Drink. Water Eng. Sci. Discuss., 2, C67–C69, 2009
www.drink-water-eng-sci-discuss.net/2/C67/2009/

Drinking Water Engineering and Science Discussions

Interactive comment on "Impact of decreasing water demand on bank filtration in Saxony, Germany" *by* T. Grischek et al.

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Received and published: 16 October 2009

The title of the paper clearly indicates that just one aspect of RBF is discussed with focus on a certain region in Germany. As true for most RBF sites, the results are highly site specific. From the view of the authors, the title does not promise more than is to be found in the paper. The intention of the paper is to underline and to give some examples for the impact of lower abstraction rates due to a decreasing water demand which is of considerable interest for waterworks and decision makers in the field of supply management. The authors do not know literature about this aspect yet and felt that discussing this aspect is new and a valuable contribution. The aim was to provide a practical paper to rise attention/point out critical aspects of fluctuating water abstractions on RBF quality and quantity. The management options are general

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and not at all focused on management of fluctuating water demand, which is seen as subject for a revision of the paper by the referee. Presenting the best option of improved well operation is again very much site-specific and would need a very detailed description of one of the mentioned RBF sites, which could be done in another paper. If the anonymous referee 1 can provide the best option for all RBF sites in general and can prove it scientifically, this would be highly appreciated.

The authors thank the referee 2 for constructive comments.

1. Indicators to identify increases from landside groundwater due to the decreasing water demand may be persistent or less degradable organic compounds identified in the surface water and used for mixing calculations. This might be compounds such as carbamazepine or EDTA. Normally, there is no routine analysis of such compounds, because of very low concentrations and high costs. Thus, the waterworks rarely have sufficient information about the concentrations and cannot use it as continuous indicators. One could assume that parameters indicating agricultural land-use for land-side groundwater flow towards the wells may be used. However, for the examples in our paper, there is only one out of 3 sites where an increasing nitrate concentration indicated an increasing portion of land-side groundwater. The regularly investigated spectrum of raw water monitoring done by the waterworks seems not to include a useful indicator.

2. The results observed in the region of Saxony are very site specific. But the problem is arising at other sites outside of Saxony, too, and should be monitored at each site despite of its specifics. Such monitoring programmes should include groundwater flow modelling to provide a base for site specific measures such as specific well operation.

3. It is right, that a decreasing water demand offers to operate the existing wells in such a way that longer travel times can be achieved which may result in further removal of organic micropollutants and equilibration of water quality. In case of high nitrate or sulphate concentration in the land-side groundwater as main problem, as true for many RBF sites in Saxony, it is not possible to take advantage of longer travel times.

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4. Using Processing Modflow and the water balance tool for selected sub-sections, the percentage of land-side groundwater in the pumped water can be determined. This was done for the RBF site Göttwitz showing that the fraction of bank filtrate is reduced as a result of decreasing abstraction. It was not done for the RBF site Meissen, where the portion of the land-side groundwater is low. It will be done for the RBF site Görlitz-Weinhübel, where a groundwater flow model is under construction.

Interactive comment on Drink. Water Eng. Sci. Discuss., 2, 101, 2009.