; WQ Study) describes the use of the Trophic State Index (TSI) (page 37). The index uses presumed linkages between phosphorus, chlorophyll-a, algae, water clarity and dissolved oxygen, to allow determination of trophic status from a single indicator.

The linkages are described in the WQ Study and are listed (1-3) below as they appear in the study, italics are added.

1. *Phosphorus . . . determines the level of algal productivity* within a lake.
2. *Algal abundance (chlorophyll-a), presumed to be the primary limitation on light transmission through the water column, determines water clarity (Secchi Disk depth) within the lake.*
3. *Algal senescence, deposition, and decay, combined with fixed levels of dissolved oxygen in the hypolimnion due to thermal stratification, results in the depletion of the dissolved oxygen within the hypolimnion.*

Listed items A-C refer to data collected on the southern end of Cayuga Lake that indicate the linkages are not valid.

- A. While phosphorus is the limiting nutrient in Cayuga Lake, *the value of TP as an indicator of algal abundance has been repeatedly disproven* (as measured by NYS DEC in the form of TP and chlorophyll-a) for the southern end. Effler, et al., 2010.
- B. It was documented in 2002 that *algae are not the primary limit on water clarity* on the southern end:

“It is demonstrated that inorganic tripton, rather than phytoplankton, is the primary regulator of Tn and SD it represents most of the PP, and is primarily responsible for the Tn, lower SD, and higher TP in the shallow area compared to the deep water region. Efforts to improve clarity in this shallow region of the lake

should consider the feasibility of controlling the input of terrigenous suspensoids rather than reduction in P loading.” (Effler, et al., 2002)

- C. *The southern end* does not develop a hypolimnion due to its shallow depth and extent of water exchange with the main lake, more to the point, it also *does not exhibit the required oxygen depleted sediments* to meet this assumption. (Oglesby, 1978 and Callinan, C.W. 2001b)

The New England Interstate Water Pollution Control Commission, of which New York is a member, sent a letter (enclosed) to EPA Region 1 in January 2011 rejecting the use of numeric nutrient criteria specifically because the relationship between nutrients and environmental responses varies from waterbody to waterbody and requires consideration of site-specific factors. In this letter, the stressor-response approach is preferred (and supported by EPA’s Scientific Advisory Board). This approach requires confirmation monitoring if a stressor exceeds a threshold to determine that a negative environmental response is also occurring, such as TP > 20ug/L and increases in algae.

Despite the opinion professed in the above letter, DEC relies on the TSI indicator linkages as outlined in the WQ Study. This approach allows use of the TP guidance value as a sole indicator of trophic status and as a surrogate for organic matter when considering disinfection byproducts. Page 39 of the WQ Study lists exceedances of the TP guidance value in the southern end of Cayuga Lake and presumes a corresponding decrease in water quality based on the TSI indicator linkages. This thinking led to the listing of the southern end of Cayuga Lake as impaired by nutrients/phosphorus in 2002.

The same application of the TP guidance value as a sole trophic indicator continues to dominate the dTMDL despite numerous studies done on Cayuga Lake, many commissioned and overseen by DEC, that show TP (stressor) is not correlated to chlorophyll-a (environmental response), clarity is not controlled by algae, and the sediments do not become oxygen depleted on the southern end.

- *We request that DEC acknowledge that the Trophic State Index (TSI) cannot be applied to southern Cayuga Lake (or any other lake or segment thereof with similar conditions) because data show that the required presumed linkages between trophic indicators are not met in the lake.*
- *Actual measurements, not indicators, must be used to determine algal levels. Water quality parameters such as chlorophyll-a, water clarity, and oxygen levels, must be evaluated independently to assess trophic state.*
- *As an alternative, exceedance of Trophic State Index parameters must be followed by confirmation monitoring of presumed environmental responses before making any determination of stressed, threatened, or impaired.*

How to monitor, existing blueprints

In March 2001, the Framework for a Cayuga Lake Watershed Monitoring Plan was published as Appendix M of the Cayuga Lake Watershed Intermunicipal Organization’s [Cayuga Lake](#)

[Restoration and Protection Plan](#). It was authored by Clifford Callinan, P.E. (NYSDEC) and William Kappel (USGS). Mr. Callinan shared an earlier draft with Kate Hackett, then of Tompkins County Planning Department, with a request to take the lead on developing such a plan. At the time, Ms. Hackett did not have capacity to take on this role (email enclosed).

Another opportunity presented itself in November 2006. The TC WRC had already been working closely with Cornell University's Lake Source Cooling (LSC) scientists and DEC staff. A LSC permit renewal revived discussion of the merits of the associated lake monitoring. At that time, TC WRC Chair Frank Proto suggested a joint venture to explore more strategic monitoring efforts in the southern end of Cayuga Lake, and Ms. Hackett was able to take the lead (invitation letter enclosed). The MP, then called the WRC/CU Monitoring Committee, began to meet.

In August 2008, the MP presented DEC with a proposed [Monitoring Plan: Southern Basin of Cayuga Lake](#). Despite following the guidance of the 2001 Framework document developed by DEC staff and meeting with both Mr. Callinan and Ron Entringer (then the main DEC staff working with 303(d) listings) and addressing their comments, DEC did not provide comments or response on the plan.

In September 2008, the Cayuga Lake Watershed Network (CLWN) and Cayuga Lake Watershed Intermunicipal Organization (CWIO) presented a [Guide to Surface Water Quality Monitoring in the Cayuga Lake Watershed](#), which was also modeled on the Framework. This plan was meant to expand the concepts of the MP Monitoring Plan beyond the southern end of the lake to the whole watershed. It also provided guidance for individual monitoring efforts (research, regulatory, volunteer, etc.), which could be used to increase the value of their efforts to meet lake wide needs. It has not been widely used due to a lack of institutional support. There is no evidence the state engaged in this effort at any level.

dTMDL Monitoring Plan, opportunity for partnering and good management

Section 7.7.2 of the dTMDL states that water quality monitoring “will be coordinated” in order to “determine the effectiveness of the implementation actions associated with the Cayuga Lake TMDL” (page 76), and then describes four DEC monitoring programs and mentions that “Several academic, non-profit, and volunteer groups perform routine monitoring on Cayuga Lake” (page 77).

A TMDL or other watershed management plan provides the best opportunity to date for development and implementation of a watershed monitoring plan. DEC wrote the template in 2001. Two separate efforts tailored it to the watershed based on best available science in 2008. All parties involved in development of both 2008 monitoring plans exist today. The MP, members of which include representatives from the CLWN and CWIO, would be happy to work with DEC to help them develop a monitoring plan for Cayuga Lake that DEC can use to assess the impacts of implementation of the dTMDL, or another watershed management plan.

- *We request that the dTMDL include language specifically stating that a truly coordinated monitoring plan will be developed to track water quality before and after best management practice installation.*
- *We request DEC lead the effort, in coordination with monitoring stakeholders, to update and implement a watershed monitoring plan.*

We appreciate DEC's careful consideration of the comments presented in this letter and the attached Comments Document. We respectfully request a dialogue with DEC before the next draft is released and a public hearing on the next draft.

Sincerely,

Members of the Monitoring Partnership

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References:

- Callinan, C. W. 2001a. *Water Quality Study of the Finger Lakes: Part A: Synoptic Water Quality Investigation*. NYSDEC Technical Report 76. Accessed June 4, 2021 from https://digitalcommons.brockport.edu/tech_rep/76
- Callinan, C.W. 2001b. *Water Quality Study of the Finger Lakes: Part B: Sediment Core Investigation*. NYSDEC Technical Report 78. Accessed June 23, 2021 from https://digitalcommons.brockport.edu/cgi/viewcontent.cgi?article=1076&context=tech_rep

Effler, S. W., Matthews, D. A., Perkins, M., Johnson, D. L., Peng, F., Penn, M. R., & Auer, M. T. 2002. *Patterns and impacts of inorganic tripton in Cayuga Lake*. *Hydrobiologia*, 482(1-3), 137-150.

Effler, S. W., Prestigiacomo, A. R., Matthews, D. A., Gelda, R. K., Peng, F., Cowen, E. A., & Schweitzer, S. A. 2010. *Tripton, trophic state metrics, and near-shore versus pelagic zone Page 86 of 90 responses to external loads in Cayuga Lake, New York, USA*. *Fundamental and Applied Limnology/Archiv für Hydrobiologie*, 178(1), 1-15.

Oglesby, R. T. 1978. *The Limnology of Cayuga Lake* in J. Bloomfield [ed] *Lakes of New York State: Volume 1 Ecology of the Finger Lakes*. 1-120.

Enclosures:

1. Comments Document
2. Previous letters with relevant comments highlighted
 - a. 2010 TC WRC letter to DEC promoting MP and collaboration
 - b. 2018 letter to DEC regarding WI_PWL factsheets
 - c. 2018 letter to DEC regarding HABs Action Plan
 - d. 2020 letter to DEC regarding LSC permit modification
3. NEIWPC letter to EPA regarding numeric nutrient criteria
4. Callinan to Hackett email regarding monitoring “Framework” document
5. TC WRC to CU Partnership invitation letter
6. TC Health Department statement regarding causes for end of swimming at Stewart Park
7. MP to DEC letter regarding ‘generalities’ of the HABs Action Plan with ‘specifics’ promised in the TMDL (see page 16 of the Comments Document)

Cayuga Lake Monitoring Partnership

Comments Document For the draft Total Maximum Daily Load for Phosphorus in Cayuga Lake

6-24-2021

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Comments in order of TMDL Section:

Comments are italicized.

Citations are listed at the end of the comment document.

Section 1 Introduction

- *DATA VS. DATUM “Data” is the plural version of the singular “datum.” In a sentence, “data” is always treated as a plural noun. Please correct the verb usage throughout the document.*

Section 1.2 Problem Statement:

Document states, “Over the past several decades, the lake has experienced degraded water quality that threatens source water quality and has reduced the lake’s recreational and aesthetic value.”

- *Cite your references.*
- *This statement is not supported by Figures 8 and 9 (section 2.3.3) as they show both an increase in the early 2000s and a decrease since that time. Please review your conclusions.*
- *As it is a phosphorus TMDL, phosphorus should be listed in the problem statement.*
- *When will the sediment TMDL, 9E or other watershed management plan be developed?*

Section 1.2.1 Scope of Water body/Segment Impairment:

The Cayuga Lake Watershed Intermunicipal Organization recently reaffirmed updating of the watershed map to include the section of the Seneca River that periodically flows southward into Cayuga Lake (based on lock position (open/closed) and hydropower releases). This area of the watershed was not historically included in any finger lake. In 2005, a USGS gage (04232730) was installed on the Seneca River just upstream of the route 89 bridge crossing. Data from that gage have changed our understanding of the water dynamics in the northern portion of Cayuga Lake (information from USGS can be provided upon request).

That portion of the Seneca River does indeed contribute water significantly into the Northern End segment of the lake and should be included in the official map of the area. Further, DEC included that portion of the watershed in their modeling (per the public information session on April 19th). Not including it in the map misrepresents the model and TMDL load calculations and will discourage participation in the TMDL from landowners in that area.

This section lists the towns that border the lake, but not the villages nor the City of Ithaca. The other counties in the watershed are listed, but not the other towns and villages that are in the watershed.

Table 1 Main Lake, Mid-South Classification includes “Drinking Water with limited treatment”, while under best uses, the description is, “This classification may be given to waters that, if subjected to approved disinfection treatment, with additional treatment, if necessary, to

remove naturally present impurities, meet or will meet New York State Department of Health drinking water standards and are or will be considered safe and satisfactory for drinking water.”

- *Include the currently excluded small portion of the Seneca River section (referenced in Section 2.1) in the watershed description and all maps (starting with Figure 1) based on USGS data.*
- *To be consistent, list all the municipalities in the watershed, noting which ones border the lake. A table with waterfront municipalities and counties indicated may serve the purpose better.*
- *All portions of Cayuga Lake meet the drinking water standard as a source water as stated under the “Best Use” column of the table. Source waters for drinking water are presumed to require filtration and chlorination. The classification information is either inaccurate or inconsistent with the best use information. The classification statement should be corrected or updated to meet federal and state standards. This has ramifications for the subsequent statements regarding natural organic matter (NOM) in the document.*

Section 1.2.2 Scope of Unimpaired Segments:

“The Main Lake, Mid-South and Main Lake, Mid-North segments of Cayuga Lake are currently threatened as a drinking water source due to algal (phytoplankton) biomass concentrations driven primarily by both external phosphorus loading to the lake (NYSDEC 2018) and internal phosphorus circulation.”

- *Cited source does not determine primary driver(s) of algal blooms. The certainty with which external phosphorus inputs have been shown to be a primary cause of HABs is overstated in the draft TMDL.*
- *Cited source lists several drivers of algal blooms. All sources should be stated consistent with the current scientific understanding, or at least consistent with NYS’s own 2018 “Harmful Algal Bloom Action Plan Cayuga Lake.”*
- *No Cayuga Lake segments are threatened as a drinking water source based on algal (phytoplankton) biomass. The recent advent of potentially harmful cyanobacterial blooms should not be conflated with general algal/phytoplankton biomass. Biomass is easily removed from source water and does not pose a threat to drinking water.*

Section 2 Watershed and Lake Characterization

Section 2.1: Watershed Characterization

Watershed maps exclude the Seneca River portion of the watershed. The name, ‘Sixmile Creek’ has been changed, see the official letter below:



U.S. Board on Geographic Names
U.S. Geological Survey
523 National Center
Reston, VA 20192

June 8, 2018

Mr. Timothy Larkin
P.O. Box 107
Brooktondale, NY 14817

Dear Mr. Larkin:

We are pleased to inform you that the U.S. Board on Geographic Names, at its May 10, 2018 meeting, approved your proposal to change the name of Sixmile Creek to Six Mile Creek in Tompkins County.

The change has been made in the Geographic Names Information System, the nation's official geographic names repository, which is available and searchable online at <https://geonames.usgs.gov>. The entry reads as follows:

Six Mile Creek: stream; 20 mi. long; heads in the Town of Dryden 0.7 mi. ENE of Yellow Barn Hill, 2.9 mi. WNW of Dryden Lake at 42°28'03"N, 76°19'44"W, flows S, W, and NW through Yellow Barn State Forest, Hammond Hill State Forest, the Town of Caroline, the Town of Ithaca, and the City of Ithaca to enter Cayuga Inlet 1 mi. S of the mouth of Fall Creek; the name comes from a trail used by Native Americans which crossed the stream six miles from the Cascadilla Creek crossing in Ithaca; Tompkins County, New York; 42°26'47"N, 76°30'43"W; USGS map – Ithaca West 1:24,000 (mouth); Not: Notantakto Creek, Sixmile Creek, Six-Mile Creek, Teegastoweas Creek.

Sincerely,

Lou Yost
Executive Secretary
U.S. Board on Geographic Names

- *Include the Seneca River section in the watershed description and map (Figures 3 and 4) based on USGS data.*
- *USGS updated the name of Six Mile Creek from Sixmile Creek in 2018. Please make corrections throughout the document.*
- *Figure 3 - Map Delineating Cayuga Lake is too small, consider enlarging it so that details can be read.*
- *Figure 3 - Cascadilla Creek should be added because it is referenced in the text.*

Section 2.0 appears outdated to the casual reader because several years have passed since the water quality data were collected. New landcover information is available (2016) and some Counties may have even newer information. It is our understanding that the SWAT model does not treat landcover information as a changeable variable and that the 2011 landcover data are most relevant to the 'pre-2013 data' (water quality, precipitation, hydrology, etc.) that was used to calibrate the model. Further, that the 2013 water quality data were collected to validate the model.

Seven years have passed between collection of the validation data and release of the draft TMDL. More than four years have passed since DEC was in possession of all the data and associated models.

The following information may be best placed in the Monitoring Section, 7.7.2.

- *Please include a timeline for updating the model data (landcover, precipitation, hydrology, water quality, etc.) and rerunning the model to confirm appropriateness of suggested phosphorus reductions, assess progress towards TMDL goals, inform actions, and other relevant milestones.*
- *Please list all TMDL milestones explicitly in the final TMDL.*

Sections 2.1.1-2.1.3 Segment Designations

The text references the Towns of McKinneys and Coonley Corners, those towns do not exist. Additionally, the lake segments use obscure references to McKinneys Point and Coonley Corners Rd, which are not familiar to most people reading this.

- *Use geographic references that exist or include GPS coordinates for all sections.*
- *If DEC chooses to use the historical location references, provide the historical map in the final TMDL along with corresponding location names.*

Section 2.2 Lake Morphometry:

Paragraph two states, “There is complex and dynamic circulation between the Southern End and the main lake (Effler et al. 2010...)”

- *Include the specific findings of the Effler 2010 report (referenced in the draft TMDL) that the southern end mixes with the main lake roughly every day. This point is critical in understanding that the southern end is never really a separate segment of the lake and supports the notion of a whole lake TMDL.*
- *Expound more on the internal seiche and how climate change will only increase the mixing of the sections through intensified wind patterns, further making the southern end ‘segment’ an arbitrary designation that is not truly manageable or trackable as a separate entity from the main lake.*

Section 2.3 Water Quality:

- *Add Community Science Institute to table of Water Quality Investigations in Cayuga Lake from 1970s-Present. Include the indicator that these data are collected under a DEC approved quality assurance project plan.*

Section 2.3.1 Cayuga Lake Modeling (CLM) Project:

Paragraph two states, “The CLM Project data indicated that individual TP concentrations were greater than 20 µg/L at the Southern End (Sites 1-2) with summer average values also greater than 20 µg/L.” A major finding of the Cornell study was that P and sediment issues cannot be separated in this system.

