

FILTRATION ON THE DISCHARGE SIDE OF THE YOUR PUMP STATION

Well water or lake water is often the most feasible and least expensive water source available for golf course irrigation. Unfortunately, these types of water sources have a tendency to include a lot of "suspended solids" in sizes ranging from lawn furniture to micro-organisms. Last month we looked at several methods of filtering out some of the big stuff at the pump station intake. Filtering out the smaller stuff that may cause problems with the more delicate components of your system requires a little more aggressiveness and engineering technology. The questions you asked yourself last month still apply:

1. How clean is my water source?
What am I trying to filter out?
 2. What components am I trying to protect and where in my system should I locate the filter to accomplish this?
 3. How does the filter work; does it have any hydraulically or electrically operated components that require special consideration?
 4. How much time and money can I afford to spend for installation and monitoring of the filter?
 5. Do I feel lucky?
- If you answered question #5 with a yes, don't worry about filtration...Quit your job and move to Tahoe.

Most of the effective methods of removing smaller suspended solids from irrigation water require positive pressures or flows through the filtration equipment. For this reason it is often necessary that the components be located on, or at least partially serviced by, the discharge side of the pump station. Often the type of particulates you are trying to separate from the water will clue you into the best method of filtration.

If you are drawing a lot of sand out of your well or lake, you may want to include a "sand separator" in your system. Separators are typically long cylinders that create a spiral flow between inlet and outlet. This flow pattern creates centrifugal force which pushes the sand against the separator

wall. The separator is installed at a high vertical angle which forces the sand to a purge valve located at the bottom end of the unit. This valve needs to be opened either manually on a regular basis, or electrically by a signal from the control system and can be piped back into your storage lake or into your sewer and drain system.

The effective operation of this type of filter is dependent on maintaining a relatively high velocity of water through the separator. If your system has a lot of variation in flow volume, it may be necessary to install several separators of different sizes and direct flow through whichever separator will effectively filter out the solids.

Irrigation water often has damaging suspended particles that do not have enough specific gravity relative to the water to be effectively removed by centrifugal force. These particles must be removed by forcing the water through one of more filter elements that trap the damaging particles but allow the water (and particles that are small enough to have no significant effect on the system operation) to pass.

One method to accomplish uses a bed of sand in combination with a sand separator to filter out particulates. These units are called "media filters" and consist of a series of drums that include a sand separator assembly and are partially filled with a "media sand" bed through which the water flows. Particles are trapped within the media sand and the water is allowed to pass into the irrigation pipe network. The trapped particles are cleaned out of the media sand by a sequenced "backwash" process where water is forced through the sand bed in the opposite direction and sent out of the system through a backwash disposal pipe network.

Another method commonly used is to install an "automatic self cleaning filter" unit that consist of a series of drums that include a sand separator assembly and are partially filled with a "media sand" bed through which the water flows. Particles are trapped within the media sand and the water is allowed to pass into the irrigation pipe network. The trapped particles are cleaned out of the media sand by a sequenced "backwash" process where water is forced through the sand bed in the opposite direction and sent out of the system through a backwash disposal pipe network.

Another method commonly used is to install an "automatic self cleaning filter" unit that consists of a tube that contains several cylindrical screens or discs in varying degrees of porosity. The water is forced into the center of the tube and out through the screens. Particles are trapped on the interior surface of the cylindrical screens and the filtered water continues on its way to the irrigation system. As the filtered particles build-up on the surface of the screen, the difference in pressure between the interior and exterior of the screen increases. The filter includes a differential pressure switch that monitors this pressure build-up and when the pressure increases to a certain differential (usually 5-10 psi), the switch opens a hydraulically operated exhaust valve and activates a rotating suction mechanism that effectively "scrubs" and "vacuums" the solids off of the screen surfaces. A small amount of water is required for this flushing action but does not significantly effect the flow in the irrigation system. These solids and the water required to flush them are discharged through the exhaust valve. When the screen is clean enough to reduce the pressure differential to a normal level, the cleaning and flushing mechanisms. The flushed water can be piped back into your storage lake or into your sewer and drain system.

Each of the filtration methods discussed in this articles have certain requirements with regard to water pressure and/or flow volume in order to operate effectively as designed. In addition, they all will create a certain amount of pressure loss through their assemblies during the operation of the system. It is important that you select the correct type, size and configuration of filtration components to suit your needs and to operate in harmony with your irrigation system. It may be to your advantage to enlist the services of a professional irrigation consultant and the appropriate filtration system manufacturers representatives prior to installing filtration equipment on your irrigation system.