

WETT DESIGNS AND ENDPOINTS

Hello. I'm Frank Doherty, Founder and President of Aquatox Research.

The New York State Department of Environmental Conservation has the authority to issue effluent discharge permits in New York. Permits are issued for a 5-yr duration and all permits for facilities discharging wastewater to surface waters are required to perform a range of analytical tests on a monthly basis for the duration of the 5 years. [Toxicity testing](#) will appear in a subset of all of the permits issued with testing conducted on either a monthly or quarterly basis for one year out of the 5-yr permit cycle.

The test design is site-specific driven. A facility is either required to conduct acute tests which are 48-hr in duration or chronic which are 7-days in duration. The acute tests require 2 24-hr composite samples of effluent collected on consecutive days. The chronic tests require 3 24-hr composite effluent samples collected on alternating days. The DEC also requires us to use receiving water to dilute effluent in the test. Both types of tests require the preparation of a series of dilutions through the mixing of effluent and receiving water. There are 5 effluent treatments running from whole sample at [100% down to 6.25% effluent](#). Each test has a control treatment made up of 100% receiving water.

The endpoint of the acute test is the [median lethal concentration \(LC50\)](#). It is based solely on any mortalities that occur in the test. The endpoints for the chronic tests are the [no-observed-effect-concentration \(NOEC\)](#), the [lowest-observed-effect-concentration \(LOEC\)](#) and the [25% Inhibition concentration \(IC25\)](#). The NOEC is the highest concentration in the test at which there were no effects. The LOEC is the lowest concentration in a test for which there were significant effects and the IC25 is the hypothetical concentration at which 25% of the test organisms would exhibit effects.

For the chronic fish test, the endpoint is a change in dry weight of fish in an effluent treatment compared with the control. For the chronic invertebrate test, the endpoint is a change in reproductive output of organisms in an effluent treatment compared with the control. Please join me in the follow on video where I discuss the comparison of test endpoints with pass/fail limits that appear in a facility's NY effluent discharge permit.

Thank you for your time. I look forward to discussing any questions you may have about our services.