- *The current science (CLM Project) suggests that the total phosphorus (TP) exceedances of 20ug/l guidance value in the southern end reflect large sediment loads into the area*

during events and are NOT strongly related to bioavailable P and algal blooms. This does not seem to be reflected in the draft TMDL.

- Please review Effler et al. 2002 and Effler et al. 2010, both cited in the TMDL, for the full discussion of phosphorus inputs, inorganic tripton, chlorophyll a, and algae on the southern end of Cayuga Lake. Please pay extra attention to the suggested management approaches.
- Please provide a table of the southern end TP data that led to the determination of exceedance of the narrative standard. Include a map of the sampling locations. Areas sampled in WWTP outfalls and stream mouths, such as those locations sampled in the Water Quality Study of the Finger Lakes (Callinan, 2001), are not valid sampling locations. Nor are samples collected in mixing zones or during runoff events. New York State's Fact Sheet, "Ambient Water Quality Value for Protection of Recreational Uses" 10/22/1993 lists criteria for collection of TP samples including location. The location is mid-lake. Clearly in a lake as large as Cayuga Lake, there can be multiple 'mid-lake' sampling points, however, near shore, tributary inputs and mixing zones would not meet New York State's own standards. Please provide information that shows the final interpretation of impairment does not include such data.

Section 2.3.2 CU LSC and Other WQ Monitoring Programs: Paragraph two states that TP and Chlorophyll-a (Chl-a) data collected in late 1990's were indicative of oligo-mesotrophic lakes and data from the early 2000's through 2012 (via citation in TMDL) indicated mesotrophic conditions.

Major WWTP upgrades to reduce phosphorus are referenced in the document but not followed up on with respect to impacts on water quality.

- Summarize all the data shown in Figures 8 and 9 to reflect data from the period covering 2012 through 2018.
- the text includes a reference to Figure 7, then the next sentence starts, "Several site" followed by an "OBJ." The OBJ is missing.

The paper, Apportionment of Bioavailable Phosphorus Loads Entering Cayuga Lake, New York states that, "Point source contributions to the total bioavailable P load (BAP_L) are minor (5%), reflecting the benefit of reductions from recent treatment upgrades." Prestigiacomo, et al., 2105.

- Please comment on observed or expected water quality changes in the southern end of Cayuga Lake after the 2006 wastewater treatment upgrades. It is worth commenting on this important change in loading and will provide valuable insight into what can and cannot be expected from non-point source loading reductions.

Section 2.3.3 Historical WQ for the Southern End and Main Lake, Mid-South segments:

- *It is impressive that the model performed so well at predicting 2013 water quality as it was an unusual year. This shows that the model performs well even at the outer limits of expected parameters.*
- *Error bars would assist the reader in understanding how this outlier year could be compared with other years.*
- *Include water quality data tables for the Main Lake, Mid-North and Northern End segments.*
- *Include summaries of water quality data from those lake segments in section 2.3.2.*
- *Add sample sizes, error bars, and indicate whether all were surface samples or not for Figures 8 and 9 and the new Figures for Mid-North and North End segments.*
- *Figure 9: Caption should read, “...(Bottom) the Main Lake, Mid-South...” not, “...(Bottom) the Southern End segment...”.*
- *A casual comparison of the Summer Average TP and Summer Average Total Chlorophyll-a does not show a clear relationship between the two, especially for the model year 2013 Southern End – the TP is highest at 27.0 ug/L and the Chl-a is lower than most other years at 4.4 ug/L. Please address this apparent conflict with the presumed linkage of TP and Chl-a made throughout the TMDL.*
- *Figure 9 Bottom graph – the 2018 value of 4.0 has an asterisk but there is no note to describe why.*

Section 3 Numeric Water Quality Target

Table 10*(page 26) lists the Summer Average Total Chlorophyll-a Target for the Main Lake, Mid-South as 4 ug/L.

- *According to the bottom graph in Figure 9, Summer Average Total Chlorophyll-a has not been below 4 ug/L in 20 years. How realistic will it be for this segment to reach this target, especially when the segments on either side have higher targets and continually mix?*
- *Section 2.3.3 and Section 3 – it would clarify the Summer Average Total Chlorophyll-a Target in Table 10 if Section 2.3.3 also included figures for Summer average TP and Summer Average Total Chlorophyll-a for the two northern segments.*
- **Table 10 appears again on page 43 but contains different information*
 - *Table 9 also appears twice, on pages 20 and 41. They are not the same tables. This duplication of Table numbers impacts MANY tables in the document. Please correct.*
 - *The table on page 40 is not labeled.*
- *Table 10 implies the impairment is drinking water, not recreation. There is not now, nor has there ever been, a drinking water facility using the southern end of Cayuga Lake. There is also no reasonable expectation that the southern end of Cayuga Lake will ever need to be accessed for drinking water, at least not more so than the northern end, which is not currently designated as Class A. The classification information is already provided in Table 1 and does not need to be repeated in Table 10.*
- *Clearly state in the document what impairment triggered development of this TMDL and provide supporting evidence.*
 - *This belongs in the problem statement*
- *Clearly support how this TMDL will resolve the triggering impairment.*

- *This belongs in Section 6 under 'Reasonable Assurance'*

Section 4 Assessment of Sources

Section 4.1 Analysis of Total Phosphorus (TP) Contributions:

Includes the four detailed tables of the TP loading for each segment.

- *Consider a more realistic assessment of inputs, for example, section 2 does not include section 1 inputs – that is not possible.*

Tables 11 and 12 include footnotes for MS4s, stating “MS4 loading is accounted for in the developed land load.” This is confusing because the MS4s include loading numbers that are much higher than the Developed Land loading.

- *It would be helpful to have a summary table so that the reader better understands this statement (just before Table 11): “Approximately 91% of the TP load to Cayuga Lake is from nonpoint sources and 9% from point sources.”*
- *The footnote needs to be revised or the Developed Land loading needs to include the value in the MS4 line.*

Tables 11-14 footnote states: Runoff from farm fields is accounted for in the nonpoint source agricultural load.

- *It is unclear exactly how that is accounted for and if some or no reductions are expected from these lands. Please provide more information, particularly in the main body of the document. Please do not leave all explanation in the Appendices.*

Section 4.1.1 Agricultural Sources:

As written here and elsewhere that CAFOs are mentioned, it is unclear how various land uses within a CAFO are addressed in the model. Discharge from CAFOs is assumed to be zero (0). In reality, this falls back to enforcement, weather, timing, labor/operator skill & follow-through, following the CNMP exactly, etc. This is an unrealistic presumption.

- *It appears that wineries (grape cultivation) and breweries (hops cultivation) are ignored in the TMDL. Please comment on how they were included and what reductions are being asked from those lands. If they were excluded, please provide a rationale, and explicitly state in the TMDL that they were excluded.*
- *Please provide a summary of CAFO compliance records/performance over the last 7 years (time elapsed between model data collection and publication of the draft TMDL) to support the assertion that discharges will not exceed permitted amounts.*
- *Clarify how CAFO land (owned and leased or otherwise operated), not the barnyard area, is handled in the analysis.*
- *Where phosphorus reductions from agriculture are modeled, please indicate how much comes from CAFOs and non-CAFO farms and from barn lot areas versus planted and cultivated areas.*
- *Include the following as part of the TMDL compliance actions:*

- *increase DEC oversight of CAFO compliance with their CNMPs,*
- *increase DEC oversight with regards to rate of manure application, timing of manure application, and time between application and working land to incorporate manure, and*
- *increase DEC enforcement beyond minimal response to complaints.*

Section 4.1.2 Developed Land:

The last sentence of the one paragraph in this section states, “Shoreline development can have a large phosphorus loading impact to nearby waterbodies in comparison to its relatively small percentage of the total land area in the drainage basin.”

- *Add Cayuga Lake specific information (with citations) to the above statement such as percentage of shoreline developed, estimated number of septic systems, estimated loading, etc. Provide information that is informative about this specific watershed and will help guide actions.*

Section 4.1.3 Forested Lands and Wetlands:

This is the text for the entire section, “Forested lands (including shrub and grassland) comprise 154,000 acres or approximately 30% of the Cayuga Lake drainage basin. Wetlands comprise an additional 23,000 acres or 5%. TP loading from forested lands and wetlands consists primarily of overland runoff.”

- *What is the cause of overland phosphorus runoff? Is it caused during timber harvesting or general erosion from forested areas?*
- *Has DEC considered, or is there any research on the rather recent prevalence of European earthworms? They are causing erosion of the humic layer and leaving the highly erodible mineral soil. If that has been considered, what implementation actions does DEC recommend?*
- *What implementation actions does DEC recommend in general regarding forested lands and wetlands?*

Section 4.1.4 Residential and On-Site Septic systems:

USEPA 2002 is used as a reference for assessing septic system functionality.

This section also states, “For a review of the septic analysis for the Cayuga Lake TMDL see Appendix F.”

- *Because Cayuga County has an inspection program, they will have more accurate data than the USEPA 2002 reference. Please use Cayuga County data that is more accurate and watershed specific.*
- *Appendix F, Table F3 lists “Individual, Municipal and Private/Commercial/Institution (PCI) Permits within the Cayuga Lake watershed” but there is no analysis and no description of the permit classes. Please include a description of the permit classes and provide some analysis of the available data.*

- *Septic loading contribution is set at 0.4% for all segments except the North End. Even given the limitations in available information this consistent percentage seems unlikely and needs further clarification as to how this was arrived at.*

Section 4.1.5.1 Wastewater Treatment Facilities:

The first sentence states, “The following SPDES facilities are included in the Cayuga Lake TMDL because they likely have the greatest impact on Cayuga Lake water quality . . .”

- *How can that be true when the total phosphorus point source load is only 9%? This statement should be clarified.*
- *Specify what the one industrial facility is that is mentioned on the third line of this section.*

Section 4.1.6.1 Internal Loading/Recycling:

- *Suggest removing the first word, “According...”. It reads as though DEC is dubious of the CLM findings it commissioned, oversaw, and approved.*
- *The first sentence implies that internal nutrient cycling is somehow harmful or unusual. All lakes experience internal nutrient cycling. What is DEC’s goal for this section?*
- *The second paragraph seems to ignore the initial statement that Cayuga Lake does not experience internal TP loading. If the goal is to discuss legacy phosphorus, please change the terminology so the reader is not confused. Better yet, delete the second paragraph.*
- *Please include a more complete discussion of the CLM project results regarding mussels in Cayuga Lake.*
- *Results presented in Li, et al. 2021 show that internal phosphorus cycling is controlled by quagga mussels in the lower four Great Lakes. They also show that this diminishes the impact of phosphorus from the watersheds and has important implications for management. Please address this issue with respect to impacts on effectiveness of the dTMDL proposed BMPs.*

Section 5 Phosphorus Loading Capacity Analysis

Section 5.1.1 Lake Modeling Using the Cayuga Lake Model (CLM):

- *Why is groundwater ignored in the model?*
- *Table 15 –*
 - *Please add sample sizes, standard deviations (or similar), and indicate if all readings are surface readings.*
 - *Please provide a map of sample locations*

Section 5.2 Cayuga Lake Model to Determine Loading Capacity:

- *It is confusing to have run so many scenarios on LSC when the CLM showed, and the draft TDML makes clear, that the LSC discharge is a very minor contributor to Cayuga Lake’s phosphorus load. This could mislead casual readers. Please clarify this apparent incongruous presentation of information.*

Section 5.3 CLM Scenario Results to Achieve Water Quality Targets:

- *Please cite data and sources from other agricultural watersheds where 30% reductions in P have been successfully achieved.*
- *Please include some estimation of the time interval required, based on model runs, to see impacts of phosphorus reductions, for example, three times the residence time of the water body, to help stakeholders better understand the time scale of this effort.*
- *Please consider impacts on the above time interval given that mussels may be the primary controller of phosphorus cycling in the lake.*
- *Why was no scenario run to estimate expected water quality changes in the southern end of Cayuga Lake from the 2006 wastewater treatment upgrades?*
- *Why was no scenario run to estimate the expected water quality changes in the southern end of Cayuga Lake from the 2010 NYS Dishwasher Detergent and Nutrient Runoff Law?*
- *Please provide the data and results for each CLM phosphorus loading scenario in an appendix to help stakeholders better understand the chosen scenario.*

Section 6 TMDL Load Allocations

Section 6.1 Impaired Segment Overview of Load and Waste Load Allocations and Load Reductions:

A 15% reduction in Load Allocation is suggested for forested lands.

- *From what portion or activity of the forest?*
- *Who oversees or is responsible for forest management on private lands?*
- *How is this consistent with recommendations to increase tree plantings?*

Section 6.3 Wasteload Allocation for Impaired Segment:

During the public information session on April 19, 2021, a question was asked about the cost to Freeville for meeting the new phosphorus concentration limit. A 'guesstimate' of \$130-150,000 was given by Koon Tang with the comment that this is not a lot of money.

Cornell's Lake Source Cooling is not a traditional discharger in that no 'new' water is introduced to the lake.

- *\$130-150,000 is a lot of money for a small municipality such as Freeville. Further, it is unclear if the estimated cost was for implementation only or an estimate of lifetime costs.*
- *Upgrades to municipal infrastructure and changes in development requirements may be necessary to meet the final TMDL requirements. Costs and impacts should be clearly stated in the document so impacted parties can prepare accordingly.*
- *It should be clearly stated that the water discharged from the LSC facility originates in the lake and does not contact anything besides pipes during its trip from intake to discharge. The only issue is the difference in phosphorus concentrations between the hypolimnion where the intake is located and the epilimnion where the discharge is located. These lake layers mix completely each year erasing this difference. More importantly, as noted earlier, the southern end segment of the lake mixes naturally with*

the main lake mid-south segment every 1+ days, erasing any varying water quality parameters. These are important points that should be elucidated in the TMDL.

- *Finally, any “load” assigned to LSC in a given segment should also be subtracted from the appropriate segment as the same phosphorus that is discharged is also “removed.” DEC cannot logically consider the LSC discharge a “load” and ignore the equivalent ‘removal’ of phosphorus at the intake location.*

Section 6.4 Unimpaired Segments overview of Load and Waste Load Allocations and Load Reductions:

- *Spellings ‘Waste Load’ and ‘Wasteload’ are used throughout the document. One spelling should be chosen.*
- *Tables 11 and 12, Forest has a “+” but no corresponding footnote.*

Section 6.7 Margin of Safety:

- *The numeric threshold for Chl-a is used to derive a quantitative phosphorus limit for the TMDL under the assumption that Chl-a is dependent on P loading. Multiple factors beyond TP levels have been implicated in the proliferation of HABs in waterbodies across a wide range of TP concentrations including bioavailability of P, temperature, wind, and presence/absence of dreissenid mussels. Since limiting Chl-a is the target outcome of the TMDL, a lower TP annual load may ultimately be necessary than that modeled by the CLM given confounding factors. It is unclear whether the MOS accounts for this uncertainty.*
- *Climate change impacts are expected to support higher Chl-a production during summer months while reducing the efficacy of landscape BMPs. A lower TP annual load may ultimately be necessary than that modeled by the CLM. It is unclear whether the MOS accounts for this uncertainty.*

Section 6.10 Reasonable Assurance:

Merely stating that the TMDL provides reasonable assurance does not provide evidence of the fact.

Paragraph three states, “Reasonable assurance of achieving the LAs relies upon a blend of existing programs, which have proven successful in reducing loads from targeted source sectors, and innovative solutions based on proven science to reduce nonpoint source loads.”

- *Please provide information to support the statement that the TMDL will provide reasonable assurance that source reductions will be achieved.*
- *Please list the impairment(s) and use(s) with specific information supporting that the use(s) will be restored.*
- *It is unclear from what follows (Section 7 and Appendix G) what exactly qualifies as “innovative solutions”. Please provide examples.*
- *Data collected in support of model and TMDL development do not support a connection between Chl-a levels and TP concentrations in Cayuga Lake. Therefore, the first sentence of the second paragraph that states, “The Cayuga Lake TMDL provides ‘Reasonable Assurance’ that phosphorus loadings will be reduced to result in the achievement of Chl-a water quality targets” cannot be met. Please explain the use of Chl-a as a*

quantitative phosphorus limit and how this parameter will be used to assess achievement of LAs, given that collected data show that TP and Chl-a are not correlated.

- *An earlier comment bears repeating here in the context of “Reasonable Assurance”: According to the bottom graph in Figure 9, Summer Average Total Chlorophyll-a has not been below 4 ug/L in 20 years. How realistic will it be for this segment to reach this target, especially when the segments on either side have higher targets?*

The paper, Apportionment of Bioavailable Phosphorus Loads Entering Cayuga Lake, New York (Prestigiacomio, et al. 2016 states that, “Most of BAP_L (>70%) is received during high flow intervals. Large interannual variations in tributary flow and coupled BAP_L will tend to mask future responses to changes in individual inputs.”

- *How will DEC meet the reasonable assurance goal if:*
 - *storm events drive inputs and interannual variation mask future responses,*
 - *climate change increases the intensity and variability of storm events (This comment is also particularly applicable to the assertion regarding seasonal variation in Section 6.9 – how are the statements in that section in sync with the findings in this paper?),*
 - *mussels dampen the impact of watershed phosphorus inputs?*
- *The same paper found that BAP_L represented only about 26% of the TP load, this appears to support the lack of relationship between TP concentration and Chl-a levels.*
- *Does this TMDL accurately reflect the data and findings from the CLM?*

Section 7 Implementation Section

Section 7.1 Summary:

The first sentence states that the TMDL will restore the Impaired Southern End segment water quality and protect all the designated uses.

