Responsiveness Summary
Permit No. NY0244741, DEC # 7-5099-00009/00001
Cornell University
Cornell University Lake Source Cooling Facility

May 27, 2020

Background

The New York State Department of Environmental Conservation (NYSDEC) issued a final State Pollutant Discharge Elimination System (SPDES) permit for Cornell University – Lake Source Cooling (LSC) Facility on May 27, 2020. The final permit was developed as a Department Initiated Modification (DIM) pursuant to 750-1.18(b)(3)&(7). The DIM was based on a review of lake and discharge monitoring data, which identified increasing Total Phosphorus (TP) levels in the LSC discharge. The increased phosphorus levels in the discharge are from increasing phosphorus levels in the deep portion of the lake where the LSC intake is located, further explained in the final Fact Sheet for the LSC permit. The draft permit was publicly noticed in the *Environmental Notice Bulletin* on April 8, 2020, and in the *Ithaca Journal* on April 9, 2020. The public comment period closed on May 11, 2020.

Timely comments were received from:

	Affiliation	Name	Date
1	USEPA Region 2 Water Division	Virginia Wong, Chief, NPDES Section	5/5/2020
2	Cornell University (Permittee)	Rick Burgess, PE, Vice President, Facilities and Campus Services	5/7/2020
3	Tompkins County Water Resources Council	Roxanna Johnston, Chair -Monitoring Partnership	5/11/2020

On May 20, 2020, the Department received late comments from Cayuga Lake Environmental Action Now (CLEAN). As required by 6 NYCRR 621.10(e), NYSDEC has prepared this Responsiveness Summary to address the comments that were received on the draft permit during the public comment period. The comments on the draft permit and fact sheet, and NYSDEC's responses, have been organized to follow the format of the final Permit. Frequently raised comments are summarized and presented as one general comment and are not repeated as specific comments in the Responsiveness Summary. Otherwise, comments, or portions of comments, are quotations. The full text of all comments received as part of the public notice process are included in the Appendix of this Responsiveness Summary.

All relevant[1] comments on the draft permit and fact sheet are addressed below with commenter(s) referenced at the end of each comment.

Changes made to the permit in response to comments

- Added language to the Phosphorus Offset Program (Item A.2) that clarified that Offset Best Management Practices (BMPs) not listed in the catalogues, posted on the Department's Nonpoint Source Program Guidance and Technical Assistance website, may be selected provided the basis of the design and the expected TP reduction is sufficiently documented and justified.
- Removed language from the Phosphorus Offset Program (Item A.2) that requires priority be given to BMPs which are designed to promote infiltration.
- Added language to the Phosphorus Offset Program (Item A.2) that selection of BMPs shall document consideration of the source and form of phosphorus and are consistent with the Cayuga Lake Harmful Algal Blooms (HABs) Action Plan.
- Clarified that the annual BMP Report can be combined with the LSC Optimization report in the Schedule of Submittals.
- Removed Special Conditions related to the Cayuga Lake Water Quality Model.
- Added a map identifying subwatersheds tributary to the impaired waterbody segment areas where Offset BMPs should be prioritized.

Changes made to the fact sheet in response to comments

- Clarified the reason for the modification is due to phosphorus levels in the deep portion of the lake where the LSC intake is located are increasing in the Summary of Permit Changes section.
- Added Attachments A and B to provide additional supporting data for the determination of effluent limitations.

[1] Pursuant to 6 NYCRR 750-1.18(d), when a permit is modified, only the aspects of the permit that are modified are subject to public review

1. Timing of permit modification

Comment 1.a: Comments were received that the Department is working on a phosphorus Total Maximum Daily Load (TMDL) for Cayuga Lake and questioned why the Department is issuing a permit modification now as opposed to waiting for the Cayuga Lake TMDL. (EPA, Tompkins County Water Resources Council)

Response:
This modification is the result of a review of lake and discharge monitoring data, which identified increasing phosphorus levels in the LSC discharge. The increased phosphorus levels in the discharge are from increasing phosphorus levels in the deep portion of the lake where the LSC intake is located. The modification includes a program requiring the permittee to implement BMPs[2] to offset any expected TP discharge increase resulting from expansion of the LSC system to new buildings and will ensure that future operation of the LSC system will not cause or contribute to an increase in phosphorus load to the lake.

On February 26, 2020, the permittee submitted a request to extend the interim TP effluent limitation beyond June 1, 2020. The permittee previously requested, and had been granted, two extensions of the interim TP effluent limitation. Each of these extensions rely on Footnote 1 of the permit's Schedule of Compliance and are appropriate because the Cayuga Lake TMDL has not yet been finalized.

Issuing the permit at this time will negate the necessity for the Department to grant the permittee's request to, again, extend the interim TP effluent limitation beyond June 1, 2020. It is important that the TP offset requirements are effective in advance of the TMDL, because finalization of the TMDL is expected to involve an extended timeframe for public participation and must be approved by EPA. Issuing the modification at this time will assure that the TP offset requirements will be implemented and associated benefits to the lake can be realized sooner.

2. Impaired Status of southern end of Cayuga Lake

Comment 2.a: Comments were received noting research and modeling conducted by Upstate Freshwater Institute and Cornell researchers do not support the designation of the southern end of Cayuga Lake as impaired by phosphorus. Commenters requested changes to the fact sheet to reflect this information. (Cornell, Tompkins County Water Resources Council)

Response: No changes were made in response to this comment as the impairment status of the receiving water is beyond the scope of the permit modification. As noted in the fact sheet, in 2002, Cayuga Lake, Southern End (PWL No. 0705-0040, Ont-66-12-P296, Portion 4)) was listed on the New York State Section 303(d) List of Impaired/TMDL Waters as impaired due to phosphorus, silt, and sediment from municipal and nonpoint source discharges. The segment continues to be listed on the 2016 NYS Section 303(d) List.

[2] The final permit includes two sets of BMPs – those implemented to reduce phosphorus load through the new offset program and those implemented to improve efficiencies of the cooling system through the existing optimization program

Comment 2.b: Comments were received asserting that the current location of the LSC discharge provides a net benefit to the southern segment and requesting the fact sheet be modified to include this information. (Cornell, Tompkins County Water Resources Council)

> **Response:** No changes were made to the fact sheet as requested by the comment. The characterization that hydrodynamic and water quality modeling, completed by Cornell, predicted that relocating the outfall would offer no sustained reduction in Cayuga Lake's phytoplankton contained in the fact sheet is accurate

3. TP effluent limitation – Anti-backsliding

Comment 3.a: The Permit Limits, Levels and Monitoring page of the draft permit is being modified from the current permit to include a final water quality-based TP effluent limit of 6.4 lb/day as a monthly average, which is the most stringent limit that has ever been in effect. While the current permit includes a future limit of 4.8 lb/day monthly average limit (or as modified in a final TMDL), that limit never went into effect.

Page 5 of the Fact Sheet indicates that the current limit is 4.8 lb/d. This is legally wrong. The current TP monthly average limit is 6.4 lb/d which is the same as the proposed limit. While 4.8 lb/d has been included in the permit since May 2013 as a final limit (and footnoted to state that the limit could be modified to be consistent with a final TMDL allocation), this limit has never gone into effect because the effective date of the final limit has never passed.

Both Courts and EPA guidance have confirmed that the Clean Water Act's anti-backsliding prohibition does not apply where revisions to effluent limitations are made before the scheduled date of compliance for those limitations. Cornell strongly believes that a new Fact Sheet should be issued that acknowledges that the 4.8 lb/d limit has never been in effect so that the Department will not be charged with violating the anti-backsliding prohibition for establishing the current 6.4 lb/d interim permit limit as the final numerical phosphorus limit under the new permit. (Cornell)

> **Response:** Changes were made to the Anti-backsliding section of the fact sheet in response to this comment. The final fact sheet acknowledges that, as the 4.8 lb/d final effluent limitation has not taken effect, a backsliding determination is not required. However, the final fact sheet continues to include supporting documentation describing the basis of the revised final effluent limitation of 6.4 lb/d.

