

DEPARTMENT OF PUBLIC HEALTH – DRINKING WATER DIVISION

GUIDANCE DOCUMENT SEASONAL WATER SYSTEM START-UP GUIDELINES

There are many unique concerns that seasonal water systems face that other year round water systems do not. Seasonal systems depressurize and drain their water systems typically over the winter months when the water is not used and to prevent freezing damage to water system piping and other components. Major areas of concerns with seasonal water systems during start-up include:

1. Stagnation of the water in the well or well(s) from non-use for an extended period of time which can lead to deterioration of water quality.
2. Contamination entering depressurized water system components (tanks and water distribution system piping) as these components are typically left vented or open to the atmosphere during the off season.
3. Many seasonal water systems are not maintained by DPH certified water system operators and those individuals that maintain the water systems may not understand or recognize potential risks that these systems face.

Recognizing that many of the small Transient Non-Community Public Water Systems (PWS) in Connecticut are not managed and/or maintained by licensed professionals, this Guidance Document is intended to aid the system owner with starting up a seasonal PWS.

The following guidelines are based on a generic water system with no permanent water treatment systems in place. Many water systems have different design features and these procedures should be tailored to fit your individual public water system's needs. Although it is best to hire a water professional for start-up, the following guidelines are offered as a recommended start-up procedure that should be followed. These steps along with the proper water quality testing will help ensure the safe delivery of drinking water to the public at the beginning of the operational season.

Timing

Start-up of the water system should begin well in advance of the anticipated first day of public use. The water system needs to be inspected, maintenance/repair work performed, disinfected, and sampled for water quality prior to opening day. Sometimes the disinfection and sampling procedures must be performed more than once if coliform bacteria or other contamination is found to be present in the first round of sampling. Leave yourself plenty of time to repeat these procedures, if necessary, before opening day arrives.

Inspection of Water System

This is an extremely important aspect of start-up. The water system has been idle for several months and many items may not be found as they were left during shutdown.

1. ***Drilled Wells***
 - a. Ensure that the sanitary radius of the well has not been compromised. The radial distance varies with well production and is based on the pumping rate in gallons per minute of the well pump. **Figures 13, 14, and 15** show radial distances for different pumping rates.

- Inspect this area for illegal dumping, animal feces, or any other sources of pollution that may result in a risk of contamination to the water supply. Clean any leaves/brush from the vicinity of the well.
- b. Check the integrity of the well casing and watertight well cap. Make sure they have not been vandalized and that the well cap and any associated conduit lines are tightly sealed to the well casing. If the well is not outfitted with a watertight well cap, now is the time to have one installed, as is required by Public Health Code (PHC) Section 19-13-B51 (j)(a). Only well caps that meet Pitless Adapter Standard 97 (PAS-97) are approved for use on drilled wells equipped with pitless adapters in Connecticut. The well cap vent should be inspected to ensure that it is adequately screened and shielded to prevent bugs, mice, or other foreign matter from entering the well casing.
 - c. If the well is located in a well pit then make sure the pit is clean and that no standing water is observed in the base of the pit. The top of the well pit should extend at least six inches above the ground surface and be fitted with a tightly sealed cover that overlaps the pit opening by at least two inches. Most wells located in well pits are not equipped with pitless adapters thus preventing the installation of a PAS-97 watertight well cap. These wells are typically sealed at the top with a split plate sanitary seal. A split plate sanitary seal allows the well's discharge piping, vent, and electrical wiring to extend through the top of the well casing. Inspect this seal to ensure that it is in good condition with no unsealed openings. Also inspect the well vent to ensure that it is adequately screened and shielded. Sanitary seal vents should extend through the top of the seal and terminate in an inverted "U" or "J" to prevent debris from falling through the screen into the well. All electrical wiring should be encased in approved conduit. Well pits are required to be equipped with gravity drains and have a watertight floor (typically concrete). The gravity drain must discharge to the ground surface. Inspect and test the gravity drain to ensure that there are no obstructions and that the discharge end is adequately screened to keep out rodents.

Undrained well pits and buried wellheads significantly increase the risk of contamination to a PWS and are not allowed. Well pits are also havens for animals if they are not adequately sealed. Wells that are buried or located in poorly constructed undrained well pits should be equipped with a pitless adapter and raised at least six inches above grade using the guidelines in the attached **Well Casing Extension Guidance Document** to comply with PHC Section 19-13-B51f (e). Only Connecticut licensed well drilling contractors are authorized to raise well casings.