- *Is this still considered a “protective TMDL”, as stated at numerous Monitoring Partnership meetings and in public meetings by then Lake and Monitoring Section Chief Jeff Meyers?*
- *Please list the impaired use(s)*

Appendix G is frequently referred to for more detailed information regarding implementation of the TMDL. In reality, Appendix G is a list of existing programs, competitive funding opportunities, etc. To date, these programs and funding streams have not been adequate to meet the watershed’s needs, according to DEC as evidenced by the development of this TMDL.

- *New York State’s Fact Sheet, “Ambient Water Quality Value for Protection of Recreational Uses” 10/22/1993 states that the 0.02 mg/l phosphorus (total) value was derived based on aesthetic effects for primary and secondary recreation and does not apply to drinking water uses. Please disconnect TP values from drinking water in this document.*

- *What Southern End designated use is not supported due to TP, please state that explicitly.*

All recreational uses supported at the time of the Clean Water Act are still supported. Health Department bathing beach permits were issued between 1957 and 1964 at Stewart Park. The beach was closed for swimming in 1964 due to sediment-driven turbidity, high e.Coli counts, and multiple drownings. In short, water conditions at Stewart Park have long been unsuitable for swimming. If this use is the impetus for an impaired designation, how will the phosphorus TMDL restore the use ended by sediment? Please address the impairment and restoration explicitly. (Tompkins County Health Department statement is included in the comment package (Item #6) for your convenience)

- *Please provide a clear path or mechanism for targeted, active support from the DEC for implementation of this TMDL. In other words, please describe how these programs and funding streams will be used differently, or innovatively, to better support the Cayuga Lake watershed since their use to date was unable to avoid the need for a TMDL.*
- *Thank you for clearly recognizing the Cayuga Lake Restoration and Protection Plan (RPP) as a Watershed Plan on par with the Cayuga Lake HABS Action Plan.*

Section 7.2 Sub-Basin Relative Loading Characteristics:

Overview of Potential Sources of Phosphorus:

Tables 16-20 are a good first pass at apportioning phosphorus load across the watershed but are at too great a scale to provide meaningful guidance for prioritization of projects, or the types of projects, that would be most useful in each scenario considering the variety of land uses, soil types, slopes, etc. in a large subwatershed.

- *Table 17 on SRP loads from tributaries should have the same column headings as those on TP loads in Table 16 before it. Please add SRP loads per unit area to Table 17.*
- *Table 21 - Agriculture BMP efficiencies are listed with no real numbers. SRP information is needed. Please provide at least a percent reduction range that might be achievable per BMP.*

Recommended BMPs, BMP Efficiency, and Cost Section:

The second paragraph states, "Together with the information presented in Table 24 through 28, stakeholders would be able to focus on the priority sub-watersheds and estimate the relevant BMPs to get the most pollution reduction in the most cost-effective manner".

Page 64 references Tables 24 through 28, 29 and 30, no such tables exist.

- *Please correct table numbers or add missing tables.*
- *The above statement exemplifies the "generic" nature of the entire Implementation section. Priority watersheds are not identified, nor is there sufficient information on BMPs to determine cost effectiveness. Please provide specifics.*
- *Tables 15-20 do not highlight priority subwatersheds, rather all subwatersheds are listed.*

- *BMP Tables 21 and 22 give no numerical values (or even estimates) for implementation costs or phosphorus reduction nor do they reference where (landcover/use, farm type, geology, slopes, etc.) the listed BMPs are best suited, so please revise to include this information.*
- *The Ritter and Shiromohammadi, 2000 reference sells for \$200. Unless DEC intends for all municipalities, SWCDs and other stakeholders to purchase this BMP reference, please provide descriptions of the BMP practices named in Tables 21 and 22 in an appendix.*
- *Is there no newer BMP reference than Ritter and Shiromohammadi, 2000? Particularly for SRP?*

Priority BMPs:

Page 67 states, "Priority 1 projects are considered necessary to manage water quality and reduce HABs in Cayuga Lake, and when implemented in priority areas (Section 7.1) will reduce phosphorus loading to Cayuga Lake."

- *Please come up with a list of specific priority areas within subwatersheds paired with specific actions that make sense there. We understand the Genesee River 9E provides this kind of information with less data. For example, rather than general statements about planting more cover crops, say something like increase cover crops by 15% in such and such a subwatershed. As another example, the Conesus TP TMDL includes 6 agriculture BMPs and 8 developed land BMPs. It is clearer and is not a mishmash of two different lists.*
- *All BMPs are listed as Priority 1 versus any other priority. Please prioritize the BMPs. Section 7.1 does not list priority areas; it covers forms of phosphorus. Section 7.2 does not list priority 1 areas, rather, all areas are listed without prioritization. Please prioritize areas.*
- *Please explain item #5 on page 68. This seems to imply development of a watershed-wide municipal stormwater program. If that is the case, would this then fall under the MS4 permit requirements and reporting expectations?*

The TMDL states that these BMPs were adapted from the Cayuga Lake Harmful Algal Bloom Action Plan (Action Plan) and will support implementation of the Cayuga Lake TMDL. These BMPs are not adapted, they are identical to those in the Action Plan. The Action Plan repeatedly states that these BMPs are generic and the TMDL will provide further specificity, but it does not. A letter was sent to DEC staff specifically addressing this issue. It is included (Item #7) in the comment package for your convenience.

- *Please provide specific BMPs targeting appropriate phosphorus forms by subwatershed and land use or agricultural practice.*

The TMDL places heavy emphasis/priority on implementation of NRCS proscribed actions on agricultural lands while acknowledging that adoption by the landowner is entirely voluntary. Focusing heavily on a single land use sector under the assumption they will comply is dubious. Actions should expand the initial scope beyond just physical implementation projects if for no other reason than to increase the likelihood of adoption of such projects.

Suggested Additional Short-Term Actions:

- *Support educational actions to engage and increase awareness across sectors to implement voluntary actions.*
- *Explore innovative approaches that provide incentives for adoption of BMPs by landowners, e.g., supporting development of WRRs such as DEC staff did for Owasco Lake and/or payment for ecosystem services.*
- *Move this Action from Mid-term to Short-term: Acquire and conserve lands within the watershed to protect, maintain or establish buffers before development or other land conversion.*

Suggested Additional Long-Term Actions:

- *#1 Overemphasis on “high value” lands already providing ecosystem services. Acquisition of highly degraded sites for targeted restoration and/or BMP implementation should also be included, e.g., conversion of an abandoned industrial site adjacent to a waterway.*
- *Develop databases and other management tools that can assist SWCD staff, municipal road crews and others with identifying BMPs in need of retrofitting prior to failure at end of life to ultimately save costs.*

“For additional projects and actions please see the Cayuga Lake HABs Action Plan”, page 69.

- *Please include the RPP in this statement or provide justification for why the projects/actions within that document are not acceptable for inclusion as it is identified as an existing watershed management document in the TMDL.*

Section 7.4.2 Lake Source Cooling:

- *Section 7.4.2 lists LSC contributions to the total phosphorus load based on permit limits. Please provide the same information for the wastewater sector (referenced in section 7.4 only generally) by their permit limits.*
- *Why is LSC included in the Wastewater sector? It is not discharging wastewater. Please accurately identify this discharge as non-contact, or circulated, etc. lake water.*
- *LSC is attributed 0.5% of the annual total phosphorus load to Cayuga Lake. This is impossible. Please accurately reflect the removal of water from 1 segment of the lake to another segment of the lake, without treatment, contact or alteration. It may be necessary to briefly explain the different water quality characteristics of the lake water at the intake versus the lake water where it is discharged. It may also be necessary to briefly describe how this difference in water quality is relevant given the overall exchange rate of water between the regulated segments of the lake.*

Section 7.4.5 NYS Dishwasher Detergent and Nutrient Runoff Law:

- *Please comment on observed or expected water quality changes in the southern end of Cayuga Lake after the 2010 NYS Dishwasher Detergent and Nutrient Runoff Law was enacted. It is worth commenting on this important change in loading and will provide valuable insight into what can be expected from non-point source loading reductions.*

Section 7.7 Compliance and Enforcement: The implementation actions proposed by the TMDL rely heavily on adoption of land-based BMPs beyond the purview of the State of New York, yet this section completely ignores the role of the counties and municipalities when it comes to land-based regulations.

- *While a review of all local land use regulations may be beyond the scope of the TMDL, the document should at least acknowledge the role of local municipalities regarding compliance and enforcement. That would also go a long way towards helping local municipalities estimate needs for future staff, education, programs, etc. to fully comply with the TMDL.*

Section 7.7.2 Water Quality Management:

Monitoring Plan

- *Who will be responsible to coordinate water quality monitoring on Cayuga Lake and in the watershed?*
- *DEC calls out the importance of CSLAP monitoring data for determining the effectiveness of the implementation actions. Will DEC cover the cost of all 5 monitoring locations going forward, or at least until the impaired use determination is lifted?*
- *How does DEC want stakeholders to track BMP reductions for crediting to the model?*
- *DEC should support and provide funding for before and after BMP implementation monitoring using existing monitoring programs like Community Science Institute (CSI).*
- *Please include a timeline for updating the model data (landcover, precipitation, hydrology, water quality, etc.) and rerunning the model to confirm appropriateness of suggested phosphorus reductions, assess progress towards TMDL goals, inform actions, and other relevant milestones.*
- *Please list all TMDL milestones explicitly in the final TMDL.*
- *Will there be future iterations of the model like Chesapeake Bay TMDL?*

Lake Classification and Inventory

- *Along with listing a website, please provide more program specifics about the Lake Classification and Inventory, such as how often the monitoring is done and what locations on Cayuga Lake are monitored.*

River and Stream Monitoring Programs

- *Community Science Institute's stream monitoring warrants its own heading in this section as it is more frequent and more comprehensive than any of the NYS DEC monitoring efforts. Also, it is completed under an approved QAPP and therefore should be used in the same capacity as NYS DEC monitoring data. If there are reservations about use of these data, NYS DEC should make it a point to resolve these, so this valuable resource is not sidelined.*

Section 7.8.2 Forestry Conservation Practices:

- *Should we assume that the only measures needed to reduce loading by 15% are to employ BMPs during timber harvesting?*
- *Are there any estimates on how much timber harvesting occurs in an average year?*
- *Per the April 19th public information meeting, NYS DEC has authority over forested lands. Does that mean DEC will take the lead in implementing these measures?*
- *Who oversees forestry management on private lands?*
- *SWCDs are listed as possible leaders in implementation of forestry practices in the draft TMDL, however, feedback from SWCDs is that they have no authority in this area. How will DEC resolve this?*

Section 7.9.6 Green Infrastructure: The TMDL devotes this section to promoting the benefits of green infrastructure, yet it is completely lacking as an identified action within the prioritized lists of BMPs/actions.

- *Include GI within the framework of prioritization. Given the flexibility of GI it can be amended to existing actions specifically addressing stormwater management and sewer.*
- *Consider adding this to the short-term list of BMPs.*

Section 8 Public Participation

Public Participation:

DEC's outreach for the TMDL is unacceptable. Five years have passed since the last public meeting on this topic after three very intense years (2013-2016) of collaboration between DEC and stakeholders, the Monitoring Partnership being one of those entities. Initially allowing only 45 days to review the draft TMDL was shameful, 35 days were spent requesting an extension before one was granted. The circuitous route to find information on the website is equally abysmal as shown here:

To find the relevant TMDL information on the NYS Department of Environmental Conservation website, one must locate at least three separate webpages.

- *The actual draft TMDL is on the [Clean Water Plans](#) page, which requires scrolling through over two print pages worth of information to find the Cayuga Lake TMDL/Phosphorus draft and appendices. **There is no mention of a draft comment period or how to make comments.***
- *The [Cayuga Lake page](#) provides facts about Cayuga Lake, HABs, and Hydrilla with no reference to the TMDL or that a draft is available. At the very bottom under "More about Cayuga Lake," there is a link to the [Cayuga Lake TMDL Outreach](#) page, which includes public presentations and technical advisory committee meeting documents dating back to 2013. The top entry is a link to a recorded "presentation" dated April 19, 2021, but this is not the actual recording of the virtual public meeting and therefore missing the useful Q&A between attendees and DEC. It is unfortunate that DEC did not post the actual virtual public meeting recording because there were a number of interested stakeholders not able to attend the 4/19/21 meeting.*

The only other way to get information about the draft TMDL comment period and how to submit comments, was to receive an email from DEC (be on the appropriate email list) or you

would have to find the [Press release](#) or [Environmental Notice Bulletin](#) that contains the information.

The April 19, 2021, Public Information Session was little more than a power point presentation of the draft TMDL table of contents. No dialogue was allowed. Follow up questions were not taken. Participants were hidden from each other. Presenters did not always appear to know the answer to questions, which made the lack of dialogue and follow up questions even more exacerbating.

- *Before the final TMDL is released:*
 - *Provide a public hearing.*
 - *Provide more public information sessions that allow for dialogue and follow up questions.*
 - *Allow participants to ‘be in the same room’, do not hide participants from each other.*
 - *Address some of the major information gaps that have become apparent during the first part of the public comment period and were raised during the April 19th public information session such as:*
 - *A thorough explanation of CAFO operations and lands in the model and regarding reductions*
 - *What forestry practices are targeted for reduction?*
 - *Are MS4’s and WWTF permits capped?*
 - *Is DEC promoting a whole watershed MS4 approach?*
 - *What role will DEC play in implementation?*
 - *How will the listed DEC programs and funding streams be more successful under the TMDL than they have been to date?*

Appendix G

This Appendix is woefully inadequate at providing useful information regarding technical assistance resources or securing funds for implementation. It seems more concerned with promotion of program accomplishments rather than providing guidance to accessing funds and assistance, e.g., the inclusion of the “AEM Base Program accomplishments” table serves no practical purpose in this regard.

- *Remove all extraneous information not relevant to the purpose of the Appendix, Identifying Technical and Financial Resources for execution of implementation plan.*

The description for the New York State Agricultural Nonpoint Source Abatement and Control Program provided in the Appendix is a perfect template for replication for the other programs (e.g., EQIP, WQIP, GIGP, etc.). This Appendix reads as if authored by two dozen individuals working across multiple agencies and thrown together.

- *Identify and provide a brief description for each funding source identified in the appendix. Suggested that the format of Ag NPS Program is replicated.*

The identified financial programs are neither exhaustive nor sufficient to execute the implementation schedule within the proposed timeframe. While it is acknowledging the fact that program availability, structure, etc. are variable, additional information should be provided and be mined – amongst other sources – from the already identified RPP and HABs Action Plan.

- *Please provide more information on additional State programs able to provide financial assistance such as NYSDOS Local Waterfront Revitalization Program.*
- *Please provide additional information on federal programs able to provide financial assistance such as GLRI and GLC, Land & Water Conservation Fund, etc.*
- *Multiple private foundations are based in the Cayuga Lake watershed and provide funding to projects proposed by this document. Unless policy prohibits identification of private sources within the TMDL, these should be included.*

The TMDL is designed in part to provide guidance to all individuals interested in implementing actions to help achieve the target phosphorus loading rate. As such it would be extremely helpful to identify the agencies, organizations, etc. that could be contacted to provide technical assistance in this matter. While many of these are described in various levels of detail throughout the TMDL, compiling them in a single section of the document with basic contact information would be extremely helpful.

- *Compile a list of technical resources available to assist individuals with implementation. Though not exhaustive, a suggested list includes DEC Office of Water, DEC Regions 7 and 8 office, DEC Finger Lakes HUB, Ag & Markets, each of the Soil & Water District offices, NRCS centers, DOH, CLWIO, CSI, Cornell, FLI, County Planning Offices*

Comments, Questions and Discussion points grouped by TMDL Themes:

Agriculture:

- *Tables 21 and 22 need to have numeric scoring and be aligned with NRCS or State AgNPS/MS4 guidance manual documents that determine the actual systems we can implement.*
- *Will DEC provide engineering support for implementation of BMPs? Many of the BMPs listed require some type of approval authority in the State of NY. Not all SWCDs have enough certified staff to implement all BMPs.*
- *How are legacy phosphorus from early settlers' land clearing practices and glacial deposits (both still being exported) factored into the model (Nagle, et al., 2007)?*
- *What BMP reporting requirements are going to be required of SWCDs and municipalities? How will this be reimbursed by NYS or EPA?*
- *The TMDL draft presumes 0% contribution from CAFOs permitted discharges/uses and puts a permanent cap (is that true?) on those entities.*
 - *It is implied but not explicitly stated that all permitted entities will be capped, please be explicit.*
 - *Has DEC reached out to impacted entities (farm organizations, farm bureaus, etc.) to discuss this proposal?*

- *How are permit violations addressed within the context of achieving TMDL P reduction goals?*
 - *Cultivated crops, hay pasture crops, forest and Freeville WWTP are the only significant reductions proposed. Will the burden largely fall on smaller farms?*
 - *CAFOs rely on nutrient management planners – only 4-5 are registered in Tompkins County, will there be an increased need for them?*
 - *DEC needs to include a better description or even a picture/diagram with an example CAFO and all its associated land – perhaps the barn area with all the cows having a zero on it but the hundreds of acres of corn and hay having a nutrient export value and reduction goal?*
 - *How does DEC approach events like the spill recently into Great Gully (see images below, photo credit DEC)?*



TP and SRP Loading:

Loading estimates: Comparison of DEC TMDL model (Fall Creek 2013) versus CSI dataset (limited annual synoptic sampling of base and storm flows on multiple streams over many years), and Doug Haith 2012 TP calculation (Haith, et al., 2012)

- TMDL SRP: 17 tons/year; CSI SRP: 49 tons/year
- TMDL TP: 200 tons/year; CSI TP: 124 tons/year; Haith TP 2012: 98 tons/year

The discrepancy with TP and SRP loading estimates is from northern tributaries where CSI has data and DEC extrapolated. The TMDL states that DEC validated their Cayuga Lake tributary loading model by comparing model estimates of phosphorus concentrations in Fall Creek with CSI's actual measured concentrations of phosphorus in Fall Creek, and the agreement was good (*Appendix B, Table B8*). This is consistent with the good agreement between TMDL loading estimates and CSI loading estimates for the southern tributaries. The TMDL does not state that DEC compared model estimates of phosphorus concentrations with CSI's measured phosphorus concentrations in northern tributaries.

