Clarke County, Virginia
Clarke County water Well Ordinance
Contact: Alison Teeter, Assistant Plnaning Administrator
(703)955-3275
Health Ordinance
Adopted: 1990

CLARKE COUNTY WATER WELL ORDINANCE

Section Titles

CROSS REFERENCES

Groundwater Act - see Code of Va Sections 62.1-44.85, 62.1-44.97, 62.1-44.101
Va. Code Sections 15.1-299, 15.1-510, 32.1-176.5

1
DEFINITIONS -

As used in this chapter:

(a) "Adequate water" means that the water supply system shall be capable of supplying water in an adequate quantity for its intended usage and meets the standards in Appendix IV

.

(b) "County" means the County of Clarke, Virginia.

"Ground water"1 means subsurface water occupying the zone of saturation.

(1) "Confined ground water" means a body of ground water overlain by material sufficiently impervious to sever free hydraulic connection with overlying ground water.

(2) "Free ground water" means ground water in the zone of saturation extending down to the first impervious barrier.

(d) "Health Department" means the same as Health Director.

(e) "Health Director" means the Director of the Lord Fairfax Health District or his duly authorized agent. The County Health Officer (Sanitarian) is a duly authorized agent.

(f) "Negative coliform test" means a negative test as described in the latest edition of "Standard Methods for Examination of Water and Wastewater.

(g) "Person" means any individual, firm, corporation, partnership or other entity, singular or plural.

(h) "Pitless Adapter" means a mechanical, gasketed, device which is attached through a hole drilled, or cut in the well casing, connecting the pressure tank influent pipe to the pump drop pipe, which is approved for such use by the Water Systems Council, Pitless Adaptor Standard No. 1 (PAS-l), or the National Sanitation Foundation.

(I) "Pollution" means the addition of sewage, industrial waste, chemicals, or other material harmful to water, whether intentional or not. Sources of sewage pollution may be privies, sanitary sewers, septic tanks, subsurface irrigation or drainfields, seepage pits, sink drains, barnyard wastes, chemical storage tanks, fertilizer stockpiles, and like

_____

1Clarke County exhibits Karst geomonphology and surface water and ground water rapidly interact.

sources by whatever name.

(j) "Potable water" means water that is safe for human consumption and culinary purposes free from pathogenic bacteria, protozoa, cysts and other disease producing organisms and free from physiologically harmful chemical and mineral substances.

(k) "Private water supply system" means a water supply system from which water is not

available to the public, its location and outlets being on private property, and serving not more than one dwelling, or agricultural unit. For the purpose of this chapter, an agricultural unit shall be comprised of the main dwelling, tenant houses for the farm employees and other related farm buildings. Commercial and industrial units referred to in this subsection are those employing fewer than twenty-five persons where water is not available to the public.

(l) "Public Individual Well" means a well serving one commercial or industrial unit.

(m) "Public water supply system" means a water supply system serving two or more dwelling, commercial, agricultural or industrial units, or any system serving more than twenty-five persons, or the public.

(n) "Safe Water" means potable water meeting the quality standards included and described as primary maximum contaminant levels in the "Virginia Waterworks Regulations", Virginia Department of Health, as specified in Appendix III. (As evidenced by analytic test results certified by a laboratory approved to conduct such tests by the Virginia Department of Health.)

(o) "Spring" means a natural issue of water from the earth, rock formation or fracture onto the land or into a body of water, the place of issuance being relatively restricted in size.

(p) "Terminus Cap" means a well terminus cap which is approved for such use by the Water System Council, Pitless Adaptor Standard No. 1 (PAS-l) or the National Sanitation Foundation.

(q) "Unconsolidated formations" means a formation composed of mud, silt, clay, soft shale sand or gravel, or creviced rock.

(r) "Water service connection" means the water service connection of a public water supply and shall be considered the effluent connection of the water meter or the effluent pipe of the pressure tank where there is no water meter. The water service connection of a private water supply shall be considered the effluent pipe of the pressure tank.

(s) "Water supply system" means the source, works and auxiliaries

for collection, treatment and distribution of potable water from the source of supply to the water service connection.

(t) "Well" means an artificial excavation that derives water from the interstices of the rocks or soil which it penetrates. Wells referred to are "shallow" or "deep" depending upon whether they derive water from "free" or "confined" ground water respectively. However, wells of depths greater than fifty feet in unconsolidated formations shall be classified as deep wells. Any exploration, testing, or production well for whatever purpose constructed, is considered a water well, and subject to this chapter, since improper construction can lead to groundwater contamination.