Comment 3.b: The fact sheet states that the discharger cannot currently meet the final limit of 4.8 lb/day, due to rising level of phosphorous in the intake water. The final limit of 4.8 lb/day was calculated using existing effluent quality prior to 2013. Please provide in the record for this permit action the analysis of more recent discharge levels supporting the statement that this discharge cannot meet the final limit of 4.8 lb/day. The anti-backsliding procedural guidance advises that an existing effluent quality analysis be performed to justify relaxation of a permit limit. In those cases, if the EEQ result is still less than the proposed relaxed limit, the discharger receives the result of the EEQ analysis as a limit, thus only allowing the backsliding that is necessary at the time. (EPA)

> **Response:** As noted in response to comment 3.a above, backsliding and associated guidance are not applicable to effluent limitations that have not yet taken effect. However, in response to this comment, Attachment A was added to the fact sheet and

provides additional information and analyses of data, reported since 2013, to support the final effluent limitation of 6.4 lb/d.

Comment 3.c: Please provide more detail, including data analysis, to support the statement that levels of phosphorous have risen in the vicinity of the intake. (EPA)

Response: Changes were made to the fact sheet to provide additional details on TP levels as suggested. Attachment B was added to the fact sheet and provides the monitoring results over the 2009-2019 period that show increasing background levels of both TP and Soluble Reactive Phosphorus (SRP) in the intake water.

4. TP Final Effluent Limitation

Comment **4.a:** Cayuga Lake is classified for drinking water use. Please provide in the record for this permit action any modeling results that support a final limit of 6.4 lb/day at the current discharge location, and why the 20 ug/l total phosphorus basis for this limit is appropriate and protective of designated uses. (EPA)

Response: The final effluent limitation of 6.4 lb/day is based upon the applicable water quality guidance value of 20 μg/l and the 95th percentile statistical average flow rate of 37.5 MGD (~1.6 m3/sec) over the July 2000 – December 2009 period. No dilution factor is included, which is appropriate given the impaired status of the receiving water. NYSDEC performed many modeling scenarios to evaluate the water quality changes in the Southern End segment of Cayuga Lake (0705-0040) from a base case scenario (i.e. permit discharges at permitted flows and no nonpoint source reductions). Several modeling scenarios were simulated to evaluate the LSC's impact to the Southern End segment of Cayuga Lake (0705-0040). The differences in water quality among the management scenarios were very small and were within the modeled variability for the segment, demonstrating that an LSC discharge of 6.4lbs/day did not appreciably impact the water quality in this segment of the Lake and would be protective of drinking water use. Should the final TMDL determine that a waste load allocation is necessary for this discharge to protect the drinking water use, the Department will propose a permit modification as noted in footnote 1 of the final permit.

Comment 4.b: Cornell understands that it will not be deemed to be in violation of the TP limit if an approved phosphorus offset program has been implemented in accordance with the permit. Cornell requests that the following footnote be added to the 6.4 lb/d limit on Page 3:
"If Phosphorus concentrations within the intake lake segment rise to levels such that the discharge load is above 6.4 lbs/day, the discharge will not be in violation of this load limit if phosphorus offsets that were estimated to reduce the net discharge below this limit have been implemented." (Cornell)

Response: No changes were made in response to this comment. The Department fully expects that the TP offset program will be effective in controlling the ambient TP levels of the lake. Should the ambient levels continue to rise, 6 NYCRR 750-1.10(c) allows for a modification of the permit to include a less stringent effluent limitation under certain circumstances.

5. Description of Discharge

Comment 5.a: It should be stated in the permit [(page 3, Table 1) and fact sheet] that Cornell University'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'. (Tompkins County Water Resources Council)

> **Response:** No changes were made as this comment is beyond the scope of the permit modification.

6. pH

Comment 6.a: We realize [limiting pH to a range of 6.5 to 8.5] 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 recirculates 'Cayuga Lake Non-Contact Water', it would be more logical to make this a monitoring requirement rather than to set a minimum and maximum. (Tompkins County Water Resources Council)

> **Response:** No changes were made as this comment is beyond the scope of the permit modification.

7. Phosphorus Offset Program

a. 2:1 Offset Ratio

Comment 7.a.1: Cornell agrees with the Department's stated basis for requiring a 2:1 offset ratio. This standard requirement means that Cornell must implement watershed BMPs that will reduce external phosphorus load by at least twice as much as the estimated increase in internal phosphorus circulated within Cayuga Lake due to the expansion of the campus district cooling system to serve a new building. The 2:1 offset BMP requirement is not only conservative, but it also takes into account the uncertainty in both the estimation methods and the variability of phosphorus levels in the lake. Because of this built-in conservatism, Offset BMPs will help efforts to reduce external phosphorus load as a means to protect lake water quality for the future. Tompkins County asserted that a 2:1 offset seems overly conservative to account for inaccuracies in underlying calculations and questioned whether the 2:1 is a standard ratio for this type of program and requested the reference be cited in the permit or appendix. (Cornell) (Tompkins County Water Resources Council)

> **Response:** As noted in the fact sheet, in selecting the 2:1 ratio, the Department relied on EPA guidance[3] which concluded that a 2:1 offset represents an uncertainty ratio that is adequately conservative and protective of water quality while not being unduly restrictive so as to discourage transactions.

Comment 7.a.2: Will [an offset program] be a standard condition in all new/renewed discharge permits in Cayuga Lake? If not, why not? (Tompkins County Water Resources Council)

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[3] USEPA, Accounting for Uncertainty in Offset and Trading Programs, EPA Technical Memorandum, February 12, 2014, https://www.epa.gov/sites/production/files/2015-07/documents/final_uncertainty_tm_2-12-14.pdf)

Response: No changes were made as this comment is beyond the scope of the permit modification. The Department determines the need for offset programs on a case by case basis depending upon the specific conditions and circumstances of each permit.

Comment 7.a.3: Please include a watershed map highlighting the respective subwatershed areas [that will be prioritized for locating Offset BMPs] (Tompkins County Water Resources Council)

Response: Changes were made in response to this comment. The final permit includes a map identifying subwatersheds tributary to the impaired waterbody segment areas where Offset BMPs should be prioritized.

b. Offset BMP Approval

Comment 7.b.1: Cornell is comfortable with the multi-step planning and reporting approach [for the Offset Program as described in the draft permit] as long as the Department confirms that Cornell can proceed with construction of an expansion before it receives approval from the Department of its planned offset and the TP offset quantity estimate, it just cannot begin to utilize the chilled water system in the new building until Department approval is received. (Cornell)

Response: As noted in the draft and continued in the final permit, the TP Offset Program applies to expansion of the LSC system to serve new buildings not connected to the LSC at the time of permit modification. The submission of an approvable procedures plan (Phosphorus Offset Program - Item B) is expected to streamline the review and approval process. In addition, early engagement with the Department as new buildings are being designed will ensure projects are not unduly delayed. Cornell may choose to proceed with construction of buildings at its own risk.

Comment 7.b.2: Cornell requests that the following be confirmed and reflected in the final permit and fact sheet: The Department will review all submittals in a timely manner and will generally approve, disapprove with explanation, or request additional information within 60 days of the Offset BMP request. Approval of these submittals will not be unreasonably withheld or delayed. If no response is received within 60 days, approval must be deemed granted. (Cornell)

Response: No changes were made in response to this comment. See response to comment 7.b.1 above. The Department agrees that it will not unreasonably withhold review and approval of the individual offset projects and will make its best efforts so as not to delay projects.

c. Offset BMP selection

Comment 7.c.1: Cornell requests that the following statement be added to Item 2 (on Page 5) in the Phosphorus Offset Program requirements: “Offset BMPs not included in those catalogues can also be used as long as the basis of the design and the expected TP reduction is sufficiently documented and justified.” (Cornell)

Response: Changes were made to the permit in response to this comment. The suggested language was included in the permit. The Department agrees that stormwater management is an evolving science and agrees that the permit should not limit the selection of BMPs with a proven track record for TP removal. The timeframe for

review and approval by the Department may be longer for new practices not listed in the catalogues, though, and will be dependent on the completeness of the submission.

