IN-WATER VESSEL HULL CLEANING

Best Management Practice

Fact Sheet – July 2013

Vessel hull cleaning in dry dock is the preferred hull cleaning method to minimize the impact of hull cleaning to surface waters, when technically and economically feasible. The U.S. Environmental Protection Agency's 2008 and 2013 Vessel General Permits prohibit in-water hull cleaning in California unless conducted using Best Available Technology (BAT) as determined by California State Water Resources Control Board staff. Since they have not yet determined BAT for in-water hull cleaning, San Francisco Bay Regional Water Quality Control Board staff have prepared the following interim best management practice (BMP) for in-water hull cleaning. Until the State Water Board determines BAT for in-water hull cleaning, dischargers are encouraged to employ the following interim BMP, or a more environmentally protective practice. Failure to do so may result in unauthorized discharges of pollutants into waters of the United States and Regional Water Board enforcement.

INTERIM BMP

The interim BMP for in-water hull cleaning consists of a containment and collection system capable of collecting all process water generated during in-water hull cleaning and directing it to a treatment system (Figure 1). This interim BMP is not a mandatory treatment system. A different collection and treatment system capable of achieving the same or greater pollutant capture and removal is acceptable.

The interim BMP employs a scrubber unit with rotating plastic brushes to remove attached biological material from a vessel's hull. The scrubber unit is held against the hull with approximately 1,000-pounds of pressure per square foot by a self-contained propeller and an approximately 400-gallon-per-minute (gpm) pump on a pier or barge.

A suction line attached to the discharge outlet from the scrubber unit collects and directs the process water to the pier or barge, where it is filtered by a 100-micron stainless steel mesh screen, followed by two 10-micron filter cartridges in parallel, followed by four 5-micron filter cartridges in parallel, and lastly conveyed through four pressure vessels arranged in parallel, each containing 3,000 pounds of organo-clay. If necessary, additional pressure vessels can be used in series or in parallel to fully accommodate the flow rate and maximize pollutant removal. The discharge point into the receiving water should be a minimum of 10-feet below the water surface. If large liquid storage containers are available, process water can be treated and discharged in batches.

