

**Categorisation of the fluid
category of risk - coastal
seawater**

1. In its Guidance, Defra supplemented the statutory definitions in Schedule 1 to the regulations by providing examples of fluids, fittings, applications and processes in each of the fluid categories to provide guideline characteristics against which particular fluids, substances or compounds, either alone or in combination, can be assessed. Whilst the Guidance does not specifically mention seawater, Defra gives examples of fluid category 5 systems which are in contact with the natural environment:
 - Commercial irrigation outlets below or at ground level;
 - Permeable pipes (in other than domestic gardens) laid below or at ground level.
2. The quality of seawater in coastal areas – marinas, beaches and estuaries - will be influenced by storm-water overflows from sewerage systems in adjoining land, by local surface water drainage from the adjacent land, surface water from coastal drainage systems and by water discharged nearby from rivers and estuaries draining inland catchments. Urban sewage treatment systems discharge treated effluent to water courses which ultimately discharge into the sea. Faecal matter deposited in or near seawater by animals, fish and birds can affect its microbiological quality.
3. The chemical and biological characteristics which influence the fluid category, therefore defining the potential harm it may cause, can vary due to a number of factors:
 - Sewage storm overflows and sewage effluent contain micro-organisms capable of causing illness to humans (pathogens).
 - Surface water drainage and other outflows can be affected by the natural environment and land use from which they originate. They will carry micro-organisms and pathogens from animals and birds which populate the environment, chemicals used to treat crops and prepare land or from resultant waste deposited on it where it has been used for rearing or grazing animals.
4. The effects on the composition of water being discharged cannot be readily quantified and will be variable, whether from agricultural or urban usage or from industrial processes. Transitory circumstances can affect the variability of the outflows such as tidal, seasonal activities or storm events.
5. The definition of fluid category 5 includes fluid representing a serious health hazard because of the concentration of pathogenic organisms. Drinking water (fluid category 1) is required to be free from faecal coliform bacteria - that is to say a concentration of zero colony forming units (cfu) of *Escherichia coli* (*E.coli*) per 100ml (0 cfu/100ml). These bacteria are monitored as indicators of other, more significant, micro-organisms which are pathogenic but which are not themselves enumerated in water quality testing.
6. Arguments have been put forward that because seawater is accepted for recreational swimming or bathing, or the beach is a 'Blue Flag' beach, the water cannot be sufficiently harmful to health to be categorised in fluid category 5 for the purposes of The Water Supply (Water Fittings) Regulations 1999.
7. Bathing waters in England and Wales are legislated under The Bathing Water Regulations 2013¹ (which implement the European Bathing Directive 2006/7/EC²). They define water quality parameters for coastal, transitional and inland bathing waters. They set out the requirements to establish a bathing water profile for bathing waters in England and Wales. Schedule 5 of The Bathing Water Regulations 2013 define the classification structure and threshold values for four

¹ <http://www.legislation.gov.uk/uksi/2013/1675/made>

² <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32006L0007:EN:NOT>

categories, 'sufficient', 'good' or 'excellent', with any bathing water not meeting the minimum standard of 'sufficient' being categorised as 'poor'.

8. The highest quality water - 'excellent' classification - is water containing not more than 250 cfu/100ml E.coli and up to 100 cfu/100ml of intestinal enterococci (streptococci). This is a substantially higher concentration of E.coli than is allowed in drinking water. Streptococci can cause infection of throat, ear, skin and sinus, meningitis, sepsis and pneumonia.
9. Blue Flag³ is an international voluntary eco label award and is widely used across the UK and Europe. Its purpose is to give clarity to the quality status of the bathing waters at beaches and the general water quality in marinas. For bathing waters the Blue Flag symbol is used to indicate the bathing water profile is of 'excellent' status in accordance with the European Bathing Directive 2006/7/EC, i.e. less than 250cfu/100ml E coli and 100cfu/100ml Intestinal enterococci. The award for Blue Flag status⁴ *in marinas* is less rigorous in that 'the water in the marina must be visually clean without any evidence of pollution (oil, litter, sewage, etc)'.
10. A bathing water EU-designated as 'excellent' can therefore be of very much poorer microbiological quality than drinking water and can "represent a serious health hazard because of the concentration of pathogenic organisms" i.e. be in fluid category 5. It is very well established that ingesting seawater can cause illness and immersion can result in infections. Bathers can experience a condition known as 'swimmer's ear' due to bacterial infection contracted from, and aggravated by, the water.
11. Considering these factors and the tidal nature which adds to the variability of the quality of seawater, the water industry has considered seawater to be designated fluid category 5.

³ <http://www.blueflag.org/>

⁴ <http://www.blueflag.org/menu/criteria/marinas>