

Interactive comment on “Long-term changes in sediment phosphorus below a rural effluent discharge” by B. E. Haggard and R. J. Stoner

B. E. Haggard and R. J. Stoner

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We definitely appreciate this reviewers time and comments, as well as the first reviewer.

1) This reviewer points out a weakness in the manuscript that can easily be addressed — the authors were so comfortable with the information presented, knowing that the effluent discharge was the significant contributor of dissolved phosphate... we neglected to show upstream or control data, which is available. The authors will integrate the data available from upstream of the WWTP into the study site description, results and discussion where needed. This was an oversight on the authors part.

2) Taylor and Kunushi published some of the first work on sediment and soil EPC in 1971, and these authors noted that a one hour incubation time was sufficient for the estimation of EPC. It is true that differences in methodology might influence the

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absolute value of sediment EPC, but we would expect that this would limit comparisons across studies and not within. Still, the reviewers point is valid — however, the first reviewer makes the point that the water velocity in streams limit interactions to times less than a minute (basically, it depends on water velocity in the stream). It would probably be worth-while to refer to the differences in EPC methodology across studies, and that our EPA values are relative to our technique. Hopefully, this would suffice the reviewers concerns to some degree.

3) This reviewer suggests that this study would need to complete a mass balance or estimate net uptake or release along the sampling reach... the authors have sufficient data to accomplish this, as has been presented in Haggard et al. (2005). However, the net uptake or release at the reach-scale is somewhat different than what this study was trying to tackle — this study focused on sediment-phosphorus interactions using the EPC concept.

4) The authors would argue that the statistical evidence presented in the paper shows that effluent phosphorus concentrations were the driving factors prior to 2006, and that the sediments became the important controlling factor following improvement in the WWTP management. The change in the linear relations between effluent phosphorus concentrations, SRP concentration in the stream water, and sediment EPC provide this evidence.

We greatly appreciate this reviewers efforts, and comments... the authors feel that we can easily address the first two comments provided by this reviewer, which will improve the quality of this manuscript.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 767, 2009.

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