From: Megan Andrews-Sharer
To: DNR ESTABROOK
Cc: Ken Leinbach
Subject: Estabrook Dam Comments - Ken Leinbach
Date: Thursday, March 31, 2016 10:21:40 AM

Dear Kristina,

I am submitting the written comments of Ken Leinbach, Executive Director of the Urban Ecology Center, supporting the removal of the Estabrook Dam. He has written the following three articles:

- http://urbanecologycenter.org/pdf/Estabrook%20Dam.pdf (May 2015) **The text of this article is included below.**
- http://urbanecologycenter.org/blog/if-you-won-t-listen-to-me-listen-to-the-lorax.html (August 2015)
- http://urbanecologycenter.org/pdf/newsletter/2009/may_june_09.pdf (2009)

Best Regards,
Megan Andrews-Sharer

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Ken's article, and most detailed remarks encouraging the removal of the Estabrook dam:

"To all involved with the decision on what to do with the deteriorating Estabrook Dam,

As the Executive Director of the Urban Ecology Center, I have received an exceptionally high number of calls related to this community problem. In part because of this community outpouring, in part because we use the river as an educational asset for tens of thousands of students each year, and in part because of friendships I have developed with home owners who live on the impoundment above the dam -- I have looked very closely at this issue. I have seen the incredible ecological rebound first hand since the removal of the North Avenue Dam below Estabrook, as well as the amazing recreational asset that a still water system can provide for the community above Estabrook. The Urban Ecology Center uses the river more than any other group in the city. We provide environmental education for children and adults on both the stretch of river below the dam and the area above the dam as well. We teach hundreds of kids each summer how to canoe on the Lincoln Park impoundment. I state all of this to make clear that our organization can benefit from either scenario: dam repaired or dam removed. Most people that I heard speak at the March 24th council meeting had a strong opinion each sighting facts that backed their case. Like you, I listened. At that point, I was not prepared to make a decision about my position, and I said this at the meeting. However, since the meeting I have done additional research, and I would like to share with you the line of reasoning I would use to make a decision, were I in your shoes.

First, it must be understood that any option considered must address the known toxins that exist in

the sediments above the dam and near Lincoln Creek. No matter what happens to the dam, these toxins must be removed and capped, and this action must be financed with government dollars (I believe that this is already in process). Those who own property along the river but had nothing to do with the toxins in the sediment should not be held responsible for the cost associated with cleaning up these sediments (as some have suggested they should). Leaving the toxins in place is not an option … they have to be dealt with. With the requirement to remove the toxins in all cases understood, there are three options to consider:

1) Do we repair the dam and manage the impoundment with seasonal draw-downs as we are doing now?
2) Do we repair the dam and manage the impoundment differently so it stays as a permanent "lake"?
3) Do we remove the dam entirely?

I will address each of these three options in order.

1) Do we repair the dam and manage the impoundment with seasonal draw-downs? No, definitely not. The most important thing to consider for the long term is the ecological impact of any decision we make. If there is anything that I hope we have learned over the past century, it is that everything is connected. In this case, a healthy life-sustaining waterway means clean water, a productive fishery, vibrant riparian land, healthy and sustainable parks, and positive recreational opportunities (instead of crime along abandoned polluted waterways). All of these factors connect to lifestyle satisfaction, which translates to job retention in the area, etc. Thus, whatever decision is made must keep a long term healthy natural ecosystem at the forefront of the decision. Our current management of the impoundment above the Estabrook Dam through seasonal draw-downs does not in any way nurture a healthy natural ecosystem. In fact, it does just the opposite. Many plants, fish, frogs, other amphibians, dragonflies, crayfish, macro invertebrates (bugs that live in the water), and micro-organisms at the bottom of the food web cannot adequately adapt to a summer lake and a winter river. The entire impoundment area is scoured, frozen or desiccated each year as a result of these seasonal draw-downs. The seasonal operation does not allow for a sustainable and balanced fish population or wildlife and plant community. It is true that many of these plants and animals do exist in the area today, even with this oscillation, but our current management does not produce anywhere near the diversity or abundance of life that this waterway should have or is capable of supporting. For this reason it is my opinion that this "status quo" option should be taken off the table.

