

Title: Biotic Responses to Briny Concentrate from a Reverse Osmosis Water Treatment Plant in Albemarle Sound, North Carolina, USA.

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Abstract: Reverse osmosis water treatment plants (RO-WTPs) produce briny concentrate as a byproduct of producing potable water. This concentrate is often discharged through a diffuser pipe into nearby receiving waters. There have been no studies on the effects of the briny concentrate on the local and transient biota adjacent to the diffuser pipe. This study addresses the local effects of the briny concentrate on the nekton and macrobenthos in the receiving waters and proposes possible effects with an increased discharge. Four sampling locations were established, one at an existing RO-WTP in the Pasquotank River, a control site located about 0.5 km from the diffuser pipe downstream in the same embayment, and two proposed RO-WTP discharge locations located in the main body of the Sound. Sampling of macrobenthos, macroplankton, and nekton were taken monthly at all locations from July 2005 to June 2006. There was a seasonal component to macrobenthos and fish abundance. In addition, there was a distance effect from the discharge pipe for the macrobenthos which was not apparent for the fish. The numbers of species caught at all sites were similar. The proposed RO-WTPs will have increased concentrate discharged. It is hypothesized that there will not be an effect on the presence and abundance of either the macrobenthos or nekton species, but there will be a distance effect relative to the macrobenthos near the discharge pipe.