Comment 7.c.2: The Phosphorus Offset Program (Item 2 - Page 5 of the draft permit) indicates that "Priority shall be given to BMPs which are designed to promote infiltration." Based on the University's research and extension activities, particularly with respect to agricultural BMPs, Cornell is concerned that a focus on infiltration may have unintended consequences on migration of phosphorus. Cornell concurs with the Department that measures to capture and infiltrate stormwater runoff can provide water quality benefits in many developed landscapes. The University is committed to installing 'green infrastructure' across its Ithaca campus. In addition, our faculty and extension are working with soil and water conservation districts and highway departments to improve road ditch management practices. However, given the relative importance of agriculture in the Cayuga Lake watershed, prioritization of infiltration BMPs may constrain the use of effective methods to achieve a long-term reduction in phosphorus migration toward the lake. Cornell therefore requests the removal of references to infiltration as a priority. (Cornell)

Response: Changes were made in response to this comment. The final permit removes the requirement that priority be given to practices that promote infiltration. The final permit also includes a condition that the planning and selection of offset BMPs must consider the source and form of phosphorus, consistent with the Cayuga Harmful Algal Blooms (HABs) Action Plan. This may include the selection of runoff reduction (i.e. infiltrative) practices, as well as other effective BMPs to achieve a long-term reduction in phosphorus migration toward the lake.

Comment 7.c.3: 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 targeting soluble reactive phosphorus (SRP). Work in the Lake Erie watershed found that some BMPs promoting infiltration actually increased SRP in runoff, negating the benefits of TP reduction (Tompkins County Water Resource Council)

Response: Changes were made in response to this comment. See response to comment 7.c.2 above.

Comment 7.c.4: We suggest DEC provide examples of BMPs that target SRP and give those priority, or at least equal weight as BMPs targeting TP. (Tompkins County)

Response: See response to comment 7.c.2 above. The final permit includes reference to the Cayuga Lake HABs Action Plan. The Plan includes recommendations for planning and selection of Offset BMPS that consider the source and form of P, as well as references[4] for practices designed for conservation of soluble phosphorus

[4] Sonzogni, W. C., Chapra, S. C., Armstrong, D. E., and Logan, T. J. 1982. Bioavailability of phosphorus inputs to lakes. Journal of Environmental Quality, 11(4), 555-563
Ritter, W. F., and Shirmohammadi, A. (Eds.). 2000. Agricultural nonpoint source pollution: watershed management and hydrology. CRC Press. 342p
Sharpley, A. N., Daniel, T., Gibson, G., Bundy, L., Cabrera, M., Sims, T., and Parry, R. 2006. Best management practices to minimize agricultural phosphorus impacts on water quality.

d. Offset BMP Tracking

Comment 7.d.1: The EPA supports the inclusion of the phosphorous offset provision on the proposed permit modification. We would like to see more detail included as to how implementation of this program will be evaluated and tracked for efficacy. (EPA)

> **Response:** As noted in the draft permit and continued in the final permit, the permittee must submit for review and approval by the Department, a plan that details the procedures for tracking, collecting, reporting and verifying data for Offset BMPs to ensure they are implemented and operating correctly. The plan must include:
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> - Procedures to be used for estimating the number of pounds of TP offset by the BMP, verification of performance, and the criteria to be used (e.g., NRCS practice standards and specification, Maintenance Guidance for Stormwater Management Practices, engineering specifications, etc.).
> - Procedures for documenting and tracking Offset BMPs.
> - Procedures for inspection and tracking inspection and maintenance history of Offset BMPs.
> - Procedures for verifying that Offset BMPs continue to be effective.
>
> Each Offset BMP must be submitted prior to expansion of the LSC to new buildings and must follow the approved procedures. In addition, the permittee must evaluate the effectiveness of the Phosphorus Offset Program and annually report on the status and effectiveness.

Comment 7.d.2: The permit [Offset Program - Paragraph B(2)] states that verification does not require actual monitoring. We realize this is standard language. We suggest that monitoring be considered as an option to accomplish verification, tracking and effectiveness of BMPs in ALL new/renewed permits. (Tompkins County Water Resource Council)

> **Response:** No changes were made in response to this comment. The Department will consider how offset reductions are verified in other large watershed programs when approving the required tracking and verification program.

8. Schedule of submittals

Comment 8.a: Cornell understands that while the permit requirement for an Annual BMP Optimization report and an Annual Phosphorus Offset Program report are in two separate parts of the proposed permit modification, Cornell will have the option of combining these into a single report. If this understanding is incorrect, Cornell requests that the final permit clearly state that these must be two separate reports. Otherwise, Cornell requests that the Schedules of Submittals on Page 8 state that the annual BMP Report can be combined with the LSC Optimization report. (Cornell)

> **Response:** Changes were made in response to this comment. As requested, the Schedule of Submittals in the final permit states that the annual BMP Report can be combined with the LSC Optimization report.

9. Special Conditions - Cayuga Lake Water Quality Model Plan

Comment 9.a: Comments were submitted asserting that the continuation and on-going involvement of the permittee with outreach on the water quality model, is not appropriate and should be removed from the permit. (Cornell, Tompkins County Water Resource Council)

Response: Changes were made in response to this comment. The final permit does not include any requirements for continued involvement with the Cayuga Lake Water Quality Model.

10. Monitoring Locations

Comment 10.a: Comments asserted that the map contained in the draft permit was confusing and recommended the map be clarified or deleted. (Cornell, Tompkins County Water Resource Council)

Response: Changes were made in response to this comment to clarify the monitoring locations. The final permit includes a revised map, as provided by the permittee, to correctly identify the location of the LSC discharge and remove unnecessary detail.

Appendix A: Timely Comments Received on Draft Permit

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 2
Water Division
290 Broadway, 24th Floor
New York, New York 10007

Ms. Elizabeth A. Tracy
NYSDEC Region 7
615 Erie Boulevard West
Syracuse, NY 13204

Re: **Cornell University Lake Source Cooling (LSC) Facility**
SPDES No. NY0244741

Dear Ms. Tracy:

On April 8, 2020, the New York State Department of Environmental Conservation (NYSDEC) provided notice of the draft Department initiated modification of the State Pollutant Discharge Elimination System (SPDES) permit for the Cornell University Lake Source Cooling Facility (SPDES No. NY0244741). The facility is classified as a minor discharger to Cayuga Lake, a Class A Special Waterbody. In accordance with 40 CFR §123.44, the Environmental Protection Agency has reviewed the draft permit and provides the following comments for your consideration as NYSDEC develops the proposed and final permits. These comments must be satisfactorily addressed in order to eliminate the potential for permit objection pursuant to the 1975 Memorandum of Agreement between the EPA and NYSDEC and 40 CFR §123.44.

As a reference to prior concerns related to the phosphorous limit and antidegradation procedures, we have attached comments that were submitted for the issuance of the 2013 SPDES permit for this facility. With this current permit action, NYSDEC proposes to make the former interim limit of 6.4 lb/day the final limit, with a reopener clause should the calculated waste load allocation (WLA) for the Cayuga Lake Total Maximum Daily Load (TMDL) differ from 6.4 lb/day. The 2013 permit had a final limit of 4.8 lb/day, which was calculated using an existing effluent quality statistical analysis of discharge levels prior to 2013. The interim limit had been extended in previous permit modifications and has been the effective limit since the 2013 permit took effect. The EPA believes NYSDEC has not provided enough information to justify establishing 6.4 lb/day as the final limit.

1. NYSDEC has been working towards proposing a phosphorous TMDL for Cayuga Lake, which will include a waste load allocation for this discharge. More information is necessary to justify 6.4 lb/day as a final limit set in advance of the establishment of a WLA when the TMDL is issued.

2. The fact sheet states that the discharger cannot currently meet the final limit of 4.8 lb/day, due to rising level of phosphorous in the intake water. The final limit of 4.8 lb/day was calculated using existing effluent quality prior to 2013. Please provide in the record for this permit action the analysis of more recent discharge levels supporting the statement that this discharge cannot meet the final limit of 4.8 lb/day. The antibacksliding

procedural guidance advises that an existing effluent quality analysis be performed to justify relaxation of a permit limit. In those cases, if the EEQ result is still less than the proposed relaxed limit, the discharger receives the result of the EEQ analysis as a limit, thus only allowing the backsliding that is necessary at the time.

3. Please provide more detail, including data analysis, to support the statement that levels of phosphorous have risen in the vicinity of the intake.

4. The draft permit limit is calculated using the State's guidance value of 20 ug/l total phosphorus for ponded waters which represents the State's current numeric interpretation of its narrative standard for phosphorus and nitrogen, and was developed to be protective of aesthetics and the primary and secondary contact recreation best uses. It is our understanding that as part of its efforts to develop a proposed TMDL for Cayuga Lake the State is considering moving towards the use of a site-specific chlorophyll-*a* target for the protection of drinking water supplies, which is the applicable best use for this portion of Cayuga Lake. Such an approach would be similar to the approaches used in recently submitted and approved TMDLs for the protection of the drinking water use. In summary, since Cayuga Lake is classified for drinking water use, the permit fact sheet should explain why the 20 ug/l total phosphorus limit is appropriate and protective of the drinking water use.