2) Do we rebuild the existing dam in a way that creates a permanent, ecologically-sound lake? For political and social reasons (and frankly some selfish reasons … I like kayaking on the impoundment) this is the option I would have liked to be able to advocate for. I believe that an urban area of 1.5 million people is enhanced by a diversity of opportunities and experiences. Having unique parkland that allows for the still water experience of boating and fishing, as well as the "cool" factor of having a park with lake trails and islands to explore is a good thing for the community. The real question is -- can this be accomplished in an ecologically sound and sustainable manner; and can it be done with minimal short- and long-term economic costs? Certainly such natural impoundments like beaver dams do exist in nature. With proper design of

the dam, accounting for fish movement, ice issues and flooding, it seems possible that exploring this option could yield an ecologically sound plan. I have done some of this exploration for the purpose of forming my own opinion, discussing at length these issues with experts in related aquatic fields. Unfortunately, no one that I have spoken with has been able to recommend a way to create an ecologically sound impoundment with a new or repaired dam without changing the way we manage the entire river basin. This could not happen overnight and would take a bundle of money. There are two reasons why this solution is problematic: ice and sediments.

Ice considerations are real. According to the Estabrook Dam Report, engineers state that the current dam is not structurally strong enough to withstand the pressures created from a full and frozen impoundment. It is for this reason, as well as concerns about spring ice break-up and flooding, that the impoundment is drawn down each fall (October). No one that I know of has argued against this. Can we make a structure strong enough to withstand this ice pressure when melting snow and ice are also causing peak flows to occur? Perhaps. However, we will still have the spring ice break-up to contend with, which can complicate flooding in this populated urban area.

Aside from the concerns about ice, there are also the sediment concerns. Prior to human settlement, soil systems were quite stable: heavy spring rains and floods flowed over deep-rooted prairies and strong healthy forests and picked up much less soil than today's rains. The plowing of fields with short-rooted crops (like corn and soy beans), coupled with significant development that stirs up soils, means that spring floods carry significantly more sediment than a century ago. Any impoundment created today fills up much faster than even 50 years ago. Additionally, while we have reduced pollutants entering the river, we have yet to even come close to eliminating the pollutants that enter into this highly developed watershed. As we already are experiencing with the existing toxic sediments, these pollutants settle in the sediments above dams. Sedimentation rates for this area are estimated at 1-inch per year and in less than a decade the biological impacts of these accumulated polluted sediments would be severe. Therefore, going back to a natural impoundment system is not, in fact, realistic without significant management (dredging) and ecological costs. There may still be social reasons to explore this option, but at this moment, this option should not be embraced without more time for research, or I fear we will again severely compromise the future ecological, social and economic value of the waterway. I do not believe, due to the deterioration of the existing dam, that the window of time needed for adequate research exists (I might be wrong here, as I did not investigate the current structural integrity of the existing dam as I have no expertise in this area).

3) Do we remove the dam entirely? Based on all the information that I have collected to date, this is the solution that I have to advocate for, if somewhat reluctantly. We know, from the experience of the North Avenue Dam removal, that, while the process was not without flaws, the end result has been an amazing ecological success. Where once there were barely any fish (only two or three hardy species recorded), today there are now over 39 species, with fish literally jumping out of the water when we take kids down to the river. Within a year of the draw down at North Avenue, the mud flats were blooming with native flowers and thick with grasses. There are 160 species of birds now known to migrate through this lush ecosystem and human visitation to the newly acquired parkland has increased tenfold. It worked above the North Avenue Dam, and it can work again above Estabrook. However, doing this right will require proper sediment management, adequate

budgeting for planting, riverbank and floodplain management, a strong design consideration of the entire river from Estabrook to Bender Road as it relates to fish habitat and small craft navigation. It will require time, patience, cooperation and support among the WHOLE river basin community. This means that when the decision is made budgets should support equipment and time for habitat enhancement and for clearing a channel for canoeing this whole stretch even in low water conditions. Remember, this is not in fact a restoration project but rather, this is creating something entirely new with the river (see below). Let's do it right. As a river instead of an impoundment the water will still be there. In fact, once the sediments are remediated and planted, the park will benefit by offering a cleaner environment; fish one can actually catch and consume without being concerned about one's health; more variety of fish, more shoreline and more diverse habitats…and it will be sustainable and significantly less costly to maintain.

Dam removal is not my preferred choice, but is instead what I believe is the right choice. After listening to the many comments in support of repairing the dam at the March 24th council meeting, I can envision a few questions cropping up in response to my position supporting the less-than-popular option of dam removal.

