

# *TREASURE VALLEY IRRIGATION CONFERENCE*

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AQUA IRRIGATION

Four Rivers Cultural Center  
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## DRIP IRRIGATION MAINTENANCE



# *DRIP IRRIGATION MAINTENANCE*

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- SYSTEM STARTUP PROCEDURES
- DURING SEASON MAINTENANCE
- END OF YEAR CHECKLIST





# SYSTEM STARTUP

## PUMP STATION CHECKLIST:

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- Re-Install all plugs, caps or tubing on the pump and filter station
- Check for any cracked or broken pipes from winter freeze
- Repair / Replace inoperable valves, gauges or pump components
- Clean any debris from the pump sump, pre filter weed rack, bubbler screen or dragon filter depending on how your pump station is setup
- Grease motor bearings on pump (do not over grease)
- Inspect pump packing and add or replace if necessary
- Inspect the Control Panel or VFD



# *SYSTEM STARTUP*

## FILTER STATION CHECKLIST:

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- Inspect the media in tanks if using sand media filtration
  - Add sand to top weld of tank if it is low (use proper type of media)
  - Replace sand if you find excessive silt buildup or gravel bed mixed in sand
- Inspect inner screen and components if using automatic screen filter or disk filter (screen and disk filters are only recommended for cleaner water applications with larger emitter drip lines)
- Re-connect tubing to solenoid valves or down stream pressure reducing valve
- Check power to flush controller and solenoids to assure proper tank flushing
- Check flow meter battery
- Inspect chemigation valve



**Bubbler**  
Clean Screen

**Pump**  
Grease Motor  
Check Guages  
Check Valves

**Backflush Valves**

**Solenoid Valves**  
Check Wiring & Tubing

**Tanks**  
Inspect Media  
Add / Replace if needed

**Chemigation Valve**  
Inspect & Repair if necessary

**Sustaining Valve**  
Inspect connections & tubing  
Rebuild every 2-5 Years

**Flow Meter**  
Check battery





# *SYSTEM STARTUP PROCEDURE:*

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- Start the pump for a few minutes to discharge any dirty water from the system. Open a dump valve to avoid pumping this dirty water into the drip system
- Do a hard backflush to the filters several times initially to clear any buildup or residual from the previous year
- Flush mainlines first. Close all submain valves and open mainline flush valves (or open the ends of layflat). Run water through the mainline for several minutes until water clears up
- Flush drip lines. Open first zone valve and drip line ends. Flush each drip line until water reaches the end and looks clear. You might need to flush only a few lines at a time to maintain enough pressure and velocity.
- Continue flushing all zones and drip lines until the entire system is flushed



# *SYSTEM STARTUP PROCEDURE:*

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- Close drip line ends and pressurize the first drip zone
- Operate the system until it is fully pressurized and all air is discharged from the system
- Starting at the pump, check the entire system for leaks and any necessary repairs. Fix all leaks if possible
- Check and set all valve pressure settings to the design specs
- Check pressures at key points and note the flow at the flow meter near the filter station
- Compare actual flow and pressures to the original design
- Repeat this process for all zones in the system



# SYSTEM STARTUP

## FINAL CHECKLIST:

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- Make sure pump sounds smooth and produces adequate pressure
- Check VFD if equipped and make sure it is regulating pressure when flow changes in the drip system or during backflush
- Check filter backflush controller and watch the system go through several backflush cycles to verify controller is working, backflush valves are working and all solenoid valves are working properly
- Test your injection pump to verify if it is working correctly.
- Check all pressure gauges and air vents and replace if needed
- Finally look at the irrigation pattern in the field to determine if there are any plugged emitters in the drip lines



# DURING SEASON

## CHECKLIST:

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- MONITOR IRRIGATION PATTERNS IN THE FIELD
- USE A GOOD QUALITY FLOW METER
- MONITOR BACKFLUSH CYCLES
- FLUSH DRIP LINES OFTEN
- HAVE A MAINTENANCE PLAN
- KEEP YOUR DRIP IRRIGATION PUMP AND FILTER STATIONS CLEAN!



# DURING SEASON

MONITOR WATER PATTERN:



LOOK FOR  
EVEN WATER  
DISTRIBUTION  
(GOOD)

LOOK FOR  
INCONSISTENT  
WATER PATTERNS  
(BAD)





# DURING SEASON

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## FLOW METER

- Use a good quality flow meter on a drip irrigation system
- Check the system flow daily and compare with the original design
- Look for flow variations daily to determine if there is potential drip tape plugging or blowouts in submain piping

