Debbie Beadle

From: ebwelch@u.washington.edu
Sent: Sunday, April 29, 2012 10:41 AM
To: Debbie Beadle
Cc: Kathy Curry
Subject: Re: PC Packet Material 05/03/2012
Attachments: Samplancom2.doc

EXHIBIT NO. 103

Follow Up Flag: Follow up
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Debbie - Here is something else to post. Kathy: About as specific as I can get. I have more data from KC, but probably too detailed, unless someone is interested.

On Fri, 27 Apr 2012, Debbie Beadle wrote:

> Date: Fri, 27 Apr 2012 20:47:30 +0000
> From: Debbie Beadle <dbeadle@ci.sammamish.wa.us>
> Subject: PC Packet Material 05/03/2012
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>
> For Information Purposes.
>
> The Planning Commission Packet material for the 05/03/2012 meeting has been posted onto the Website.
>
> Thank you
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>
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April 29, 2012

To: City of Sammamish Planning Commission

From: Gene Welch, Limnologist
4228 201st Ave. NE
Sammamish, WA 98074

Sub: Critical Areas Update/Protection of Lake Sammamish

This is a follow up to my previous written comments ("Thoughts on lake ---- " 3/28/12). I attended the Commission meeting on April 29th and listened to presentations of the consultants. While the presentation by Brian Taylor on Lake Management Areas mentioned Lake Sammamish, that lake is not covered in his BAP 4-page, handout. Rather, the emphasis is on Beaver and Pine Lakes. As indicated in my 3/28 comments, Lake Sammamish water quality is expected to degrade as development proceeds and forest cover is removed on the eastside, as well as in the rest of the watershed. Therefore, equal emphasis for protection of Lake Sammamish water quality seems prudent.

Mr. Taylor's BAS Lake Management hand out recommended the use of the LID strategy to reduce phosphorus input. That approach minimized the amount of stormwater discharge, the transporter of phosphorus, from developed sites and has been shown to be more effective than conventional BMPs, even on steep slopes (Horner, 2008). Maximizing forest retention, as emphasized in my 3/28 comments, will help reduce storm water transport from sites. Retention of native vegetation, not mentioned in the BAS handouts, is part of the LID strategy and should be encouraged to protect Lake Sammamish, as well as Pine and Beaver Lakes.

The new law going into effect in January 2013, restricting the use and sale of lawn fertilizer containing phosphorus (cited in the BAS handout), is an important move to protect lake water quality. Very limited research and erroneous assumptions in the 1970s and 1980s suggested that while phosphate in lawn fertilizer was usually unnecessary (nitrogen being the key to lawn care), its pollution potential was insignificant due to the sorptive capacity of soil for phosphorus - it would simply stay put. As has been found with agricultural land, continued addition of phosphorus has super-saturated the soil so that excess will run off with stormwater, not only as particulate (as the BAS states), but also as soluble P, which is the form readily available to algae. Seepage of soluble P from lawns was shown in residential areas draining to Lake Minetooka, MN, and led to a ban on phosphorus in fertilizer. Also, recent work in Michigan has shown highly effective results of a phosphorus ban. Three years of monitoring the Huron River, following a phosphorus limiting ordinance in Ann Arbor, showed a 24-52 % reduction in soluble P and a 11-23 % reduction in total P (particulate plus soluble) (Lehman et al,. 2011). Incidentally, John Lehman is a Prof. of Limnology at the U. of MI and was one of the researchers studying the recovery of Lake Washington with the late W. T. Edmondson.

Mr. Taylor mentioned in his presentation that Lake Sammamish had issues, but did not specify. In addition to algae blooms, decreased transparency and depleted bottom oxygen concentrations, increased phosphorus can cause a shift to nuisance types of algae that often produce highly toxic substance. Lake Sammamish had blooms of a toxin (microcystin)-producing cyanobacterium in September 1997, believed to be due to runoff from a preceding large storm. Microcystin was also detected throughout the lake in 1999, despite no large bloom (Johnston and Jacoby, 2003). The good news is that the quality of Lake Sammamish has changed little since the 1990s. Summer transparency has remained at about 5 meters with no further indication of toxic algae, as evidenced by continued monitoring of the lake by the King County lake and stream group.

The current 5 meters transparency in the lake is exceptional quality for an urban lake and warrants a concerted effort of protection. The relationship between transparency and the concentration of particulate matter, including algae, is non linear. That is, only slight increases in algae (or suspended sediment) concentration will produce large decreases in transparency. Lakes with high transparency appear blue, because short wave lengths of light - the blue (and green) color - penetrate farthest in clear lakes that have very low concentrations of small particles. Think Lake Tahoe with its 28 meters of transparency! The cry should be to keep Lake Sammamish clean and blue.

The buffer strip recommendations by Amec for streams, based on evidence cited from May (2003) and Knutsen and Naef (1997), should provide reasonable protection to Lake Sammamish. Both references cite buffer strip averages of about 100 feet for erosion control, fine sediment and pollutant removal. Strips with natural vegetation will also tend to slow runoff, allowing more time for retention of phosphorus by soil.

Also of importance to the protection of Lake Sammamish quality is the recommendation(s) by Amec regarding the watershed approach. Amec suggests wetland functions be examined in a watershed-based context before alteration/mitigation and that code should be revised in that regard (pp. 10, 11, 18). Every natural, or artificial, wetland/vernal pond has some benefit to the overall slowing of stormwater runoff in the whole Lake Sammamish watershed. That is consistent with the policy of "no net loss of wetland functions and values" (AMEC/Wetlands p. 3).

References

Horner, R. 2008. Testimony to Washington Pollution Control Hearings Board on Municipal Stormwater; Impacts on Ecosystems and Water Quality, Stormwater Regulations and Low Impact Development (LID).

Johnston, B. R. and J. M. Jacoby. 2003. Cyanobacterial toxicity and migration in a mesotrophic lake in western Washington. USA. Hydrobiologia 495:79-91.

Lehman, J. T., D. W. Bell, J. P. Doubek and K. E. McDonald. 2011. Reduced additions to river phosphorus for three years following implementation of a lawn fertilizer ordinance. Lake and Reserv. Manage. 27: 390-397.