5. Please provide in the record for this permit action any modeling results that support a final limit of 6.4 lb/day at the current discharge location as protective of designated uses.

6. The EPA supports the inclusion of the phosphorous offset provision on the proposed permit modification. We would like to see more detail included as to how implementation of this program will be evaluated and tracked for efficacy.

The EPA looks forward to working with the NYSDEC to ensure that the issues identified above are addressed to the satisfaction of the EPA. In accordance with 40 CFR §123.44, NYSDEC is required to send the EPA a proposed permit, defined in 40 CFR §122.22, prior to the final issuance of the Cornell University Lake Source Cooling Facility SPDES permit modification.

If you require any information or assistance regarding this matter, please contact Ms. Karen O'Brien of my staff at (212) 637-3717 or obrien.karen@epa.gov.

Sincerely,

Virginia Wong, Chief
NPDES Section
Clean Water Regulatory Branch

cc: Ms. Carol Lamb-Lafay, Director, Bureau of Water Permits,
New York State Department of Environmental Conservation

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

NOV 16 2012

Ms. Teresa Diehsner
Environmental Program Specialist
New York State Department of Environmental Conservation
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, New York 12233

Re: **Cornell Lake Source Cooling Facility (NY0244747)**

Dear Ms. Diehsner:

On October 15, 2012, the New York State Department of Environmental Conservation provided notice of the draft modified State Pollutant Discharge Elimination System (SPDES) permit (SPDES No. NY0244747) for the Cornell University Lake Source Cooling Facility. In accordance with 40 CFR §123.44, the U.S. Environmental Protection Agency has reviewed the draft permit and provides the following comments for your consideration as NYSDEC develops the proposed and final permit. These comments must be satisfactorily addressed in order to eliminate the potential for permit objection pursuant to the 1975 Memorandum of Agreement between the EPA and NYSDEC and 40 CFR §123.44.

The EPA looks forward to working with the NYSDEC to ensure that the issues identified above are addressed to the satisfaction of the EPA. In accordance with 40 CFR §123.44, NYSDEC is required to send the EPA a proposed permit, as defined in 40 CFR §122.22, prior to the final issuance of the SPDES permit for the Cornell Lake Source Cooling facility.

If you require any information or assistance regarding this matter, please contact Ms. Karen O'Brien of my staff at obrien.karen@epa.gov or (212) 637-3717.

Sincerely yours,

Michelle A. Josilo, NPDES Section Chief
Clean Water Regulatory Branch

Enclosures

cc: Mr. Koon Tang, Director, Bureau of Water Permits,
New York State Department of Environmental Conservation (w/enclosures)

EPA Region 2 Comments on Draft State Pollutant Discharge Elimination System permit for the Cornell University Lake Source Cooling Facility (NY0244741)

The United States Environmental Protection Agency, Region 2, submits the following comments on the draft State Pollutant Discharge Elimination System (SPDES) permit for the Cornell University Lake Source Cooling Facility, public-noticed on October 15, 2012:

1. Effluent Limitations for Total Phosphorous

   The current permit in effect for this facility was originally issued in 1998 prior to the Clean Water Act section 303(d) impairment listing for phosphorous, and prior to the commencement of discharge. The existing permit was modified in 2002, administratively renewed in 2003 with an expiration date of March 1, 2008, and is currently administratively extended.

   The October 15, 2012 draft SPDES permit includes an interim limit of 6.4 lb/day for Total Phosphorous, and a final limitation of 4.8 lb/day for Total Phosphorous. The final limit takes effect upon 57 months from the effective date of a permit modification (EDPM), and is included as part of a compliance schedule to evaluate alternatives for extending the outfall pipe. It is our understanding that the permit would be modified if a total maximum daily load (TMDL) analysis indicated that the extension of the outfall pipe was necessary.

   The fact sheet included with this permit includes the calculations and assumptions used to calculate the interim and final limitations. The final limitation of 4.8 lb/day is a mass-based, monthly average limitation, based on an existing effluent quality (EEQ) analysis of the effluent data from 2000 to 2009. The interim limitation of 6.4 lb/day is based on application of the applicable water quality guidance value for phosphorous of 20 ug/l, which is the numeric interpretation of the narrative water quality standard for protection of the designated use of ponded waters. The fact sheet also states that the EEQ limitation of 4.8 lb/day was calculated using statistical analysis procedures in EPA's *Technical Support Document for Water Quality Based Toxics Control (March 1991),* which employs the 95th percentile confidence level of the lognormal distribution of past data. This approach calculates a maximum projected effluent that is demonstrated to be achievable based on past data, and is frequently used by EPA in permits and enforcement agreements.

   While the interim limitation does represent the application of the standard at the end of the discharge pipe, the inclusion of an interim limitation and compliance schedule is not consistent with federal NPDES regulations for water quality based effluent limitations at 40 CFR §122.44(d), nor for schedules of compliance at 40 CFR §122.47. This is also in conflict with: (1) federal regulations addressing antidegradation at 40 CFR §131.12; (2) NYSDEC's own antidegradation policy referenced in the permit fact sheet *Water Quality Antidegradation Policy,* signed by the Commissioner of NYSDEC, dated September 9, 1985; and, (3) TOGS 1.3.9, *Implementation of the NYSDEC Antidegration Policy – Great Lakes Basin* Supplement to Antidegradation Policy dated September 9, 1985.

   Compliance schedules are allowable in the instance that a facility is unable to meet a final water quality based effluent limitation. Given that the facility has demonstrated its ability to

comply with a limitation of 4.8 lb/day as a monthly average, it is not appropriate to grant a compliance schedule with interim relief from that limitation. Additionally, the allowance of additional loading is not consistent with NYSDEC's antidegradation policy, which states that for waters in better condition than the applicable water quality standard, additional loading would only be allowed when both of the conditions below are met:

1. Allowing lower water quality is necessary to accommodate significant economic or social development in the affected areas, and

2. Water quality will be adequate to meet the existing usage of the waterbody when allowing a lowering of water quality.

In the case of the southern portion of Cayuga Lake, this waterbody is listed as impaired for phosphorous and silt/sediments. NYSDEC's antidegradation policy further states:

> Water which does not meet the standards assigned thereto will be improved to meet such. The water uses and the level of water quality necessary to protect such uses shall be maintained and protected. (*Water Quality Antidegradation Policy*, signed by the Commissioner of NYSDEC, dated September 9, 1985)

This means that the permit must include a numeric effluent limit that requires the facility to maintain existing effluent quality. Specifically, the permit must include the limitation of 4.8 lb/day as the applicable monthly average limit, starting at the effective date of the permit in order to be consistent with antidegradation requirements and to prevent further degradation of the southern portion of Cayuga Lake.

The fact sheet also notes that in accordance with NYSDEC policy and NPDES regulations, the more stringent of the calculated effluent limitations shall be included in the permit. NYSDEC states that it is including the technology based limit of 4.8 lb/day which is more stringent than the water quality-based effluent limit of 6.4 lb/day. NYSDEC has actually included an interim limit and compliance schedule granting relief from the technology based limit of 4.8 lb/day. Federal regulations governing compliance schedules at 40 CFR §122.47 are only available for relief from *water quality-based* effluent limits, and only for achieving those water quality standards promulgated after 1977. Technology based requirements represent achievable levels, while compliance schedules are available where a facility has demonstrated that meeting limits based on water quality standards is not achievable. Given that the limit of 4.8 lb/day was calculated based on past data, using statistical calculations that project a maximum projected effluent, this level is achievable and inclusion of a compliance schedule is not appropriate.

2. Compliance Schedule for Evaluation of Outfall Extension

The EPA notes that the permit includes a schedule of compliance to evaluate the extension of the outfall pipe, and if warranted by the TMDL, to extend the pipe upon the effective date of permit modification. As noted above, this permittee has already demonstrated the ability to comply with the final effluent limitation of 4.8 lb/day as a monthly average. Therefore, the inclusion of a compliance schedule granting relief from the final limitation is not appropriate and does not meet the requirements of federal regulations for compliance schedules set forth

at 40 CFR §122.47. Specifically, this schedule has no standing and is not in effect unless the permit is modified, which may or may not take place in the future. Additionally, the extension of the pipe would address the impacts to the lake in terms of ability to provide mixing, but would not affect the quality of the effluent nor Cornell's ability to meet the final limitation of 4.8 lb/day.