The TMDL and its phosphorus load reduction requirements will impact all facets of the economy for generations to come. Therefore, it is critical to get the SRP and TP loads as accurate as possible to target BMPs and optimize the effectiveness of our efforts. There is no sense, for example, in trying to reduce TP that is mostly particulate phosphorus from Fall Creek when reducing SRP in Yawger and Great Gully Creeks would actually make a difference.

- *Section 5.1.1. Compare TMDL model estimates of phosphorus concentrations with CSI's measured phosphorus concentrations in northern tributaries to refine loading estimates.*
- *Section 7.2: DEC should list the sources of local data that will be used to continue to improve the model.*
- *Section 7.2: DEC should state how often they will update the model. If a plan for this work has not been created, it should be done and included in the final TMDL.*

Opportunities: This section is a loose collection of comments and thoughts

- *When the TMDL is finalized, will there be new pathways to funding through that planning mechanism?*
- *There are many plans that come down the pipeline. For the most part, we can all agree that the scientifically driven planning process (in this case, using a TMDL) is important for guiding management decisions, and the plans themselves tend to get funded. The difficulty moving forward will be driving targeted state funding based on the recommendations within the plan.*
- *How, where, and when can we expect to obtain project(s) funding associated with TMDL recommendations?*
- *Will the watershed be positioned for direct lines of NYS funding outside of the competitive grant process?*
- *Are these practices also consistent with climate adaption practices?*

Municipal: WWTF, MS4s, Construction General Permit and Forestry

DEC mentioned financial impacts to the Freeville WWTP during the April 19, 2021, public information session, a comment is included in the first part of this document. WWTFs in Freeville and Interlaken are both assigned a 67% reduction in the draft TMDL (Tables 9 and 10). Freeville was not contacted about permit modifications prior to release of this document. Interlaken is in the middle of a planned upgrade and was in discussion with DEC, but it is unclear if the planned upgrade will meet the requirements called for in the draft TDML.

The Ithaca Area Wastewater Treatment Facility is currently operating under a 1.0 mg/l and 40 lbs/day TP limit. The draft TMDL proposes a concentration reduction to 0.5 mg/L and maintaining the 40 lbs/day limit (page 42). The facility was not contacted about permit modifications prior to release of this document.

All 8 WWTFs in the watershed are listed for permit modifications to include weekly SRP monitoring for at least two years (page 71, Section 7.4.1). Results will be used to determine if SRP limits should be imposed on WWTFs.

Section 7.4.4 clearly states that all new discharges will require a 100% offset of phosphorus loadings. It also states that any expansion of existing discharges will require 100% offset. The heading for this section is "Accounting for Growth in the Wastewater Sector." It seems, however, that this section will affect growth in any sector wishing to build new or connect to existing treatment facilities. The potential impact of this section should be made clearer to watershed municipalities.

- *Will DEC provide new funding to offset unexpected monitoring costs for the WWTFs?*
- *Are there existing technologies for SRP reduction/removal for WWTFs? If so, are there costs estimates per MGD or some other way to anticipate possible budgetary needs?*
- *Will DEC create a new funding stream to support possible treatment updates necessitated by the TDML?*
- *It appears SPDES permits will be capped by this TMDL. The potential impact to rural/growing municipalities of requiring a 100% offset for additional phosphorus discharge from the wastewater sector should be made clearer through inclusion of a section on Municipal Impacts in the TMDL, or preferably, through outreach to Municipalities. The latter could be accomplished by working with CWIO to host information sessions.*
- *Page 32, Section 4.1.5.1 states the eight permitted municipal wastewater treatment plants and one industrial facility are included in the TMDL because they likely have the greatest impact on Cayuga lake water quality. Page 42, Section 6.3 says the four permitted WWTFs and LSC comprise 21.8% of the annual TP load to the southern end segment of the lake. Page 71, Section 7.4 says the point source contributions (Wastewater Sector) were found to be small relative to nonpoint sources. Page 71, Section 7.4.2 says LSC contributes 0.5% of the TP annual load to the lake. Please clarify if the Wastewater sector is a small or significant contributor. Please confirm the number 21.3% (the sum of 21.8% provided in Section 6.3 minus 0.5% provided for LSC in Section 7.4.2) for the southern end WWTFs. Please address how inputs of TP to the southern segment of the lake are different than inputs to the whole lake as the southern end mixes with the whole lake every 1+ days (on average) and inputs to any 1 section of the lake are still inputs to the whole lake?*

Addressing Mid-term Priority 1 BMP #5, section 7.2, page 68:

- Implement a comprehensive municipal stormwater program, including hydraulic evaluation and mapping of drainage, as well as the replacement and upgrade of subsurface resources. This project is envisioned to be a collaborative effort among SWCDs and municipalities in the Cayuga Lake watershed.
 - o *It is unclear if DEC means for this to apply to the entire watershed, though that is what appears to be indicated. This is a massive undertaking for both the SWCDs and municipalities. As of June 18th, 2021, municipalities and SWCDs participating in the development of these comments and CWIO meetings have not been contacted about this topic. DEC should expand on their expectations for this program and begin discussions with appropriate stakeholders before incorporating this into a regulatory document.*

Tompkins County Stormwater Coalition feedback addressing the draft CL TMDL bulleted list of MCMs in section 7.5.1:

- Develop comprehensive maps of MS4 watershed and outfalls.
 - o *TC SWCD has grant funding and is working with 7 municipalities to map the stormwater conveyance system. The City and Town of Ithaca have already completed this mapping.*
- Develop and provide public education and outreach on the sources of phosphorus (e.g., use of phosphorus-free fertilizers, leaf litter collection, proper disposal of wash water).
 - o *This could be completed through the Tompkins County Stormwater Coalition. The coalition has funds and could conduct/pay for education and outreach on phosphorus sources.*
- Prioritize inspection of illicit discharge, detection, and elimination within area of high illicit potential, such as plant nurseries, big box stores, and other commercial businesses that may be a source of phosphorus.
 - o *It is not documented or apparent that this is happening in most MS4s. TC SWCD hires field mapping staff in the summer who might do some of this work. The impact of this MCM will depend on how many outfalls are prioritized as having high illicit potential.*
- Prioritize inspection of construction activities.
 - o *TC SWCD provides construction site inspection services for the smaller municipalities on as needed basis. We typically have contracts with Danby, Caroline, Newfield, and Ulysses.*
- Increase good housekeeping/pollution prevention BMPs for municipal operations and facilities, such as more frequent catch basin cleaning, street sweeping, and facility inspections.
 - o *It is not documented or apparent that this is happening in most MS4s.*
- Incorporate, where feasible, cost-effective runoff reduction techniques and green infrastructure during planned municipal upgrades including municipal right of ways (e.g., bioswales, green streets, porous pavement, replacement of closed drainage with grass swales, replacement of the existing islands in the parking lots with bioretention or curb cuts to route the flow through below-grade infiltration areas).
 - o *It is not documented or apparent that this is happening in most MS4s. Projects and funding would need identified.*

MS4s in the Cayuga Lake watershed are operating under an expired permit. DEC has been working on an update for several years. In the current permit, those watersheds with a TMDL

for phosphorus are required to use the “Enhanced Phosphorus Removal Design Standards” in accordance with the NYS Stormwater Design Manual. There is also a requirement for a retrofit program that addresses runoff from sites to correct or reduce existing erosion and/or pollutant loading problems, with particular emphasis placed on phosphorus. Here is a link to the enhanced phosphorus removal supplement in the design manual: https://www.dec.ny.gov/docs/water_pdf/swdm2015chptr10.pdf. It can be met in a variety of ways, stormwater wetlands/ponds, infiltration/bioretention. Built/Urbanized MS4s may have to use more technological methods that require less space.

Per very recent communications with DEC (to the TC Stormwater Coalition): When the draft updated MS4 permit is released it is going to have a Chapter 8, which will be “enhanced water strategies” for watersheds without a TMDL or *watersheds with a TMDL where the pollutant load is not significantly coming from MS4s*. Cayuga Lake watershed is considered the latter. A possible change in the new permit will be subwatershed specific requirements, for example, different requirements for activities in Cascadilla Creek versus Cayuga Inlet.

There will be additional minimum control measures (MCMs) that must be met, but they will not be as rigorous as the requirements for NYC East of the Hudson and Onondaga Lake MS4s, which have phosphorus TMDLs where a significant amount of the load is coming from MS4s. MCMs stated in the draft Cayuga Lake TMDL (7.5.1 bulleted list, pg. 73) will be similar/close to what will be in Chapter 8 of the MS4 permit. The NYC East of the Hudson and Onondaga Lake MS4 requirements in the current permit are more stringent, because the MS4 pollutant load in the TMDL is more significant. Since this is currently not the case in the Cayuga Lake TMDL, we should not see the requirement for a retrofit program or septic system inspection program etc.

The enhanced phosphorus standard is relevant to the Construction General Permit (GP-0-20-001). The draft TMDL language in section 7.5.1, Construction Permit section, may mean that construction activities in particular areas (subwatersheds) will have to comply with the enhanced phosphorus standards.

The Construction General Permit may require enhanced phosphorus standards for some construction. While the bulk of financial impact will fall to the developer, municipalities will be required to educate developers and enforce these standards. It could also serve as a deterrent to development.

The lack of clarity in the draft TMDL language is problematic. The final wording of the TMDL will lock in compliance to some portions of the Construction General Permit and an unpublished MS4 permit update. It is impossible to comment on the unpublished MS4 permit, which also makes it impossible to comment on the TMDL implications if the TMDL is finalized prior to release of the MS4 permit.

- *DEC must address possible/probable updated MS4 permit and Construction General Permit impacts more clearly in the draft TMDL so municipalities can provide meaningful comments and have some way to assess impacts on growth and budgets in their own jurisdiction.*
- *MS4 impacts in general have not been addressed in the public communication efforts thus far and should be addressed in a more transparent way through public hearings.*

- Will DEC provide new funding support for enhanced MS4 requirements?
- The Construction General Permit may lock municipalities into new requirements based on the final TDML language. As stated in an earlier comment, the potential impact should be made clearer through inclusion of a section on Municipal Impacts in the TMDL, or preferably, through outreach to Municipalities. The latter could be accomplished by working with CWIO to host information sessions.
- Page 47 of the dTMDL states there are six municipalities in the Cayuga Lake watershed that are covered under the MS GP-15-003 (*correct permit number to GP-0-15-003), however, there are ten (10). The list does not include Tompkins County, Town of Caroline, Town of Newfield, or the Village Lansing. Please correct the permit number and the list of municipalities.
- Page 72, under 7.5.1 states that there are six municipalities in the Cayuga Lake watershed that qualify as small MS4s and are covered by GP-0-15-003. There are ten (10) municipalities that are covered by GP-0-15-003 and the municipalities listed in this section are different from those listed on page 47. This list includes the City of Ithaca, Village of Lansing, Town of Dryden, Village of Cayuga Heights, Town of Newfield, Town of Ulysses, and Town of Caroline, which totals to 7. It leaves out Tompkins County, Town of Lansing, and Town of Ithaca. Please correct the list of municipalities and clarify small, smaller, etc. designations.
- Regarding timber harvest permitting, who does/will do that? DEC said they have authority. What is DEC's plan to achieve 15% reduction? Will DEC lead on private property?

Addressing the Forestry reduction

- Slide 40 from a 2016 presentation on the Cayuga Lake TMDL, https://www.dec.ny.gov/docs/water_pdf/clmppubmtg20160309b.pdf lists practical load reduction scenarios for phosphorus based on watershed modeling as follows:
 - Developed land: 0-20%
 - Forest: no reduction**
 - Agricultural land: 0-60%
 - Septic load: 0-100%
 - Point source: effluent limits should consider technology capabilities (0.05, 0.2, 0.8, 0.1, 1.0 mg/L TP)
- *Is the 15% reduction from forested lands a later addition to the TMDL to offset the reduction set for agriculture? If not, what was the rationale for adding a forest reduction?*
- Section 6.0, tables 9, 11, 12 and 14 call for a 15% reduction in forestry runoff. Section 4.1.3 on page 32 has two sentences on Forested Lands and states that TP loading consists primarily of overland runoff.
 - *Please describe what is meant by overland runoff so that appropriate offsets can be considered.*

- Tables 23 and 24 (pages 65-66, Section 7.2) contain nothing about forest management. The Priority 1 BMPs copied from the HABs Action Plan also do not provide forestry targeted information.
 - o *Please include BMPs to assist in meeting the phosphorus reduction from forested lands.*
- Section 7.8.2 Forestry Conservation Practices is the only area of the TMDL that spends any time on the topic. It does not address the fact that authority over forestry practices on private property is virtually non-existent. A nice BMP field guide is referenced. SWCDs can assist willing farmers develop forestry plans through AEM. DEC is the only entity with authority over forestry activities, this is limited to State lands.
 - o *Is DEC assuming responsibility for the 15% reduction in forestry runoff? If not, will DEC work with municipalities to enact local laws requiring permits for private logging? Further, will DEC provide training and funding support for municipal staff to provide enforcement, or will DEC assume enforcement on private lands?*

Source Water Threat:

- *Section 1.2.2:*
 - o *List all threats mentioned in Cayuga Lake’s 2004 SWAP. For phosphorus (or related) provide SWAP details.*
 - o *List all the postulated causes for HABs from the Action Plan. It is ok to state that phosphorus inputs are one of the few (the only?) causes that can be addressed.*
 - o *Disconnect current day HABs from a justification for the TMDL as they occurred nearly 2 decades apart **or** list all Finger Lakes that serve as a drinking water sources and also experience HABs as threatened/impaired and create appropriate watershed plans as required.*
 - o *In this section and the 303d list, if necessary, remove all mention of threatened source water status related to NOM and DBPs due to lack of any supporting evidence, **or** provide evidence of increases and connection.*
 - o *There are currently no local, state, or federal regulatory guidelines or requirements regarding NOM in drinking water source waters. Please remove language indicating threats to drinking water from NOM in Cayuga Lake unless some regulatory framework exists for such a statement. If so, cite and explain the regulatory framework.*

Section 1.2.2 references Cayuga Lake’s 2004 SWAP without listing the specific threat related to phosphorus called out in that document.

The 2018 Action Plan is cited stating that the Mid-South and Mid-North segments of the lake are threatened as drinking water sources by algae concentrations driven primarily by external phosphorus loading. This has categorically not been established. The suspected causes of increased algal concentrations (in the form of harmful algal blooms, or HABs) include remobilization of phosphorus by zebra and quagga mussels, phosphorus inputs, and climate change variables including increasing water temperature, decreasing water pH, more periods of drought, intense storms, and increasing wind.

It appears that draft TMDL is trying to tie recent HAB occurrences in Cayuga Lake to the phosphorus TMDL. HABs were not recorded in Cayuga Lake until 2014. The Southern End segment of the lake was added to the 303d list in 1998 with phosphorus listed in 2002. Phosphorus and chlorophyll levels in the lake have been declining (this is very loosely based on Figures 8 and 9 provided in the draft TMDL) since

roughly 2012. Skaneateles Lake has been recording HABs since 2017, yet it is not listed as threatened for drinking water/source water. Listing HABs as a threat to drinking water is valid. Equating Cayuga Lake HABs to an excess of nutrients is not supported by existing data.

The TMDL also attempts to link disinfection byproduct issues to an excess of nutrients in Cayuga Lake. This same attempt was made in the Action Plan. Utility data, analyzed by certified laboratories over several years, do not support the inferences made in the draft TMDL that Cayuga Lake's NOM is threatening drinking water quality. Furthermore, a specific analysis of DBPs in drinking water from Cayuga Lake concluded that water age, not lake water quality, was the cause of DBPs (MRB Group, 2016).

There can be grave consequences in listing a use as impaired without supporting data. It is also reckless to assign the cause for a possible impairment without data. Listing, in the form of the 303(d) list, or inferring in the draft TMDL, a connection between phosphorus levels in Cayuga Lake and disinfection byproducts in finished drinking water without substantiating data would be a mistake.

Streams:

Streambank erosion and riparian corridor management BMPs are only referenced in Section 7.2 on pages 67 and 68 of the draft TMDL under Short-term priority BMPs. Methods suggested are hard armoring, natural stream design, and stream stabilization facilities. References to streambank rehabilitation and other 'stream' topics are covered only very generally in section 7.9. This section serves more as a background review, a list of select programs, and the value of green infrastructure than a meaningful discussion of streams in the watershed. The lack of any discussion of *Cayuga Lake watershed stream conditions* and *more useful BMPs* is unfortunate. For example, using existing dams on Six Mile Creek, trapping and dredging might be a useful BMP.

Channel migration (cutbank erosion or meander development) mostly moves the previously deposited bedload which makes up much of the cutbank alluvium. That bedload is not a major contributor of available phosphorus to Cayuga Lake, it just moves slowly downstream to the next bar.

The greater fraction of the suspended sediment load is coming from tributaries of the major streams, not the streams themselves. Main channel degradation moves up through the headwaters in the form of channel erosion and slumping (landsliding). There is no feasible way to stop some of these processes. The following images were taken in the Six Mile Creek watershed this May in the general vicinity of the X's on the map, southwest of the City of Ithaca's drinking water reservoir (photo credit Joe McMahon). This area has not been logged or in active agriculture in over 100 years.



