



50th Anniversary
AQUA-AEROBIC SYSTEMS, INC.
A Metawater Company
1969 – 2019

OPERATION UPDATE

A Newsletter for Aqua-Aerobic Plant Operators

WINTER 2019

IN THIS ISSUE

- 1 The Do's and Don'ts of Operating an AquaSBR®, Part II
- 3 The Do's and Don'ts of Operating an Cloth Media Filter, Part II
- 5 Send Us Your Data and Win

THE DO'S AND DON'TS OF OPERATING AN AQUASBR®, PART II

After receiving such positive feedback from the previous newsletter, we've decided to publish a Part II of the Do's and Don'ts of operating an AquaSBR® Sequencing Batch Reactor and Aqua-Aerobic® Cloth Media Filter. The examples below are common issues that operators experience and are a guide to help you prevent future issues and/or potentially correct any current issues you may be experiencing. As always, we encourage you to give us a call to discuss your concerns if they are not listed below. Didn't receive Part I of the Do's and Don'ts? Let us know and we will send you a copy!

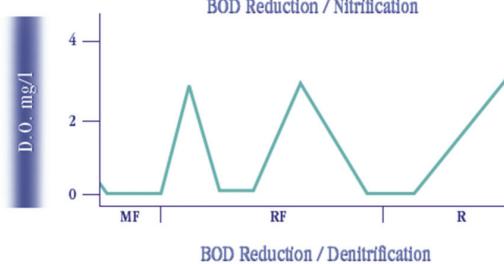
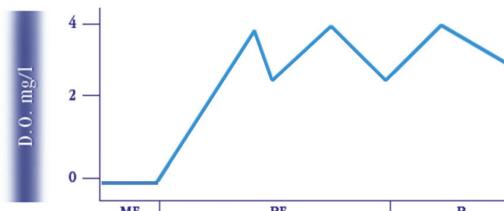
DO attempt to minimize the level of oil and grease in the SBR system. Excess oil and grease, in conjunction with cold temperatures, can lead to the growth of *M. Parvicella* filaments in the SBR, which can lead to slow settling issues.



Foam caused by excess oil and grease.

DO keep in mind that operating an SBR at lower temperatures leads to a reduction in the rate of nitrification. Nitrifiers work at approximately half the rate at 10° C than they do at 20° C. This often means that the targeted MLSS for winter operation will be greater than that for summer operation for plants that need to nitrify as part of their discharge permit.

DO target a minimum of 2.0 mg/l of dissolved oxygen (D.O.) in your SBR during aerated phases if your facility needs to nitrify to meet your effluent permit. The nitrification rate in the SBR is maximized when a D.O. target of 2.0 mg/l is achieved.



The upper D.O. profile depicts a plant targeting nitrification. The lower profile depicts a plant targeting denitrification.

DO confirm that there is adequate alkalinity in your plant to support a healthy biomass. Aqua-Aerobic recommends a minimum target in the effluent of 50-100 mg/l of alkalinity. Operating at less than this amount of effluent alkalinity can be detrimental to nitrification. Alkalinity is typically consumed by the nitrification process, as well as the addition of certain metal salts for phosphorus removal, such as aluminum sulfate (alum) or ferric chloride.



THE DO'S AND DON'TS OF OPERATING AN AQUASBR®, PART II *continued from page 1*

DON'T target to keep the D.O. in the SBR below 2.0 mg/l for extended periods of time during the React Fill and React phases. Operating with a D.O. target of less than 2.0 mg/l can lead to a reduced nitrification rate, as well as lead to the proliferation of filaments, such as *H. Hydrossis*, which thrive in low D.O. environments.



Hach D.O. probe for monitoring oxygen levels in the SBR.

DON'T forget that you control the hydraulic capacity of your SBR and you can increase or decrease the capacity by simply changing the quantity of cycles that the SBR operates by modifying the phase times in the control panel. This can be a useful tool when there is a rain event forthcoming, as you can increase the number of cycles the system operates in order to increase your hydraulic capacity to avoid Storm Flow operation and its associated shortened Settle phase.

DON'T let your D.O. concentration become too high during the Mix Fill phase or targeted anoxic phases of React Fill and React. A maximum D.O. during these phases should be 0.3 mg/l or lower.

