



County of San Diego

Department of Environmental Health

Land and Water Quality Division

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Well Disinfection for Fire-Damaged Properties

Individual water wells may incur contamination as a result of fire damage to components and/ or the need to reopen the well to replace water lines to the well. Once all repair work is completed to the well and water lines, the well should be disinfected and water samples taken to a State Approved Laboratory for testing. A list of approved labs is provided at end of this document.

Exposed piping, electrical supply lines, storage tanks and other surface exposed components of the water supply system may be damaged or destroyed by fire. It is strongly suggested that the water well disinfection procedures outlined below be implemented after repairs to the potable water distribution system have been completed. It is also recommended that a water sample be taken and submitted to a state certified laboratory for analysis (see list below). This is to ensure that any contamination that may have entered the well as a result of the damage has been eliminated.

WATER WELL DISINFECTION

Disinfection involves seven steps:

1. A chlorine solution containing at least 50 mg/l (or parts per million) available chlorine is added to the well. The table below lists quantities of various chlorine compounds required to disinfect 100-feet (30-meters) of water filled casing at 50 mg./l for diameters ranging from 2 to 24 inches (50 to 600 millimeters). Chlorine concentration can be easily measured with a simple pool test kit, if available.
2. If the well pump requires removal for repair or replacement, the pump and discharge pipe should be washed with a chlorine solution as it is lowered into the well.
3. After it has been placed into position, the pump shall be turned on and off several times (e.g. "surged") to thoroughly mix the disinfectant with the water in the well. Repeat this procedure several times at one-hour intervals.
4. Pump until the water discharge has the odor of chlorine. This chlorinated water should be pumped through the entire distribution system.

5. The well and associated piping should be allowed to stand without pumping for 24-hours.
6. Chlorine required to disinfect 100 feet of well casing or water pipe @ 50 MG/L (parts per million):

Diameter of Casing In. (mm)	(70%) Calcium Hypo chlorite	(25%) Chloride of Lime	(5.25%) Sodium Hypo chlorite (Liquid Measure)
2 (50)	¼ oz. (7 g)	½ oz. (14 g)	2 oz. (59 ml)
4 (100)	1 oz. (28 g)	2 oz (57 g)	9 oz (266 ml)
6 (150)	2 oz. (57 g)	4 oz. (113 g)	20 oz. (0.6 l)
8 (200)	3 oz. (85 g)	7 oz. (0.2 kg)	2 ½ pts (1.0 l)
10 (250)	4 oz. (113 g)	11 oz. (0.3 kg)	3 ½ pts (1.7 l)
12 (300)	6 oz. (0.2 kg)	1 lb. (0.45 kg)	5 pts (2.4 l)
16 (400)	10 oz. (0.3 kg)	2 lb. (0.9 kg)	1 gal (3.8 l)
20 (510)	1 lb. (0.45 kg)	3 lb (1.4 kg)	1 2/3 gal (6.3 l)
24 (610)	1 ½ lb (0.7 kg)	4 lb. (1.8 kg)	2 1/3 gal (98.8 l)

7. The water shall then be pumped to waste until the presence of chlorine is no longer detectable. The absence of chlorine is best determined by testing for available chlorine residual using a test kit designed for this purpose.

The chlorinated waste should not be discharged directly to sensitive landscaped areas, storm sewers, or drainage ditches, and should never be discharged to creeks, streams or environmentally sensitive habitats. Ideally, the chlorinated waste should be drained to a flat or gently sloped area where it can infiltrate into the soil. Also note that heavily chlorinated water should not be disposed of through the plumbing systems of homes that utilize individual sewage disposal systems (septic tanks). Such strong disinfectants could neutralize the bacteria needed to stabilize the sewage and also could damage the soil absorption system.

(Optional) A bacteriological sample should be taken and submitted to a laboratory for examination.

If the laboratory analysis shows the water is not free of bacterial contamination, the disinfection procedure should be repeated. Depending on the level of contamination, it may be necessary to use a higher concentration chlorine solution (several times that shown in the table). The water should be retested. If the repeated attempts to disinfect the well are unsuccessful, a detailed investigation to determine the cause of the contamination should be undertaken.

When small individual domestic wells to be treated are of unknown depth or volume, at least one pound (0.45 kilograms) of calcium hypo chlorite (70% available chlorine) or two gallons (7.5 liters of household bleach (sodium hypo chlorite), such as Clorox or Purex, may be used in lieu of the chemicals shown in the above-referenced table.

Please Note:

- Some authorities recommend a minimum concentration of 100 mg/l. To obtain this concentration, double the amounts shown.
- When dry chlorine is used, dry product should be mixed with water prior to use.

CAUTION: WHEN USING DRY CHLORINE, USE GOGGLES FOR EYE PROTECTION AND WEAR PROTECTIVE CLOTHING AND GLOVES.

State Approved Laboratories for Water Quality Analysis

Below is a listing of state approved laboratories for drinking water and/or wastewater analysis. The following list is provided for information only. The County of San Diego does not endorse the businesses listed.

Associated Laboratories 806 N. Batavia Orange, CA 92868 (714) 771-6900 (714) 538-1209 (fax)	Edward S. Babcock & Sons, Inc. 6100 Quail Valley Court Riverside, CA 92507 (909) 653-3351 (909) 653-1662 (fax) www.babcocklabs.com	Clarkson Lab & Supply, Inc. 350 Trousdale Drive Chula Vista, CA 91910 (619) 425-1993 (619) 425-7917 (fax) www.clarksonlab.com
Clinical Laboratory of San Bernardino 21881 Barton Road Grand Terrace, CA 92313 (909) 825-7693 (909) 825-7696 (fax) www.clinical-lab.com	D-Tek Analytical Laboratories 9020 Kenamar Dr., Suite 205 San Diego, CA 92121 (760) 729-7890	Environmental Engineering Laboratory 3538 Hancock St. San Diego, CA 92110 (619) 298-6131 (619) 298-6141 (fax)
MWH Laboratories 750 Royal Oaks Dr., Ste. 100 Monrovia, CA 91016-3629 Labs (800) 566-Labs (626) 386-1100 (626) 386-1101 (fax) www.mwhlabs.com	Motile Laboratory Services 4600 Carlsbad Boulevard Carlsbad, CA 92008 (760) 929-8213 (760) 433-6265 (fax)	Enviromatrix Analytical, Inc. 4340 Viewridge Ave., Ste. A San Diego, CA 92123 (858) 560-7717 (858) 560-7763 (fax) www.enviromatrixinc.com
Weston Solutions, Inc. 2433 Impala Drive Carlsbad, CA 92008 (760) 931-8081	Pacific Analytical, Inc. 6056 Corte Del Cedro Carlsbad, CA 92009 (760) 438-3100 (760) 496-2211 (fax) www.pacificanalyticalinc.com	ATS Laboratories 104 South 8 th Street Brawley, CA 92227 (760) 344-2532