

Salinity tolerance evaluation methodology for desalination plant discharge

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ABSTRACT

Seawater desalination plants generate concentrate (brine) which typically has 1.5 to 2 times higher total dissolved solids concentration (salinity) than that of the ambient seawater. When returned to the ocean without dilution, this concentrate may have a negative impact on the aquatic environment in the area of the discharge. The environmental impact of the desalination plant discharge is very site-specific and depends to a great extent on the salinity tolerance of the specific marine organisms inhabiting the water column and benthic environment influenced by the discharge. This work presents methodology that allows establishing the site-specific maximum level of salinity concentration (salinity tolerance threshold) at which marine organisms not only survive, but can also grow and reproduce normally. The described method was used successfully for the permitting of the concentrate ocean discharge of two large seawater desalination projects in California — the 189,000 m³/d (50 MGD) Carlsbad and Huntington Beach desalination plants.

Keywords: Desalination; Salinity tolerance; Discharge; Concentrate; Seawater; Brine
