

Institute for Sanitary Engineering, Water Quality and Solid Wastemangement | ISWA

Research

Study at the wastewater treatment plant Mannheim into the elimination of organic micropollutants under wet weather conditions: Investigations using granular activated carbon on an industrial scale

Since July 2016, the wastewater treatment plant (WWTP) Mannheim has been operating an adsorptive treatment stage with powdered activated carbon (PAC) for the elimination of organic micropollutants (OMPs). Currently, 90 % of the annual wastewater volume is treated for OMP removal with powdered activated carbon.

During rain events, the conventionally treated flow is directly forwarded to the filter plant. To achieve a full-stream treatment for OMP removal, the residual wastewater volume should be treated with granular activated carbon filters (GAC).

After successful laboratory and pilot-scale tests, industrial-scale tests have been taking place in three converted filter cells of the filter plant since October 2018.

The filter cells are charged with three different effluents of wastewater. One filter is fed with effluent from the secondary clarifier (F16) and the second filter with effluent from the powder activated carbon treatment stage (F14).

The third filter receives a mixture of the two effluents (F15) (see Figure 1). During the investigations, the filters are feed continuously. In the future, they will operate only for influents exceeding 2,000 L/s. Sampling during rain events will be used to examine the removal of the GAC filters under these conditions in more detail. In addition to the removal of OMPs from the different effluents, operational aspects such as backwashing or filling and emptying of the filter cells will be also tested.

Figure 2 shows the piping for feeding the filter cells (left) and one filter cell in operation (right).

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192

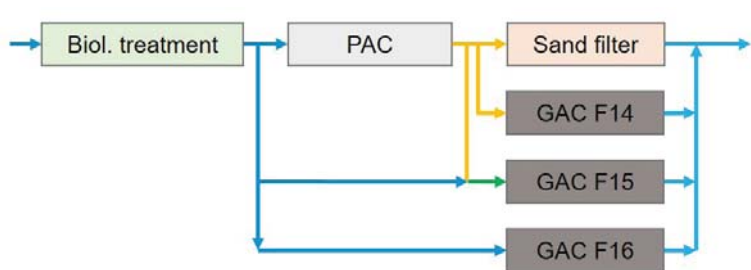
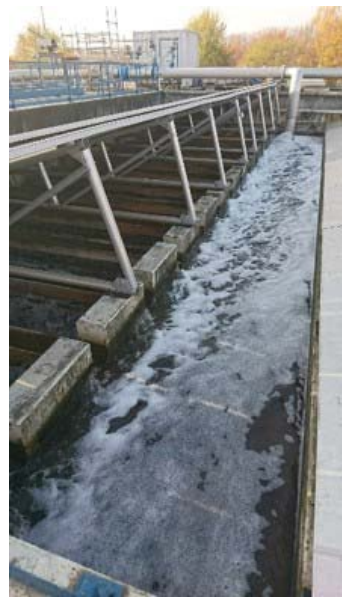


Figure 1: Flow chart for the investigations



Figure 2: Piping (left)



GAC filter in operation (right) (Source: KomS)