DO check for influent sources of quaternary amines if your plant experiences symptoms of a toxic shock to the biomass, such as loss of nitrification. Quaternary amines are commonly utilized in cleaning chemicals. Quaternary amines are toxic to the biomass in your SBR, and are long lived and difficult for the biomass to break down.

DON'T ignore the percent of design load that your SBR is operating at. Comparing the actual influent load to what it was originally designed for is one of the most important operational aspects of running your plant. The percent of design load will dictate the amount of aeration required for your system, as well as the targeted MLSS concentration.

DO remember that to achieve denitrification, an adequate source of soluble carbon is needed in the SBR, as well as low dissolved oxygen levels. This is one of the reasons that you should target denitrification late in the React Fill phase or early in the React phase. If you have a targeted aeration "off" time late in the React phase, there would be no soluble carbon in the SBR and the ability to achieve denitrification at that point in the cycle would be limited.

DO know that not all settling issues are related to filamentous organisms. For instance, viscous bulking occurs when the biomass is exposed to nutrient deficient conditions and they are lacking adequate amounts of nitrogen or phosphorus. Viscous bulking is typically more of a concern for an industrial application than a municipal application. Nutrient deficiency can be identified by performing an India Ink stain of the biomass, as well as by testing the effluent of the SBR to determine if any soluble phosphorus or ammonia is present.

DO know that you have the ability to lengthen the Settle phase in the SBR if conditions warrant. This can be a useful tool in optimizing the operation of the SBR.

DO use the microscope on a regular basis to inspect your MLSS. Typically, the analysis is performed at a magnification of 100X to 400X. You should be looking for good floc structure, a healthy biomass with a proliferation of ciliates, and limited amounts of rotifers, filaments or nematodes.



Multi-headed stalk ciliate is a sign of a healthy biomass.

DON'T operate your SBR system at a low (<6.5) pH. Operating your SBR (or digester) at a low pH will reduce the nitrification rate, as well as potentially lead to issues with foaming and settleability.

THE DO'S AND DON'TS OF OPERATING A CLOTH MEDIA FILTER, PART II

Aqua-Aerobic Systems has been providing cloth media filters for over 25 years. During this time, we have learned helpful tips and things to avoid when operating a cloth media filter. Presented below is Part II of the "Do's and Don'ts" for operating your Aqua-Aerobic® Cloth Media Filter. Again, we encourage you to give us a call to discuss your concerns if they are not listed below.

DON'T let your backwash pump be exposed to freezing conditions without a pump casing heater installed. Damage can occur to the pump.



Pump damage caused by freezing temperatures.

DO keep your backwash pump vacuum gauges operational. Monitoring the vacuum reading on the backwash pump during the backwash stage is one of the most important aspects of operating your cloth media filter.



An inoperable vacuum gauge makes it difficult to monitor filter operation.

DON'T ignore pump cavitation during backwash. It is oftentimes an indication that the cloth media is fouled and needs to be chemically cleaned or replaced.

DON'T ignore maintenance on your backwash pump or your drive motor, as they could fail you when you need them most. Recommended maintenance intervals for your filter are available in your O&M manual or available from Aqua-Aerobic Systems upon request.



It is important to check your pump oiler to ensure it is not low on oil, as pictured above.

DO review the frequency of backwash of your filter. If the backwash frequency is increasing, while the load to the filter is staying the same, it is an indicator that the cloth may be fouled and need to be cleaned.

DO perform a mechanical inspection of your filter on at least an annual basis. Items such as confirming the V-ring seal is intact and in place, the backwash shoes are flush with the cloth, and the upper rider wheel is in contact with the center tube should be reviewed.

DON'T forget that a drawdown test can be performed on the backwash pump to confirm its pumping rate. For an Aqua MiniDisk® filter, the targeted pumping rate is typically 65 gpm per pair of disks. For a Model 54 Classic AquaDisk® filter, the targeted pumping rate is typically 120 gpm per pair of disks. For an AquaDiamond® filter, the targeted pumping rate is typically 400 gpm. Procedures for performing a drawdown test are available upon request.



