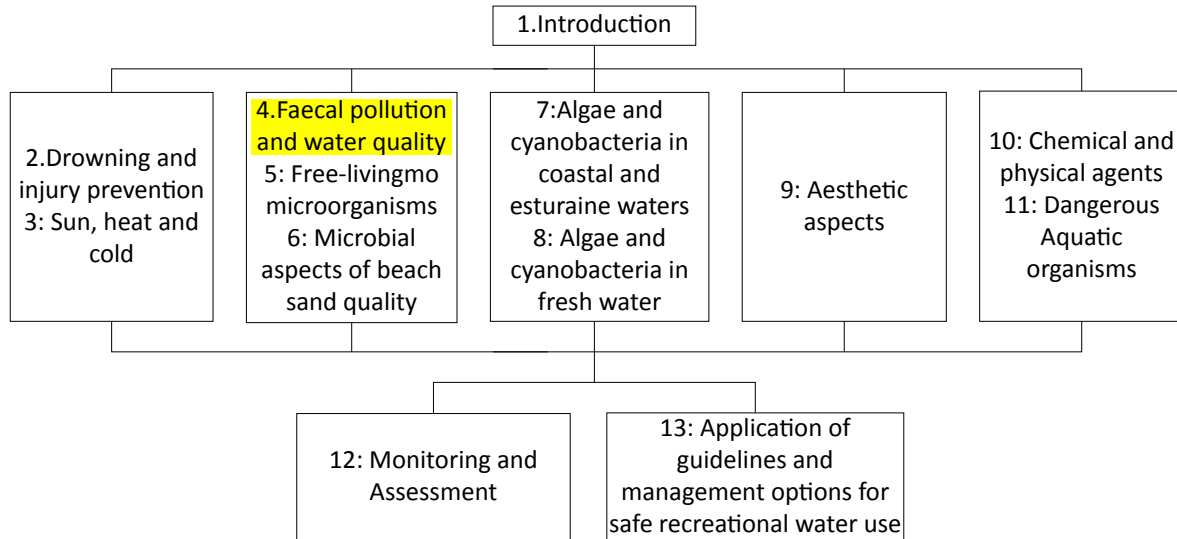


Recreational Water Safety Guideline Values

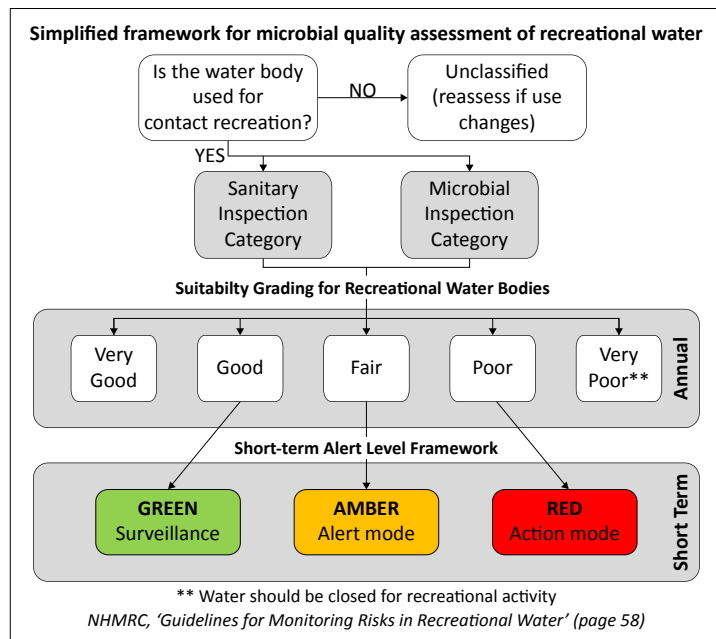
In 2003, the WHO updated the “Guidelines for Safe Recreational Water Environments, Volume 1, Coastal and Fresh Waters”¹ to include risk management procedures in addition to the derivation of guideline values.

Structure of Guidelines for Safe Recreational Water Environments, Vol. 1: Coastal and Fresh Waters



Source: *Safe Recreational Water Guidelines; WHO (2003), Pg 2*

Chapter 4 on the ‘Microbial Quality of Recreational Water’ addresses the assessment and management of risk based on microbial and sanitary inspection classifications. Whereas the microbial water assessment provides a quantitative indication of the quality at a particular point in time, the sanitary inspection provides an indication of the likelihood of the occurrence of a particular water quality. Combining the classification (based on sanitary inspection and microbial quality assessment) with the prevention of exposure at times of increased risk leads to a framework for managing recreational water quality.



