

**MONTANA STATE DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES**

WATER QUALITY BUREAU

Circular 7

BY RICK ROSA, Sanitary Engineer

Helena, Montana

DISINFECTION OF WELLS

Nature of Contamination

A well is contaminated if a water sample analysis shows the presence of coliform bacteria. Coliform bacteria indicates the possible presence of disease-producing bacteria that normally live in the intestinal tracts of man and warm-blooded animals. The water supply can be considered to be polluted by either human or animal waste

Wells may become contaminated by several different methods. In new wells, contaminating material may enter during the construction period. In old wells, contamination may enter during floods. It may be carried in by animals or by drainage which may find its way into the water, either over the surface or through the topsoil. The instructions given herewith are designed to assist in disinfecting wells which have become contaminated. If a well is poorly constructed or located, it may be subject to continuous contamination and such conditions cannot be cared for by following these instructions; it being necessary to remove or exclude the source of contamination first.

A chlorine solution is the simplest and most effective agent for disinfecting a well, pump, storage tank or piping system. Liquid house-hold bleach is the most commonly available source of chlorine. This circular will deal with disinfection procedure using bleach such as purex or clorox.

**Quantity of Liquid Household Bleach Required
for Water Well Disinfection**

On the following page is a chart for determining the amount of bleach required for a specific well capacity. Well diameter and water depth are used in the determination.

DISINFECTION PROCEDURE

Drilled, Driven, and Bored Wells

1. When the well is being tested for yield, the test pump should be operated until the well water is as clear and as free from turbidity as possible.
2. After the testing equipment has been removed, slowly pour the required amount of chlorine solution into the well. Add 5 to 10 gallons of clean, chlorinated water (see Table 1) to the well to force the solution out into the formation. One-half cup of laundry bleach in 5 gallons of water is enough for this purpose.
3. Wash the exterior surface of the pump cylinder and drop pipe as they are lowered into the well.
4. After the pump has been set in position, operate the pump until a distinct odor of chlorine can be detected in the water discharged. Connect the pump to the service line and resume pumping until the chlorine odor can be detected at the faucet.
5. Allow the chlorine solution to remain in the well and service line for at least 24 hours.
6. After disinfection, pump the well until the odor of chlorine can no longer be noticed in the water discharged. All traces of chlorine must be removed before collecting water samples for testing.
7. The effectiveness of disinfection should be checked after completing work by testing water samples for the presence of coliform bacteria. The samples should be collected in a container supplied by a qualified laboratory and in accordance with laboratory instructions.

Dug Wells

1. Pour the required amount of chlorine solution into the well through the manhole or pipesleeve opening just before inserting the pump cylinder and drop-pipe assembly. The chlorine solution should be distributed over as much of the surface of the water as possible to obtain proper diffusion of the chemical through the water.
2. Wash the exterior surface of the pump cylinder and drop pipe with the chlorine solution as the assembly is being lowered into the well.
3. After the pump has been set in position, pump water from the well until a strong odor of chlorine is noted. Connect a hose to the discharge opening of the pump and wash down the well walls with the chlorinated water. Connect the pump to the service line and resume pumping until chlorine odor can be detected at the faucet.
4. Follow steps 5-7 as explained under disinfection procedure for drilled wells on page 3.

TABLE 1

QUANTITY OF LIQUID HOUSEHOLD BLEACH REQUIRED FOR DISINFECTION

DEPTH OF WATER IN WELL (FEET)	WELL DIAMETER (INCHES)															
	2	3	4	5	6	8	10	12	16	20	24	28	32	36	42	48
5	1C	1C	1C	1C	1C	1C	1C	1C	2C	4C	1Q	2Q	3Q	3Q	4Q	5Q
10	1C	1C	1C	1C	1C	1C	2C	2C	1Q	2Q	3Q	4Q	4Q	6Q	8Q	2.5G
15	1C	1C	1C	1C	1C	2C	3C	4C	2Q	2.5Q	4Q	5Q	6Q	2G	3G	4G
20	1C	1C	1C	1C	1C	2C	4C	1Q	2.5Q	3.5Q						
30	1C	1C	1C	1C	2C	4C	1.5Q	2Q	4Q	5Q						
40	1C	1C	1C	2C	2C	1Q	2Q	2.5Q	4.5Q	7Q						
60	1C	1C	2C	3C	4C	2Q	3Q	4Q								
80	1C	1C	2C	4C	1Q	2Q	3.5Q	5Q								
100	1C	2C	3C	1Q	1.5Q	2.5Q	4Q	6Q								
150	2C	2C	4C	2Q	2.5Q	4Q	6Q	2.5G								

FOR QUANTITIES LYING TO THE LEFT OF THIS LINE, ADD 5 GALLONS OF CHLORINATED WATER, AS FINAL STEP, TO FORCE SOLUTION INTO FORMATION.

FOR QUANTITIES LYING TO THE RIGHT OF THE LINE, ADD 10 GALLONS.

6. C = CUPS Q = QUARTS G = GALLONS .5 = 2