THE DO'S AND DON'TS OF OPERATING A CLOTH MEDIA FILTER, PART II

continued from page 3

DO know that Aqua-Aerobic Systems is constantly expanding our offering of cloth styles. We currently have available cloths in nominal 5 or 10 micron pore sizes, both in chlorine resistant and non chlorine resistant varieties.



DO inspect the effluent seal gasket of your filter on a regular basis to confirm that it is intact and in place. If it is compromised, it can directly affect the effluent quality from your filter.

DO know that Aqua-Aerobic has upgrades available for your backwash valve actuators. Some of the older AquaDisk® filter installations were installed with pneumatic actuators or Nibco electric actuators for the backwash and sludge valves. Aqua-Aerobic has observed improved reliability with RCEL electric actuators for those applications.

DO avoid having excess oil, grease and/or debris enter the filter. Excess oil and grease can foul the filter cloth and lead to the need to clean the filter.



Grease and debris in the filter tank, which can foul the filter and should be removed.

DO know that Aqua-Aerobic has also come out with a new style of cloth for all applications that reduces backwash frequency and improves hydraulic capacity of your filter, if your installation is seeing excessive backwash or lack of hydraulic capacity. This style of cloth has been installed on all of the new installations sold since 2015, but is also available as an upgrade for our older installations.

DO know that Aqua has an available sun cover for the operator interface on your control panel. The sun cover will protect the operator interface from damage due to exposure to UV light.



An example of an operator interface sun cover.

By following this simple list of "Do's and Don'ts," you could extend the life of your cloth media filter for many years to come.

If you have additional concerns or questions, we encourage you to call our 24/7 Customer Support line at (800) 940-5008; email CustomerService@aqua-aerobic.com for mechanical or electrical issues; or ProcessSupport@aqua-aerobic.com for process issues.

SEND US YOUR DATA AND WIN!

Since 2014, our Customer Service team has conducted an annual Treatment Plant Award Drawing as a “thank you” to those plants that send in their operating data.

Contest Winners Receive:

Two free days of on-site assistance from one of our Field Service Technicians. The days on site can be used within a calendar year of the drawing and can be utilized for process or mechanical training, or equipment inspection.

We are grateful to all of our plants that have sent in their operating data over the past several years. The data is very useful to our process engineers in the event your facility contacts us with process concerns. The data also allows us to access how your system is loaded relative to the original design and assists us in formulating our process recommendations.

If you have not yet sent us your data, please send it to ProcessData@aqua-aerobic.com. To qualify for the next drawing in Spring 2020, we request a minimum of 6 months of data in the calendar year, with a minimum of the information below:

- Influent average and maximum flows (Required)
- Effluent data (required)
- Influent data (if available)
- Daily operating information such as MLSS, settleability, pH, etc. (if available)

We look forward to receiving your 2019 data and wish you luck in being one of the selected plants for the award!

GIVE US YOUR FEEDBACK

For 20 years, this newsletter has been published and sent to our valued customers who operate one of Aqua-Aerobic Systems' biological processes or cloth media filtration systems. We make every effort to include articles in each newsletter that offer process and mechanical advice, troubleshooting guidelines and additional resources to ensure that your system operates efficiently.

We would like to hear from you as to the content of this newsletter and let us know how we can make it better. Please send us any topics that you feel would be beneficial in an upcoming issue.



Your input is important so that we continue to deliver this newsletter with the most current and relevant information that meets your current or future needs. Send your editorial suggestions to: PKlebs@aqua-aerobic.com We look forward to hearing from you!



50th Anniversary
AQUA-AEROBIC SYSTEMS, INC.
A Metawater Company

1969 – 2019

6306 N. Alpine Rd. | Loves Park, IL 61111-7655
www.aqua-aerobic.com | 815.654.2501

PRESORT STD
U.S. POSTAGE
PAID
ROCKFORD, IL
PERMIT NO. 781

YOUR CUSTOMER RESPONSE CENTER:
TOLL-FREE 800.940.5008

Providing **TOTAL** Water Management Solutions

Visit our website at www.aqua-aerobic.com to learn more
about our complete line of products and services:

Aeration & Mixing

Biological Processes

Filtration

Membranes

Oxidation & Disinfection

Process Control

Aftermarket Products and Services