Main channel BMPs including hard armoring, plantings, fencing or even natural channel design focused on the main streams will not address ongoing process in the stream tributaries. Future main channel degradation may be lessened using weirs, etc., but potential side effects should be considered prior to implementation.

- *Section 7.2: Provide specific and better suited BMPs by subwatershed, land use, and BMPs for headwaters.*
- *Section 7.9, Wetland and Streambank Rehabilitation introductory paragraph:*
 - *Review Milone and MacBroom 2005*
 - *Review Karig et al 2007, Sixmile Technical report*
 - *Read Karig 1999 (Recent channel degradation in Sixmile Creek) presented at 1999 Symposium on Environmental Research in the Cayuga Lake Watershed*
 - *Use the above references to create a section describing stream conditions in the Cayuga Lake watershed to help guide phosphorus reduction actions.*

Wetlands:

Wetlands are listed as 4.0% of the watershed landcover. The Tompkins County Water Resources Council (WRC) has completed several studies looking at mapped and unmapped wetlands. In partnership with the Cayuga Lake Watershed Network, a consultant used the latest available data resources to conduct a wetland mapping study in 2016 and determined that there are three times more wetland area in the county than are represented on DEC or National Wetland Inventory maps. The WRC and some

municipalities have adopted or regularly use the [improved map](#) to make determinations for land use, development, and protection.

The following comment was submitted to the DEC in September 2018 as part of the WRC's review of the Cayuga Lake HABs Action Plan, and it appears that the HABs Action Plan was not updated, and the out-of-date "Priority BMP" is included in the draft TMDL: *Long-term #2 addresses wetlands. It should be noted that Tompkins County has more up to date and accurate wetlands maps than available from DEC or NWI. In 2016, the Cayuga Lake Watershed Network, with financial support from the Park Foundation and Tompkins County, published Wetland Mapping for Tompkins County, New York. In total, more than 15,000 acres of wetlands were mapped. The report and link to the maps are available here: <http://www.cayugalake.org/wetlands-mapping-project.html> Similar mapping could be undertaken for the remainder of the watershed to provide for more targeted wetland enhancement/restoration.*

- *was wetland retention factored into the model?*
- *Section 7.2: Add adoption of the Tompkins County wetlands map to the list of Priority BMPs for use in compliance with attaining TMDL phosphorus reductions.*
- *Section 7.2: Add creation of similar mapping for the Cayuga Lake watershed portions of Cayuga and Seneca (and possibly Schuyler and Tioga) to the list of Priority BMPs.*

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-L- WRctoDEC promote MP and collaboration

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March 4, 2010

Mary Jane Peachy, Regional Engineer
Ken Lynch, Regional Director
NYS DEC, Region 7
615 Erie Blvd. West
Syracuse, NY 13204-2400

Mark Klotz, Division Director, Water
NYS DEC
625 Broadway
Albany, NY 12233

Dear Mary Jane, Ken and Mark,

Your recent campus visit regarding Cornell University's Lake Source Cooling project was reported by our colleagues on the Cayuga Lake Monitoring Partnership (formerly the Water Resources Council/Cornell University Monitoring Partnership). It was encouraging to hear both about the visit and that the discussion focused on sound science and a sharing of viewpoints. This is exactly the approach the Tompkins County Water Resources Council (WRC) and Cornell University used in 2004 when we began discussing Lake Source Cooling (LSC) and Cayuga Lake. We now have a membership that is far broader than just the WRC and the University working collaboratively to address lake issues.

The Water Resources Council approved a Joint Statement (attached) detailing the collaborative partnership between the WRC and the University in 2007. The Joint Statement also includes the WRC's opinion, based on review of all the available data at that time, that "the scientific consensus to date is that LSC does not contribute" to impairment issues in the southern end of Cayuga Lake. Since the Joint Statement was issued, more studies, reports and presentations have been forthcoming, all of which continue to support the conclusion that LSC is not harming the lake. Moreover, comparing these studies provides valuable insights to the state of Cayuga Lake:

- Cayuga Lake, including the southern basin, is well within mesotrophic metrics with the exception of limited storm events;
- Dramatic improvements have been made in both urban (publicly owned treatment works) and rural (agriculture) practices to reduce loading of both sediment and phosphorus;
- Sediment and sediment-bound phosphorus loading is dominated by the streams, and the stream load is dominated by legacy sources (glacial deposits and sedimentation from pre-1900 agricultural practices), not current land use practices;
- The loss of wetlands in the southern basin creates a situation where turbid water and mucky lake bottoms are to be expected. Over time, the sediments deposited in the lake will reform lakeshore wetlands;
- The expectation of clear water suitable for swimming in the southern end of the lake is counter to the natural forces at work there;
- The use of total phosphorus (TP) as an indicator of trophic state is flawed in that it is not correlated to chlorophyll levels on the southern basin;
- Most importantly, the focus on TP and LSC has become a stumbling block to any discussion of the whole ecology of the lake, research needs, reasonable use expectations and sound management approaches

It is increasingly frustrating to see anecdotal information and emotional appeals featured in the newspaper or serious discussions on lake management, while professionals from a number of disciplines, who understand Cayuga Lake's complex ecosystem, are seemingly marginalized.

The Cayuga Lake Monitoring Partnership hopes to raise the level of discussion regarding Cayuga Lake and its watershed through promotion of sound science.

To date the Partnership has accomplished the following:

- Served as a springboard for collaborative monitoring efforts and grant applications;
- Developed a working and flexible monitoring plan, (attached) which has served as a platform for important data sharing, research projects and grant writing;
- Promoted in-depth give-and-take discussions through community forums, and a monthly series in the Ithaca Journal on Cayuga Lake and its related challenges and opportunities, Cayuga 2.0, examples attached;
- Steadily consulted and worked with the Tompkins County Water Resources Council, Finger Lakes Institute, Cayuga Lake Watershed Network, Community Science Institute, Floating Classroom and other entities, including local governments, on the health of the lake and related issues, including the dominant role that tributaries play in this ecosystem.

The Partnership stands ready to help the DEC in its work tied to Cayuga Lake, including help in developing a greater understanding about the complexity of the system and sharing with the public the vast amount of data that has been collected since the onset of Lake Source Cooling. These data go a long way toward answering questions about pollutants, the health of the lake, and setting the boundaries for ecologically sound uses of the lake. This last item, ecologically sound uses, has highlighted the disparity between public perception and ecological reality regarding the lake.

The Tompkins County Water Resources Council is also available to assist the DEC in promoting scientifically based management approaches for Cayuga Lake. The WRC has fostered more than just the work of the Partnership through the efforts of the Wetlands Committee, Aquifer Committee, and Recreation Committee (reports attached). The WRC also has an Education Committee and is prepared to assist the DEC with changing preconceived notions about healthy water bodies, including the locally difficult issues of why 'weeds' may be a good sign and how swimming is in conflict with ecological processes.

The work at hand requires open minds and a spirit of collaboration, rather than treading down old paths that may divide and divert. It sounds like the DEC, too, is seeking common, progressive ground.

Please let us know how we or various colleagues can assist you in your important work and deliberations.

Cordially,



Roxanna Johnston
Chair, Cayuga Lake Monitoring Partnership



Frank P. Proto
Chairman, Water Resources Council

cc: Pete Grannis, Commissioner, NYS Department of Environmental Conservation
cc: Rachel Crispell, Chairwoman, Tompkins County Ag & Farmland Protection Board

Enc.

City of Ithaca Water Treatment Plant

202 Water St., Ithaca, NY 14850 607-273-4680, FAX 607-216-0460
Charles Baker, Chief Operator, cbaker@cityofithaca.org



NY Lab Id No: 11811 EPA Lab Code: NY00981

Roxanna Johnston, Watershed Coordinator-Technical Director, rjohnston@cityofithaca.org

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August 6, 2018

Sarah Rickard
Bureau of Watershed Assessment and Management
625 Broadway, 4th Floor
Albany, NY 12233-3502

Dear Ms Rickard,

I am writing to provide comments on the Draft 2018 Section 303(d) list for Cayuga Lake. I serve on the Steering Committee for the Cayuga Lake HABs Action Plan, Chair the Monitoring Partnership Committee (Tompkins County) and am the Watershed Coordinator for the City of Ithaca. In my role on the Monitoring Partnership Committee, I also served on DEC's Technical Advisory Committee to the Cayuga Lake Modeling Project (CLMP) and have helped with outreach surrounding the phosphorus TMDL being developed for Cayuga Lake.

DEC required the CLMP as part of Cornell's Lake Source Cooling SPDES permit. DEC participated in designing every aspect of the project and had final approval of the project. The goal of the project was to lay the groundwork for the future phosphorus TMDL for the southern end of Cayuga Lake.

The current NY standard for phosphorus (and nitrogen) as stated on DEC's web page is, "*None in amounts that result in the growths of algae, weeds and slimes that will impair the waters for their best usages.*" The CLMP determined that phosphorus loads were not contributing to growths of algae, which has been the focus of DEC's impairment listing. Weeds can also be ruled out based on the substantial data collected by Robert Johnson first as the manager of Cornell Ponds and more recently as the proprietor of Racine-Johnson Aquatic Ecologists in support of the Hydrilla eradication program. I am not aware of any concern over slimes from DEC or the public.

Based on the results of the in-depth, 3-million-dollar project, which DEC helped design and approved at every step, I do not see how Cayuga Lake can remain on the 303(d) list for a phosphorus impairment. **I request that DEC review the CLMP results and consider removing the phosphorus impairment listing for Cayuga Lake.**

I am also submitting comments on the updated Cayuga Lake WI/PWL fact sheets. The fact sheets, at least for Cayuga Lake, were updated sometime in 2018 as part of the HABs Action Plan development. While DEC is not soliciting formal comment on these, the generic WI/PWS fact sheet states that input from watershed partners will be solicited through workshops, worksheets and review of the draft updates before the Final WI/PWL Assessment Report is issued. Also, per the generic fact sheet, these documents are to provide a consistent and objective inventory, and a record of water quality history for New York waters. These fact sheets make up Appendix E of the Cayuga Lake HABs Action Plan. They contain many errors and cannot therefore be used to provide focus for management priorities or be used to measure progress, the two other main objectives of the WI/PWL fact sheets. I request that DEC make watershed partners aware of these updated documents and solicit comments to improve their basic accuracy, so they can be used in the manner they are meant to be.

Sincerely,

Roxanna Johnston
Watershed Coordinator, City of Ithaca

Cc: Scott Cook, Finger Lakes Hub Supervisor

Cayuga Lake HABs Action Plan, Appendix E WI/PWL Fact Sheets

General Comments:

All 4 management sections reference zebra/quagga mussels as part of the cause of increased algal biomass, however, the Cayuga Lake Monitoring/Modeling Project (CLMP) summary found that algal abundance had NOT increased despite the rising levels of bioavailable P in deep water– can both be true for Cayuga Lake?

The Intermunicipal Organization's (IO) Restoration and Protection Plan (RPP) update is referenced in all 4 management sections. Why? DEC does not actively support or participate in the IO. The IO was established in 1998, not 2017. The IO and the RPP could be valuable for implementation of a 9E Plan if there was active collaboration with the State.

The North and Main Lake sections both list non-point sources (NPS) as the generic source for pollution then state under "Source Assessment" that there are no apparent sources of significant pollutant loading to the waterbody and no action is suggested. This raises the question, are the threats real? If so, why is no action suggested, if not, why do the threats remain listed?

Comments by management section:

- Northern End:
 - Not listed despite swimming beach closure due to algal growth (green and cyano) and turbidity. How is this not listed but the south end is listed over lack of a swimming beach?
 - *Cladophora* increase supported by changes in observations from Bloomfield (early 70's) to now. NPS listed as suspected source of pollution. Further reading of the same document says that NPS is not the source? What is likely source then?
- Main Lake, Mid-North:
 - Is it proper to assess the water supply as threatened when it isn't? Is it proper to use the 'threatened' criterion as a protective measure? I'm unsure if the Priority Waterbodies List (PWL) was designed to be used this way. Also, is this approach being used consistently across the state?
 - The Department of Health Source Water Assessment Program (SWAP) is cited as the source for threats to drinking water supplies on Cayuga Lake. I believe this is an improper application of the SWAP. SWAP lists vulnerabilities or possible threats to the source of the drinking water supply. SWAP is meant to guide protective measures, not list active impairments. It is not the same as listing a waterbody as threatened on the PWL.
 - Section description has typo: It should be 'Cooney Corners Rd.', not 'Coonley Corners Rd.'. Also, a search on Google finds no Cooney Corners town, so the reference point becomes an entire NS running road from which to start an E-W transect across the lake. A better description should be developed. Perhaps using an intersection on the road?
- Main Lake, Mid-South:

- Bolton Point supplies the TOWN of Ithaca, and others, with drinking water. It does not supply the CITY of Ithaca with drinking water.
- It is a bold new approach to say that waterbodies are threatened based on disinfection by-product (DBP) levels in drinking water systems. I'm not sure it's valid. Or maybe it is a great idea. Regardless, equating chlorophyll measurements, treatment process changes and changing regulatory requirements to a threatened drinking water supply is tenuous at best, and potentially irresponsible. Regardless, is this standard being applied uniformly? For example, are Fall Creek and Six Mile Creek also listed as threatened due to DPB issues? All 3 large water suppliers have made operational changes to address increasing regulation of DBP's in our finished water.
- I repeat my concern about the use of the SWAP. It was not intended as a listing mechanism for the PWL. SWAP information would be more appropriately incorporated in updates to the Watershed Regulations and Rules.
- 3rd PP under 'Use Assessment' says chlorophyll-a levels routinely exceed 4 ug/L, 1st PP under 'Water Quality Information' says chlorophyll-a levels occasionally exceed..., which is it?
- What is this reference NYSDEC/DOW, BWAM, March 2018?
- 3rd PP under "Water Quality Information" infers that chlorophyll-a levels have increased due to increases in bioavailable P, while noting that overall TP has not increased. The previous bullet pointed reference is cited, where can this reference be found? What is the statistical significance of these apparent increases? How do these trends compare with historical data?
- Southern End:
 - 'Overview': CLMP found that P was not a source of impairment for use of the southern end of Cayuga Lake. How come that work, which DEC helped develop and oversaw, is not reflected here?
 - 'Overview': Silt/Sediment is a reason for lack of a swimming beach, but no work is planned to target that. Why?
 - 'Overview': The other 2 management sections that designate the drinking water use as 'threatened' both contained explanatory language that this term 'threatened' was not being used in the traditional manner. Why is that language missing here?
 - 'Use Assessment', 2nd pp: There is no basis for the inference that the City of Ithaca did not choose Cayuga Lake for its new drinking water plant due to water quality concerns. There is no question that Cayuga Lake's water is fine as a drinking water source. This statement is irresponsible as it calls into question the quality of drinking water being provided by Bolton Point.
 - 'Use Assessment', 3rd pp: Primary and secondary contact recreation were considered to be impaired (by the DEC) due to elevated nutrients and algae. Both of those concerns were addressed and refuted by the CLMP. Why are those results not reflected here?
 - 'Use Assessment', 3rd pp: Implying that *Hydrilla* ever threatened contact recreation in this section of the lake is misleading. There were 2 areas in

streams that were thick with the plant; off the Farmer's Market in Cascadilla Creek and off the CU boat launch in the Inlet. Linderman Creek was also clogged but not an area of any imaginable recreation.

- 'Water Quality Information', 3rd pp: Here DEC states that chlorophyll-a levels rose while TP went down but that bioavailable P 'may' have gone up. It seems shaky to make the bioavailable P connection without some evidence that it went up. During this same timeframe we know that waste water P loadings decreased dramatically. That would tend to favor a decrease in the proportion of bioavailable P.....
- 'Source Assessment', 1st pp: The CLMP work is referenced....but later a report from Tompkins County Planning Department dated 2003 is used to highlight possible sources of P pollution. The CLMP work is more recent and more exhaustive than anything published by the TCPD (with respect). The CLMP results should be highlighted here. That work was done as the basis for TMDL development but it is being systematically excluded from the rationale. Specifically, Lake Source Cooling and the 2 large lake discharging waste water plants are listed as possible sources of P. They have been found to be insignificant. The tributaries are the major source. Increasing development along the streams was also debunked in earlier work done by Greg Nagel, et.al.
- 'Management Actions', 4th pp: Implying that the *Hydrilla* eradication effort failed is misleading at best. The original finds of *Hydrilla* in the Inlet, Cascadilla and Six Mile Creek have been eradicated. *Hydrilla* in Fall Creek was discovered later but presumed to always have been present, it is not considered a later 'spread'. It has also been eradicated. None of that would have been possible without the rapid response of locals and eventual support from the State. Very high flow events occurred just before the initial Inlet and Fall Creek treatments. These are likely the source of the spread in the south end of the lake. These are small patches that are well contained and likely to be eradicated. The Aurora population is estimated to be as in the same age range as the initial Inlet population. It may not have spread after treatment began, but before.

