



COMBINED SEWER OVERFLOWS



Introduction to Combined Sewer Overflows

Combined sewer overflows (CSOs) provide controlled spills of storm water and domestic sewage from a combined sewerage system during heavy rainfall. The excess flow is spilled into streams, rivers or the sea when the increased flow caused by the storm water runoff exceeds the sewerage system's capacity. They ensure that the excess flow is spilt in a controlled way and at specified and managed locations, which are consented by the Environment Agency.

Combined Sewer Overflows provide a failsafe during heavy rain storms to prevent domestic sewage and storm water backing up through the system and flooding peoples' homes, gardens, streets, highways and open spaces.

CSOs are mostly owned and operated by water companies and are regulated by the Environment Agency. The Environment Agency issues consents to water companies which allow spills from CSOs subject to defined conditions. The consents for CSOs, are issued under the Water Resources Act (1990) and regulations introduced to transpose the European Urban Waste Water Treatment Directive. They generally require that a CSO is maintained in a fit operating state and that discharges do not cause an environmental nuisance to users of the receiving waters.

The operation and performance of CSOs is monitored jointly by the Agency and water companies in accordance with government policy and implementation of the European Urban Wastewater Treatment and Bathing Water Directives. Natural biological processes break down organic waste in the receiving water.

Most CSOs were generally installed from the late 1800s to mid 1900s, they are no longer constructed.

Issues Surrounding CSOs

One of the main issues that CSO managers will have to cope with in forthcoming years is the increased annual rainfall and severe storm events, driven by climate change. These will increase the environmental impact of CSOs unless measures are introduced to limit spill frequency and increase CSO storm water storage capacity. Other issues include:

- The country's changing rainfall patterns mean that combined sewerage systems are now regularly overwhelmed.
- The aging condition of sewers and drains results in higher levels of infiltration.
- Brown field development, urban creep, home improvements and higher water usage removes spare sewer capacity and results in spills occurring more frequently.
- Irresponsible behaviour increases the volume and variety of chemicals, oils and other wastes picked up by storm water as it flows across car parks, roads, lawns and other surfaces before it enters the combined sewerage system.
- In wet years bathing and shellfish water quality will be affected and compliance will go down, CSOs and storm run-off from city streets and farmland are the main causes.



Photo courtesy of Fareham Borough Council

CSOs near sites regarded as 'sensitive' under the Urban Waste Water Treatment Directive such as designated bathing sites and shellfish waters, are generally limited to a spill frequency of between three times per year and once every five years, depending where the CSO is sited.

Combined Sewage Overflows in the Future

It is generally accepted that it is, and will remain for the foreseeable future, impractical to eliminate spills from CSOs. Redirecting all domestic sewage and storm water into separate sewers is currently unrealistic in terms of both cost and disruption. We have to acknowledge that it is not economically feasible to construct the infrastructure that has the capacity to cope with the most extreme weather events. The most sensible option is to reduce the load to the sewers, thus minimising the number of occasions when they overflow.

The Flood and Water Management Bill (FWMB) will focus on improving surface water management by reducing the amount of surface water and highway run-off that enters sewers, reducing the number of occasions CSOs will need to deal with excess flows. It will introduce Sustainable Urban Drainage Systems (SUDS). The idea behind SUDS is to try and replicate natural systems, to drain away dirty and surface water run-off through collection, storage, and cleaning before allowing it to be released slowly back into water courses.



*SUDS site, Waterlooville
Photo courtesy of Environment Agency*

Using less water (water conservation), harvesting rainwater (grey water household systems), using rain butts, draining to soak-a-ways and the use of permeable paving will reduce the volume of water in the sewerage system and thereby the frequency that the system is under capacity.

Implications for the Solent

There are currently 121 CSOs consented to spill into the Solent and Southampton Water. The Environment Agency include unsatisfactory CSOs in their five year National Environment Improvement Programme. They have not identified any improvements in the period 2010 to 2015 period for the Southern region, however, spill monitoring equipment is to be added to a large number of CSOs.

The Solent and Southampton Water currently meet the water quality requirements laid down by the Bathing Water and Shellfish Water Directives. However, the Environment Agency currently estimates that between four and ten percent of UK designated bathing beaches will fail the new minimum bathing water standard set in the revised 2006 Bathing Water Directive. Measures to achieve full compliance will largely require reducing the impact of diffuse pollution and intermittent storm sewage discharges from CSOs. The implications for the Solent's recreation and tourism industry of contaminated water is serious. Sewage debris on beaches or water users falling ill will have a significant impact on the Solent's local economy.

The shellfish industry is a sector particularly vulnerable to polluted water; the Solent is an important site for wild native oysters and this species is already under threat from unknown sources. Shellfish grown in sewage contaminated waters can cause food poisoning. Filter feeding animals such as mussels and oysters concentrate sewage related pathogens and toxins in their tissues as they feed. The EC Shellfish Hygiene Directive (91/492/EEC) sets criteria on the suitability of all shellfish for human consumption. Harvesting sites are monitored and classified in terms of concentrations of coliform bacteria and salmonella. Sites are graded from A to C depending on how much purification (depuration) the shellfish require before consumption.