

**Science Advisory Panel  
for  
Commercial Passenger Vessel Wastewater Discharge**

**Guidelines for Whole Effluent Toxicity (WET) Testing**

The Science Advisory Panel was asked to render an opinion regarding the value of toxicity testing of cruise ship effluents discharged in Alaska waters. The Panel feels that Whole Effluent Toxicity (WET) Testing can provide valuable information. The goal of WET testing is to determine what level of effluent dilution results in “no observable effect”. However, the study will be difficult and must be designed very carefully. For example, the temperature of the sample and the physical environment must be maintained, or ammonia will be an issue. Lab selection will be extremely important. Any study design must address variability of samples. If WET testing is undertaken, the Panel would like to provide input for the design of the study and review all study proposals.

The following guidelines are provided to assist in study design and laboratory selection:

1. The test facility must be a laboratory certified for WET Testing by a State or other appropriate entity.
2. Cruise ship wastewater effluent must be delivered to laboratory and the test initiated within 24 hours. The samples should be taken from ships as they are operating in Alaska or British Columbia. Sample preservation requirements of the test laboratory must be followed while the samples are in transit to the lab.
3. Tests should be conducted on a number of samples that represent a range of wastewater discharges. The Panel recommends that a minimum of five ships provide effluent for testing. Grab samples are recommended. The grab samples will give an idea of any spikes of toxicity. One gray water and one treated blackwater sample should be taken from each ship.
4. Tests should be conducted for a dilution series calculated to bracket no observable effects concentration (NOEC). The panel recommends a dilution series of

- 50% - 5% - 0.5% - 0.05% - 0.005% - 0.0005%. Each test must meet the test acceptability criteria for each test method; otherwise the results will not be accepted.
5. Acute testing should be conducted for 2 invertebrates and 1 vertebrate; specifically, acute bivalve larval development, acute topsmelt, and sea urchin/sand dollar fertilization (re. West Coast Methods Manual).
  6. When developing language for contract with the test facility the type of test to be run (acute, chronic, static, static-renewal, etc.), the type of sample, the frequency of testing, some minimum QA/QC requirements, a range for the dilution series, sample preservation methods, and the protocol to be used should be specified.
  7. Tests may be conducted as static or static non-renewal. The static non-renewal may be less costly and less volume of effluent will be required than the static renewal tests. Some toxic substances may degrade or be adsorbed, however, possibly reducing the apparent toxicity. The sea urchin fertilization test is a static non-renewal test by definition of the method. Samples should be archived in case a test returns unexplained results, or unusual results are noted.

The Panel is concerned that results can be easily misinterpreted or manipulated to suit a reviewer's particular bias. Careful and clear interpretation of results should be provided when the results are disseminated. The Panel would like to review the reports and results before dissemination.

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