

BALSAM LAKE PROTECTION & REHABILITATION DISTRICT

Citizens Committee Meeting East Balsam Water Quality Meeting Minutes

April 27, 2019, 9:00 AM

Polk Business Center Meeting Room

1) CALL TO ORDER:

• Tom Kelly called the meeting to order at 9:11 AM

2) PRESENT:

- Commissioner Tom Kelly (facilitator)
- Commissioner Rod Preble
- Commissioner Bill Mork
- Commissioner Andy Wilhoit (teleconference)
- Bill James (National Expert in the field, UW Stout)
- Cheryl Clemens (Harmony Environmental)
- Jerry Shaughnessy (teleconference?)
- Paul Commers (teleconference?)
- Joel Paper (teleconference?)
- Peter Oberst
- John Davis
- Paul Duxbury
- Paul Gydesen
- Ray Sloss
- Laura Sloss
- Patty Kabus (recorder, teleconference)

3) INTRODUCTIONS AND COMMITTEE PURPOSE:

- Tom thanked everyone for coming
- Tom provided a brief background of the history of this project
- Purpose of this meeting is education and communication, as well as feedback

4) WATER QUALITY REVIEW:

- Bill James presented an overview of the East Balsam water quality
 - East Balsam had 50% internal phosphorous loading in previous Barr estimates- Bill explained the history of how we have determined this
 - Bill has been working on East Balsam Lake since 2015
 - Described how anoxic conditions affect phosphorous
 - Iron in a lake will bind phosphorous in aerobic conditions, but in Balsam Lake, there is a low Fe:P ratio so not enough iron to bind
 - Went through a process to measure oxygen every hour in 2016 and 2017
 - Findings
 - o East Balsam stratifies and mixes often
 - \circ $\$ Lake bottom becomes an oxic often throughout the summer
 - This shows a high potential for internal P loading
 - o There is not enough soluble iron to trap all the soluble P
 - Some soluble P taken up by algae for blooms
 - Internal loading of phosphorous went from 50% in 2010, to 70% in 2017 (varies depending on seasonal weather)
 - Predictive analysis with internal load control Phosphorous 57% improvement, Chlorophyll 70% improvement
 - Tom noted that as water quality improves, there is an economic benefit to property values of lake properties. That is not our objective but is a result
 - 1 pound of Chlorophyll will produce 300-500 pounds of algae (per Ray Sloss)
 - Secchi depth transparency (visibility of the water) of the lake is predicted to increase 88%
 - Nuisance bloom frequency will reduce from 80% to 20%

5) OPTIONS CONSIDERED:

- Cheryl Clemens reviewed the options that were considered in previous studies
 - Dredging: \$15-\$45 Million, has environmental concern for sediment suspension, and removing plants, where to put the sediment (estimate from Ayres Engineering in 2014)
 - Aeration: Difficult to get complete aeration, can lead to more algae, not less because warmer water from the top is brought down to the bottom which can increase decomposition, anaerobic conditions can still develop and release phosphorous, and P is not bound under aerobic conditions when there isn't enough iron in the water, which is the case in East Balsam Lake.
 - East Balsam Outflow: Minimum cost \$50 Million. In order to increase outflow, you
 also need to increase inflow. This is not a practical solution

- Reducing Runoff (External Load): This would not be effective for East Balsam because the bulk of the phosphorous is due to internal loading, not external loading. External program completed in the past and Healthy Lakes (per Tom Kelly) will make more of a difference post-alum treatment
- Alum Application: This is the recommended method for treatment

6) ALUM OVERVIEW AND STRATEGY:

- Bill James noted that during alum treatment, alum (aluminum sulfate) is added to the water column (under the surface, exact depth to be determined). It forms a 'floc' that binds to phosphorous, will not release even if the water becomes anoxic and will continue to bind phosphorous
 - Post meeting, Cheryl Clemens provided this additional information about the process: HAB's subsurface injection technology utilizes injection lines with jet nozzles that are suspended from the application boom and penetrate 6-8" into the lake. The alum is injected under pressure to flash mix with lakewater and the floc forms at a depth of 12-18". This method bypasses the lakewater's surface tension and allows the floc to form and settle quickly out of the photic zone (documented settling rates of 1 foot every 2 minutes). Thus, floc contact with algae and potential wind redistribution of floc is minimized.
- This is shown to have 5-20 year effectiveness, is safe when dosage is professionally estimated, has low fish death rates and improves plant growth
- It lowers pH balance but careful management of this reduces the impact
- Bill provided a history of alum use in water treatment and lakes
- Alum is a common food additive, very safe when dosage is correct. Does not harm plants or fish, and can improve fish spawning as well as plants
- Dosage is 100 grams per square meter. This is a pretty typical recommended dose.
- 300 acres would be treated
- Cost \$1.3 Million over 7 years with grant monies available to help cover the cost
- Monitoring Cost \$154,000 over 10 years
 - Question as to what water monitoring involves
 - Sediment cores, secchi (depth visibility), measure P, typically every 2 weeks
 - This helps identify when it is time for more doses
- Alum can move around. Attempt to apply when the wind is low to minimize movement, and doses are applied below the water
 - Cheryl noted we treat the deep water zones because we treat the source of the problem, rather than at the shore, which is where we see the symptom (algae)
 - Area is selected based on the results of the study. It is where anaerobic conditions develop.
- Strategy: Smaller dose applications over time (every other year or as needed based on monitoring) are the most effective, because alum can lose > 50% of P binding strength over time

- Adjustments could be made due to the results of the monitoring and technology improvements over the span of the treatment timeframe (such as direct sediment injection, which is currently in development)
- Maintenance vs monitoring
 - Triggers for doses based on predefined goals and levels over time
 - Alum treatments don't last forever. Typically can last up to 20 years in stratified lakes and 6 years in shallow lakes. Longevity increases based on correct management
 - Effectiveness of alum treatment in East Balsam is projected to be high
 - 20 year effectiveness estimate would start after the last treatment

7) PLANNING AND GRANT PROCESS

- Cheryl Clemens reviewed the planning schedule
- There is a need to amend the Long Range Plan (LRP) in order to quality for grant money
 - The full Long Range Plan will be updated in 2020.
 - Cheryl suggested making the amendment available on the website prior to the annual meeting, it needs to be approved by the board prior to the annual meeting
 - Final LRP Amendment at the Annual Meeting
 - Seek Wisconsin DNR Approval in August
 - Grants due Feb 1 of each year, and are approved in April
 - 1st Alum application would be in mid-June 2020

8) COMMITTEE QUESTIONS AND CONCERNS:

- Will the increase in plants in deeper water impact boating? Cannot be definitively predicted. Rod noted that CLP harvesting is only in the corner of East Balsam. Bill noted harvesting may increase in certain areas to control growth
- Grant money Grant cap is \$200,000 per project. Each separate application is considered a separate project.
- Comments on communication strategy
 - Public presentation should more concise and less technical
 - Consider 2 meetings (not just June 8) to give everyone an opportunity to attend
 - Explain how treatment area will improve water quality throughout East Balsam
 - Provide other alum treatment examples
 - Address how increase in clarity will impact aquatic plant growth. For example, is there a greater likelihood that Eurasian water milfoil will thrive in East Balsam if it is introduced?
 - BLPRD consultants are not in the alum treatment business
 - Why should the rest of the lake support an alum treatment for East Balsam?
 - Water quality will not necessarily improve throughout Balsam Lake
 - o BLPRD projects over the years have benefited other areas of the lake
 - Consider a tiered assessment with East Balsam owners paying more (committee to review Cedar Lake example)

9) NEXT STEPS:

- Committee meeting May 18 Cheryl asked for questions to cover at the next meeting
 - Answer committee questions
 - Cost Breakdown
 - Financing
 - Committee Recommendation
 - Communication Strategy
- Meeting June 8 for the public and constituents, invite Homeowners Association to the meeting
 - Finalize Water Quality Amendment and Communication Strategy

10) ADJOURN:

• The meeting was adjourned at 11:06