(1) "Bored well" means a well that is excavated by means of a soil auger (hand or power) as distinguished from one which is dug or drilled.

(2) "Drilled well" means a well that is excavated wholly or in part by means of a drill (percussion or rotary) operated by cutting or abrasion or by use of a water jet.

(3) "Driven well" means a well that is constructed by driving a casing, at the end of which there is a drive point and screen, without the use of any drilling, boring or jetting device.

(4) "Dug well" means a well that is excavated by means of picks, shovels or other hand tools, or by means of a power shovel or other dredging or trenching machinery, as distinguished from one put down by a drill or auger.

(u) "Well grouting" means the filling of the annular space between the well casing and the natural earth or rock with a mixture of neat Portland cement or bentonite clay and water applied under pressure from the lower terminus of the grouting to the top of the well.

(V) "Well Lot" means a parcel of land extending at least 100 feet in a radius about the well location, attached in fee simple and protected by covenants running with the land for the life of the structure the well serves.

4
APPLICATION OF CHAPTER: COMPLIANCE

(a) The requirements of this chapter shall apply to all new water supply systems, both private and public, and they shall also apply to replacements of, or additions to existing systems.

(b) Building contractors, plumbers, well diggers, well drillers, property owners, and all persons making installations and/or repairs to existing installations shall be responsible for compliance with applicable sections of this chapter.

(c) Where requirements of this Chapter are more stringent than those of the State Health Department, the requirements of this Chapter shall prevail.

APPROVAL OF SYSTEM REQUIRED PRIOR TO USE.

(a) No person shall use or allow to be used, rent or lease for use, any water system unless or until such system is approved by the Health Department. The location, source and construction of water supply systems shall conform to the requirements of this chapter and specifications therein pertinent to the type of supply.

(b) Approval of Existing Water Supply Systems. Water supply systems constructed prior to the effective date of this ordinance (May 1, 1990) shall be exempt under this provision.

(c) Systems permitted and under construction on the effective date of this ordinance shall be approved based on criteria ineffect on the date of construction permit issuance.

INSPECTIONS

(a) The County Health Director may inspect an entire public water supply system or any part thereof maintained at any premises in the County for the purpose of determining if such system is being constructed, operated or maintained in a sanitary manner so as to produce safe water. Inspections shall be made at reasonable times and, whenever practical, in the company of the owner or occupant of such premises.

(b) The Director shall provide advice on safe, adequate, and potable water supplies.

UNSAFE WATER PROHIBITED.

(a) No owner, tenant or lessee of any premises supplied with a potable water supply shall misuse or neglect such supply so as

to allow the water therefrom to become unsafe for human consumption or other domestic purposes.

INSTALLATION OF SYSTEMS: PERMIT REQUIRED.

(a) Permit Required. No person shall obtain a building permit in the County for any structure, the use of which requires a new water supply, until one of the following conditions has been met:

(1) Any person applying for a building permit for a structure to be served by a new private groundwater well, shall first construct and test the well. The applicant must obtain a permit from the Health Department for the construction of such well as required by this ordinance. Water samples from the well shall be taken after the well is developed in accordance with Appendix IV. Public water supply systems shall be tested for the contaminant levels established in Appendix III. Private water supplies shall be tested for coliform bacteria and nitrates. A copy of all test results shall be provided to the Health Department and the building permit applicant.

(2) For any structure to be served by an existing public water supply system, the building permit applicant must first obtain a statement from the system owner that such public water supply system is in compliance with State and County regulations and that capacity will be available for the applicant at the anticipated time of connection.

(b) Application for Permit. Application for a permit shall be made on forms furnished by the Health Department and shall contain a description of the location and dimensions of the land on which the water supply system is to be constructed. The Department may require such plans

and/or specifications as are necessary to determine the adequacy and safety of the system, and such information. shall be made a part of the records of the department. Applications for a permit to construct a public water supply system which will have fifteen or more connections can be made through the County Health Department or the applications can be made concurrently to the Division of Water Programs, Lexington Regional Office, Virginia Department of Health.

(c) Approval or Denial of Permit. When the Health Director is satisfied that a proposed water supply system can be constructed in accordance with provisions of this chapter, he shall issue a written permit to proceed with construction.

When the Health Director determines that a proposed water supply system cannot meet the requirements of this chapter and there are no other adequate alternatives, he shall deny in writing, a permit and specify therein the reason for denial.

