Lake Champlain Basin Program
Technical Advisory Committee meeting
Wednesday, April 4, 2018, 10:00 AM – 3:00 PM

Approved TAC meeting summary

Members: William Ardren, Fred Dunlap, Andrew Schroth, Angela Shambaugh, Mark Malchoff, Jennifer Callahan, Breck Bowden, Jamie Shanley, Martin Mimeault, James Jutras (phone), Eric Perkins (phone), Bernie Pientka (phone), Laura DiPietro (phone), Dennis DeWeese (phone), Bethany Sargent (phone)

Staff: Meg Modley, Ellen Kujawa, Eric Howe

Guests: Dave Braun (Stone Environmental), Becky Tharp (Watershed Consulting Associates), Luke Myers (SUNY Plattsburgh/Lake Champlain Research Institute), Kip Potter (representing Stone Environmental)

10:00 AM Executive Session: Review Rock River RFP
Motion to go into executive session: Breck Bowden moves, Angela Shambaugh seconds.

TAC discussed the Rock River Geomorphic Assessment RFP.

Breck: Motion to approve RFP with suggested revisions. Seconded by Angela. All in favor, Martin abstains, motion is carried.

10:30 AM: Updates, announcements, and public comments
Angela: Vermont received a provisional pass on the EPA TMDL report card. The current round of ecosystem restoration grants ends April 23; the next round in September. There's an upcoming clean water board meeting, which will also include discussion of FY 2020. Vermont Clean Water Week has been announced, and will run from July 30-August 4th.

Breck: LC Sea Grant has hired Mark Campion and he will be starting on April 23rd.

Andrew: There's a new UVM faculty hire in Engineering Department; they will be working on hydrodynamic and water quality monitoring as part of ESPCoR. Judith Van Houten is retiring in May.

Mark: Marina workshop on Friday 3/30 went quite well. Lots of outreach materials to be circulated to boaters and anglers this summer. Planning to do hands on oil spill cleanup activity in September.

Bill: Madeleine Lyttle will be retiring shortly; we hope to fill that position.

Martin: Upcoming QC election. The liberal budget looks to be very positive for WQ management, so watershed groups may have approximately double their previous budgets, and there will be significantly more resources to support water quality.

Jamie: Long term monitoring program (acid rain project) was mentioned on VPR this week. Michael Wironen also quoted on his PhD phosphorus budgeting work.

LCBP updates, *Eric Howe, LCBP*

Eric: Matt and Rachel had a healthy baby boy named Caleb on March 27. Omnibus funding bill has passed and our Lake Champlain funding situation seems quite solid. Lake Champlain details are still unresolved, but the total Lake Champlain EPA appropriation is about $8.4 million, though LCBP will not receive this whole package – around $4.4 for LCBP operations, and the remaining money goes to implementing the Lake Champlain TMDL. GLFC appropriation received about a $2 million boost. Boat launch stewards are in the process of being hired. Most of these approximately 12 stewards will be posted in VT, with one or two in NY and two in QC. Steering Committee meeting next week for budget approval. Also included on that agenda are an update from the IJC on the two Lake Champlain references (Lake Champlain – Richelieu River flooding study, and water quality on Missisquoi Bay and Lake Memphremagog). State of the Lake will be released in mid-June. Figures and text are mostly finished.

10:45 AM Review and approve summary of previous TAC meeting

Martin moves to approve minutes as written. Seconded by Angela. All in favor, Andrew and Breck abstain, motion is carried.

10:50 AM Volunteer cyanobacteria monitoring workplan, *Lori Fisher (Lake Champlain Committee)*

Lori Fisher presented the updated workplan. Volunteer reports have increased, and the volunteer monitoring component contributes about 80-85% of these reports.

Breck requests clarification of program development and updates on new research; Lori will clarify and add a sentence to address this question. Every year, the program needs to change slightly – for example, the 2017 late September *Scytonema* bloom in Burlington necessitates mentioning identification during 2018 trainings.

Jen: Motion to approve with revisions (added sentence about updates on new research). Breck seconds. All in favor, Angela abstains, motion is carried.

