## HISTORY OF GUIDELINE DEVELOPMENT

### Cyanobacterial toxins: Cylindrospermopsins (CYNs)

Cyanobacterial toxins were not evaluated in the 1958, 1963 and 1971 WHO *International Standards for Drinking-water* or in the first two editions of the *Guidelines for Drinking-water Quality*, published in 1984 and 1993. In the addendum to the second edition of the Guidelines, published in 1998, it was concluded that there were insufficient data to allow a guideline value to be derived for any cyanobacterial toxins other than microcystin-LR. The assessment was brought forward to the third edition of the Guidelines, published in 2004, and the fourth edition of the Guidelines, published in 2011.

CYNs were re-evaluated in 2020, in a background document to the *Guidelines for Drinking-water Quality* and *Guidelines for Safe Recreational Water Environments*, where provisional lifetime and short-term drinking-water health-based guideline values for total CYNs of 0.0007 and 0.003 mg/L, respectively, were derived based on kidney effects in mice. These values were designated as provisional due to the high level of uncertainty—it is based on data for only CYN and the toxicological database is limited, as reflected in the composite uncertainty factor of 1000 applied to derive the lifetime guideline value. Although the guideline values are based on toxicological data for CYN, the guideline values are for total CYNs (sum of all congeners, free plus cell-bound) since CYNs may occur as mixtures and further, the limited evidence suggests that other CYN congeners have similar toxicity to CYN. It was further recommended that alternative safe water sources should be provided for bottle-fed infants and small children when total CYN concentrations are greater than the lifetime guideline value, as a precautionary measure. The guideline values and associated guidance were incorporated in the fourth edition of the Guidelines incorporating the first and second addenda, published in March 2022.

The background document, which established a provisional recreational water health-based guideline value of 0.006 mg/L, informed the update of the WHO *Guidelines for Safe Recreational Water Environments*, published in 2021 as *Guidelines on Recreational Water Quality*.