The quantifying of the risk comprises of:

Step 1: Sanitary Inspection

The preparation of a sanitary inspection report seeks to identify all possible sources of pollution impacting on recreational water bodies. This should prioritise the identification of likely human faecal sources of pollution of recreational water bodies (which pose a more significant public health risk than animal sources). The sanitary inspection seeks to quantify the susceptibility of recreational waters to faecal influence from ‘very good’ (i.e. low risk of faecal exposure) to ‘very poor’ (i.e. high risk of faecal exposure).

¹ [Guidelines for safe recreational water environments. Volume 1: Coastal and fresh waters](#)

Step 2: Microbial Assessment Categories (95th percentile)

Various index bacteria, including E. coli and thermotolerant coliforms, have been used for the monitoring of recreational waters however intestinal enterococci² is the indicator recommended by WHO³. While a minimum of 20 samples is considered necessary for the generation of the 95th percentile, this should be embedded in a rolling 5-year data set of 100 samples to accurately assess microbial water quality. The following microbial assessment categories have been proposed where a recreational water is used for whole-body contact recreation (i.e. where there is a meaningful risk of swallowing water).

Microbial Assessment Categories

Category	95 th percentile (Enterococci)	Basis of derivation	Estimation of probability
A	≤40 cfu/100ml	No illness in most epidemiological studies	GII risk: <1% AFRI risk: <0.3%
B	41-200 cfu/100ml	200 / 100mL is above the illness threshold in most epidemiological studies	GII risk: 1-5% AFRI risk: 0.3-1%
C	201-500 cfu/100ml	Substantial increase in risk of adverse effects where dose response data available	GII risk: 5-10% AFRI risk: 1.9-3.9%
D	>500 cfu/100ml	Significant risk of high levels of illness transmission	GII risk: >10% AFRI risk: >3.9%

GII: gastrointestinal illness AFRI: acute febrile respiratory illness

Safe Recreational Water Guidelines; WHO (2003), Pg 70

Step 3: Grade Recreational Water Quality

The recreational water quality grade is determined from the matrix derived from the sanitary inspection category and the microbial assessment category. This constitutes a five-level classification for recreational water environments (i.e. 'very good', 'good', 'fair', 'poor' and 'very poor') in addition to a follow-up category where there is potential discrepancy between the results of the microbial water quality assessment and the sanitary inspection.

Classification matrix for faecal pollution of recreational water environment*

		Microbial Assessment Category (95 th percentile intestinal enterococci/100ml)				Exceptional circumstances ⁸
		A ≤40	B 41-300	C 201-500	D >500	
Sanitary Inspection Category (susceptibility to faecal influence)	Very low	Very Good	Very Good	Follow up ¹	Follow up ¹	ACTION
	Low	Very Good	Good	Follow up	Follow up ¹	
	Moderate	Good ²	Good	Poor	Poor	
	High	Good ²	Fair ²	Poor	Very Poor	
	Very high	Follow up ²	Fair ²	Poor	Very Poor	
Exceptional circumstances ³		ACTION				

¹ Implies non-sewage or unidentified sources of faecal indicators (eg livestock) which need to be verified.

² Indicates possible discontinuous/sporadic contamination (often driven by results such as rainfall). These results should be investigated further, and initial follow-up should include analytical results, review analytical errors.




³ Exceptional circumstances are known periods of higher risk (e.g. a rupture of a sewer in a recreational water catchment) Under such circumstances, the classification matrix may not fairly represent risk/safety.*

*In certain circumstances, there may be a risk of transmission of pathogens associated with more severe health effects of recreational water use. Public health authorities should be engaged in the identification of such conditions.

Safe Recreational Water Guidelines; WHO (2003), Pg 84

The classification of the recreational water bodies enables the management of public health risks which should comprise of (a) good-quality public information in real time about the recreational water quality (i.e. public health advisories), and (b) long-term management aimed at pollution abatement and prevention.

Definition for Recreational Water Quality Grades

	Very Good: Water is considered satisfactory for swimming at all times. Good: Conditions are safe for swimming most of the time.
	Fair: Conditions are generally okay for swimming, although swimming should be avoided during and after heavy rainfall.
	Poor: Conditions may not always be okay for swimming. There may be a higher risk of illness from ingestion particularly by the very young, the very old and those with compromised immunity. Very Poor: Avoid swimming at these locations, as there are direct discharges of faecal material.

Microbial Quality of Recreational Water, Western Australia Department of Health (2007), pg. 4

² Previously classified in the genus Streptococcus and also referred to as faecal streptococci

³ While E. coli is NOT suitable as an indicator of public health significance in saline water and WHO considered that there was insufficient data to develop guideline values for E. coli in fresh water.