11:05 AM Discuss and approve Human and ecosystem health risks of mercury and cyanotoxins in Lake Champlain final report

Angela noted several typos. TAC suggests a title change to better summarize the report's methods and findings: "Survey of mercury and cyanotoxin concentrations in fish tissues in Lake Champlain."

Jen: motion to approve, pending subcommittee's approval, in addition to the title change revision. Breck seconds. All in favor, motion is carried.

11:30 AM Tile drain base-flow phosphorus removal using St. George Black workplan, *Becky Tharp (Watershed Consulting Associates)*

Becky Tharp presented the workplan for the new tile drain base-flow phosphorus removal using St. George Black. St. George Black is a locally sourced shale, which will be used as an effluent filter. Tile drains provide agronomic benefits but can lead to increased P release from agricultural fields.

Breck: In workplan, change 12 hours to 24, and add sample handling protocol if not included already.

Jamie: Will you be measuring flow? Is the ditch lined to prevent effluent escape? Becky: yes, measuring flow, and the unit will be self-contained.

Breck: Can you include a sketch of the device and the location it will be installed? Becky: We can't provide much more information on where it will be and what exactly it will look like, since part of the project presented in the workplan is developing the unit's specifics and location.

Kip: How much do you know about the tile field you'll be using? New tile, old tile, surface inlets? Becky: There are no surface inlets that we know of, but farmers are not always aware of them, and this is something we'll be looking for. It's an older tile field. Kip: older tiles can present some extra challenges – something to consider going forward.

Laura: Understand the challenge of high flow and clogging, but low flow may not be high enough in Phosphorus to show a statistically significant difference between influence and effluent. Also, is there any value in continuous flow monitoring, in addition to the SRP samples at 12 times? Becky: The low flow samples so far have shown some significant phosphorus. In addition, they may pick up significantly after a manure or other fertilizer application. Also, WCA's intention is to monitor the flow continuously but collect samples 12 times.

Breck: What about the residence time of the water in the unit? Need to consider when calculating inflow vs outflow concentrations as there might be a time delay. Angela: This will likely change as the filter ages. Becky: We'll add this calculation to the workplan.

Andrew: Understanding the particular mechanism of St. George Black as an adsorptive medium is important to consider. There's also a history of sulfidic shale contaminating water quality. This would be worth running some analyses. Becky: These analyses have been conducted and there were no significant contaminants found in the outflow.

Andrew: Could you run samples of filter materials throughout the project to determine how much phosphorus is being absorbed? Becky: Yes, but that would be a significant cost and may be for a different project - perhaps a subsequent phase of this project if we see phosphorus reduction. Filter materials may release phosphorus down the road.

Breck: Students in Don Ross's lab could run the column anaerobically and see if anything is coming off the filter materials.

Laura: Dave mentioned the other day that bench analysis only picks up on 1% of the phosphorus present in the field. Do you feel confident that you'll be able to track actual phosphorus in the lab? Also, can you use Stone's work on Jewett Brook to look at low flow concentration rates after an application event? In addition, two weeks of low flow calibration may not be enough – can you use Dave Braun's data to help calibrate your efforts? Becky: We feel confident that we'll be able to accurately track phosphorus; we'll look at Stone's data to help calibrate our methods.

Breck: This design is intended to go in the ditch, correct? Not certain that's the right place. Sediment moving will be a large piece of this project so you're bypassing high flow events, but these high flow events will be the largest. Could you consider an end-of-pipe solution rather than one in the ditch? Becky: our project is two parts – the automated open/close system for the

end of pipes, and the St. George Black unit in the ditch. We considered combining these – and that would be ideal – but it's not possible yet. Lining ditches is another possibility but not possible yet. Breck: what more are you going to learn by putting this in a ditch rather than simply using more bench work? Becky: moving to the field means new challenges and opportunities for further questions. Breck: what's the key question here? Does it work and is it safe, or does it work and can it be implemented in the field? Becky: We don't know for certain that it works, but it shows promise in the lab. Part of this is about low flow concentrations and whether there's enough information there. Breck: the results of this project will be totally specific to the ditch and field you pick. Becky: LCBP's aim from this RFP was to understand tile drain effluent and potential solutions. This project at least presents a step in a direction towards that understanding.

Angela: Could we populate a list of questions we'd like to see answered at the end of the first field season? An interim report would be very helpful.