City of Ithaca Water Treatment Plant

202 Water St., Ithaca, NY 14850 607-273-4680, FAX 607-216-0460
Charles Baker, Chief Operator, cbaker@cityofithaca.org



NY Lab Id No: 11811 EPA Lab Code: NY00981

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Bureau of Watershed Assessment and Management
625 Broadway, 4th Floor
Albany, NY 12233-3502

August 23, 2018

Dear Mr. Cook,

I am writing as a member of the Steering Committee to provide comments on the final Harmful Algal Bloom Action Plan for Cayuga Lake. A great deal of work went into creating these documents in a short time frame. They are meant to provide a basis from which to approach HABs management and a context for specific projects. As such, it is important that the documents are as accurate as possible. Some of my concerns are listed below:

- I appreciate that a mechanism has been made available for the public to provide input to this living document. However, the Steering Committee and other relevant participants, do not have a process for reviewing comments, responding to comments or updating the document.
- Much information presented in the plan is generalized lake management or finger lakes water quality trends. While that is valuable background material, generalized information should not be the focus of a management document for Cayuga Lake, especially when there is so much data available specific to this lake. The goal of the Action Plans was to look at 12 lakes that were *different*, thereby finding different successful approaches that could be duplicated in a wide variety of New York lake systems. A lot of that opportunity is lost if the originating plan doesn't highlight specifics that are known about each water body.
- DEC required the Cayuga Lake Modeling Project (CLMP) as part of Cornell's Lake Source Cooling SPDES permit. DEC participated in designing every aspect of the project and had final approval of the project. The goal of the project was to lay the groundwork for the future phosphorus TMDL for the southern end of Cayuga Lake. The CLMP found that total phosphorus was not linked to chlorophyll levels or algal abundance in the southern end of the lake. Not only is this not stated in the Action Plan, is it contradicted many times with the assertion that it is 'known' that phosphorus is impairing the use of the lake. This contradiction should be addressed. The results of the CLMP study are the most recent and most thorough investigation of the trophic state of Cayuga Lake. These results should be the basis for management options to optimize water quality in the lake.
- I am not submitting comments here on the updated Cayuga Lake WI/PWL fact sheets or Appendix E of the final Action Plan as those comments were previously submitted on August 6th, 2018. The WI/PWL fact sheets of Appendix E contain many errors that impact the Action Plan as a whole.

It is with the goal of improved accuracy that I submit the following comments. I appreciate the effort that went into creating this document and am hopeful that the State's interest in this topic will lead to improved water resource management across the State. I look forward to hearing from Hub staff regarding my comments and future work with the Finger Lakes Hub and DEC on water quality projects.

Sincerely,

Roxanna Johnston

Suggested edits and General comments on the Final Cayuga Lake HABs Action Plan

Prepared by Roxanna Johnston, Steering Committee member

August 23, 2018

Note, page numbers for *Executive Summary* are as listed in your word processing program, no page numbers are given in the actual document. Page numbers for the *remaining document* are as listed in the document.

1. Pg. 3 of Exec Summ, 2nd PP. Please present that data that supports the assertion that phosphorus is proven to impair recreation in the southern end of Cayuga Lake. DEC's own study, the Cayuga Lake Modeling Project (CLMP), proved this to be untrue.
2. Pg 4 Exec Summ 2nd PP. Link for funding stream - all trace back to CFA which is largely panned by users of the program. It is a significant hurdle to accessing funds.
3. Pb 4 Exec Summ 3rd PP. Appreciate the inclusion of a process for providing comments. Please see comment #1 under General Comments near the end of this document.
4. Pg 4 Exec Summ NYS blue box, item 1 Suggest removing the number 0.3. Most readers will not be able to distinguish this from a regulatory limit. Suggest instead: "The U.S. EPA recommends health advisory levels in drinking water, see section 3.2.2." Also recommend dividing section 3.2 into two sections, 3.2.1 for the details regarding surface water suppliers, 3.2.2 for the EPA health advisory language. It will make finding the health advisory information easier.
5. Pg 7, section 1.3, 4th line, delete "(e.g., phosphorus)": Many experts have stated that phosphorus is not the sole nutrient driving blooms. Highlighting is at this point in the document will leave many readers with the impression that phosphorus is the only nutrient of interest. Also, the Cayuga Lake Modeling Project showed the increases in phosphorus were not with increases in chlorophyll alpha or algal blooms in Cayuga Lake. This plan is meant to be focused on Cayuga Lake, those specifics should be highlighted.
6. Pg 11, section 2.4, top of page. It's difficult to believe that lake turbidity can increase enough to make drinking water treatment difficult when we treat Six Mile Creek water year-round with turbidities that can easily reach between 2-3K NTUs. I reached out to Glenn Ratajczak at Bolton Point to get some stats. Bolton Point's max turbidity was 0.130 NTU for 2017. The highest the current Production Mgr has seen is 12 NTU. The max remembered by retired staff is 100 NTU. The plant did shut down to let that pass as they had ample water in storage and didn't need to ramp up chemicals to continue production during the short-term event.
7. Pg 11, section 2.5. Seems like "Lake Origin" should be the first section, not the last.
8. Pg 19, section 3.7 Replace "Other Uses" with "Fauna" or "Terrestrial Animals"?
9. Pg 23, second to last PP, section 5.1 Lake Monitoring, DBP study: Has DEC adopted the numeric criteria for phosphorus (12 and 17 ug/L respectively) or chlorophyll (4 and 6 ug/L respectively) for drinking water lakes and reservoirs? If so, when did these go into effect? If not, is there a plan to adopt them in the near term? If these criteria have not been adopted, can they be used to regulate water bodies? What about lakes where TP amount does not correlate with chlorophyll level, as found in Cayuga Lake by Upstate Freshwater Institute in the CLMP? How would these criteria be modified for hardwater, alkaline lakes with high inputs of inorganic particulate matter?
10. Pg 24, 1st PP. John Halfman's data is specifically excluded. Do not include it in this document. Or, see below, include it and other relevant datasets with the appropriate caveats regarding QAPPs and ELAP.

11. Pg 24, 2nd pp. What is the goal of excluding water quality data not collected under a QAPP and analyzed by a certified lab? The cost is the loss of vast amounts of historical and current peer reviewed research that could fill in gaps, help with trends, etc. Also lost will be most of the water quality data collected by utilities. Most are not ELAP certified, and even if their samples are processed by a certified lab, they are not collecting samples under a QAPP. These data sets can go back a hundred years. Relying solely on “officially approved’ data limits information so drastically as to call into question the ability to make accurate statements.
12. Pg 24, 3rd PP. Either the CSLAP data can be applied to the whole lake due to mixing, or it cannot. This paragraph tries to have it both ways. Better to simply state that CSLAP data reflects only the mid sections of the lake and stop there. None of the data sets used in the following water quality graphs cover the whole lake. All the data sets are limited in scope and time.
13. Pg 25, 2nd to last pp. Because this plan is supposed to be about CL specifically, it should be noted that using TP as an indicator of trophic state on the southern shelf has been proven to be inaccurate. The exceedances of the guidance value are almost all storm driven and the TP is almost entirely unavailable for algal growth. TP is meant to be sampled mid lake, not at shallow near shore areas. It should further be clarified that extensive data shows that TP on the southern shelf is not correlated to chl a and that there is no evidence of increased algal blooms from the storm driven inputs.
14. Pg 25 Sec 6 and Pg 26, Table 2. This is the place to discuss research that shows TP is not contributing to growth of algae at the southern end of Cayuga Lake, most notably the results of the CLMP. Exclusion of this data almost seems purposeful and is certainly not helpful in guiding appropriate actions to improve water quality. Also, secchi disk transparency was shown to be “compromised as a surrogate measure of trophic state in this system of lakes”, Peng and Effler, 2005 *Inorganic tripton in the Finger Lakes of New York: importance to optical characteristics*, with acknowledgements to Cliff Callinan and the NYS DEC.
15. Pg 27, section 6.1. The same applies to this section. The work done by Effler et al and UFI should be discussed here. Several papers were written on Cayuga Lake discussing the importance of tripton (inorganic particulate matter), rather than algae, to matters of clarity. It would also be a good place to mention whiting events which can be mistaken for algal blooms. (all Effler UFI docs)
16. Pg 27, section 6.1, 1st pp, 2nd to last sentence. Halfman 2017 is cited. Per DEC’s rules Halfman’s data should be excluded. DEC should provide justification for inclusion of this data as opposed to other data of similar quality.
 - a. Pg 28 - No change in water clarity noted – GOOD
 - b. Pg 28 to 29 – No change in surface water temperature – GOOD
 - c. CSI data could be used in the graphs on page 28 and 29. Why is it excluded? It would fill in some of the gaps in years. There is a QAPP and the lab is certified.
17. Pg 30, Figure 8. Halfman’s data should be excluded (or more data should be included).
18. Pg 30-31. Sec 6.2 found NO change in TP levels for the lake as a whole. Only the mid-south location section showed an increase, whereas the south, mid-north and north sections did not. Why then, is the TMDL focused on the south section? Why is there a TMDL? No increase in P, no increase in temp, no decrease in clarity....
19. Pg 33, 1st pp. Halfman cited
20. Pg 34, 1pp. Improved discussion of P and N levels.

21. Pg 35, fig 13. Halfman cited
22. Pg 37, discussion chlorophyll and DBPs. The chlorophyll threshold is not a number of any import (at least I don't think DEC has a regulatory value established). Including a number recommended by staff doesn't seem like a good anchor for later arguments about appropriate chl levels. Also, there should be more definitive (or originating studies) to cite regarding chl levels and potential DBPs than DEC staff. Studies that have been reviewed by more scientists should be the basis for this discussion. Cliff Callinan's research could then said to align with the body of work, or something like that.
23. Pg 37, last sentence referring to drinking water intakes. This does not need to be a speculative statement. BP and other surface water purveyors were asked to collect samples in July of this year. The State DOH ran the samples. Information on the depth of intakes and chl a levels is available. It is likely some facilities have older chlorophyll data as well. Also, Halfman likely has chl profiles on the lake, or other researchers have data on this. Speculating about possible impacts on the drinking water could create concerns about a problem that may not exist..
24. Pg 38. 6.4 Other Conditions. There is a newer paper by Makarewicz (2017) specifically detailing alewife driven trophic changes that favor cyanobacteria in Conesus Lake. Is there data on the appearance and population trends for alewife in Cayuga Lake? Is research targeted for this topic? It seems important to follow-up given the lack of a direct connection between TP levels and algal biomass in the lake.
25. Pg 39. 6.5 Remote Sensing. A discussion of the limitations of chl a as an indicator of algal biomass and trophic state is warranted. BGA move up and down the water column so surface measurements are limited in use for trending 'quantities'. Algae populations shift continuously and algae have varying amounts of chl a in their cell walls – again limiting the ability to ascribe changes in chl a measurements to linear changes in algal densities. (or relative chl a measurements to relative algal density). Effler and others have authored papers on this topic, specifically focused on Cayuga and other Finger Lakes. Also, whiting events should be addressed here as remote sensing can 'mistake' a whiting event for an 'algal bloom' (Halfman, 2018 HABs symposium).
26. Pg 43. section 7.1, 1st PP, second to last sentence: Shoreline surveillance networks are listed as not yet established. Suggest rewording to say that shoreline networks will be in place for 2018....
27. Pg 44. section 7.1, Table 4. Please include a map of confirmed habs for 2014-2017. I recognize the extent of the bloom can't be mapped, however, knowing the location of sample collection and confirmation still provides an idea of the extent of the problem.
28. Pg 52, 4th pp. The Cayuga Lake Modeling Project proved that the southern shelf is not impaired by phosphorus. Excessive growth impairing recreation has yet to be documented in any credible way in the southern end of the lake. DEC should justify why they are continuing to develop a P TMDL instead of a sediment TMDL.
29. Pg. 53. Table 8: HABs, aquatic plants and algae are listed for the south of Cayuga Lake. Again, where is the justification for this being related to P levels, or the justification for it AT ALL? Where have the HABs been on the south end of Cayuga Lake? What public swimming beach is closing? How is it different than any other portion of the lake where there is NO PUBLIC SWIMMING area? The swimming beach off Stewart Park was closed due to sediment related turbidity.

30. Pg 53, Section 8.2, last sentence. It is worth noting that several of these permitted dischargers have undertaken extensive updates since 2004, the date of the cited source. Actual relative inputs can be published here based on the results of the DEC commissioned CLMP study.
31. Pg 54, last PP of section 8.2 SWAP. The pp states that State is working with stakeholders to develop SWPP structure. Please provide contact information. The local health department is unable to provide information on this topic. I do not believe they are aware of or engaged in this process, which seems odd. Specifically, this language continues to be included in our annual drinking water report, the local HD does not know about this effort or when/if might be completed: *J. SOURCE WATER PROTECTION The New York State Health Department is in the process of developing a Source Water Assessment Report for every surface drinking water source for the state. When the reports are completed, the water systems will review them and provide a summary. If these reports become available in 2017, a summary will be posted on the website and provided in next year's AWQR...*
32. Pg 55, Section 9. Very interesting work. Promising things to track.
33. Pg 60, 10.0, Figure 23. It would be useful to see a list of the percentage of land cover by each use alongside it's percentage of phosphorus load (TP and SRP) and nitrogen.
34. Pg 61 – A 3rd map showing bloom confirmations would be informative.
35. Pg 63, 4th pp. **It should be noted that LSC is not a discharger but rather is circulating in-lake water from deep to shallow. It is not a source of anything but may be a conduit for circulation of autochthonous nutrients.**
36. Pg 63, last 2 PP of LENS section: are somewhat redundant. This information was given earlier in the section
37. Pg 64, section 10.4: The TMDL is mentioned throughout. What is the timeline and process for update this HAB Action Plan once the TMDL is published?
38. Pg 66, 12.4, 3rd pp. How will the recent court ruling effect CAFO regulations and possibly this HABs strategy document? CAFO permits should be briefly explained here as well.
39. Pg 66, 12.5 Research Activities. Is DEC endorsing or funding the Halfman research? If so, that should be clearly stated (and would explain the inclusion in the water quality section of the report), if not, it's odd to mention this 1 research project when so many exist
40. Pg 66, winter sampling. Yay! Will that continue?
41. Pg 66, last pp, suggested addition to research section. As suggested by Dr. Dave Bouldin, soluble reactive phosphorus levels in deep CL waters should be measured prior to stratification, after major snow melt and prior to leaf out (March or April). This can easily be accomplished by taking a sample from LSC. These samples can be analyzed for a variety of P forms at the CU Nutrient Lab. There is no need to complicate sampling or disregard this easy access to deep lake water. Surface water chlorophyll should be tracked in summer. The former is predictive of the latter.
42. Pg 67, 1st full pp, end of research section. Tell us what the CL results were, not other lakes unless as a comparison.
43. Pg 67. TMDL vs 9E. **This section still does not address the question of why CL is getting a TMDL when the sources of the loading are well understood to be non-point source. It would be understandable to say that the TMDL planning process was already underway before EPA and NYS had fully adopted the 9E approach, as a 9E Plan is obviously the right fit for CL.**

44. Pg 69, 13.1.1 P forms, last pp mentions practices designed to reduce soluble P. As we are likely to be unfamiliar with these practices it would be helpful to provide a table or list rather than expect us to find and review 3 research papers before considering a local project for funding.
45. Pg 69, 13.1.2 last PP. Love this section about road ditches. Nice addition.
46. Pg 70, Steering committee members: Darby Kiley represented the Tompkins County Water Resources Council (WRC), not Cayuga County. She now works for the Tompkins County Planning Department and is no longer the Chair of the WRC but does provide staff support.
47. Pg 70, section 13.2: *"The priority projects listed below have been developed by an interagency team and local steering committee that have worked cooperatively to identify, assess feasibility and costs, and prioritize both in-lake, if applicable, and watershed management strategies aimed at reducing HABs in Cayuga Lake."* This section is not an accurate reflection of the involvement of the Steering Committee members. We were in the room for 2 events with short notice and no advance agenda or materials to review. Our input was severely limited by that process. Feedback on the draft document was also time restricted and we were instructed to not gather input from the very groups we represent.....not the best process and definitely not cooperative.
48. Pg 71, funding. I will be sure to point folks to the New York State Water Quality Rapid Response Team (NYSWQRRT) to help them navigate the CFA process. At the recent HABs Symposium in Geneva NY, Amy Clinkhammer was also given as a contact for help with funding. I'm not convinced the Rapid Response Team or Ms. Clinkhammer are really prepared to provide technical and grant writing assistance as this was never discussed with the Steering Committee.
49. Pg 79, 13.5 In-Lake Mgnt: This language was deleted from the final document; *"However, there is a series of reservoirs (Sixty Foot Reservoir, Thirty Foot Reservoir, and Van Natta Reservoir) within the Sixmile Creek system; more information is needed to evaluate their contribution to seasonal release of phosphorus that is then conveyed to Cayuga Lake."* As a member of the Steering Committee and an employee of the utility that uses (or has used) all of these reservoirs, I would like know more about why it was proposed and why it was subsequently deleted. If there's a need for this information, it could be collected using staff and resources at the Drinking Water Plant. Quite a bit of phosphorus data was collected above these dams at the USGS gage at German Cross Rd. in the early 2000's. That data has been supplied to DEC since the draft document was shared.
50. Pg 73-74, Priority 1 Projects, 3 years, my summary bulleted below in small font. A = Ag, M = Muni: There is a major emphasis on Agricultural projects with a secondary focus on Municipal or State road projects. With a target of 3 years and the plan released too late for most applications to go in for 2018, most projects won't be awarded funds until late in 2019. So, most projects would start until 2020. Was any funding fast tracked to get projects started earlier? What assistance will be provided to SWCD's to implement a new round of projects that were not previously in their work plan (staff support, grant tracking, managing funds, etc.)? Will there be State representatives to work with municipalities providing similar support or fast tracking of funds?

