

Hand Pump Maintenance and Well Disinfection

INSPECTION

Identify/Address Deficiencies and Maintenance Needs

Packing Gland/Stuffing Box

- Is the pump rod or packing nut worn?
- Is the pump rod lubricated (food grade)?
- Are the Teflon or rope-type seals in good shape?
- Is the pump cap firmly secured, and bolts tight?



Poor Condition



Good Condition

Pump Base, Casing, and Slab

- Does the flange have a watertight seal?
- Is the well casing at least 12 inches above grade?
- Is the annular space around the casing sealed?
- Does the hand pump have a concrete slab around the base?
- Is the concrete slab in good condition?



Poor Condition



Good Condition

Drinking Fountain Reservoir and Assembly

1. Is the reservoir gasket intact, providing a watertight seal?
2. Are there any bolts missing?
3. Are the screens for the vent, drain, and fountain intact?
4. Are the reservoir and fountain drains free of obstruction so they properly drain?

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4



Well Disinfection

When to Disinfect

Well disinfection can eliminate or reduce many kinds of harmful bacteria and viruses, as well as non-harmful bacteria that can cause unpleasant taste and odors. However, disinfection will **not** correct water problems caused by chemical contamination from nitrate, fuels, pesticides, or other substances. Well disinfection should be performed under the following circumstances:

- When total coliform bacteria are present in the water
- After well casing or pump repairs
- When drinking water tastes or odors change, e.g., from iron or sulfur-reducing bacteria
- As part of the annual maintenance
- During start-up of seasonal wells
- If the well has been subjected to flooding conditions

STEP 1 - Mixing a bleach solution

- Add a half-gallon of bleach (no additives; bleach should be less than 6 months old) to a clean pail with about 3 gallons of water.
- This is generally sufficient to disinfect a 4 inches in diameter well, 100 feet deep or less.
- For wells deeper than 100 feet, or with a larger casing diameter, increase the amount of bleach proportionately.
- Do not use excessive concentrations of bleach. This will raise the pH of the water in the well and, in turn, reduce the disinfection effectiveness.



*Use Caution
Severe eye damage may result from
contact with bleach.
Eye protection is recommended.*

STEP 2 - Adding bleach solution to the well

- Pour the mixture into the well.
- To aid introducing bleach to the well, it is recommended you use a funnel to pour the bleach solution into the well.
- When possible, introduce the bleach solution into the well through the chlorination plug. By using the chlorination plug, the bleach solution is introduced directly into the well casing and down through the water column in the well. (See arrow).
- Bleach solution can also be introduced through the stuffing box or siphon spout. However, most of the disinfectant will only go into the drop pipe, resulting in a less thorough disinfection. If the hand pump does not have a designated chlorination plug, and the intention is to disinfect the entire well including the casing, then it should be disinfected by a licensed water well contractor, as the hand pump will likely require lifting.



STEP 3 - Bringing bleach to all hand pump components

- Pump the well until a strong bleach odor is present in the water.
- Chlorine test strips should be used to provide a visual indication that bleach is present.
- If the hand pump has a drinking fountain, make sure all of its components have chlorinated water pumped to and through them.

- Leave the bleach solution in the well for 6-24 hours;
- Overnight for longer contact time is recommended.
- To protect users from high chlorine concentrations, remove the pump handle and post “Do Not Drink” warnings.

STEP 4 - Removing the chlorinated water

- Pump the well until the bleach odor can no longer be detected. This may take several hours of pumping.
- Using a pump jack is recommended.
- Chlorine test strips should be used to ensure total chlorine is absent.
- TOTAL chlorine must be absent prior to taking water samples for total coliform analysis.
- When chlorine test strips are unavailable, wait a few days after the last trace of chlorine odor has been detected before submitting a water sample for coliform analysis. This will ensure a valid test result.

Expectations and Concerns

It is not unusual for a hand pump well to require repeated disinfection attempts to clear the well and pump of total coliform bacteria. If the well does not clear after a number of disinfection attempts, a licensed well contractor should be contacted for further assistance. It is essential that any water system defects that could allow contaminants to enter the well be corrected prior to beginning the disinfection process.

Follow Up

If coliform bacteria regrow in the water system, additional disinfection(s) is required. After sampling confirms coliforms are absent, it is required to retest the water in approximately 30 days. This will be done by MDH staff. If coliform bacteria are again detected, repeat the disinfection procedure.

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To obtain this information in a different format, call: 651-201-4700.