This permit should include a requirement to evaluate extension of the outfall pipe and the potential impact of alternatives, because NYSDEC has contemplated this action for several years and may very well require such mitigation as the result of a TMDL analysis. However, the permit should include milestones triggered by the effective date of the permit, not a schedule of compliance granting an additional loading allowance of phosphorous, triggered only by a future permit modification.

3. Reasonable Potential Analysis for other Water Quality Based Effluent Limitations

There is no reasonable potential analysis in the permit fact sheet to determine whether there are other pollutants that cause, contribute, or have the reasonable potential to cause or contribute to a violation of water quality standards at the point of discharge. In accordance with 40 CFR §122.44(d), permitting authorities must establish effluent limitations that are protective of applicable water quality standards. NYSDEC has only analyzed this discharge and included a WQBEL for total phosphorous. The permit fact sheet and draft permit must address any pollutant sources that could potentially cause or contribute to an exceedance of water quality standards. This analysis would usually be based on a priority pollutant scan included with the permit application as well as NYSDEC's knowledge of the facility, e.g., whether additional chemicals are used to prevent fouling or to clean the cooling system, and in this case, the quality of the intake water. We note that the southern portion of Cayuga Lake is also listed as impaired for silt/sediments. However, there is no numeric limitation, monitoring requirement, or application of a water quality standard addressing the discharge of solids in the permit. NYSDEC must include water quality based requirements that are protective of water quality standards for all pollutants that cause or contribute to an exceedance of ambient criteria.

4. Requirements for In-lake Monitoring to Support the Total Maximum Daily Load

The permit includes the requirement to conduct in-lake monitoring to support development of a TMDL. We support this condition of the permit and recommend that this section be made more specific with respect to deadlines for submittal. For example, we note that there is a milestone due date for the submittal of a Quality Assurance Project Plan (QAPP), and that the implementation schedule of the QAPP will become an enforceable schedule of the permit. This schedule will be written by the permittee and approved by NYSDEC. The EPA recommends that, at a minimum, NYSDEC also establish a due date within the permit for the commencement of monitoring, which could be triggered by NYSDEC approval of the QAPP. We also recommend that the permit include final due dates for completion of analytical monitoring and for developing the modeling plan.

5. Requirements to Minimize Impingement and Entrainment at the Cooling Water Intake Structure

The biological monitoring requirements of the permit require an *Entrainment Characterization Study*, which will be used by the NYSDEC to determine whether additional technological controls are necessary to meet the performance goals of the NYSDEC Comissioner's policy (CP-52), which established closed-cycle cooling, or equivalent performance, as the Best Technology Available, as required by section 316(b) of the Clean Water Act. The permit does not address the minimization of adverse impact due to impingement of fish unless the permit is reopened and modified to address additional controls for entrainment. Clean Water Act section 316(b) requires a determination of BTA for both impingement and entrainment. Given that the facility has been in operation for several years, and monitoring was required in the previous permit, this permit should require a specific definition of what best technology available would be for the impingement of aquatic life at the intake structure. The permit must state the specific controls, including existing controls, as an enforceable permit condition, and the fact sheet must document the assumptions that lead to the conclusion that these controls represent BTA.

6. General Conditions.

The draft permit does not adequately incorporate general permit conditions as required by federal regulations. As specified in 40 CFR §122.41, all conditions applicable to NPDES permits and corresponding state programs shall be incorporated into permits either expressly or by reference. If incorporated by reference, a specific citation to these regulations (or the corresponding approved state regulations) must be given in the permit. The NYSDEC *must* include in the permit, either expressly or by reference, all general conditions. specified in 40 CFR §122.41.

Cornell University

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May 7, 2020

Elizabeth A. Tracy
NYS Department of Environmental Conservation, Reg. 7
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Syracuse, NY 13204-2400

Fedex and Email: Elizabeth.Tracy@dec.ny.gov

Re: DEC ID # 7-5099-00009/00001 - Cornell University Lake Source Cooling Draft Modified SPDES Permit – Permittee's Comments

Dear Ms. Tracy:

Cornell University (Cornell) has reviewed the draft modified SPDES permit for the Lake Source Cooling (LSC) facility and offers the following comments and requests for changes or clarifications. Cornell appreciates the Department's commitment to protecting Cayuga Lake while ensuring that the LSC facility will be able to continue as a cornerstone of not only Cornell's, but also the region's, climate mitigation strategy. It is also appreciated that the draft permit and its associated Fact Sheet acknowledge that Cornell has completed and submitted its peer reviewed lake and watershed models which the Department has stated it is using in the development of the Cayuga Lake Total Maximum Daily Load (Cayuga TMDL) allocation for total phosphorus. Cornell, like many in the community, is looking forward to seeing the draft TMDL once the Department proposes it.

Compliance with the proposed modified permit will continue to be a challenge to Cornell, but one to which we are fully committed. The addition of a Phosphorus Offset Program, mirrored on other Department and USEPA programs, will enable Cornell to manage campus operations into the future with minimal increases in fossil fuel consumption. There are, however, several conditions of the draft SPDES permit and items in the Fact Sheet that Cornell believes should be modified to clarify certain new requirements or to establish a more transparent and workable integrated compliance program. These are discussed below.

SPDES PERMIT

a. Numeric Total Phosphorus (TP) Limit

The proposed permit makes final the 6.4 pounds per day (ppd) total phosphorus limit, which has remained continually in place as an interim limit since 2013, albeit with the provision that if the final approved Cayuga TMDL contains a total phosphorus Waste Load Allocation for the LSC facility other than 6.4 ppd, the permit will be re-opened. While Cornell has fully met the

Department's requirements to document that the LSC operation has no adverse impact on Cayuga Lake, the University accepts the regulatory position that a permit limit on total phosphorus is required for continued discharge to Cayuga Lake Segment 4. The University has concluded based on years of analysis, monitoring, and mathematical modeling that the LSC should have no TP limit[1] or that any limit should be calculated as a seasonal or annual rolling average. Despite this long-standing position, Cornell reluctantly accepts the 6.4 ppd monthly average limit.

As the Department is aware, the LSC facility has consistently met the proposed 6.4 ppd limit despite major changes in the lake ecosystem that are outside of Cornell's control. Confidence in our continued ability to meet this limit even as the Ithaca campus continues to evolve is predicated on the assumption that the Department and Cornell will continue to work together to craft reasonable and sustainable solutions that reflect changes in our water, lands, and air resources.

Cornell understands that it will not be deemed to be in violation of the TP limit if an approved phosphorus offset program has been implemented in accordance with the permit.

Cornell requests that the following footnote be added to the 6.4 ppd limit on Page 3:

"If Phosphorus concentrations within the intake lake segment rise to levels such that the discharge load is above 6.4 lbs/day, the discharge will not be in violation of this load limit if phosphorus offsets that were estimated to reduce the net discharge below this limit have been implemented."

b. Proposed Phosphorus Offset Program

1. *Plan Approval*

The proposed permit requires the submittal of an initial plan for offset tracking, reporting, etc. and a submittal for each offset per expansion project. Each must be approved by the Department. In addition, the proposed permit requires the submittal of an annual report by February 1 each year evaluating the effectiveness of the offset program. Cornell is comfortable with this multi-step planning and reporting approach as long as the Department confirms the following:

- Cornell can proceed with construction of an expansion before it receives approval from the Department of its planned offset and the TP offset quantity estimate, it just cannot begin to utilize the chilled water system in the new building until Department approval is received.

- The Department will review all submittals in a timely manner and will generally approve, disapprove with explanation, or request additional information within 60 days of the *Offset BMP* request. Approval of these submittals will not be unreasonably

1 Because the LSC does not add any TP to the Lake and because modeling shows that the LSC discharge into the shallower southern end of the Lake actually improves water quality in that segment of the Lake.

withheld or delayed. If no response is received within 60 days, approval must be deemed granted.

Cornell requests that the above two points be clearly confirmed and reflected in the final modified permit and/or description in the Fact Sheet.