SYSTEM AND DISCHARGE MONITORING

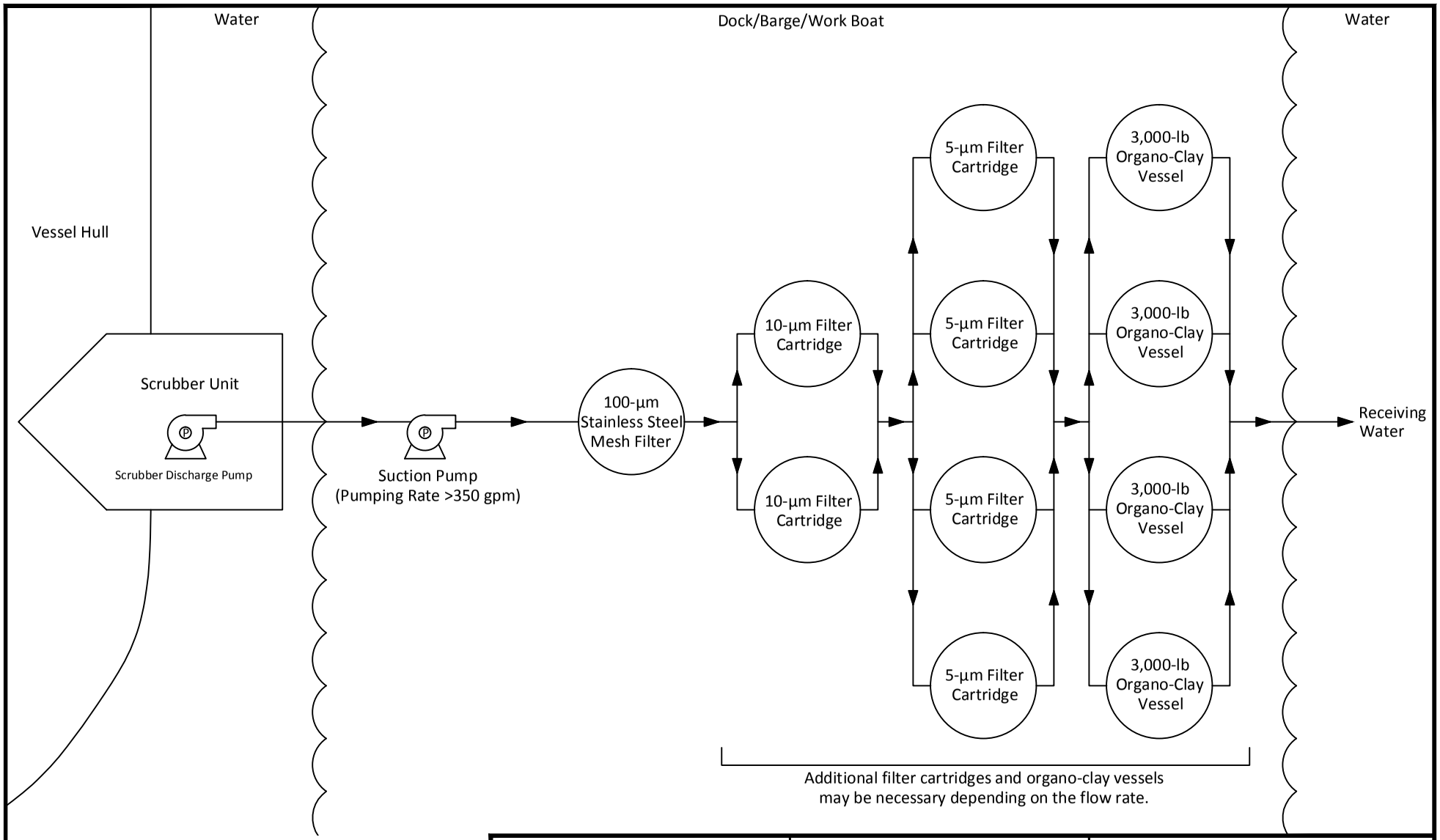
The suction pump flow should be monitored continuously and recorded hourly to ensure that a minimum of 350 gpm (400 gpm is optimal) of process water is recovered from the scrubber unit. Treatment system influent and effluent samples should be collected daily and analyzed for total and dissolved copper and zinc. Sampling should begin three detention times (the treatment system volume divided by the flow rate) after commencing operations and continue daily until operations cease. After sampling the influent, effluent samples should be collected following one additional detention time.

The analytic results should be submitted within 30 days of project completion to the San Francisco Bay Regional Water Board, Attn. David Elias, 1515 Clay St., Ste. 1400, Oakland, CA 94612. The analytic results should be accompanied by a detailed schematic of the treatment system employed. The results may be used in the future to determine BAT for in-water hull cleaning.

OPERATIONAL TRIGGERS

To ensure proper implementation of this interim BMP, or to confirm that another practice removes pollutants as well or better, treated process water discharged into the receiving water should not exceed a total copper concentration of 100-micrograms per liter (µg/L) nor a total zinc concentration of 700-µg/L. These triggers appear to be achievable and practicable. If monitoring results exceed these triggers, the treatment system should be modified or augmented to the extent possible to improve its performance until the triggers are achieved.

For questions, contact David Elias of the Regional Water Board at 510-622-2509 or delias@waterboards.ca.gov.



Notes:
1. Not drawn to scale.
2. Schematic for concept only, not valid as a treatment design.

R. Janoch 03-28-2013

SAFETY FIRST	CLIENT:	**In-Water Vessel Hull Cleaning BMP Fact Sheet**
terraphase engineering	PROJECT: In-Water Hull Cleaning	
	PROJECT NUMBER:	**Figure 1**