

Use and comparison of QwikLite™ bioluminescence toxicity test to Microtox™ and other conventional toxicity tests to assess stormwater outfalls and Industrial Wastewater Treatment Plant (IWTP) effluent collected at Norfolk Naval Shipyard, Virginia (based on Dept of Navy report dated 09 Sept 1996)

Dates of performance: January, February, March, May, June 1996

Objective: To conduct and compare QwikLite™ toxicity bioassays with other conventional toxicity bioassays including Microtox™, *Menidia beryllina* (silverside minnow), *Mysidopsis bahia* (shrimp), *Cyprinodon variegates* (sheephead minnow), and *Arbacia punctulata* (sea urchin) to assess storm water outfalls and Industrial Wastewater Treatment Plant (IWTP) effluent collected at Norfolk Naval Shipyard, Virginia

Description of QwikLite™ being used in project:

Water samples were collected from various stormwater outfalls as well as dry dock outfalls during “wet” weather or storm events during January, February, and March 1996. Toxicity tests were performed with QwikLite™, Microtox™, *Mysidopsis bahia* (48 hour) and *Cyprinodon variegates* (48 hour). All test results were observed to show no toxicity (> 100% effluent).

During May and June 1996, “grab” samples were collected from IWTP treatment processes: Equalization Tank, Initial Reaction Tank, Dissolved Air Flotation and Thickener Tank. Each sample underwent toxicity testing with QwikLite™, Microtox™, sea urchin fertilization test, and silverside minnow test (48 hour). pH measurements were also monitored in IWTP effluent samples.

When comparing QwikLite™ results to the conventional bioassay test results, QwikLite™ was most comparable with the sea urchin tests. Both toxicity tests shared similar toxicity trends in IWTP effluent samples. However, the Microtox™ and silverside toxicity tests exhibited little toxicity throughout the tests.

Benefits of QwikLite™:

- Quick and easy setup and testing
- Test results can be achieved in 24 hour (1-day)
- Minimal training needed to perform toxicity testing
- Less expensive than conventional toxicity tests
- Large areas can be screened in a relatively short period of time
- One day responses in QwikLite™ have a definite advantage in screening suspected sites when compared to using conventional tests, particularly the standard sea urchin test