

SAN DIEGO UNIFIED PORT DISTRICT

MEMORANDUM

Date: August 8, 2019

To: Board of Port Commissioners

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Subject: Rentunder Boatwash Pilot Project: Completion of Phase 1 and Receipt of Water Quality Monitoring Study Phase 1 Technical Memorandum

The purpose of this memo is to inform the Board that the first phase of the Rentunder Boatwash pilot project has been completed and the *Water Quality Monitoring Study Technical Memorandum* (Water Quality Tech Memo) was provided to the District on June 28, 2019. This memo summarizes the water quality findings from Phase 1.

Background

As a reminder, in 2017 the Board authorized this pilot project through the Blue Economy Incubator (BEI) to evaluate the use of an enclosed basin and mechanical brushes (i.e. Boatwash) as a potential alternative to current in-water hull cleaning practices. The pilot project incorporated a phased implementation approach in which Phase 1 of the project was used to evaluate water quality during a set of controlled hull cleaning events, while Phase 2 would explore longer term water quality evaluations as anticipated with operational business practices.

Phase 1 Results

The Water Quality Tech Memo (Attachment A) provides the results from the Water Quality Monitoring Study conducted from July 2018 through April 2019. Three sampling events and a Dome Study were completed as part of Phase 1.

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The three sampling events compared the concentrations of dissolved and total copper in the water prior to, during, and after hull cleaning events, both inside the basin and in the open waters of Shelter Island Yacht Basin, directly adjacent to the Boatwash gate. The sampling also quantified the amount of particulate copper being captured within the enclosed Boatwash. Toxicity was also measured during each water quality sampling event.

Two of the three hull cleaning events used the *Rentunder* mechanical brushes inside the Boatwash to clean the vessel hulls, while the other cleaning event was completed by a diver that employed the current In-Water Hull Cleaning best management practices (BMPs) conventionally used in San Diego Bay's marina boat slips. It is important to note that the diver-cleaning event occurred within the enclosed Boatwash; however, the mechanical brushes were not active during these cleanings.

The water quality study also incorporated a leach rate analysis (i.e. Dome Study) to measure any potential differences in leach rates from the vessels cleaned using the *Rentunder* mechanical brushes compared to conventional diver-based in-water hull cleaning methods. This analysis used an in-situ polycarbonate dome that was adhered to the boat hull to capture a confined volume of water and analyze the effects of leaching over regular intervals.

Overall, the Water Quality Tech Memo finds:

- Cleaning the hull of a vessel, whether utilizing the *Rentunder* mechanical brushes or diver-conducted in-water hull cleaning methods, results in a direct release of dissolved, total and particulate copper at toxic levels into the surrounding water. While both methods of cleaning resulted in elevated copper concentrations, it was noted that the copper levels from cleaning with the *Rentunder* mechanical brushes were greater than the diver cleaning event.
- Diver conducted in-water hull cleaning, even with the use of BMPs, results in exceedances of water quality greatly above the 3.1 µg/L water quality standard. For example, dissolved copper concentrations started with a baseline of 4.1 µg/L prior to the start of the diver-conducted cleaning and increased to 52 µg/L during the cleaning event.
- The enclosed basin was somewhat effective in confining the dispersal of the dissolved, total and particulate copper as shown by the differences in water quality results within the basin and gate (outside the basin). However, it should be noted that corresponding gate samples (outside the basin) did exhibit increases in copper levels above the baseline during and after cleaning events.
- Particulate copper (particles containing copper) was present on the floor of the Boatwash basin during all three cleaning events. Levels of particulate copper ranged from 180-1,700 mg of copper per kg of dry weight. Using current in-water

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hull cleaning practices in marina slips, this particulate load eventually settles on the bay floor.

- The Dome Study indicated that the passive leaching loading associated with both the *Rentunder* mechanical brushes and diver conducted in-water hull cleaning equalized by the Day 14 following a cleaning. The *Rentunder* mechanical brushes initially showed an increase in dissolved copper leach rate through Day 3 of post-cleaning when compared to the dissolved copper leach rate resulting from the diver method.

Next Steps

This phased Boatwash pilot project has incorporated an adaptive management approach by which the Phase 1 results reported herein will be used to inform any needed programmatic modifications prior to implementing Phase 2. Such modifications may include operational adjustments, new technology(ies) and/or water quality sampling adjustments. As such, an addendum to the sampling plan will be developed to summarize the implementation approach for Phase 2 of the pilot project. This addendum will be shared with stakeholders and the Regional Water Board prior to implementing Phase 2.

If you have any questions regarding water quality results, please contact Kelly Tait at (619) 686-6372 or via email at ktait@portofsandiego.org. To request associated report appendices or for further questions pertaining to the Rentunder Boatwash Pilot Project, please contact Phil LeBlanc at (619) 686-6516 or via email at pleblanc@portofsandiego.org, or Jason Giffen at (619) 686-6473 or via email at jgiffen@portofsandiego.org.

Attachment:

Attachment A – *Rentunder Boatwash Pilot Project Water Quality Monitoring Study Phase 1 Technical Memorandum* (without appendices)