2. BMP Options for Implementation

Item 2 (on Page 5) of the Phosphorus Offset Program requirements should provide flexibility to the permittee in the types of BMPs that can be employed to offset phosphorus. Non-point source water quality experts at Cornell and elsewhere continue to advance the science of reducing phosphorus levels in runoff and infiltration at a pace where the various catalogues listed on the Department's web page (https://www.dec.ny.gov/chemical/96777.html) simply are not able to be kept up to date. A brief review of the current catalogs listed on this web page indicate that they were written between 1986 and 2018; the majority were published before 2010. Cornell should not be restricted from considering innovative and emerging measures that have been successfully applied and documented.

Cornell requests that the following statement be added to Item 2 (on Page 5) in the Phosphorus Offset Program requirements: "*Offset BMPs not included in those catalogues can also be used as long as the basis of the design and the expected TP reduction is sufficiently documented and justified."*

3. *2:1 Offset BMP Requirement*

Cornell agrees with the Department's stated basis for requiring a 2:1 offset ratio. This standard requirement means that Cornell must implement watershed BMPs that will reduce external phosphorus load by at least twice as much as the estimated increase in internal phosphorus circulated within Cayuga Lake due to the expansion of the campus district cooling system to serve a new building. The 2:1 offset BMP requirement is not only conservative, but it also takes into account the uncertainty in both the estimation methods and the variability of phosphorus levels in the lake. Because of this built-in conservatism, Offset BMPs will help efforts to reduce external phosphorus load as a means to protect lake water quality for the future.

4. *Department's Priority for Infiltration*

This same provision in Item 2 (on Page 5) of the Phosphorus Offset Program requirements indicates that "Priority shall be given to BMPs which are designed to promote infiltration." Based on the University's research and extension activities, particularly with respect to agricultural BMPs, Cornell is concerned that a focus on infiltration may have unintended consequences on migration of phosphorus.

Traditionally, bioretention BMPs for reducing phosphorus, if well sited, do provide infiltration. However, clay soils and confining layers (fragipan, hardpan) are common in the Finger Lakes region and serve to impede infiltration. More importantly, through modeling[2] and empirical

2 Knighton, J., Pluer, E. M., Prestigiacomo, A. R., Effler, S. W., & Walter, M. T. (2017). Topographic wetness guided dairy manure applications to reduce stream nutrient loads in Central New York, USA. Journal of Hydrology: Regional Studies, 14, 67-82.

studies[3,4,5], these practices have been shown to retain phosphorus only until soils reach saturation, at which point they may act as a net source. Unfortunately, time to saturation is likely to be relatively short given that NY agricultural soils are typically highly enriched with phosphorus[6]. Newer approaches to nutrient reduction that allow for infiltration include edge-of-field bioreactors and controlled drainage techniques. While these practices have shown limited effectiveness in reducing phosphorus[7,8], they should be considered as components of an integrated system of BMPs.

Shifting focus to approaches that reduce phosphorus inputs are more likely to achieve long term net P reduction in the watershed. Whole farm nutrient management can encompass practices including field testing and calculation of the phosphorus index to guide fertilizer applications, precision animal feeding, planting winter cover crops, manure management, and others; these BMPs would fall outside of the realm of "practices designed to promote infiltration". These types of practices have the potential to balance phosphorus input, storage, and outputs in an efficient manner that can sustain a long-term reduction in off-farm losses.

Cornell concurs with the Department that measures to capture and infiltrate stormwater runoff can provide water quality benefits in many developed landscapes. The University is committed to installing 'green infrastructure' across its Ithaca campus. In addition, our faculty and extension are working with soil and water conservation districts and highway departments to improve road ditch management practices. However, given the relative importance of agriculture in the Cayuga Lake watershed, prioritization of infiltration BMPs may constrain the use of effective methods to achieve a long-term reduction in phosphorus migration toward the lake.

Cornell requests the removal of references to infiltration as a priority.

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3 Hunt, W., Jarrett, A., Smith, J., and Sharkey, L. (2006). Evaluating bioretention hydrology and nutrient removal at three field sites in North Carolina. J. Irrig. Drain. Eng., 10.1061/(ASCE)0733-9437(2006)132:6(600), 600–608.

4 Hatt, B. E., Fletcher, T. D., and Deletic, A. (2009). Hydrologic and pollutant removal performance of stormwater biofiltration systems at the field scale. J. Hydrol., 365(3–4), 310–321

5 McPhillips, L., Goodale, C., & Walter, M. T. (2018). Nutrient leaching and greenhouse gas emissions in grassed detention and bioretention stormwater basins. Journal of Sustainable Water in the Built Environment, 4(1), 04017014.

6 Ketterings, Q. M., Kahabka, J. E., & Reid, W. S. (2005). Trends in phosphorus fertility of New York agricultural land. Journal of Soil and Water Conservation, 60(1), 10-20.

7 Rosen, T. and L. Christianson. (2017). Performance of denitrifying bioreactors at reducing agricultural nitrogen pollution in a humid subtropical coastal plain climate. Water 9.2: 112.

8 Mendes, D., & Renato, L. (2020). Edge-of-Field Technologies for Phosphorus Retention from Agricultural Drainage Discharge. Applied Sciences, 10(2), 634.

5. Annual Phosphorus Offset Report

Cornell understands that while the permit requirement for an Annual BMP Optimization report and an Annual Phosphorus Offset Program report are in two separate parts of the proposed permit modification, Cornell will have the option of combining these into a single report. If this understanding is incorrect, **Cornell requests** that the final permit clearly state that these must be two separate reports. **Otherwise, Cornell requests** that the Schedules of Submittals on Page 8 state that the annual BMP Report can be combined with the LSC Optimization report.

c. Cayuga Lake Water Quality Model Plan

Page 7 of the proposed permit contains "The Cayuga Lake Water Quality Model Plan" Special Condition with very similar language as is in the current permit. While this section acknowledges that Cornell has completed the required model and indicates that this model is being used as the basis for the upcoming Cayuga Lake TMDL, it also states "The permittee shall assist the Department to engage stakeholders as the model is developed and implemented and foster their input and feedback." This statement appears to be a relic from the current permit that was carried over to the modified permit and Fact Sheet.

Cornell requests that this entire Special Condition be removed from the final modified permit. As the draft permit states, "the permittee completed the lake nutrient model and watershed model" and, in fact, met or exceeded all Department requirements to support and document a robust program of stakeholder engagement. As currently proposed, keeping this provision with its stakeholder engagement requirement in the modified permit may lead some interested parties to conclude that Cornell has been involved in the TMDL development, including in its future presentation to stakeholders and the public. As the Department is aware, Cornell has not been involved in applying the lake and watershed models to support development of the draft TMDL. As the draft TMDL is unveiled for public review, Cornell's only role will be as a keenly interested stakeholder.

d. Monitoring Locations

References to the Monitoring Locations and the Map on Page 9 are confusing. The map should no longer show the pile cluster, and the location of the effluent monitoring should be indicated by placing an "X" on the LSC discharge at plant location. A suggested map is provided in Attachment A.

FACT SHEET

a. Anti-Backsliding and the 4.8 ppd TP Limit in the Current Permit

The Permit Limits, Levels and Monitoring page of the draft permit is being modified from the current permit to include a final water quality based total phosphorus effluent limit of 6.4 lb/day as a monthly average, which is the most stringent limit that has ever been in effect. While the

current permit includes a future limit of 4.8 lb/day monthly average limit (or as modified in a final TMDL), that limit never went into effect.

Page 5 of the Fact Sheet indicates that the current limit is 4.8 ppd. This is legally wrong. The current TP monthly average limit is 6.4 ppd which is the same as the proposed limit. While 4.8 ppd has been included in the permit since May 2013 as a final limit (and footnoted to state that the limit could be modified to be consistent with a final TMDL allocation), this limit has never gone into effect because the effective date of the final limit has never passed.

