

# Briefing Note: Environmental Challenge

## Proposed Question

### 1. **Background**

Water companies maintain large 1D sewer network models. These 1D networks are utilised by water companies (and councils) to discharge their statutory responsibilities with regard to flooding and asset management - this work is usually handled by an engineering consultancy. The 1D models are composed, broadly speaking, of manholes and conduits that represent the conveyance part of the network; the collection network (gullies and so on) is not normally represented. This can be seen in the Figure 1. The exact location, configuration, condition and performance of assets within the network is largely inferred between known (surveyed) points.



**Figure 1 – A small area within a typical 1D network showing manholes and conduits**

Sewer outfalls to the environment, known in the industry as Combined Sewer Outfalls (CSOs) or Unsatisfactory Intermittent Discharges (UIDs), have a detrimental effect on the water quality of half of the bathing waters, and 320 water bodies, in England and Wales.

CSOs/UIDs are regulated and hence must comply with numerous standards. These standards have recently been strengthened to include the monitoring of CSO/UID discharges to the environment<sup>1</sup>. The installation of monitors to measure the number / volume / duration of CSO/UID spills, known in the industry as Event Duration Monitoring (EDM), has commenced with thousands of monitor already installed.

### 2. **The problem (or opportunity)**

Fully leveraging the data that comes in from EDM is a challenge for water companies. Sweco feel that prioritising asset maintenance and survey would be a good application for the data. For example, asset failure becomes quickly evident in sewer networks, whereas the degrading performance of assets can be difficult to identify. A potential solution to this problem would automatically compare model simulations to measured data to highlight locations where assets are degraded or perhaps not properly represented in the model. Both of which are useful outcomes.

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<sup>1</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/307788/river-basin-planning-standards.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/307788/river-basin-planning-standards.pdf)  
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