Seawater Toxicity Assessments Using the QwikLite™ 200 Testing System

Collected seawater samples should be placed in polycarbonate or plastic bottles that have been presoaked and rinsed with either artificial seawater or distilled water before use. All samples should also be labeled accordingly (date, time, sample ID, site location).

Measure the salinity of sample(s) using a refractometer-hydrometer.

Add a few drops of sample onto refractometer-hydrometer window and read salinity. Standard seawater is 32 part-per-thousand (ppt) and the salinity of the sample should be in the range of 30 to 34 ppt.

NOTE: To adjust salinity, refer to Technical Application Note: “How to Measure Salinity”.

Check pH of sample using pH meter or pH strips. The sample needs to be between 8.0 - 8.2.

Adjust pH accordingly following the directions from the supplier of the acid (HCL) or base (NaOH) solutions until the sample is between 8.0 and 8.2. Drops of either solution will be added as prescribed.

Prepare Samples in Varying Concentrations for Use in Toxicity Assessment

The goal of a toxicity test is to determine the concentration of a sample solution that causes a harmful dose to live organisms. If this is the first time conducting a toxicity test with the collected sample, and if you do not have prior information about the toxicity of the sample, it is logical to prepare a series of increasing concentrations, such as: 12.5%, 25%, 50%, 75%, and 85%. This will give you a good range for detecting the potential toxicity in the collected sample. For all tests, there needs to be a Control, which has been exposed to none of the collected sample. The Control is made up of only artificial seawater, and the plankton cells (dinoflagellates) provided in the QwikLite™ Disposable Test Kit cartridges.

To prepare your five test concentrations and one control create a table to calculate the amount of collected sample, artificial seawater, and plankton cells (dinoflagellates) that will be combined for each tested concentration and control.

NOTE: Total volume allowed in the cuvette is 3.25 mL and test material (plankton) volume is always 0.5 mL.

QwikLite™ Technical Application Note

Use the formula C1 x V1 = C2 x V2, where

- C1 = initial concentration (in this case, 100% collected water sample)
- V1 = amount needed of the collected sample
- C2 = test sample concentrations being prepared (ex., 12.5%, 25%, 50%, ...)
- V2 = total volume of cuvette (3.25 mL)

See Experimental Design Table below as an example:

Experimental Design Table

Concentration (%)	Test Material Volume (mL)	Sample Volume (mL)	Sea Water Volume (mL)	Total Cuvette Volume (mL)
0.00%	0.50	0.00	2.75	3.25
12.50%	0.50	0.41	2.34	3.25
25.00%	0.50	0.81	1.94	3.25
50.00%	0.50	1.63	1.13	3.25
75.00%	0.50	2.44	0.31	3.25
85.00%	0.50	2.75	0.00	3.25

NOTE: The highest concentration you can have is 85% due to the dilution that takes place from the test material. No sea water is added to the sample for this dose so it is the most concentrated dose possible.

After completing the Experimental Design Table, you are now ready to proceed with dosing and testing.

Refer to the User Manual for dosing and testing instructions.