

**Options for the Use of Rapid Aquatic Toxicity Tests**  
**in a Regulatory Context**

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## Preface

Though humans have evolved to be independent of marine environments, a wealth of species rely upon this saline medium to live and reproduce. Areas of high marine productivity interface with human activities in the estuaries. Unfortunately, these two activities conflict. Estuaries are the destination of much human waste which disrupts the natural balance of this ecosystem by killing individuals and impairing the successful existence of the established biota. It is the responsibility of the U.S. Environmental Protection Agency to evaluate water quality in order to protect the aquatic population from adverse effects of toxic discharge.

Aquatic toxicity tests play important roles in water pollution control as tools of assessment and enforcement. This type of biological testing generates data concerning the adverse effects of a chemical or foreign substances on test organisms. Historically the emphasis on toxicity testing has been on freshwater applications and, until recently, relatively little attention has been paid to the marine environment. Presently, the E.P.A. Research Laboratory in Narragansett, RI is sponsoring the development of two rapid aquatic toxicity tests, The Early Embryo Growth Test and the Sperm Cell Toxicity Test. These tests are unconventional due to the choice of testing species, endpoint and speed with which the tests are completed. Because the tests do not fit into traditional toxicity testing roles, the use of these tests raises questions about our present concepts of acceptable aquatic toxicity testing. There is a great need for an inexpensive, rapid biological toxicity test, and the purpose of this thesis is to explore the full implications of the application of the Sperm Cell Toxicity Test and the Early Embryo Growth Test to real world uses.