



# NATURAL ENERGY LABORATORY OF HAWAII AUTHORITY

An Authority of the State of Hawaii attached to the Department of Business, Economic Development & Tourism



July 18, 2025

## Memo: Bioassay Toxicity Testing Special Study – 2025

The independent [2024 Investigative Report](#) of seawater quality issues relating to larval survival rates provides recommendations for both HOST Park and Keahole Point Larval Group (KPLG) hatcheries aimed at addressing the challenges of marine animal larval rearing systems and potentially resolving the issues. Through discussions between HOST Park and KPLG, it was determined that additional water quality assessment and characterization of the seawater being delivered to its clients would be informative. These additional assessments are beyond the current in-house laboratory capabilities of the NELHA Water Quality Laboratory.

To date, the causative agent of the seawater quality issues affecting larval rearing clients has not been identified. One of the additional outside analytical testing services that was requested was a special study of bioassay tests aimed at identifying the source the potential seawater toxicity. The 2024 report listed biofouling inside the pipeline system as one of the likely causes due to sediment accumulation that could provide a substrate for harmful bacteria and pathogens to proliferate and, also, due to the accumulation of marine biofouling organisms that have the potential to produce toxic chemical contaminants inside the pipeline system.

The NELHA Water Quality Laboratory contracted Bio-Aquatic Testing, Inc. to conduct a special study evaluating the source of potential toxicity effects of seawater at HOST Park. This special project was designed to provide lethal and sub-lethal data utilizing marine shrimp and fish species. These methods include the effects of synergistic, antagonistic, and additive effects of all chemical, physical, and additive components which adversely affect the physiological and biochemical functions of the test organisms. The test concentration consists of 100% sample water (i.e., no dilutions) and a control. The bioassay tests were:

1. Mysid (*Mysidopsis bahia*) 7-day, static renewal, chronic toxicity test for survival, growth, and fecundity. EPA Method 1007.0
2. Inland Silverside (*Menidia beryllina*) 7-day, static renewal, chronic toxicity test for larval survival and growth. EPA Method 1006.0.

Sampling locations were chosen to evaluate the source of the potential toxicity. Therefore, the locations include samples with no-contact of the pipeline system (i.e. open ocean), samples that had entered the pipeline distribution system (i.e. land-based sump stations and a mid-point distribution location), and samples from three representative aquaculture client facilities (i.e. fish, shrimp and bivalve farms) after their pre-treatment processes and collected right before flowing into larval tanks. These strategic sampling locations should provide insight into where the potential

seawater toxicity is developing, if at all. Scheduling of sample collection was timed to coordinate when the three representative aquaculture facilities were actively conducting larval rearing operations and/or when KPLG facilities were actively experiencing poor larval survival rates (i.e. mortality).

The eight (8) seawater sample locations submitted for each round of testing are:

1. Offshore, directly above the SSW-28" ocean intake pipe, pumped from a depth of 80'
2. Offshore, directly above the SSW-55" ocean intake pipe, pumped from a depth of 80'
3. SSW-28" sump – northern pump station
4. SSW-55" sump – southern pump station
5. A mid-point location along the SSW pipeline distribution system (i.e. SSW-24" pump station)
6. A representative fish farm, collected from pre-treatment seawater stream inflow to larval tanks
7. A representative shrimp farm, collected from pre-treatment seawater stream inflow to larval tanks
8. A representative bivalve farm, collected from pre-treatment seawater stream inflow to larval tanks

The project consists of three (3) rounds of sampling and testing throughout 2025. Each round of sampling will be submitted for identical testing protocols for comparative analysis. The first round of sampling occurred on May 2, 2025, with no KPLG facilities reporting poor larval survival rates at this time. Sampling rounds #2 and #3 will be collected later in 2025.



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