

HOW TO APPLY FOR A SMALL PUBLIC WATER SYSTEM PERMIT

All small water systems serving 15 to 199 service connections or 25 or more people at least 60 days of the year must operate under permit from Environmental Health (CCEH). California State Law classifies these water systems as public water systems. This handout is intended as a guideline to use in obtaining a permit to operate a small public water system, but is not meant to be a substitute for familiarity with applicable regulations. The services of a registered civil engineer, **experienced** in public water system design, are important for the successful development of any new water system.

The following is a chronological summary of the application process:

I. PLANS AND CALCULATIONS

- a. Submit two (2) complete sets of plans, supporting calculations, and plan check fee.
- b. Plans shall be clearly drawn to scale and show all of the following items whether existing or proposed:
 1. Scale used and north arrow
 2. Name, address, and phone number of property owner, contractor, person preparing plans, and contact person
 3. Property lines
 4. Well location
 5. Water lines (including sizes, materials, depths, grades, etc.)
 6. Storage tanks (including sizes, materials, etc.)
 7. Service connections
 8. Valves and hydrants
 9. Well construction features (subsurface and surface). See Appendix A: "SurfaceConstruction FeaturesforPublicWells" for additional details.
 - a. well slab
 - b. sanitary seal
 - c. casing vent
 - d. air release vacuum breaker vent
 - e. water level sounding/chlorination tube
 - f. sampling faucet
 - g. waste discharge/bypass line
 - h. check valve
 - i. well enclosure
 - j. chlorine injection fitting
 10. Pressures within the system
 11. Easements
 12. Fire flows
 13. Back-up source
 14. Other: _____

II. TMF CAPACITY

Demonstrate adequate technical, managerial, and financial (TMF) capability to be able to reliably operate a public water system in compliance with all drinking water requirements for the foreseeable future. Complete the TMF Assessment Form specific to the classification of the proposed water system. Guidelines and additional information regarding TMF capacity development is available online at the California Department of Public Health website. <http://www.cdph.ca.gov/certlic/drinkingwater/Pages/TMF.aspx>

III. PLAN CHECK AND SITE REVIEW

The Division will review plans and calculations and perform a site inspection. Based on findings, the Division will either approve or deny the plans or require plan modification or additional information. Once the plans are approved and necessary well permits are obtained, construction of the water system can begin.

IV. CONSTRUCTION INSPECTIONS

The Division will inspect various stages of construction (well construction, water line installation, etc.). The applicant and contractor must arrange for any inspections this office or any other interested agencies require.

V. PUMP TEST

Provide pump test by a licensed well contractor or other qualified person for a four (4) hour minimum after the water level has stabilized. A hydrogeological study may be required for proposed water systems located in potentially water short areas.

VI. WATER ANALYSES

Provide California Code of Regulations, Title 22, water analyses (see Appendix B for a list of testing requirements). The State certified laboratory performing the analyses must collect and transport the water samples, and verify that raw untreated well water, free of disinfecting chemicals was sampled. The following are required analyses:

A. Community Water System

1. General mineral
2. General physical
3. Inorganic chemical
4. Organic chemical
5. Radiological
6. Bacteriological analyses of representative portions of the water system.

B. Non-Transient Non-Community Water System

1. General mineral
2. General physical
3. Inorganic chemical
4. Organic chemical
5. Bacteriological analyses of representative portions of the water system.

C. Transient Non-Community Water System

1. General mineral
2. General physical
3. Inorganic chemical (nitrate and fluoride)
4. Bacteriological analyses of representative portions of the water system.

D. State and Local Small Water System

1. General mineral
2. General physical
3. Inorganic chemical (nitrate and arsenic)
4. Bacteriological analyses of representative portions of the water system.

VII. INFORMATION SUBMITTAL

Submit the following:

- A. Completed CCEH Small Water System Permit Application
- B. Completed State of California Domestic Water Supply Permit Application
- C. Completed emergency notification plan
- D. Proof of easements (if applicable)
- E. Permit fee
- F. Results of water analyses
- G. Finaled well permit
- H. Additional requirements as specified by Contra Costa Environmental Health

VIII. FINAL INSPECTIONS AND CHECK

The Division will conduct final construction inspection and final review of water system. System modifications or additional information may be required if deficiencies are discovered.

XI. PERMIT ISSUED

Once water system complies with all applicable regulations, a permit to operate will be issued upon payment of permit fee.

