Common Causes of Bacterial Contamination in Residential Wells

Cause of Problem	Solution
Bacteria can enter the system through **openings in the well casing**. The most common locations are a gap between the half-circle plates that cover the top of the casing, a missing plug, or an opening around the wires going to the pump. If insects or rain water can enter, then it is a possible source of contamination.	Seal all visible openings with silicone caulk. It forms a water-tight seal, but can be easily removed for well repairs.
Lack of proper maintenance of **treatment units** such as carbon filters, sediment filters, water softeners, etc. can result in bacterial contamination. The treatment unit itself offers surface area for bacterial growth and also may concentrate organic material for bacteria to utilize as a food source.	Replace filter cartridges as recommended by the manufacturer. Sanitize the filter housing with a dilute bleach/water solution when replacing cartridges. Maintain salt in water softener brine tanks.
Plumbing repairs or additions without system disinfection can introduce bacteria and subsequent growth is possible, especially in non-chlorinated systems.	Always disinfect water systems after plumbing repairs or additions.
Seasonal systems can have bacteria introduced during draining, startup, or anytime if drained water lines are not properly closed or capped during the winterizing process.	Never leave any part of the plumbing system open to the environment. Always disinfect the well and plumbing each spring.
Dead ends in the plumbing system allow water to become stagnant and sediment to accumulate creating conditions favorable for bacterial growth. Dead ends are created when plumbing fixtures are removed or taken out of service and the associated water lines are left in place. Dead ends can also exist on water feed lines to fire and lawn sprinkler systems, boilers, heat exchangers, church baptisteries, and other seasonal or seldom used fixtures.	Remove all unnecessary plumbing dead ends. Routinely run water through seldom-used fixtures. Ensure that feed lines to lawn sprinkler systems and boilers have proper backflow prevention installed.
Water systems with **very low water use** are, in effect, dead ends and this may promote bacterial growth.	Periodically flush the water system by lawn sprinkling or other means.
When a **submersible pump is replaced** and the well is not adequately disinfected, bacteria may be introduced on the new pump or from the drop pipe or wiring if set on the ground.	Prevent drop pipes and wiring from becoming soiled during pump replacement. Disinfect the well and plumbing after pump replacement.
A well **casing that terminates near or at the ground level** allows surface water to enter the top of the well through the well cap or vent.	Hire a licensed well contractor to extend the well casing at least 12 inches above the surrounding ground level.
Flooding can result in surface water entering the well through the top of the casing.	Always disinfect water systems if standing water collects around the casing. It is best to wait until the flooding recedes, but do not drink the water until it has been tested and shown to be bacteria free.
A **well casing that becomes damaged** when struck by a vehicle or storm debris may allow bacteria to enter the well via surface water and surrounding soil draining into the well. The damage may exist below the ground surface and not be apparent.	Wells located in areas where vehicular traffic occurs should be protected by surrounding the casing with rigid posts, large rocks, or fencing. Hire a licensed well contractor to inspect the well if damage is suspected.

This table has been adapted from Table 3.1 “Common Causes of Coliform Problems in Water Supplies and Corrective Actions” contained within a manual published by the Minnesota Department of Health.