2. *Shallow Dug Wells*

- a. Shallow dug wells in general are more susceptible to bacteriological contamination than drilled wells and strong consideration should be given to replacing these water sources with drilled wells.
- b. Inspect the sanitary radius of the well as in 1.a. above.
- c. Ensure that the top of the well casing projects at least six inches above the ground surface. Ensure that the ground surface around the well casing is slightly mounded to shed surface wash away from the well casing.
- d. Inspect the well cover to ensure that it overlaps the outside of the well tile by at least two inches and that it forms a tight seal with the top section of well tile. Inspect the cover for cracks or chips that may allow rain water to seep into the well. Repair or replace the cover as necessary. Concrete covers must be reinforced and at least four inches thick.
- e. Remove the well cover carefully so as not to cause any damage to the seating surface of top well tile. Inspect the inside of the well for watertight construction to a depth of at least ten feet. Inspect all mortared joints inside the well casing for signs of deterioration

- or leakage. Inspect all sidewall penetrations to ensure they are sealed with no signs of deterioration or leakage. Ensure that no trash, rodent carcasses, or other items are observed in the well. Remove any foreign items that may be found. Seal all deteriorated joints or sidewall penetrations with hydraulic cement or cement mortar.
- f. Inspect the seating surface of the top section of well tile for chips or deterioration that would prevent the well cover from forming a tight seal. Repair the seating surface as necessary with hydraulic cement or cement mortar.
 - g. Disinfect the well as described in the attached disinfection procedure.
 - h. Reinstall the well cover and inspect to ensure it forms a tight seal with the top seating surface of the well tile.
 - i. If significant repair work or deepening of the well is necessary to bring it up to PHC construction standards the shallow dug well should be replaced with a drilled well.

3. *Well House/Pump House*

- a. Clean the interior of all leaves, dust, nests, etc. Well houses and pump houses should not be used as a storage area for yard equipment, gas cans, paint cans, or miscellaneous items. These facilities should be kept in good sanitary condition.
- b. Inspect all water system electrical controls prior to activating. Rodents often nest in these locations. A short circuit could be created if electrical panels are powered up and a nest or rodent is situated on more than one control leg.
- c. Inspect water storage tanks, if any, for signs of contamination and excessive corrosion. Tanks should be drained of any stagnant water and cleaned/disinfected as necessary to remove any sediment from the base of the tank. Tank vents, if installed, should be screened with metallic 24 mesh (24 openings per square inch) screen and shielded to prevent foreign matter from falling through the screen. Screens should be securely fastened to the vent opening(s). If necessary, properly prepare the exterior of the tank/tanks before refinishing. If the interiors of these tanks have never been inspected, a licensed professional should be contracted to do so. PHC 19-13-B102f (5)(C) requires all finished water storage tanks to be inspected at a minimum of once every ten years for sanitary conditions and structural integrity. The interior of the tank may need to be relined with a National Sanitation Foundation (NSF) Standard 61 listed coating. Approval from the DWD is required prior to relining/painting the interior of water storage tanks. Do not enter tanks or attempt to paint the interior of tanks unless all of the necessary safety equipment, ventilation equipment, and personnel are in place to comply with the Office of Safety and Health Administration's (OSHA) confined space entry requirements. These safety requirements also apply when painting external tank surfaces, piping, and valves if these components are located in confined spaces.
- d. Underground concrete vaults that contain water system components should be equipped with a dehumidifier, ladder, lighting, ventilation, and a gravity drain and/or sump pump for dewatering. These vaults should be inspected to ensure that they are dry and clean. Valves located in these spaces should be exercised to ensure proper operation. Open gate valves should be backed off a quarter turn to help prevent the valve from locking in the fully open position.
- e. If a portable or stationary air compressor is used in conjunction with a hydropneumatic water storage tank it should be an oilless type compressor or use food grade oil for lubrication. The air filter should be inspected for cleanliness and replaced as necessary. The air intake of the compressor should be clear and situated in a manner where it will draw the best quality air possible.
- f. Well and pump houses must be kept locked to prevent unauthorized access.

Chlorination of Water System

Disinfect the well using the guidelines contained in the **attached** State of Connecticut Department of Public Health Drinking Water Division's "Disinfection of a Well Water Supply" Guidance Document. In the case where atmospheric and hydropneumatic storage tanks are used, please follow Example C from the guidance document.

Water Quality Testing

Once all chlorine has been flushed from the system (no chlorine residual), contact your certified laboratory to have the water tested for total coliform bacteria and physical parameters (pH, color, odor, turbidity). **The water quality results from the laboratory must be known and absent for total coliform bacteria prior to making this water available to the public.** In other words, plan on opening your water system early in order to ensure that it will be safe for public consumption. This will also allow additional time to perform the disinfection/flushing/sampling procedure again if total coliform bacteria is detected after the initial disinfection process.