Another useful handout: *The Well Permit Process*

APPENDIX A
SURFACE CONSTRUCTION FEATURES FOR PUBLIC WELLS

Properly installed and maintained surface construction features are important for the safe and sanitary operation of a public water supply well. The following regulations shall apply to public wells in Contra Costa County:

1. OPENINGS

- a. All openings into the top of a well which are not constructed to provide access to the well shall be sealed in a manner acceptable to the Division.
- b. All openings into the top of a well which are designed to provide access to the well, such as for sounding the well, disinfection, addition of gravel to a gravel-packed well, for air release and for any other purpose necessary for maintenance and operation of the well, shall be protected by watertight caps or plugs against the entry of small animals, insects, flood water, drainage or pump drippage, and other potentially contaminating materials.
- c. Access openings designed to permit the entrance or egress of air or gas (air release vacuum breaker or casing vents) shall be protected against the entrance of foreign material by the installation of down-turned and sixteen (16) or greater mesh screened "U" bends. The ends of such "U" bends shall terminate at least eighteen (18) inches above the surface seal or finished grade and above known flood levels.

2. WELL SLAB

- a. A well slab shall be provided for all wells.
- b. All well slab shall be constructed as follows:
 - 1 A steel reinforced concrete well slab shall be constructed on the ground surface around the top of the well casing and shall be free from cracks or other defects likely to detract from its water tightness. The slab shall be monolithically poured on thoroughly compacted native earth and shall be a minimum thickness of six (6) inches, extending four (4) inches above and two (2) inches below surrounding ground level, and shall extend at least four (4) feet in all directions from the well casing. In the area extending at least one (1) foot from the well casing, the surface seal shall extend to a depth of at least one (1) foot.
 - 2 The surface of the slab shall be smooth, troweled and shall be graded away from the well casing in all directions with sufficient fall to drain water away from the well casing.
 - 3 The slab shall be poured in contact with the sealant material in the annular space. Prior to placement of the slab, the annular seal shall be thoroughly cleaned to assure a tight bond between the annular seal and the slab.
 - 4 The top of the well casing or approved pitless adapted shall extend at least twelve (12) inches above finished grade or the one hundred (100)-year flood plan elevation, whichever distance is greater.
 - 5 The slab shall be designed to support the pump and anticipated stresses associated with pump operation.

3. SANITARY SEAL

- a. Every well shall have a sanitary seal.

- b. A sanitary seal shall form a durable, weatherproof and watertight seal on top of the well, between the pump base and the surface seal, or between the pump base and the top of the well casing. Sanitary seals that are manufactured and sold specifically for this purpose are required. "Home made" sanitary seals are not permitted. When a pump is offset or submerged, any pipes or electrical cables which enter the well shall do so above ground and from the top of the casing and shall be completely surrounded by the sanitary seal so as to be watertight. Ropes for holding pipes or the submersible pump shall be installed completely inside of the casing. Objects and materials that are not necessary for the operation of the well shall not enter the casing. Holes shall not be made in the casing. This requirement shall not restrict the proper installation of perforated casing below the annular seal or the proper installation of water level sounding/chlorination tubes or casing vents.
- c. Pipes or electrical cables which enter the well below ground shall enter via an approved pitless adapter approved by the Division.

4. WATER LEVEL SOUNDING/CHLORINATION TUBE

- a. A water level sounding/chlorination tube shall be provided for all wells.
- b. Water level sounding/chlorination tube shall be constructed as follows:

Tube shall be made of pipe similar to the well casing material.

Tube shall have a minimum inside diameter of three (3) inches.

- 1 Tube shall be installed into the well casing with a durable and watertight continuous welded bead.
- 2 Tube shall not protrude into the casing.
- 3 Tube shall be installed into the upper three (3) feet of the well casing. If casing end of the tube is installed within the surface seal, the tube shall be installed prior to the placement of the surface seal.
- 4 Tube shall have a removable cap at the exposed end.
- 5 Tube shall be designed so as to allow/facilitate the introduction of water level measuring devices or disinfecting chemicals.
- 6 Tube may be incorporated as part of the casing vent.

5. CASING VENTS

- a. A casing vent shall be provided for all wells.
- b. Casing and other well vents shall be constructed so that openings are in a vertical downward position. Openings shall be at least eighteen (18) inches above the finished surface of the well lot or well house floor and shall be covered with sixteen (16) or greater mesh screen. Casing vents shall be properly sized and constructed to allow the unrestricted flow of air into and out of the well casing, but shall in no case be less than three (3) inches in diameter. Air-vacuum release vents shall be provided between the pump and check valve and shall be sized to discharge excess air and/or relieve vacuum on the pump discharge line.

6. AIR RELEASE VACUUM BREAKER VENT

When installed the air release vacuum breaker vent shall be constructed as follows:

- a. Vent shall be manufactured and sized to discharge excess air and/or relieve vacuum on the pump discharge line. "Home made" vents shall not be installed.

