

**Response to comments (BG-2012-504):**

**Anonymous Referee #1**

Received and published: 24 December 2012

**Overall comments:** The article is interesting to the research field in phosphorus sorption and buffering mechanisms in suspended sediments in a bay area in China. The work seems well planned and performed. Concise and logic description of methodology makes the results trustable and meaningful. Some detailed comments are included below for the authors to consider in a revision of the paper. I recommend the acceptance of this manuscript for publish after minor revision.

**Detailed comments:**

(1) Please explain why the salinity of 5 and pH of 8 were chosen in the experiments? As far as I know, the salinity in the Yangtze Estuary and Hangzhou Bay should be higher than 5.

The pH values in the research areas of Yangtze Estuary are in the range of 7.7-8.4, so we chose the pH value of 8 as our experiment condition.

As the referee mentioned, the salinity in estuary is higher than 5, but we would like to explain that the purpose of this paper was to investigate P sorption to sediment in receiving waters close to wastewater outfalls. The salinity in that specific area is lower than the bulk waters of estuary. That's why we used a salinity of 5 in our experiments.

We apologize for the lack of clarity in our original submission and we hope we addressed the referee's concerns.

(2) Langmuir, Freundlich and Tempkin adsorption isotherm equations are suggested be introduced and referenced when they are firstly appeared in the manuscript.

We have added some brief introduction about the three isotherm equations when they are firstly appeared.

(3) The concept of Ps- EPC<sub>0</sub> was not clearly introduced. Please improve it for a better understanding.

Ps-EPC<sub>0</sub> refers to the phosphate carried on the sediment particles, which is ready to release to the overlying waters with a very low phosphate concentration. We have made this clearer by changing the original sentence to "Ps-EPC<sub>0</sub> is an evaluation of

the amount of reactive phosphate carried on per gram of sediment that is available for releasing to a solution devoid of phosphate”.

(4) The equation  $Ps-EPC_0 = K \cdot EPC_0$  seems not satisfied to the Dimensional Homogeneity, since the units of Ps,  $EPC_0$  and K are mg/L, mg/L and L/g, respectively. Please explain it or revise it.

I would like to explain that the unit of  $Ps-EPC_0$  is  $\mu gP/g$ . It's actually a dimensionless parameter, so the equation of  $Ps-EPC_0 = K \cdot EPC_0$  can be understood and there are no problems about the dimension.

(5) Please check and confirm some expressions such as "sorption equilibria in water sediment systems", "effluent outfall", "before being transported back to" and "were always less than", etc.

Thank you for your advice. We have checked the whole manuscript about the usage of “sediments”. The “water-sediment systems” in the first paragraph should be OK. But we found that some of the “sediments” were not properly used, so we have changed those to “sediment”.

We have checked the phrases of "effluent outfall"、"before being transported back to" and "were always less than" in the manuscript, we think that these phrases were used properly. Thanks again for your suggestions.