Breck: What's the gradient that you'll get on these tile drains? Becky: this ditch has a grade that will move water, and we also plan to have the leading edge of the unit elevated so water will be backed up somewhat (also settling sediment). Breck: Laura, are there any regulations for damming water in a ditch? Laura: we'd need to consult DEC. Likely minor dams to back up water are fine. Breck: I have reservations that you'll be able to move water through a unit in a ditch, but if you could create a dam with a weir in it, that might allow for more of a gradient and will also allow for sediment settling. Laura: we've had to do that kind of water slowing before, and this may need to be reassessed when WCA is in the field. Could we populated a sub group advisory committee to review the plan before it goes into the field?

Dave Braun: important to verify that it's a ditch and not a ditched stream.

Edits: Small change from 12 to 24 hours, and clarify the sample handling protocol if not already mentioned. Use data from Stone's Jewett Brook project to help calibrate low flow concentrations and volume. Consider what type of tile is being used in the field and whether age and layout will change the design constraints. Consider analyzing medium (solid) concentrations over time, if possible, by creating a synopsis of column experiments; if not, provide a synopsis of this research and identify opportunities for additional work as a further project. Populate an advisory board, and plan to present an interim report to the TAC next year.

Breck: Motion to approve, pending revisions suggested by the TAC and with the formation of a project advisory committee. TAC empowers this PAC to approve any further decisions on design. Martin seconds. All in favor, motion is carried.

12:15 PM Lunch

1:00 PM Long-term monitoring project workplan and interim report, *Angela Shambaugh (VTDEC), Pete Stangel (VTDEC/NEIWPCC), and Fred Dunlap (NYDEC)*

Angela Shambaugh presented the interim report for the long-term monitoring program, with assistance from Fred Dunlap and Luke Myers. One important note is the Rock River sampling effort: recently, DEC realized that BMPs were being put on the ground in the "control" zone. Focus of Rock River study has changed somewhat to reflect that – two sub-watersheds are now analyzed as one, and trends will be analyzed over time.

Breck: the paragraph that covers the change in the Rock River study design should be reworded slightly – now it reads as if the study design is invalid but you're proceeding anyway.

Fred Dunlap presented the workplan and QAPP for the upcoming season.

Fred: Based on some of the HAB work in NY, there's been suggestions that we should add levels of nitrogen and different tributary sampling at low flow concentrations throughout the year. Should we consider expanding parameters or changing timing of sampling? Martin: Trying to remember the details of the Vermont-QC agreement on this program. Much of the sampling is done by volunteers from watershed groups. Angela: the key part there is that the low flow data you have suggests decreases in phosphorus concentration.

Martin: Motion to approve workplan with suggested revisions and populate a sub-committee (with current long term monitoring subcommittee) to reevaluate parameters and sampling regime for next year. Andrew seconds. All in favor, Fred and Angela abstain, motion is carried.

1:45 PM Tile drain monitoring and treatment study workplan, *Dave Braun (Stone Env.)*

Dave Braun and Kip Potter presented the workplan for the combined tile drain monitoring and treatment study. Jewett Brook study is in three parts: literature review (task 1), monitoring of tile drainage systems (task 2), and P load estimation of tile drainage systems (task 3). Current study questions: 1) are inlets the main route for P transport to tile drains? 2) Are conditions in the Jewett Brook watershed representative of conditions in the wider Lake Champlain Basin? And 3) Given multiple tradeoffs between surface runoff and subsurface drainage, is the net effects of tile drainage increased or decreased P runoff? `

Breck: Will you be working exclusively with closed filters, or with open ditches as well? Dave: Closed. Large sedimentation chamber with pipes along the ditch, sloping at a slight grade up from the sedimentation chamber. Breck: This project is to evaluated the performance of the medium, not whether this implementation would work, correct? Dave: Both. If this implementation works well, it would be possible to install in most places.

Andrew: so you think that the sedimentation chamber will help you avoid clogging? Dave: Hoping so. Angela: will the pre-treatment sediment chamber be cleanable? Dave: Yes – a concrete vault.

Breck: need to standardize proportion analysis in workplan.

Breck: Motion to approve workplan with suggested revision. Angela seconds. All in favor, motion is carried.

3:00 PM Adjourn