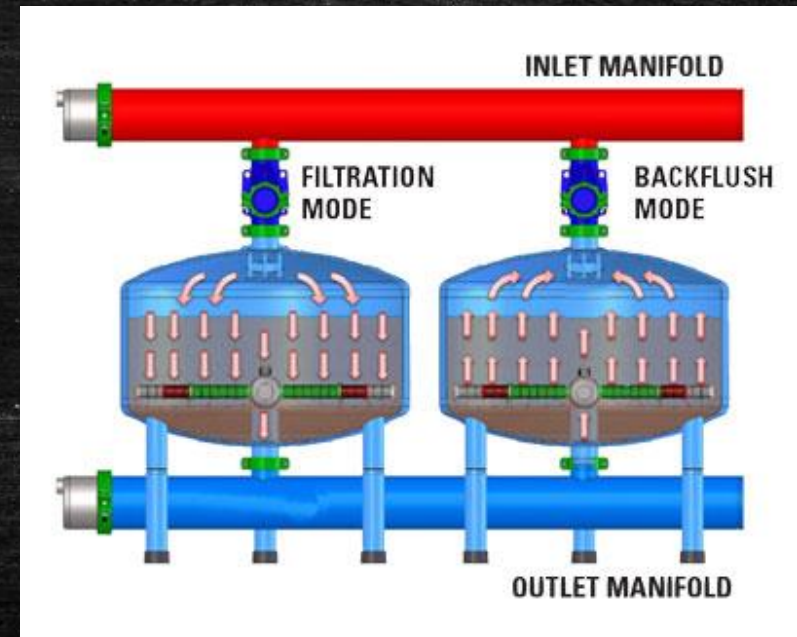




# DURING SEASON

## MONITOR BACKFLUSH CYCLES:

- MAKE SURE YOUR DRIP SYSTEM IS SET UP PROPERLY AND KNOW HOW THE FILTER SYSTEM WORKS
- CHECK THE CONTROLLER, SOLENOIDS AND BACKFLUSH VALVES (MAKE SURE CONTROLLER IS PROGRAMMED CORRECTLY)
- WATCH WATER QUALITY AND TEMPERATURE IN CANALS TO PREDICT PROBLEMS
- WATCH THE PRESSURE DIFFERENTIAL TO DETERMINE IF TANKS ARE BECOMING PLUGGED
- BACKFLUSH WITH  $>30$  psi
- LOSS OF SAND SUGGESTS EXCESSIVE BACKFLUSHING
- PRESENCE OF SLIME OR ORGANIC MATERIAL SUGGESTS INADEQUATE BACKFLUSHING





# DURING SEASON

## FLUSH DRIP LINES:

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- FLUSH DRIP LINES ON A REGULAR BASIS
- HEAVY SILT LOADS WILL REQUIRE UP TO 2 FLUSHES PER WEEK
- MAINTAIN ENOUGH PRESSURE AND VELOCITY WHEN FLUSHING  
\* FLUSH  $\frac{1}{3}$  OF ZONE AT A TIME
- SAND MEDIA WILL ONLY FILTER UP TO 200 MESH, SO EXPECT TO SEE SILT IN YOUR DRIP LINES
- IF YOU SEE ALGAE GROWTH IN THE WATER OR IRON BACTERIA FLUSH IMMEDIATELY AND BEGIN WATER TREATMENTS ASAP



# DURING SEASON

## MAINTENANCE PLAN:

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- A PREVENTATIVE MAINTENANCE IS THE BEST PLAN
  - ACID BASED FERTILIZER
  - CHLORINE (tablet or liquid form)
  - PROPRIETARY LINE CLEANERS
- HAVE A MAINTENANCE PLAN READY TO USE WHEN YOU SEE PLUGGING IN YOUR DRIP TAPE
- ASK FOR HELP
  - There are many products available to help maintain drip tape during the season
  - These products are much cheaper than replacing tape or having crop loss



# DURING SEASON

## KEEP PUMP/FILTER STATION CLEAN:

- START WITH A CLEAN LAYOUT
  - PERMANENT STATIONS SHOULD BE PROPERLY DESIGNED
  - INSTALL PORTABLE STATIONS CORRECTLY
  - KEEP PUMPS, FILTERS AND PIPES LEVEL
  - USE AIR VENTS WHEN NECESSARY
- KEEP THE AREA SPRAYED
  - KEEP WEEDS DOWN
  - MAKE IT EASILY ACCESSIBLE
- KEEP CHEMICALS STORED PROPERLY
- INSTALL SHADE OVER THE PUMP AND ELECTRICAL PANEL





# END OF YEAR

## CHECKLIST:

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- DO A FINAL CHLORINE INJECTION DURING THE LAST IRRIGATION
  - THE REMAINING WATER IN THE SYSTEM SHOULD HAVE 5-10 PPM CHLORINE
- DO A HARD BACKFLUSH TO THE SAND MEDIA FILTERS, SCREEN FILTER OR DISK FILTER
  - THE FILTERS SHOULD BE CLEAN WHEN YOU START UP NEXT SEASON
- DRAIN ALL WATER FROM PUMP AND FILTER STATION
  - REMOVE PUMP PLUG
  - DRAIN WATER FROM PIPING BETWEEN FILTERS AND AFTER FILTER
  - DRAIN TUBING FROM SUSTAINING VALVE, ZONE VALVES AND SOLENOIDS
- LEAVE ALL VALVES SLIGHTLY OPEN TO AVOID FREEZE DAMAGE



# END OF YEAR

## CHECKLIST:

- BLOW OUT ALL BURIED PIPELINES WITH AIR COMPRESSOR
- COVER PUMP AND ANY OPEN PIPE ENDS
- STORE PORTABLE DRIP COMPONENTS INSIDE (VALVES, LAYFLAT, FITTINGS, ETC.)
- PUT IT AWAY RIGHT SO THAT YOU DON'T HAVE TO WORRY OVER THE WINTER





# THE END

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## QUESTIONS ??

- CORBY GARRETT
- AQUA IRRIGATION  
– PARMA, ID

**'Serving agriculture's drip irrigation needs'**



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