

FAQ - Ponds and Pond Filters

Ohio Administrative Code (OAC) 3701-28-14

December 2012

Question:

- 1. Do the rules require the local health department inspector to check a water supply for evidence of chlorine in the system prior to collecting a bacterial sample?**

Answer:

*Yes. The local health department must always measure the chlorine residual (or other chemical residual) before collecting any water sample for a new or alteration permit. You should have a chlorine test kit. Some LHDs use chlorine test strips, however, ODH strongly recommends the use a DPD test kit that can measure down to .1 ppm. The homeowner should also be encouraged to always keep a test kit on site that is accurate enough to detect the low residuals of whatever disinfectant they are using. Water wells not required to have continuous disinfection should have **no chlorine** detected at the time a water sample is collected. All system that are required to have continuous chemical disinfection should have the required chemical residual present at the time the water sample is collected.*

Question:

- 2. Do we need to have an accurate measurement of the chemical disinfectant in order to determine the contact value for that disinfection system?**

Answer:

The chemical residual should be accurately measured. Check the retention tank size (120 gallon minimum) and measure the chemical residual after contact. For chlorine, it should be no less than .4 ppm. You do not need to calculate the CT value if they have one 120 contact tank and it is a single family home.

Question:

3. What is the required disinfection / filtration treatment equipment installation placement order on private water system pond?

Answer:

Where the rule is specific the devices must be installed in that order (see 3701-28-14 (M) (2)(a) and (b)). Where the device order has not been specified then there is some leeway for the contractor. This was done to allow some flexibility since there are differences of opinion amongst contractors on the order and placement of the disinfection system components and the coagulation components for a rapid sand filter configuration. For continuous disinfection systems, only the UV is specified to be the last device on the treatment run.

One school of thought has the rapid sand filter placed prior to the chemical disinfection to treat the raw pond water to remove cyanobacteria (blue green algae) before the cyanobacteria cell lyses from the chemical disinfection process. If this is done then there must be at least a cartridge filter sized sufficiently to remove precipitated particles after the oxidation/disinfection process if chlorine, iodine, or ozone was the disinfectant. The other thought on filter/disinfection order is to have the disinfection first so that oxidized particles are filtered out in sequence from larger particles to smaller particles. This increases the run life of the most expensive cyst reduction filters.

It has also been considered that a rapid sand filter system that uses the coagulation option rather than the stepped cartridge filters will provide better protection from the toxins associated with Cyanobacteria – Harmful Algal Blooms (HABs) (see fact sheet Pond Water - Drinking Water Treatment of Blue-Green Algae).

Question:

4. Can both the coagulant and the chemical disinfectant be added at the same point prior to the two holding (retention) tanks?

Answer:

No. The disinfection system and the filtration system are *different* systems. The pond rule is specific that when coagulation is added it will have its own dedicated retention (contact) tank. So there will be two chemical feed pumps if they are using alum plus chlorine or iodine. When ozone is being used for disinfection the ozone injection is done via a venturi and there would be one chemical feed pump for coagulation since the ozone is generated on site by a corona arc.

There is concern that not having sufficient retention time after coagulation can allow the alum to pass into the rapid sand filter and cause the sand to clump and clog the system.

An optional configuration that uses an **unpressurized** retention (contact) tank **after** the coagulation allows quiet settling of the particles. However, this requires the addition of another pump to re-pressurize the system and thus additional cost of the system. This configuration is in an acceptable option that is not specified in the rule.

Question:

5. What is meant by “absolute” filter size as opposed to a “nominal” filter size?

There is a substantial difference between filters that are rated as “absolute” and “nominal”. An “absolute” rated filter removes 99.95 percent of particles for the filters rated micron size. A “nominal” rated filter removes around 85 percent of that rated micron size, or in other words, allows 15 percent of the particles of that rated micron size through the filter.

Question:

6. How can enough water be provided by a private water system for all the household needs since many of the NSF 53 cyst reduction filters have a low flow rate?

The installation of the filters must allow a flow of at least 10 gallons per minute per household. This will likely require the installation of the cyst reduction filters in parallel (not in series). In this way all of the filters work at the same time. For example a cyst filter rated for 2.5 gallons per minute would require the installation of four cyst filter units to maintain at least 10 gallons per minute.

Question:

7. Does the local health department need to be sampling for turbidity?

Answer:

Local health departments do not need to take a water sample for turbidity unless there is a problem noted with the system and is part of a complaint investigation. It is the responsibility of the contractor to make sure the water is treated to point that it is clear.

Question:

- 8. Rule 3701-28-14 (M) (5) requires 1.5 cubic feet of sand with effective sand size between 30 and 45 millimeters should this read .30 and .45?**

Answer:

Yes, that is a typo. It should read .30 mm and .45mm.

Question:

- 9. Currently, some pond treatment system installers are using a product that has an effective size of .45 to .55 mm.**

Answer:

The sand size for rapid sand filters is the same as spec for the slow sand filter but, only requires a 1.5 cubic foot bed. The smaller sand spec was chosen to improve on the typical nominal 12 to 20 micron filtration capability of rapid sand filters and decrease the changing frequency of the expensive cyst reduction filters. There were no comments on this issue during the rule review period. ODH is not opposed to modifying the sand specs for rapid sand filters to .45 to .55 mm.

Question:

- 10. Pond treatment system contractors are asking for a sample layout of equipment that meets the rule requirements for Chlorination and U.V. Is this a document that you can provide in the very near future?**

Yes. We will provide some layout drawings. Note: The UV device is always the last device on the required disinfection /filtration system and the end of the private water system. There should be a sample port immediately following the UV device. The water softener and 5 micron filter needs to be installed before the UV. Note: For chlorination, filters need to follow the chlorination system and be installed prior to the retention/contact tank which is the last piece of equipment on the run. Although not required, a 5 micron filter should be installed before a cyst filter to increase the run life of the cyst filter.