Both Courts and EPA guidance have confirmed that the Clean Water Act's anti-backsliding prohibition does not apply where revisions to effluent limitations are made before the scheduled date of compliance for those limitations. *American Iron and Steel Institute v. Environmental Protection Agency*, 115 F.3d 979, 993 n.6 (D.C. Cir. 1997) (denying petitioners' anti-backsliding claim and noting that "EPA interprets [CWA] § 402 to allow later relaxation of [an effluent limitation] so long as the limit has not yet become effective."). *See also,* U.S. EPA, Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; 65 Fed. Reg. 31682, 31704 (May 18, 2000) ("The [EPA's] interpretation of the CWA is that the anti-backsliding requirements … do not apply to revisions to effluent limitations made *before the scheduled date of compliance* for those limitations.") (emphasis added), and the Preamble to the Great Lakes Water Quality Initiative, 50 Fed. Reg. 20837, 20981 (April 16, 1993) ("anti-backsliding requirements do not apply to changes made in an effluent limitation *prior to* its compliance date") (emphasis added).

Since the 4.8 ppd final TP limit was put into the SPDES permit (in May 2013), the effective date of this final limit has been extended 2 times, and a third modification request to once again extend the effective date of the 4.8 ppd limit has been pending since February 26, 2020. As the Department has recognized, the extensions have been needed because the Cayuga Lake TMDL had not even been proposed, let alone finalized. Each of these permit modifications pushed the effective date for the "final" phosphorus limit further into the future so that the 4.8 ppd limit would not go into effect. Cornell strongly believes that a new Fact Sheet should be issued that acknowledges that the 4.8 ppd limit has never been in effect so that the Department will not be charged with violating the anti-backsliding prohibition for establishing the current 6.4 ppd interim permit limit as the final numerical phosphorus limit under the new permit.

Cornell requests that misstatements on page 5 of the Fact Sheet related to the current monthly average TP limit in the permit be corrected. Suggested language for this section of the Fact Sheet is included in Attachment B.

b. ***Outfall Relocation***

As the Fact Sheet acknowledges, the lake modeling completed by Cornell predicts that relocating the current LSC outfall would offer no sustained reduction in Cayuga Lake's "phytoplankton". When Cornell modeled the relocation of the LSC outfall, the conclusion was that the current location was a net benefit to water quality (chlorophyll and turbidity) on the southern shelf.

c. Phosphorus Levels in Cayuga Lake

Page 3 (of 9) of the Fact Sheet, in the section on "Summary of Permit Changes", incorrectly states that Phosphorus levels in the impaired southern end of the lake are increasing. While deep water TP levels are increasing in the Lake, there is no evidence of increases in phosphorus levels on the southern shelf. **Cornell requests** that this misstatement be clarified.

d. Revised Fact Sheet or Responsiveness Summary

Because of the serious problems with the April 2020 version of the Fact Sheet discussed in section *a* above, **Cornell requests** that a new Fact Sheet be issued not only to correct the misstatements made in the April 2020 version discussed in section *a* above but also to address other changes made in response to the comments made in this letter. If a new Fact Sheet is not issued, then the Responsiveness Summary will need to indicate what portions of the April 2020 Fact Sheet are being replaced by the relevant provisions in the Responsiveness Summary.

Cornell appreciates the opportunity to provide comments on the department-initiated modification to Cornell's Lake Source Cooling SPDES Permit and Fact Sheet. Please contact Patrick McNally by email at pom1@cornell.edu with any questions or clarifications.

Sincerely,

F. F. Burgess III
F. F. Burgess III (May 5, 2020)

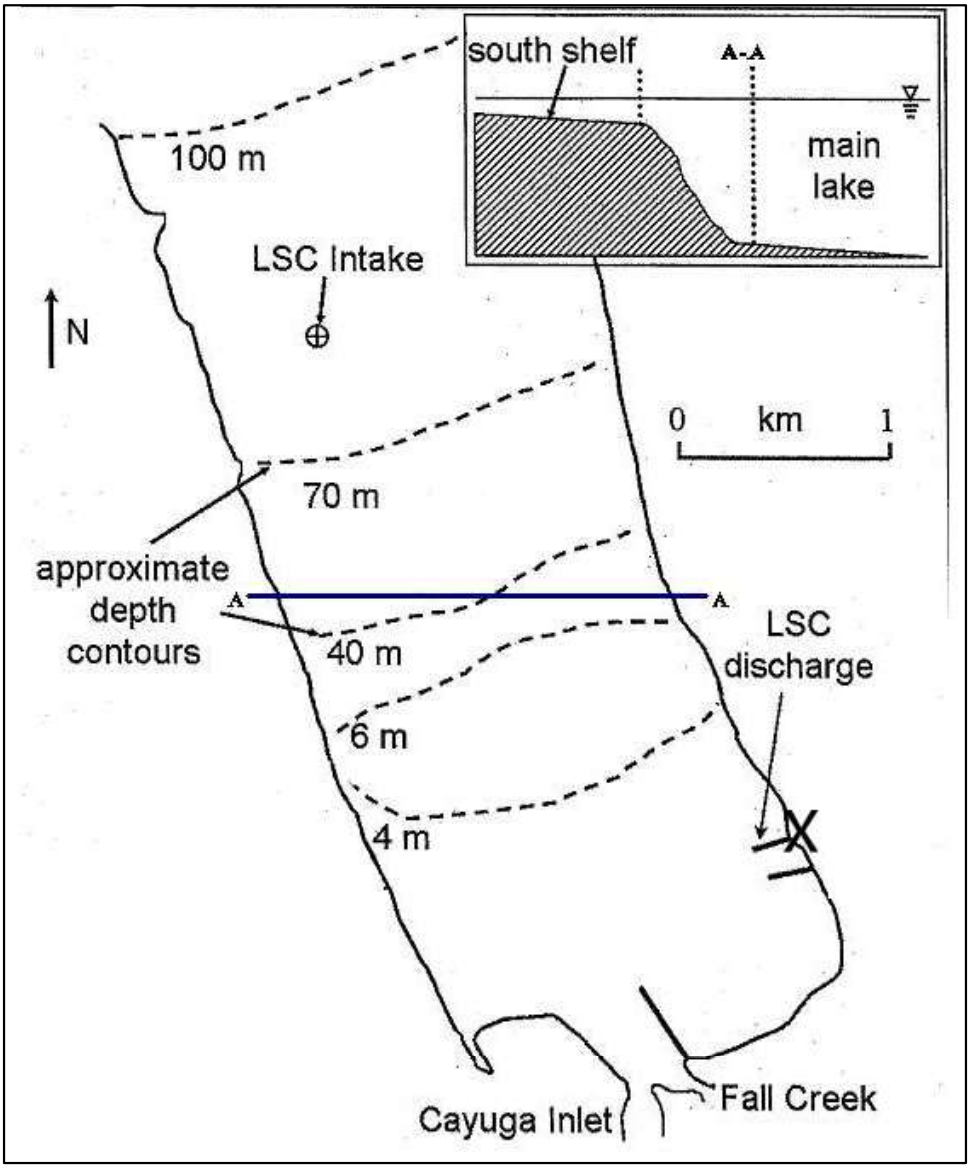
Rick Burgess, PE, CEM
Vice President, Facilities and Campus Services

Enclosures

cc: Brian Baker, NYSDEC Albany
Cheri Jamison, NYSDEC Albany
Thomas Vigneault, NYSDEC Region 7
Matthew Russo, NYSDEC Region 7
Robert Bland, Cornell University
Jared Pittman, Cornell University
Patrick McNally, Cornell University

Attachment A

Revised Monitoring Location Map for the Modified Permit



Attachment B

Recommended Revised Fact Sheet Language on Anti-Backsliding

Anti-backsliding

The limitations contained in the permit are at least as stringent as the previous permit limits and there are no instances of backsliding.

Total Phosphorus: The draft permit includes a final water quality-based effluent limitation of 6.4 lb/day as a monthly average, which is the most stringent limit that has ever been in effect. While the current permit includes a future limit of 4.8 lb/day monthly average limit, that limit never went into effect. The final 6.4 lb/day effluent limitation in the draft permit represents the daily load calculated using the applicable water quality guidance value of 20 µg/l and the long term average flow rate of 37.5 MGD (~1.6 m^3/sec), and is equivalent to the currently effective interim effluent limitation. The previous 4.8 lb/day final effluent limitation listed in the 2013 permit, which never went into effect, was based upon actual phosphorus loading data from 2000-2009. Monitoring results over the 2009-2019 period show that background levels of TP in some parts of the lake, over which the permittee has no control, have been slowly increasing over time and will make the previous future (never effective) effluent limitation of 4.8 lb/day unachievable.