- b. Terminal end of vent shall open downward and terminate at least eighteen (18) inches above the surface seal or finished grade. The terminal end shall be protected by sixteen (16) or greater mesh screen.

7. SAMPLING FAUCET

- a. A sampling faucet shall be provided for all wells.
- b. The sampling faucet shall be non-threaded and located as follows:
 - 1 So that it is accessible;
 - 2 On the discharge line between the pump and the pressure tank in such a manner that a sample may be taken when the pump is not in operation;
 - 3 A minimum of eighteen (18) inches above the surface seal or finished grade;
 - 4 So that the opening of the faucet is facing downward; and
 - 5 So that it is self-draining.

8. BACKFLOW PREVENTION

- a. All pumping equipment shall be equipped with protective devices to effectively prevent the entrance of foreign matter or back-siphonage into the well casing.
- b. All wells discharging into a standpipe shall be protected by an air gap separation. Air gap separation shall mean a separation of at least two (2) pipe diameters between the well discharge pipe and the rim of the standpipe. No water well discharge pipe shall enter a standpipe below the rim. No person shall install any equipment or mechanism, or use any water treating chemical or substance, if it is found that such equipment, mechanism, chemical or substance may cause pollution or contamination of the water supply. Such equipment or mechanism may be permitted only when equipped with an approved backflow prevention device.

9. WASTE DISCHARGE/BYPASS LINE

- a. A waste discharge/bypass line shall be provided for all wells.
- b. Waste discharge/bypass line shall be located between the check valve and pressure tank so that the well can be pumped to waste. It shall be located at least twelve (12) inches above any known flood levels and finished grade and protected against the possibility of back-siphonage or back-pressure. Waste discharge/bypass line shall not connect to any sewer or storm drain except via an air gap separation. Waste shall be discharged so as not to cause a nuisance.

10. CHECK VALVE

A check valve shall be provided between the pump and storage or pressure tank. Only check valves specifically manufactured as check valves are permitted. "Home made" check valves are prohibited.

11. STORAGE AND PRESSURE TANKS

Storage and pressure tanks used for storage of potable water or to provide pressure for delivery of potable water shall conform to any guidelines established by the enforcement agency. Tanks used for potable water storage or to provide pressure must have been manufactured specifically for this purpose. Tanks which have previously

contained materials other than potable water may not be used. Flexible tank liners shall be National Sanitation Foundation (NSF) approved. Interior tank coatings must meet AWWA Standard (D102-78 and appear on the U.S. Environmental Protection Agency (EPA) list of approved tank coatings.

12. TRAFFIC BARRIERS

- a. A traffic barrier shall be provided for all wells if such wells are located five (5) feet or less from an area subject to vehicular traffic.
- b. Traffic barriers shall be constructed as follows:
 - 1 Steel posts shall be placed between the well and the vehicular traffic area.
 - 2 Posts shall extend at least four (4) feet above and two (2) feet below finished grade. Posts shall be set in concrete.
 - 3 Posts shall be spaced no more than three (3) feet apart and shall be of sufficient number and location adequately protect the well from vehicular traffic.
 - 4 Posts shall be at least three (3) inches in diameter.
 - 5 Post installation shall not affect the integrity of any well slab.

13. CHLORINE INJECTION FITTING

- a. A chlorine injection fitting shall be provided for all wells.
- b. Fitting for chlorination injection shall be installed on the well discharge line.

14. EMERGENCY CHLORINATION OUTLET

- a. An emergency chlorine outlet shall be provided for all wells.
- b. A 100V circuit and outlet box in series with the pump motor circuit for use of an emergency chlorinator shall be installed.

15. WELL ENCLOSURE

- a. A well enclosure shall be provided for all wells.
- b. Enclosures shall be a minimum six (6) foot high with locked gate and be approved by the enforcement agency.
- c. Enclosures may be incorporated as part of the traffic barrier.
- d. The design of the enclosure shall allow ready access and sufficient room for all anticipated maintenance needs.

16. ACCESSIBILITY

The surface construction features of the well shall be located and designed so as to be easily accessible by service personnel.

APPENDIX B
ORGANIC CHEMICALS
(Every 3 Years)