(d) Changes in Conditions. Material changes, such as site grading or septic location changes, etc., in site conditions under which a permit was issued shall void such permit. No person shall proceed with construction until such time as written approval for the changes has been obtained from the Health Department, provided that such changes can be approved in accordance with provisions of this chapter.

(e) Voidance of Permit. Permits shall be null and void after twelve months from the date issuance, unless extended for an additional period not to exceed twelve months, in writing, by the Health Director.

FEES.

The County shall establish, set and charge such fees as it deems necessary and reasonable to defray the cost of permits and/or licenses, inspections, and testing as are required to be issued under this chapter. Such fees are set forth in Appendix I following this chapter.

LOCATION.

All well water supply systems shall conform with the following general principles regarding site.

(a) No water supply for human consumption shall be located within any building except a separate structure housing pumping equipment.

(b) New water supplies shall be protected from surface wash or flooding by suitable sloping or ditching of ground surfaces or by suitable dikes or curbs. Positive surface drainage should be provided away from the well to prevent surface runoff from entering the wellbone hole prior to grouting the well casing. Water supply systems shall not be located in ground swale areas or flood plains which are subject to surface run-off and/or flooding.

(C) All wells shall be located at a minimum distance from known sources of pollution as set forth in Table I, Appendix II, following this chapter.

(d) All wells shall be located on the premises consistent with the general layout, topography and surroundings, including

abutting lots.

(e) Any new well which is the water source for a private water supply systems shall be located within the boundary of the lot it serves.

(f) Any well which is the water source for a public water supply system shall be located on a well lot with lot maintenance provided by the entity or person operating the water system. No fertilizer, insecticide, herbicide, or other chemical may be applied to any well lot.

(g) No well shall be located in drainageways or sinkholes. (See Appendix II, Table I)

GENERAL REQUIREMENTS.

(a) Construction and Performance Characteristics. A report shall be made on each well, tested according to Appendix IV, and such report shall be supplied to the owner and the Health Department by the well driller. Pump test results shall be supplied to the owner and Health Department by the pump installer. Such report shall include at minimum the following:

(1) The type, diameter and length of the casing;
(2) The total depth of the well;
(3) The standing (static) water level, that is, the water dept below the ground surface when not pumping;
(4) The yield of the well in gallons per minute, and the elevation of the water surface when pumped at the designated rate, if a pump test is required;
(5) The number of hours the pump is operated at a stipulated rate during the pumping test, if required;
(6) A record of any pumping performance;
(7) A log and samples of materials encountered during drilling when requested;
(8) The physical appearance of the water at the end of the final pumping test.
(9) The results of analytic tests made to determine potability by the well pump installer, licensed driller, or certified professional geologist.

(b) Protection of Wells. Wells under construction or repair shall be protected at all times so as to prevent any drainage or foreign matter from entering the casing. When drilling operations are suspended, as overnight, the casing shall be securely covered or capped. Upon completion of drilling, a secure cap or plug shall be placed on or in the top of the casing. Water used for drilling operations or for tempering or cooling of well tools shall be clean and free of

pollution.

(C) Disinfection. Upon completion of construction and/or repairs of any water supply system, or following repairs to the pumping equipment, it shall be disinfected and flushed.

(d) Nonacceptable Equipment. No pitcher, split-base or chain bucket pump shall be installed on any water supply system.

(e) Cross Connections. Where frostproof hydrants are used, installed adequate draining shall be provided to prevent possible backf low. Backf low preventors are required. There shall be no cross connection between a private water supply system and a public water supply system.

(f) Abandoned Wells. No person shall use an abandoned or unused well for the purpose of disposal of sewage, sewage effluent or other polluting material. The owner of any permanently abandoned well shall immediately fill and/or seal the well with cement or bentonite clay or other equally suitable material under supervision of the Health Director. Permanent abandonment occurs when a well is not used for a period of two (2) years and/or when the construction of the well no longer meets criteria in this chapter. Immediately as used above means within 48 hours of drilling completion if the well to be abandoned yields insufficient water, or within 30 days if a previously constructed and operational well is abandoned. Any person who abandons or intends to abandon a well shall make a written report to the county including the location of the well.

(g) Chemical or Physical Alteration of Wells after Drilling.

(1) Hydraulic fracturing of wells may be permitted by the Health Director under the provisions of this chapter, and shall be considered bn a case by case basis.

(2) The use of explosives in wells is prohibited.

(3) The use of chemical and biologic additives to remove pollutants and/or to improve well yields may be permitted by the Health Director under the provisions of this chapter and shall be considered on a case by case basis.