The draft permit therefore includes a final water quality based effluent limit of 6.4 lb/day, equal to the current interim limit for continued discharge to segment 4, with Footnote 1 stating that "if the final approved Cayuga Lake TMDL specifies a Waste Load Allocation other than 6.4 lb/day, the Department shall propose a modification to this permit to incorporate a limit based on the LSC Waste Load Allocation of the approved TMDL." Footnote 1 assures that the permit will be modified if the TMDL allocation requires a different limit. In addition, the proposed Phosphorus Offset Program (see below) contains an option for developing Offset Best Management Practices (*Offset BMPs*) to reduce the amount of TP being delivered to Cayuga Lake over time; these BMPs may be implemented in the watersheds for Lake Segments 3 and 4.

As noted in the Additional Modifications section of this Fact Sheet, the permittee conducted a study to relocate the discharge from Outfall 001 to a location within the Class AA segment of Cayuga Lake. This study concluded that a relocated outfall would not offer improved water quality conditions in the Lake. As also noted in the Best Management Practices section of this Fact Sheet, the permittee is required to maximize efficiency of the lake source cooling system to minimize the volume of water used.

City of Ithaca Water Treatment Plant

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Elizabeth A Tracy
May 7th, 2020
NYSDEC Region 7 Headquarters
615 Erie Boulevard W
Syracuse, NY 13204

Dear Ms. Tracy,

I am writing as the Chair of the Monitoring Partnership (MP), a committee of the Tompkins County Water Resources Council, to submit the following questions and comments regarding the draft permit for Cornell University's Lake Source Cooling facility.

The MP was formed in 2006 during a permit review of Cornell University's Lake Source Cooling (LSC) facility 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 included by DEC in a LSC permit modification for monitoring to support development of a Total Maximum Daily Load (TMDL) for Cayuga Lake. DEC invited the MP to serve on the Technical Advisory Committee to provide oversight to 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.

General Comment: It is worth noting that the research directed and reviewed by DEC and completed by Upstate Freshwater Institute and Cornell University researchers in support of a TMDL 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 recirculates 'Cayuga Lake Non-Contact Water', it would be more logical to make this a monitoring requirement rather than to set a minimum and maximum.

- P. 3, FOOTNOTES regarding a possible TMDL based change to the permit: Why is the DEC proposing a permit that may change in a few months when the TMDL is published? This creates a great deal of uncertainty for the permittee. We suggest waiting until the TMDL is published to substantially change the 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 targeting soluble reactive phosphorus (SRP). Work in the Lake Erie watershed found that some BMPs promoting infiltration actually increased SRP in runoff, 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 BMPs targeting TP.

- P. 6, PHOSPHORUS OFFSET PROGRAM, B:2-5, Verification and Tracking of BMPs: The permit states that verification does not require actual monitoring. We realize this is standard language. We suggest that monitoring be considered as an option to accomplish verification, tracking and effectiveness of BMPs in ALL new/renewed permits.

- 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 final model development or subsequent TMDL. Furthermore, a significant number of the public view LSC in an unfavorable light. To have CU assist the State in rolling out the State's model and subsequent plans is at best confusing, at worst it undermines the credibility of the DEC, the model and subsequent plans. If DEC needs assistance engaging stakeholders and doing outreach, we suggest they ask other governmental organizations such as County Water Quality Coordinating Committees.

- P. 9, MONITORING LOCATIONS: Delete the map. It is confusing as all the monitoring is done inside the LSC facility.

- FACT SHEET P. 5, RECEIVING WATER INFORMATION TABLE, Wastewater Type: Change to 'Cayuga Lake Non-Contact Cooling Water'.
- FACT SHEET P. 5, Impaired Water Body Information: See earlier comment on same topic. We suggest waiting until the TMDL is published to update the permit to avoid potential near term changes that may have negative impacts on facility operations.
- FACT SHEET 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 given that this topic has been a major concern of stakeholders for years.

- FACT SHEET P. 7, PERMIT REQUIREMENTS, Cayuga Lake Water Quality Model, Stakeholder engagement: See earlier comment on this topic. Requiring Cornell to engage stakeholders for DEC's work on a lake and watershed model and subsequent TMDL will be confusing at best. For some community members, it will have a strong negative impact on their perception of DEC, the model and the TMDL. *We strongly suggest removing this requirement.*

- FACT SHEET P. 7, PERMIT REQUIREMENTS, Additional Modifications: See earlier comment on same topic. *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 FACT SHEET.

- FACT SHEET P. 9, Outfall and Receiving Water Information, Impaired Waters: It is worth noting, again, that the research directed and reviewed by DEC and completed by Upstate Freshwater Institute and Cornell University researchers <u>did not support</u> 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

Roxanna Johnston on behalf of the Monitoring Partnership

Appendix B: Comments Received Outside of the Public Comment Period of Draft Permit

May 20, 2020

Elizabeth A Tracy
NYSDEC Region 7 Headquarters
615 Erie Boulevard W
Syracuse, NY 13204
Sent via Attorney for CLEAN Serenna McCloud, Esq.

Re: Comments on technical review of the Lake Source Cooling SPDES Permit

Dear Ms. Tracy,

CLEAN is a group of local citizens concerned about the environmental health of Cayuga Lake. I am a co-founder of CLEAN, which was established in 2017. We have reviewed the recent comments on the new SPDES permit for Cornell's Lake Source Cooling Project sent to you by the Monitoring Partnership, a committee of the Tompkins County Water Resources Council. We have the greatest respect for the salient and unwavering contributions of the Water Resources Council over the years. Our few comments below in blue font are offered in a spirit of positive collegiality.

The Monitoring Partnership commented to you:

- *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 recirculates 'Cayuga Lake Non-Contact Water', it would be more logical to make this a monitoring requirement rather than to set a minimum and maximum.*

We think the indicated pH min 6.5, max 8.5 range is appropriate and should be left in the final permit. Cayuga Lake is a deep and for much of each year a highly-stratified lake. The LSC is pulling cold water from deep in the non-photic zone and releasing into a shallow photic zone of the lake, which is more complicated than "recirculation." Just as managements of stratified hydropower reservoirs are ***very strictly*** controlled to prevent release of deeper anoxic waters downstream, so LSC should be similarly regulated from releasing deep waters into the shallower photic zone if the pH of that water were to become outside of the relatively permissive, two orders of magnitude pH 6.5-8.5 pH range, all of which hopefully supports healthy aquatic ecosystems.

CLEAN Steering Committee
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Ithaca, NY 14850

Clean the Lake.
Protect the Lake.

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www.CLEANcayugalake.org

- *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.*
- *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.*

The Lake Simcoe Region Conservation Authority in Ontario uses a 2.5:1 offset ratio. Michael Walters, chief administrative officer of the authority(tel: 905.895.1281 x 234 1.800.465.0437 Mobile 905.955.3056; m.walters@LSRCA.on.ca | www.LSRCA.on.ca) explained to us that 80% of P is required to remain on urban developed sites. If post-site-mitigation, 2 kg of P is still leaving a site the property owner/developer is required to pay into a P-offset account at a rate of C$35,000/kg. Thus, if 2 kg P is leaving a site annually, the offset fee would be 2 kg*2.5*C$35,000 = C$175,000 paid into a neighborhood mitigation fund. Construction of infiltration basins is one remediation strategy being used there.

Regarding priority watershed areas for P-offsets, we think the permit should specify that these need to be watersheds that drain into the south end of Cayuga Lake (including Salmon Creek and points south). The lake drains south to north and thus offsets in the northern portion of the lake's watershed will be of no benefit to southern portions of the lake.

- *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 targeting soluble reactive phosphorus (SRP). Work in the Lake Erie watershed found that some BMPs promoting infiltration actually increased SRP in runoff, 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 BMPs targeting TP.*

As SRP is understood to be a potent driver of Harmful Algal Blooms, we recommend that the permit specify limits on SRP as well at Total Phosphorus and that actual monitoring of SRP and TP be required periodically to measure levels of both being released at the LSC outfall and at the P-offset subwatershed area(s).

- *P. 6, PHOSPHORUS OFFSET PROGRAM, B:2-5, Verification and Tracking of BMPs: The permit states that verification does not require actual monitoring. We realize this is*

standard language. We suggest that monitoring be considered as an option to accomplish verification, tracking and effectiveness of BMPs in ALL new/renewed permits.

We look forward to the possibility of being of assistance in these matters in future.

Respectfully,

John Dennis on behalf of CLEAN