What about the "historic restoration" argument? Let's be clear, there is no "historic restoration" involved with this project as some have suggested. Whatever route is chosen is a decision to create a new ecosystem, a new management plan and a new recreational plan. Over the past century and a half, we have manipulated the Milwaukee River, the environment around the river, and the entire watershed that feeds this stretch of urban river to such a degree that there is no way to approximate what it once was. I recognize and am amazed at the history surrounding these manipulations. In the 1930's, 1600 workers sweated and toiled to blast rock and change the course of the river, dredging and filling as they want. Their effort was based on the engineering and knowledge base of the day. There was little thought given to "environmental impacts and benefits" back then. Commerce was the rule of the day. Environmental modifications and loss were widespread everywhere without knowledge of the long-term ramifications. We've filled in wetlands, vastly increased sediment loads, put in dams, increased pavement, and added toxins by the ton. My point here is this: the argument that repairing the dam will "restore" the river to its original level, prior to the blasting of the rock outcroppings in the 1930's as if this will restore a once pristine ecological system really does not hold water (pardon the pun). The blasting of this outcropping was one of many thousands of manipulations done to the Milwaukee River. We cannot undo them all, and just undoing one will not, in itself, solve a problem.

What about property value loss? This one is hard. I know good people who will be affected by this decision. However, I read the river report and talked to people who were involved with the cited real estate study conducted by the University of Wisconsin-Madison that concluded that property values were not affected by previous dam removals. It makes sense to me. I saw first hand how the property values above the North Avenue dam significantly increased as the pollutants were contained and the river restored to ecological health. I also heard real estate experts put their name on the line to debunk the River Report's conclusion of minimal property value loss. Who do you believe? This is outside of my expertise, so my opinion on this one is of little value. I will say this though, I live on a city street with no natural amenity out my back door, and I for one would trade my house of equal value with any property owner along the Milwaukee River corridor in a

heart beat. While it would be great to live on a lake-like impoundment, I would just as gladly move my home along a free flowing natural river. What about flood control? The Dam was indeed created for flood control reasons. However, it does not appear to have much, if any, actual impact on flooding. In short: it really didn't work. This conclusion does have some debate associated with it. However, talking with experts on river hydrology and observing 14 years of significant river flooding has convinced me that while the dam may have minor impact on small flood events, in truth it has no real impact on large flood events. It is a small dam and significant flooding quickly overwhelms its designed intent for control.

In Conclusion

I had hoped to come up with a creative compromise solution that would allow for a healthy "lake like" ecosystem, happy property owners, and a very cool and permanent amenity for Milwaukee County. I have come to the conclusion, however, that unless we secure very significant funding and somehow buy more time this is not likely and may not even be possible. I looked into small hydro-electricity generation as a means of diverting some of the public burden, but my cursory search did not reveal a realistic system for a small dam of this size, nor does hydro-electricity solve the ecological or engineering issues raised above. Thus, in the current economic climate I fear the answer is clear.

The dam must be removed, but done so in accordance to what I stated above, where appropriate funds are put into ecological and recreational restoration all the way up to Bender Road.

While the issue here is controversial and contentious, the not-always-pretty democratic process to arrive at community consensus (and ultimately a decision) is in fact impressive. Thank you for taking your valuable time to read this and I'd be happy to answer any questions that may have arisen from this letter.

One final Note: If we did have a way in which to buy some time with a band aid fix of some kind to the dam and we did manage to find a significant funding source, here is what I would suggest. We should use this dam as a catalyst for initiating a two year process to create an entire Milwaukee River Basin plan. In my research there was almost unanimous consensus among all ecologists, biologists, and hydrologists that in the ideal world this "problem" that we face would not be taken in isolation. As stated earlier, everything is connected to everything else … especially in a river system. It would be very exciting to sit down with area experts from the entire river basin and come up with a master plan and strategy for total river renewal. In this master plan it would be decided where it makes sense, for the sake of life in the river and the humans that live nearby, to have impoundments, fast flow, hydro-electricity, wetlands, etc. With this big picture approach we would work hard to eliminate the pollutants that enter the system and significantly reduce the sediment load approaching the stable system that existed before human settlements. What is exciting is that we have the expertise right here. At UWM we have some of the top fresh water ecologists in the world. If stimulus money can be used to study a volcano in Alaska (as I read in the paper today), why couldn't it be used to study the Milwaukee River Basin? If funds were available I would offer my services to coordinate experts in the field for such dialogue to begin. In this scenario, an impoundment in Milwaukee might actually become feasible and embraced by all.

However, it is just a likely that the extra time and research would only verify the wisdom in taking out the dam.”