

## Written evidence submitted by Water UK

### 1 Are there standard treatments applied by your water and sewage plant able to trap very small particles such as micro-plastics?

#### Sewage Treatment

There are no specifically designed treatment processes to capture very small particles but there are limits set relating to suspended solids which we design to meet. There are a range of different sewage treatment process techniques which broadly follow the principles outlined below.

Primary treatment - removing large solids (screening) followed by settling out of smaller solids, which are removed as sludge

Secondary treatment - biological treatment to reduce biological and chemical oxygen demand when the effluent is discharged to river. This is not designed to remove the particulate matter but instead returns any secondary sludges to the primary treatment for capture.

Tertiary treatment - in some instances e.g. further filtration treatment may coincidentally remove additional small particles from the treated waste water but will return any captured matter back to the primary stage for settlement.

Not all works have the same processes and many do not have tertiary treatment. You should also note that the sewage network overflows have no ability to remove small particles prior to discharge to the natural water environment.

#### Water Treatment

All surface water treatment plants have 3 stage treatment which includes coagulation, flocculation and filtration. This is primarily to remove cryptosporidium spores at 0.5 microns (um) and should coincidentally remove micro-plastics down to this size and prevent them going into the drinking water.

Wastewater and sludges from the water treatment plant are treated to maximise water resources and the waste streams are then discharged to sewer, local water course or the sludge thickened and spread on land or sent to sewer.

### 2 Do you currently measure plastic pollution in your treatment works?

There is no nationally agreed methodology for taking any measurements. The water industry uses the term "suspended solids" in sewage treatment which will be a mixture of organic and inorganic solids. The water treatment processes use the term "turbidity" which will be impacted by micro-plastics. However there are no specific measurements for only plastic at either water or wastewater treatment works. The most recognisable plastic volumes come from the screens at the front end of the sewage treatment and are known as screenings but will contain organic material, metals, wood and other debris.

### 3. What technical challenges are there to capturing and treating micro plastics?

The water industry has no current experience or technologies to separate out micro plastics other than those discussed above and treatment of micro plastics by the water industry has never been explored. The key challenge is to separate the micro plastics from the organic content on available operational scale and at reasonable cost. It is anticipated that any additional filtration will require

pumping of effluent or sludges against a series of fine mesh with significant power demand and investment needs.

**4 What methods do you use to prevent captured micro-plastics in sewage sludge from spreading into the rivers/oceans?**

The water industry operates its sewage sludge spreading practices under the Safe Sludge Matrix which is designed to prevent nutrient run off and should coincidentally ensure that micro plastics are also prevented from be washed into the rivers/oceans. The Safe Sludge Matrix is managed through Water UK, British Retail Consortium and ADAS.

**5 What practices could be taken to tackle the discharge of micro plastics? Are you implementing or considering implementing any of these?**

The water industry believe prevention is the best long term solution and would be keen to see suitable controls at source, improved product design and relevant changes to highway drainage to prevent micro contaminants including micro-plastics entering the wastewater networks and treatment plants.

For instance washing machine filters to remove fibres, ban of microbeads in any products eg cosmetic exfoliation products or sand blasting – with a drive to return to biodegradable substitutes or sand and highway drainage may be collected and treated through the improved use of discreet soakaway arrangements.

*June 2016*