Runoff reduction BMPs -- A+M

Cover crops - A

Field erosion control systems - A

Streambank stabilization -- M+A

Install control structures at outlets - M

Barnyard runoff BMPs - A

Pilot drainage tile BMPs - A

Establish or improve/repair riparian buffers -- M+A

Road ditches - M

Control timing

Proper sizing of structures

Ditch stabilization during and after work

Check dams or other measures to slow flow

51. Pg 74-76, Priority 1 Projects, 3 to 5 years, my summary bulleted below in small font. A = Ag, M = Muni: Most of these initiatives are not simple implementation projects but will require a sea change in long term commitment of staff and programmatic funding. Some of these require rule making. Will the State provide political and technical support to guide communities, agencies and organizations through this process? Regarding the funding for upgrading septics – the current money is very limited in scope and not designed to be a long-term program. Will the State revise that funding stream, in light of this HABS recommendation, to include second homes, homes not directly on the lake and to continue for a number of years? This would give Counties time to build the capacity required to perform the tasks recommended here.

Increase SWCD staff through appropriations (planners, engineers, technical staff) - A

Implement AEM tier 3A to reduce nutrients on crop and animal farms - A

Establish septic system program

Calls out current funding to address some lake shore septics – County HD

Build capacity of SWCD through purchase of equipment - A

Comprehensive municipal stormwater program (watershed wide) - M

Streambank stabilization – M+A

Tree planting – A+M

Livestock exclusions - A

Manure management - A

Shared equipment for incorporation and spreading

Covers, storage systems, recycling options

Acquire lands for conservation – PLLT + M + A

52. Pg 76, Priority 1 Projects, 5 to 10 years, my summary bulleted below in small font. Who does DEC envision will propose constructing wetlands? This sounds like a state level driven (or at least partnered) project. Has the State set aside funds for the feasibility studies. These are very specific and presumably have received earmarked funding. Will the State provide coordination of tile drainage mapping as that will cross watershed and agency boundaries?

Acquire and conserve land

Construct wetlands

Feasibility studies for sanitary sewer systems in Seneca Co. and Ledyard and Genoa

Map drainage tiles

53. Pg 78, Priority 2 Projects, my summary bulleted below in small font. Increasing SWCD staff is a given to accomplish any of the short-term goals and is explicitly call for in the long-term goals. Increasing staff requires increased building space, equipment and even vehicles. It seems beyond the scope of the funding to support this kind of expansion. Has the State given thought to how this might be done and how it will be sustained?

SHORT-TERM

Interseeder pilot project

Drones to inventory BMPs

MID-TERM

Increase SWCD staff to do ed/outreach and muni stormwater work

Increase SWCD staff to write non-CAFO N Mgmt plans and implement BMPs

LONG-TERM

Increase SWCD staff to assist with mapping and monitoring projects

54. Pg. 79-82, Monitoring, Research and Coordinated Actions: Many important items are listed in these sections yet none of these activities are listed as priorities for funding. These are critical components to effective use of funding and policy development. These should each be given a priority ranking, or better yet, be built in to implementation projects where possible. As the

document is currently listed, researchers, agencies and organizations like the Network and CSI will struggle to access HABs funds.

55. 104 Appendix D. Programs should be singular, NYSDEC only discusses CSLAP on this link. Using a whole page for a url might be better served with a short summary of CLSAP, then the URL. Why isn't DEC's WAVE program included here? (Water Assessments by Volunteer Evaluators)
56. Pgs 105-109 missing
57. Appendix E reviewed separately. Comments submitted to 303(d) list and HABs contacts 8/6/18, shared with Monitoring Partnership members and those on the e-mail list.
58. Appendix F mis-numbered, should be 124-125, not 110-111.

General Comments: *Highlighted comments are new or updates* to the list of general comments submitted for the draft HABs Action Plan:

1. Add a prescribed time for review and update of the action plan, who is responsible for it and who will be involved.
2. Please respond to steering committee members regarding comments that were not accepted into the final version of the HABs document. Saying that we worked collaboratively to write these documents is already a stretch. Ignoring comments without at least some feedback is not acceptable.
3. Did not see any reference to making funding application easier. I think that's an important component the State can address in the near term. Tee-Ann Hunter (IO Chairperson) and I started a conversation with Venetia Lannon about this.
4. Alkalinity and CaCO₃ and CO₂ should be monitored in the lake to better understand what role whitening events have on phosphorus removal, control of algal blooms and removal of organic matter from the system.
5. Dr. Bouldin's analysis of 50 years of data suggests a 6 yr RAA period for detecting trends in phosphorus changes. This is likely the best time-frame to smooth out hydrologic variability in the data and should be built into monitoring programs with respect to expected changes in the system.
6. Along with the above, Fall Creek (FC) flow data must be maintained to have an estimate of watershed loads to CL. The USGS gauge must stay funded. A second component that needs long-term funding support is phosphorus monitoring in FC. Dr. Bouldin suggests using FC as a model watershed and taking the flow and loading from it x 5 as estimates for total CL watershed inputs.
7. Climate change may be disrupting the C balance in the lake and related chemical and biological processes important to trophic state.
8. Climate change is likely to increase rain delivery of P laden sediments to CL through increasing intensity of storm events. How can this be buffered?
9. Data from Godfrey's thesis should be included in the baseline assessment of Cayuga Lake. A large volume of data on water quality and phytoplankton can be found in this document. It is the basis for many later research projects. The thesis can be found on CU e-commons at: <https://ecommons.cornell.edu/handle/1813/56393> The digitized data (as compiled by Erica Gardner at the City WTP) was provided to DEC.

10. Information on internal wave impacts on water quality (specifically nutrient levels on the S. shelf) can be found in Seth Schweitzer's thesis on CU e-commons at: <https://ecommons.cornell.edu/handle/1813/17147>
11. A newer look at the topic, focusing on inputs from Cayuga Inlet, can be found on e-commons here: <https://ecommons.cornell.edu/handle/1813/51620>
12. Greg Nagle's work shows that much of the sediment transport coming from Cayuga Lake tributaries is dominated by glacial deposits and historical land clearing practices. Addressing current practices is always the right thing to do but it won't erase the thousands and hundreds of years of sediment (and P) yet to move out of these streams: <https://ecommons.cornell.edu/handle/1813/7661>
13. Dave Matthews (UFI) authored an excellent article on all things TP, chl a, tripton, trophic state and more for Cayuga Lake. It should be referenced for baseline status and for future management plans (this and TMDL). You can find a copy here: <https://www.tandfonline.com/doi/pdf/10.1080/07438140209354152>
14. The new commitment to monitoring and funding of BMPs is good. However, much of the approach taken in the document is the same approach that's been in use for the last 50 years. What new do we expect to see from this effort and what new things do we expect to learn from the monitoring? I encourage more research into carbon cycling and climate change aspects relating to the trophic state of the lake. I also encourage new approaches to Right-to-Farm laws and state level road maintenance that are not in balance with clean water or environmental goals.
15. Encourage research into management options for dreissenids and better understanding of their natural population cycles. If they can be reduced like milfoil has been then perhaps P cycling in the lake would be less likely to lead to HABs.
16. Lakes and reservoirs as regulators of carbon cycling and climate by Lars J. Tranvik et. al., published in *Limnol. Oceanogr.*, 54(6, part 2), 2009 talks about the many different impacts climate change will have on hydrology and thus C cycling and productivity in lakes. BMPs on the landscape should be run through a matrix to insure their effectiveness based on climate and hydrologic changes expected in our region. A table of management approaches based on types of C changes is included in the document.
17. Commitment to long-term CSLAP mid-lake data collection is valuable. However, it will not address shoreline inputs and impacts.
18. Temperature, pH and alkalinity are important measures to capture in shallow, near shore areas. These can be captured by volunteers with simple equipment and/or kits to supplement CSLAP data.
19. This report seems to have little input from Cornell (or other research institutions) Agriculture, Soil Science or Cooperative Extension experts. Given that likely actions will include farming practices, target sediment retention and require buy-in from the public, it seems the above experts should have a role in the Action Plan.
20. Oglesby and Schaffner (and Schaffner and Oglesby) have articles from the early/mid 70's with important summaries of nutrient and chlorophyll relationships for Cayuga Lake and other Finger Lakes. These should be included in developing the baseline. One of them can be found here: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.587.1446&rep=rep1&type=pdf>

21. The steering committee and DEC should have a discussion of the various forms of phosphorus (SRP, TP, MRP, TDP, TDSP, etc.), available data, gaps and management approaches that will be effective. Which forms of phosphorus should we be measuring?
22. Effler and fellow researchers at UFI have written many papers addressing the importance of measuring organic and inorganic particulate matter separately. They have developed and tested new measurement methods that are far superior to past methodologies. For lakes like Cayuga, secchi disk is a flawed indicator of trophic state because so much of the relative clarity is driven by inorganic materials. I can provide publications, but some members of the current Hub team were part of that research and can therefore describe its relevance better than I.
23. Presentations and publications need to be very clear about what form of P is being presented. Current efforts have been a confusing mixed bag.

City of Ithaca Water Treatment Plant

202 Water St., Ithaca, NY 14850 607-273-4680, FAX 607-216-0460
Nathaniel Carman, Acting Chief Operator, ncarman@cityofithaca.org



NY Lab Id No: 11811 EPA Lab Code: NY00981
Roxanna Johnston, Watershed Coordinator-Technical Director, rjohnston@cityofithaca.org
www.ithacawater.org

Scott Cook
Finger Lakes Hub Supervisor
Bureau of Watershed Assessment and Management
625 Broadway, 4th Floor
Albany, NY 12233-3502

April 20, 2020

Dear Mr. Cook,

I am writing as the Chair of the Monitoring Partnership (MP), a committee of the Tompkins County Water Resources Council. The MP was formed during a permit review of Cornell University's Lake Source Cooling (LSC) facility where Cornell University (CU) was asking for modification of the LSC monitoring program. The first MP meeting was October 31st, 2006 where all lake monitoring efforts were discussed with the goal of developing a more strategic approach to monitoring the southern end of Cayuga Lake. The MP did develop a monitoring plan and presented it to the New York State Department of Environmental Conservation (DEC). Many suggestions from that plan were later implemented by DEC via an LSC permit modification for monitoring in support of developing a Total Maximum Daily Load (TMDL) for Cayuga Lake. The MP was invited by DEC to serve on the Technical Advisory Committee for that monitoring program in July, 2013. The MP remains active today providing a conduit for communication between all the monitoring entities on the lake and providing science-based comments on lake management topics such as a TMDL, harmful algae blooms and suggestions for improved monitoring. The Monitoring Partnership is submitting the following question and comments regarding the draft permit for Cornell University's Lake Source Cooling facility.

General Comment: It is worth noting that the research directed and reviewed by DEC and completed by Upstate Freshwater Institute and Cornell University professors does not support the designation of the southern end of Cayuga Lake as impaired by phosphorus.

- P. 3, Table 1, WASTEWATER TYPE: It should be stated in the permit that CU's LSC facility is circulating Cayuga Lake water. That is very different than discharging 'wastewater' into Cayuga Lake. A good place to address this would be to simply add the words 'Cayuga Lake' in front of 'Non-Contact Cooling Water' on page 3 in the 1st table under the heading: WASTEWATER TYPE. The cell would read, 'Cayuga Lake Non-Contact Cooling Water'.
- P. 3, pH min 6.5, max 8.5: We realize this is standard language in surface water discharge permits. However, it implies that the discharger has some control over, or impact on, this parameter. As CU's LSC facility only recirculates Cayuga Lake water, it would be more logical to make this a monitoring requirement rather than to set a minimum and maximum.
- P. 3, FOOTNOTES regarding possible TMDL based change to permit: Why is the DEC doing a permit that may change in a few months when the TMDL is published? This put a great deal of uncertainty on the permittee and seems unnecessary. We suggest waiting until the TMDL is published to do a permit to avoid potential near term changes that may have negative impacts on facility operations.
- P. 5, PHOSPHORUS OFFSET PROGRAM: Will this be a standard condition in all new/renewed discharge permits in Cayuga Lake? If not, why not?
- P. 5, PHOSPHORUS OFFSET PROGRAM, A, 2:1 offset:

- 2:1 seems overly conservative to account for inaccuracies in underlying calculations. Is 2:1 a standard ratio for this type of program? If not, what is the ‘normal’ ratio, or a common ratio, for offset programs? If not, why was it chosen for this program? If yes, please cite the reference in the permit or appendix.
- Will this be a standard condition in all new/renewed discharge permits in Cayuga Lake? If not, why not?
- P. 5, PHOSPHORUS OFFSET PROGRAM, A:1, Priority locations for offset BMPs: Please include a watershed map highlighting the respective subwatershed areas included in these priority locations.
- P. 5, PHOSPHORUS OFFSET PROGRAM, A:2, Design details for offset Best Management Practices (BMPs): Priority is given to BMPs that promote infiltration. This appears in conflict with the Cayuga Lake Harmful Algae Blooms (HAB) Action Plan that prioritizes BMP’s that target soluble reactive phosphorus (SRP). Further, work in the Lake Erie watershed found that some BMPs promoting infiltration actually increased SRP in runoff, more than negating the benefits of total phosphorus (TP) reduction.
 - We suggest DEC provide examples of BMPs that target SRP and give those priority or at least equal weight as those targeting TP.
- P. 6, PHOSPHORUS OFFSET PROGRAM, B:2-5, Verification and Tracking of BMPs: The permit states that verification does not required actual monitoring. We realize this is standard language. We suggest that monitoring be considered as one option to accomplish verification, tracking and effectiveness of BMPs.
- P. 7, SPECIAL CONDITIONS: CAYUGA LAKE WATER QUALITY MODEL PLAN, Stakeholder engagement: Cornell University assisted DEC with initial stakeholder engagement as part of their permit and as the leading partner in monitoring efforts. Cornell University has no role in the model development or subsequent TMDL. Furthermore, there is a significant portion of the public who view LSC and CU in an unfavorable light. To have CU assist the State in rolling out the State’s model and subsequent plans is at best confusing, as worst it undercuts the credibility of the DEC, the model and subsequent plans.
- P. 9, MONITORING LOCATIONS: Delete the map. It only confuses as all the monitoring is done inside the LSC facility.
- FACTSHEET P. 5, RECEIVING WATER INFORMATION TABLE, Wastewater Type: Change to ‘Cayuga Lake Non-Contact Cooling Water
- FACTSHEET P. 5, Impaired Water Body Information: Why is the DEC doing a permit that may change in a few months when the TMDL is published? This put a great deal of uncertainty on the permittee and seems unnecessary. We suggest waiting until the TMDL is published to do a permit to avoid potential near term changes that may have negative impacts on facility operations.
- FACTSHEET P. 5, PERMIT REQUIREMENTS, Anti-backsliding, last paragraph: It’s noted that relocating the Outfall off the southern shelf would not improve water quality conditions in the lake. This ignores the minor but consistent finding that the current outfall location provides a net benefit to water quality on the southern shelf. That should be included as this issue has been a major focus stakeholders for years.
- FACTSHEET P. 7, PERMIT REQUIREMENTS, Cayuga Lake Water Quality Manual, Stakeholder engagement: Cornell University assisted DEC with initial stakeholder engagement as part of their permit and as the leading partner in monitoring efforts. Cornell University has no role in the model development or subsequent TMDL. Furthermore, there is a significant portion of the public who view LSC and CU in an unfavorable light. To have CU assist the State in rolling out the State’s model and subsequent plans is at best confusing, as worst it undercuts the credibility of the DEC, the model and subsequent plans
- FACTSHEET P. 7, PERMIT REQUIREMENTS, Additional Modifications: It’s noted that relocating the Outfall off the southern shelf would not improve water quality conditions in the lake. This ignores the minor but consistent finding that the current outfall location provides a net benefit to water quality on the southern shelf. That should be included as this issue has been a major focus stakeholders for years. *It is disingenuous of the DEC*

to include negative cost impacts for CU while excluding small but sustained benefits from the current outfall location to the southern end of Cayuga Lake.

- We strongly urge the DEC to include the small but consistent water quality benefits from the current location of the outfall in this section of the FACTSHEET.
- FACTSHEET P. 9, Outfall and Receiving Water Information, Impaired Waters: It is worth noting that the research directed and reviewed by DEC and completed by Upstate Freshwater Institute and Cornell University researchers did not support the designation of the southern end of Cayuga Lake as impaired by phosphorus.

The MP appreciates the chance to comment on this draft permit. We also wish to express our appreciation of the continued engagement of DEC staff in our meetings. This dialogue builds stronger relationships between the researchers, community groups and local leaders who participate in our meetings.

Sincerely,

Roxanna Johnston on behalf of the Monitoring Partnership



Fostering Collaboration
on Water Issues

Training Environmental
Professionals

Coordinating
Water Research

Educating
the Public

January 3, 2011

Administrator Lisa Jackson
USEPA Headquarters
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Mail Code: 1101A
Washington, DC 20460

Dear Administrator Jackson,

The Northeast states recognize that nutrient pollution is a significant environmental problem that impacts many waterbodies in our region and nationwide. Efforts such as the Long Island Sound and Lake Champlain TMDLs and the Massachusetts Estuaries Project provide concrete examples of our commitment to reducing nutrient inputs to our waters. We appreciate EPA's continued focus on this issue and fully support EPA Region 1's attention to how nutrient issues in the Northeast are distinct from those in other parts of the country. Furthermore, all of our states have put significant effort and resources into the process of developing numeric nutrient criteria. While we have no intention of abandoning our efforts to develop and establish these criteria, we have significant concerns with the direction EPA is now taking regarding the independent applicability of numeric nutrient criteria. The New England Interstate Water Pollution Control Commission recently represented its member states at an Office of Water briefing hosted by EPA Region 1. There, we had the opportunity to share some of our concerns with your staff, and have highlighted them for you below.