Chemical

Synonyms

(1) Chloroform	Trichloromethane
(2) Bromodichloromethane	Dichlorobromomethane
(3) Chlorodibromomethane	Dibromodichloromethane
(4) Bromoform	Tribromomethane
(5) m-Dichlorobenzene	1, 3-Dichlorobenzene
(6) o-Dichlorobenzene	1, 2-Dichlorobenzene
(7) Dichloromethane	Methylene Chloride
(8) Dibromomethane	Methylene Bromide
(9) 1, 1-Dichloropropene	
(10) Toluene	Methylbenzene
(11) 1, 1-Dichloroethane	1, 1-DFA
(12) 1, 2-Dichloropropane	Propylene Dichloride
(13) Ethylbenzene	Phenylethane
(14) 1, 3-Dichloropropane	
(15) Styrene	Vinylbenzene
(16) Chloromethane	Methyl Chloride
(17) Bromomethane	Methyl Bromide
(18) 1, 2, 3-Trichloropropane	Allyl Trichloride
(19) 1, 1, 1, 2-Tetrachloroethane	
(20) Chloroethane	Ethyl Chloride
(21) 2, 2-Dichloropropane	
(22) o-Chlorotoluene	2-Chlorotoluene
(23) p-Chlorotoluene	4-Chlorotoluene
(24) Bromobenzene	Monobromobenzene
(25) Dichlorodifluoromethane	Difluorodichloromethane
(26) Chlorinated Hydrocarbons	
(a) Endrin	
(b) Lindane	
(c) Methoxychlor	
(d) Toxaphene	
(27) Chlorophenoxys	
(a) 2, 4-D	
(b) 2, 4, 5-TP Silvex	
(28) Synthetics	
(a) Atrazine	
(b) Bentazon	
(c) Benzene	

- (d) Carbon Tetrachloride
- (e) Carbofuran
- (f) Chlordane
- (g) 1,2-Dibromo-3-chloropropane
- (h) 1,4-Dichlorobenzene

Chemical

- (i) 1,1-Dichloroethane
- (j) 1,2-Dichloroethane
- (k) cis-1,2-Dichloroethylene
- (l) trans-1,2-Dichloroethylene
- (m) 1,1-Dichloroethylene
- (n) 1,2-Dichloropropane
- (o) 1,3-Dichloropropane
- (p) Di(2-ethylhexyl) phthalate
- (q) Ethylbenzene
- (r) Ethylene Dibromide
- (s) Glyphosate
- (t) Heptachlor
- (u) Heptachlor Epoxide
- (v) Molinate
- (w) Monochlorobenzene
- (x) Simazine
- (y) 1,1,2,2-Tetrachloroethane
- (z) Tetrachloroethylene
- (aa) Thiobencarb
- (bb) 1,1,1-Trichloroethane
- (cc) 1,1,2-Trichloroethane
- (dd) Trichloroethylene
- (ee) Trichlorofluoromethane
- (ff) 1,1,2-Trichloro-1,2,2-Trifluoroethane
- (gg) Vinyl Chloride
- (hh) Xylenes

ADDITIONAL ORGANIC CHEMICALS

(Testing Requirements To Be Determined by Health Department)

Chemical

Synonyms

- | | |
|----------------------------|------------------------|
| (1) 1,2,4-Trimethylbenzene | Pseudocumene |
| (2) 1,2,4-Trichlorobenzene | Unsym-trichlorobenzene |
| (3) 1,2,3-Trichlorobenzene | |
| (4) n-Propylbenzene | 1-Phenylpropane |
| (5) n-Butylbenzene | 1-Butylpropane |
| (6) Naphthalene | Naphthalin |
| (7) Hexachlorobutadiene | Perchlorobutadiene |

- (8) 1, 3, 5-Trimethylbenzene
- (9) p-Isopropyltoluene
- (10) Isopropylbenzene
- (11) Tert-butylbenzene
- (12) Sec-butylbenzene
- (13) Bromochloromethane
- (14) Alachlor
- (15) Aldicarb

- Mesitylene
- p-Cumene
- Cumene
- 2-Methyl-2-phenylpropane
- 2-Phenylbutane
- Chlorobromomethane
- ALANEX
- TEMIK

Chemical

Synonyms

- (16) Bromacil
- (17) Carbofuran
- (18) Chlorothalonil
- (19) Diazinon
- (20) Dimethoate
- (21) Diuron
- (22) Prometryn

- HYVAR X, HYVAR XL
- FURADAN
- BRAVO
- BASUDIN, NEOCIDOL
- CYGON
- KARMEX, KROVAR
- CAPAROL

INORGANIC CHEMICALS

(Every 3 years)

- Aluminum
- Arsenic
- Barium
- Cadmium
- Chromium
- Lead
- Mercury
- Nitrate (as NO₃)
- Selenium
- Silver
- Fluoride
- Perchlorate

GENERAL MINERAL

(Every 3 years)

- Bicarbonate
- Carbonate
- Hydroxide Alkalinity
- Calcium
- Chloride
- Copper
- Foaming Agents (MBAS)
- Iron
- Magnesium
- Manganese
- pH
- Sodium
- Sulfate
- Specific Conductance
- Total Dissolved Solids
- Total Hardness
- Zinc

GENERAL PHYSICAL

(Every 3 years)

- Color
- Odor
- Turbidity