

**MEMORANDUM**

Date: March 26, 2001
To: Linda Logan, John Brooker
From: Jim Laughlin, Manager, Environmental Toxicology Laboratory
Subject: Update on WADOE's Position on Low Hardness Toxicity and Hardness Adjustment
cc: Scott Tobiason

This memorandum summarizes a phone conversation I had with Randall Marshall of the Washington State Department of Ecology (WADOE) regarding possible toxicity due to low hardness and whether to adjust the hardness of lab water to match the site water.

Randy recalled a study conducted by Mike Stanaway of CH2MHill that may have addressed this issue. I talked to Mike and it would appear they saw no acute toxicity with *C. dubia* down to about 10 mg/L as CaCO₃, but did see chronic (reproductive) effects; there were no real chronic effects with *P. promelas* test.

Regarding adjusting the hardness of the lab water to match the site water, Randy stated clearly that he is against such adjustments. The WER studies are designed to be tested against moderately hard synthetic lab water and the site waters tested as they arrive. For storm water samples the hardness is typically very low. However, the hardness of the storm water runoff should not be targeted but rather the hardness of the receiving water, which is typically 40 – 60 mg/L as CaCO₃ or higher. Randy stated that if we wanted to test for a possible hardness effect that we should conduct a series of tests over a gradient of hardness values with the hardness of the receiving water being the lower limit of the gradient.