Bob Eales, 1-19-2022

This is a follow-up to our discussion on muck reduction in SKHOA marinas that was cut short a few days ago.

Marcy,

Please save this for future reference for when others take over harbor muck and water quality efforts for SKHOA

Top Line: Please let Scott known that SKHOA would like to change the aeration design in the boat ramp marina to the following:

1. Install a 1.5 horsepower Pentair AHPB35 blower ($2,200 3rd Gen Plumbing) at the equipment pad next to the first flushing canal using the tan blower housing sitting there unused.

3. Run two self-weighted air supply lines controlled by valves from the blower to separate 20-foot-long bubbler pipes.

4. Install the first bubbler pipe in the middle of the inner seaweed barrier at the entrance to the boat ramp marina. Move existing diffusers closer to each other to each side of that bubbler pipe. This will strengthen the seaweed barrier significantly.

5. Run the second self-weighted air supply line so that is long enough to reach the boat ramp and inner seaweed barrier and connect it to a second 20-foot section of bubbler pipe. That bubbler pipe is to be weighed down to lay in the top of the dense bottom muck and to be repositioned periodically and very systematically throughout the marina to increase dissolved oxygen, continuously turn water over and achieve muck better muck reduction than diffuser systems.

6. Continue with the current proposal to install a one hp compressor feeding 6 diffusers in the Windy Point marina.

7. Collect muck depth data and water quality data before project installations and periodically afterward. These measurements are designed to demonstrate degrees of compliance with Florida Department of Environmental Protection regulations needed to meet US Congress Clean Water Act laws as well as the Monroe County Canal Master Management Plan. Ronda Haag, County Sustainability Director, should be able to provide data collection details.

This approach will allow SKHOA to **compare blower fed bubbler pipe muck reduction outcomes with compressor fed diffuser muck reduction outcomes**.

This approach will also allow us to **enhance the function of the inner seaweed barrier** which has breached repeatedly over the last several years.

The dual bubbler pipe and blower installation, operation cost and annual maintenance **cost should be somewhat less** than the deleted compressor and diffuser plan for the boat ramp marina.

Blowers put out about three (3) times more CFM of air flow in shallow depts like ours than compressors of the same horsepower. This is critical and one of two critical factors supporting the above plan.!

Water turn-over and dissolved oxygen levels should be better with the increased air volume provided by the blower powered system.

Ben Daughtry (Aquarium Encounters) reports that his Pentair AHPB35 has run continuously for years without problems which would be a **significant cost savings to SKHOA** over compressor fed systems.

Diffusers sit on a base that rests on the top of the muck and the diffusers then protrude upward away from the muck. Diffusers direct their air flow upward and away from rather than down into the muck. This design significantly decreases direct mixing of muck (organics) with all important dissolved oxygen compared to the blower and bubbler pipe model described below.

Bubbler pipes that are weighted down into the muck and direct vigorous air flow directly downward into the muck subject the undesirable organics in the muck to very high direct levels of dissolved oxygen resulting in much quicker natural, desirable aerobic breakdown than diffusers and can do so without measurable increases in turbidity. Much better outcomes are the primary and critical advantage of a blower and bubbler pipe model.

The use of blower fed bubbler pipe systems to reduce bottom muck has been presented to the SKHOA general membership and been approved multiple times over several years so there is no organizational reason not to proceed with the comparison plan outlined above.

I am more than happy to sit down with Scott or any other contractor to go over details and provide ongoing onsite guidance.

Bob, thanks for getting the harbor electrical supply work accomplished, the new main entrance seaweed barrier installed and getting SKHOA to this next step in muck reduction/aeration.

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