A number of Northeast states have advanced numeric nutrient criteria development to the point of initiating the rulemaking process within their state to establish these criteria as part of their Water Quality Standards. The technical approach favored by many states bases criteria on strong scientific evidence using stressor-response relationships, where nitrogen and phosphorus are the stressors and environmental indicators are the response (e.g. chlorophyll-a, Secchi disk, indices of biological health). Because the relationship between nutrients and environmental responses is based on many site-specific factors and varies from waterbody to waterbody, these responses consolidate the many site-specific factors that must be considered for efficient application of criteria, and therefore are the most appropriate indicators of a waterbody's impairment status.

Thus, both Maine and Vermont are proposing criteria for freshwater that are based on a decision framework that takes into account both causal variables (nitrogen and phosphorus) and environmental responses relevant to each waterbody. While EPA has argued that single number criteria approaches should be used, no such uniformity of condition exists in the natural world. Because nutrients are not toxic contaminants with threshold responses, conditions demonstrated by acceptable biological responses that are reflective of a range of nutrient conditions are the most appropriate way to

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apply criteria. While ambient concentrations may be helpful in screening potential impairments, under a decision framework approach, a waterbody would be considered impaired only if one or more measured environmental response criteria did not meet limits, regardless of whether or not the established phosphorus or nitrogen criteria were exceeded. In the case that all measured environmental response criteria are met, the waterbody would not be considered impaired, even if nitrogen or phosphorus concentrations were above the state's numeric criteria.

Based on the final criteria established by EPA for the state of Florida, and feedback provided to the states of Maine and Vermont by EPA Region 1, EPA is not supportive of response-based approaches. EPA has taken the position that states can incorporate response variables but must include numeric nutrient criteria for both nitrogen and phosphorus and that each criterion must be independently applicable to determine a waterbody's impairment status. By taking this position, a waterbody could be determined to be in violation of water quality standards even when a biological impairment does not exist. In addition, by requiring both nitrogen and phosphorus criteria to be incorporated into state water quality standards and applied independently, technological controls could be required to remove both nutrients even though most systems are controlled by the most limiting nutrient (i.e., typically phosphorus in freshwater and nitrogen in marine waters). This added burden could result in significant increases in sludge production and treatment and energy costs, despite not being necessary to control eutrophication in most cases. We recognize that there are some POTWs that discharge to both freshwater and marine systems, but this is the exception and not the rule.

EPA Region 1 has recently suggested a framework that allows for a waterbody exceeding a numeric criterion but meeting acceptable levels for environmental response variables to be listed as "indeterminate" for its attainment status. We appreciate the Region's continued dedication to finding a solution that is workable for both parties, but we still have the same fundamental objection that a waterbody that is meeting environmental response criteria should be listed as attaining standards even if it exceeds a numeric nutrient criterion. We understand that EPA has concerns about implementing response-based criteria, but we feel that this is a question that is dealt with in permitting, not standards development. Further, the Northeast states have solid experience in crafting defensible and robust permits with effluent limits derived from these same response-based criteria. We are committed to working with both of our EPA regions to continue implementing these valid and defensible limits using already endorsed EPA methodologies.

In summary, the Northeast states believe that EPA has failed to produce sufficient scientific evidence or a viable legal or policy basis for the imposition of independent applicability of numeric nutrient criteria. In addition, the Northeast states do not agree that numeric criteria for both nitrogen and phosphorus are necessary for all waterbodies. Numeric criteria should only be required for the limiting nutrient in a system unless dual limitation is demonstrated.

The Northeast states have amply demonstrated that using environmental response variables to develop nutrient criteria is a scientifically valid approach that is highly protective of water quality. Many years of data collection and analysis have gone into development of these criteria. Furthermore, in their review of EPA's *Technical Guidance on Empirical Approaches for Numeric Nutrient Criteria Development*, EPA's Scientific Advisory Board (SAB) recognized that a stressor-response approach is a legitimate, scientifically-based method for developing numeric nutrient criteria when it is applied appropriately,



such as part of a tiered weight-of-evidence approach. The approaches being proposed by the Northeast states fall in line with this recommendation by the SAB, especially with respect to the potential range of acceptable nutrient concentrations, and their site-specificity, that a weight-of-evidence approach supports.

The Northeast states are very appreciative of the assistance provided by EPA Region 1 throughout the nutrient criteria development process and have every intention of continuing the scientific work that will build the foundation of their numeric nutrient criteria. We also plan to continue to address nutrient impairments through NPDES permitting, TMDLs, and adaptive watershed management, while criteria are being developed and put in place. However, the Northeast states are concerned about EPA's approach, and many states are taking the position that they will not proceed any further with adoption of numeric nutrient criteria until EPA has provided sufficient explanation of the legal requirement and scientific basis for the requirement for independent applicability of criteria. Once those concerns can be addressed, we will renew our commitment to the process of establishing these important criteria in earnest.

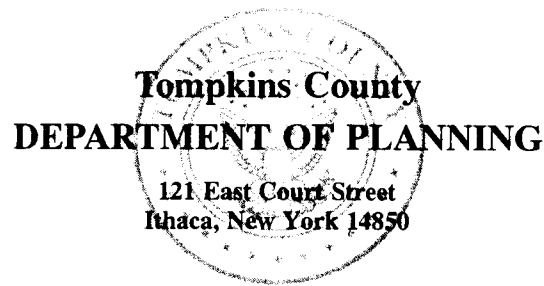
Thank you for your consideration of the concerns we have described. We are eager to continue working with you on this important environmental issue and look forward to your response.

Sincerely,

A handwritten signature in black ink, appearing to read "Ronald Poltak", is written over a faint, larger version of the same signature.

Ronald Poltak
Executive Director

Cc: Curt Spalding, Regional Administrator, EPA Region 1
Judith Enck, Regional Administrator, EPA Region 2
NEIWPCC Executive Committee



James W. Hanson, Jr.
Commissioner of Planning

Telephone (607) 274-5560
Fax (607) 274-5578

Memorandum

To: Water Resources Council Members
From: Kate Hackett, ~~KT~~
Date: November 13, 2000
Re: Draft Framework for Cayuga Lake Monitoring Plan

Cliff Callinan, an environmental engineer for DEC, is soliciting comments and suggestions on the attached draft Framework for a Cayuga Lake Watershed Monitoring Plan. Please note that this is a preliminary framework on which to build a more detailed and specific monitoring plan for the Cayuga Lake watershed. If you have suggestions for the development of a detailed monitoring plan, Cliff is open to these suggestions as well.

The goal of the plan is to develop a coordinated approach to comprehensive monitoring within the Cayuga Lake watershed. This is an important effort for the Cayuga Lake watershed as well as Tompkins County, and although there is not currently any funding for this effort, the final monitoring plan will be presented to EPA and several major grantors once it is complete.

Please review the attached and get back to me with your written comments by Wednesday, November 29. Other relevant organizations such as the Intermunicipal Organization and Tompkins County Water Resources Council are also being asked to comment. Thank you.

From: **Self <khackett@einstein.co.tompkins.ny.us>**
To: **"Clifford Callinan" <cwcallin@gw.dec.state.ny.us>**
Subject: **Re: EPA RUSS Unit**
Date sent: **Tue, 21 Nov 2000 14:36:40 -0500**

Hi Cliff,

Well, your previous email gave me lots of food for thought -- probably more than you thought it would. I apologize for not getting back to you in a more timely manner, but I have been seriously considering your request.

I am flattered that you asked, but unfortunately I think I have to decline in taking a lead role in developing this aspect of the monitoring program. This is a disappointment to me, not only because I think it is a great opportunity for me and I find this work interesting, but also because I like to be a part of the solution. As well, it would be an opportunity for me to collaborate with you and with DEC. However, at this time I am in the process of trying to develop a framework for a county watershed management plan, restructuring the county flood hazard mitigation plan, and developing a plan for conducting additional groundwater/surface water and aquifer studies in the county. As these issues must take precedence, I'm not sure I have the time necessary to taking a lead role in developing the part of the management plan.

I do have a couple of suggestions:

1. Perhaps we could identify someone at Cornell to take the lead on this aspect of the monitoring plan. Linda Wagenet or Pete Loucks might be able to help with this.
2. I would be pleased to assist in the development of this part of the plan or collaborate with others; I just can't take the lead.
3. If in March no one has offered to play a major role in this process, I might have more time.


I'm sorry to miss this opportunity and don't count me out of the process entirely: keep me in mind as someone who would still like to contribute to the process!

On another note, the Tompkins County Water Resources Council would like to submit comments to you on the draft framework. Would January be too late for them to submit something to you?

Have a safe and happy Thanksgiving,
Kate

On 10 Nov 00, at 10:24, Clifford Callinan wrote:

> Hi Kate,
>
> Hope I caught you in another pensive frame of mind. You know, of course, that one of the
this Email just such a request.
>
> Your kind words regarding the current state of the Report are much appreciated, and I cou
significantly. Please let me know if you would (can) consider taking the lead on this portion of tl
>
> Regards,
>
>
> Clifford W. Callinan, P.E.
> Environmental Engineer
> New York State Department of Environmental Conservation
> 50 Wolf Road, Room 398
> Albany, NY 12233-3508
> Office: (518) 457-0733
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>
>



Tompkins County Water Resources Council

121 East Court Street, Ithaca, N.Y. 14850
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www.tompkins-co.org/planning/committees.html

Vice President Stephen Thorn Golding
Executive Vice President for Finance and Administration
Cornell University
317 Day Hall
Ithaca, NY 14853

August 1, 2006

Dear Vice President Golding:

The Tompkins County Water Resources Council (WRC), an advisory board to the Tompkins County Legislature, is interested in exploring ways to make the current and future monitoring of Cayuga Lake more efficient and effective. To this end, the WRC would like to identify and discuss monitoring efforts that may have potentially beneficial outcomes to Cornell and the community, including, for example, the monitoring associated with the Lake Source Cooling (LSC) State Pollutant Elimination Discharge System (SPDES) permit and the "Real-Time Monitoring of the Cayuga Lake Environment" proposal submitted by Cornell professors Edwin A. Cowen and Nelson G. Hairston, Jr.

As noted in the attached letter from the WRC to Fred Gillett, New York State Department of Environmental Conservation, the WRC feels that the lake monitoring associated with the LSC permit has been very beneficial to the community and continuance of this monitoring through the current permit cycle has value. However, the WRC also recognizes that a thorough review of the data collected for LSC might indicate that efficiencies could be achieved by reducing the number of sites monitored or the number of parameters measured. Such reductions would meet the permit requirements for LSC while potentially allowing resources to be reallocated to monitoring efforts that would complement the data collected for LSC. To this end, members of the WRC are interested in working with Cornell representatives to initiate a more strategic plan for long-term monitoring of the ambient water quality in the southern end of Cayuga Lake. We envision that the data collected for the LSC permit (both in this permit cycle and in the next permit cycle) would be integrated into this plan and that the effort would include some supplemental monitoring, particularly if the monitoring associated with LSC is reduced. The intent of this plan would be to enhance the effectiveness and efficiency of monitoring in the southern end of Cayuga Lake while still meeting the needs of Cornell (in terms of administration and research) and community stakeholders (including local officials, public groups, and recreational users).

We hope that Cornell might use any cost savings associated with increased efficiency in monitoring to support long-term data collection in the southern end of Cayuga Lake. We feel that doing so would communicate a tangible sense of Cornell's commitment to the community and a treasured local resource. Environmental management can only succeed when this kind of stakeholder engagement occurs.

WRC members look forward to meeting with you to further discuss potential collaboration on this effort. If you have questions, please do not hesitate to contact me or Kate Hackett, WRC Coordinator (T: 274-5560, khackett@tom-pkins-co.org).

Sincerely,

Frank P. Proto, Chair
Tompkins County Water Resources Council

ENVIRONMENTAL HEALTH DIVISION
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MEMORANDUM

TO: Roxanna Johnston, Watershed Coordinator, City of Ithaca

FROM: Tompkins County Health Department; Environmental Health Division

DATE: June 24, 2021

RE: Permitted swimming in Cayuga Lake at Stewart Park

The Tompkins County Health Department (TCHD) issues permits for bathing beaches used for public recreation in Tompkins County. According to TCHD archive records, permits to operate a bathing beach at Stewart Park were issued each year from 1957 through 1964. During that time period, multiple beach closures were documented due to turbidity from siltation, high e.Coli levels. At least two drowning deaths occurred at Stewart Park between 1961 and 1964. In 1964 following the death of an adolescent boy, TCHD rescinded the permit and closed the bathing beach. To date, no additional bathing beach permits have been issued for Cayuga Lake at Stewart Park.

City of Ithaca Water Treatment Plant

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Charles Baker, Chief Operator, cbaker@cityofithaca.org



NY Lab Id No: 11811 EPA Lab Code: NY00981
Roxanna Johnston, Watershed Coordinator-Technical Director, rjohnston@cityofithaca.org
www.ithacawater.org

September 16, 2019

Scott Cook
Finger Lakes Hub Supervisor
Bureau of Watershed Assessment and Management
615 Erie Boulevard
Syracuse, NY 13204

Dear Mr. Cook,

I am writing as a member of the Steering Committee for the Harmful Algal Bloom Action Plan for Cayuga Lake (Action Plan) about its relationship to the pending Cayuga Lake Total Maximum Daily Load (TMDL) regulation and phosphorus reduction efforts.

Local stakeholder groups are looking to the Action Plan for guidance on how to improve their current approach to nutrient reduction. The Action Plan places a strong emphasis on phosphorus as a HAB driver and suggests projects be strategically prioritized to target phosphorus reduction. At the same time, the Action Plan refers to the pending TMDL as the guide for strategic prioritization. This has left many locals adrift about how to proceed, which projects should be prioritized, etc., in the absence of a TMDL.

At the recent Finger Lakes HABs Conference, I mentioned to you and Jacqueline Lendrum how getting the TMDL published would allow us to move forward with project prioritization in the Action Plan. It seemed then that there was a disconnect between how we viewed the Action Plan, so I reviewed the Action Plan to see how the local interpretation might have developed. Excerpts from the Action Plan are italicized, underlining is added for emphasis, my comments follow in regular font:

- P. 33: *Concentrations of soluble reactive phosphorus (SRP) should continue to be measured as part of ongoing monitoring to better inform management actions related to available phosphorus for cyanobacteria. However, a detailed evaluation of phosphorus speciation within the complicated hydrodynamics in Cayuga Lake is better addressed in detailed modeling and data analysis being undertaken in the TMDL.*
 - This provides no guidance on ways to improve our current nutrient monitoring, rather it suggests the TMDL is where we will get more detailed information.
- P. 62, LENS section: *This Action Plan should be considered the first step of an adaptive management approach to HABs in Cayuga Lake. Any completed TMDL or 9E plan developed for Cayuga Lake will supplement the loading assessment included in this report. At that time, this Action Plan can be updated to reflect current and better understanding of Cayuga Lake.*
 - This is when we expect to see specific information to guide monitoring, BMPs, etc.
 - A 9E plan is mentioned here (and in the next reference) but we understand that a TMDL is being drafted. Will there also be a 9E plan?
- P. 63, reiteration of above: *Also noteworthy is that the LENS tool does not include all the data requirements for detailed watershed load analysis that would be completed for a TMDL or Nine Element (9E) Plan, nor does it take into consideration existing best management practices (BMPs) and other nutrient reduction measures potentially implemented by the agricultural community and other potential contributors of nutrients to the lake. Consequently, the external loading estimates presented above for Cayuga Lake should*

be interpreted with caution. The TMDL being developed by NYSDEC will replace the loading assessment included in this report.

- P. 64, Internal loading and mussels: *The TMDL completed by the NYSDEC provides a more detailed loading assessment and will provide insight into the internal loading associated with dreissenid mussels.*
- P. 64, section 10.4: *Note that the TMDL completed by NYSDEC will replace the loading estimates included in this report.*
- P. 64, 11. Lake Management / Water Quality Goals: *The primary lake management/water quality goal for Cayuga Lake is to implement proactive management to minimize HABs through reducing nutrient input through well planned targeted nutrient reduction strategies from **all contributing sources** within the watershed. The necessary reductions will be stipulated in the TMDL.*
 - An important point to consider is that the local stakeholders expected the TMDL to be released within months of the Action Plan, therefore, committing staff and funds to projects in advance of the TMDL seemed potentially inefficient. The next sentence in the Action Plan does say that specific strategies are detailed in Section 13. However, this is confusing given earlier statements that all phosphorus loading in the Action Plan is generalized, should be used cautiously and will be much improved with the release of the TMDL.
- P. 69, forms of P: *Because of the importance of dissolved P forms affecting receiving waterbody quality, readers of the Action Plan should consider the source and form of P, in addition to project-specific stakeholder interest(s), when planning to select and implement the recommended actions, best management practices or management strategies in the Action Plan. Management of soluble P is an emerging research area; practices designed for conservation of soluble phosphorus are recommended in Sonzogni et al. 1982, Ritter and Shiromohammadi 2000, and Sharpley et al. 2006.*
 - Earlier portions in the document make clear that this detailed information about source and form of P will be available in the TMDL.

After re-reading the Action Plan it is clear to me why we (at least on the southern end of Cayuga Lake) felt hamstrung by the lack of a published TMDL. Would you or Ms. Lendrum be able to respond to this topic, or clarify how best to prioritize projects targeting phosphorus type and source in advance of the TMDL release? I've also copied Tony Prestigiacomo on this letter based on our discussion of the topic during the last Monitoring Partnership meeting. At least two Steering Committee groups are interested in submitting projects for the 2020 round of funding. Any clarity you can provide on this topic is greatly appreciated

Sincerely,

Roxanna Johnston, Chair Person
Monitoring Partnership of the Water Resources Council of Tompkins County

Cc: Jacqueline Lendrum
Cc: Anthony Prestigiacomo