(h) Drilled wells constructed in the bottom of a dug or bored well shall not be approved.

SPECIFICATIONS FOR CONSTRUCTION OF DEEP WELLS.

(a) General Requirements. All casing shall be made up and placed so as to be watertight throughout the depth used. When water is derived from rock formations, the casing shall extend sufficiently far into the rock as to be firmly seated on solid rock, plus a minimum of ten feet.

The well casing shall terminate at least twelve inches above the natural grade surface (preferably eighteen inches) and no well casing shall terminate in a pit, provided that this shall not apply to private wells where proper topographical conditions exist so as to permit a four-inch gravity flow drain, and where the pit walls and floor and ceiling are constructed so as to be waterproof and preclude entrance of ground or surface water. Separate structures which are constructed to house the water supply system and/or pumping equipment shall have an impervious floor, raintight walls and roof and adequate ventilation. The floors shall be four inches in thickness and shall be sloped away from the well casing with a slope of not less than one inch in eight feet. Where necessary, such structures shall be provided with an adequate drain. The well terminus shall be sealed with a sanitary seal, gasketed and protected from insects, or; if utilizing a pitless adapter shall use an approved pitless adapter and terminus cap.

(b) Specifications and Classes of Drilled Wells. All drilled wells shall be cased and grouted in accordance with following classifications. Grouting shall conform to herein below prescribed grouting procedures. No work shall be considered completed in accordance with the provisions of this chapter unless and until grouting is complete, and such shall be done within ten days after setting of the casing.

(1) Class I wells shall be cased and grouted to solid rock with a minimum casing and grout of 100 feet.

(2) Class II-A wells shall be cased to solid rock with a minimum casing of 100 feet and a minimum grout of 20 feet and shall only be used where the formation encountered precludes the use of 50 feet of grout.

(3) Class II-B wells shall be cased and grouted to solid rock with a minimum casing and grouting of fifty feet.

Material Specifications.

(1) The minimum standard of quality for steel casing casing pipe shall conform to the requirements set forth in Table II, Appendix II, following this chapter. For percussion drilled wells, the casing pipe shall be assembled watertight by means

of joints welded in accordance with approved practice or by correctly mated drive couplings. Those pipes (ten and twelve-inch) marked with an asterisk in Table II, may be used for casing rotary drilled wells, where the casing does not have to be driven, and may be assembled watertight by means of joints welded in accordance with good practice or by correctly mated standard couplings.

(2) No secondhand or reclaimed pipe shall be used as protective casing in the permanent construction of a well.

(3) Well casing pipe shall be installed so that there will be no adverse effect on water quality.

(d) Free Flowing Artesian Wells. Every artesian well that flows under natural artesian pressure shall be equipped with a valve which will shut off the flow completely, or be plugged for permanent abandonment.

(1) The water well contractor completing such well shall be responsible for installation of a valve to control natural artesian flow, or for other means of preventing waste of groundwater.

(2) Subsequent to construction, the well owner shall be responsible for maintenance of the valve or other means of preventing waste of groundwater.

(e) Applicability of well Classes. Wells for the following uses shall, at minimum, be constructed to the following classifications unless unique site and geologic conditions approved by the Health Director prevent such construction.

(1) Private Water Supply System - Class IIB or Class IIA

(2) Public Individual Water Supply System and private water supply systems Class IIB or Class IIA.

(3) Public multi user water supply system - Class I.

SPECIFICATIONS FOR CONSTRUCTION OF SHALLOW WELLS

(a) General Requirements. Shallow wells are not desirable from a public health standpoint and shall not be used for new construction except when deep wells attempted have been nonproductive, as it is normally possible to obtain sufficient water from a deep well.

(b) Springs and Surface Water Systems. Springs and surface water supply systems shall be protected and developed so as to prevent surface or ground water contamination and shall provide such treatment as is required to maintain a constant quality, safe for human consumption and/or domestic use. The owner of any spring needing or requesting approval under this chapter must control use of the entire watershed upslope from the spring in fee simple or by easement running with the land.

APPURTENANCES.

Each well installation shall be provided with the following appurtenances or their equivalent:

(a) A sample tap;
(b) A well vent;
a pressure relief valve;
(d) A gate valve;

(e) A check valve where required;
(f) An electrical disconnect switch on the pump power supply; a plug receptacle connection will not be considered a disconnect switch; and
(g) Public wells shall be equipped with a water meter and the remote meter indicator shall be located on the exterior of the building in an easily accessible location.

GROUTING PROCEDURE.

(a) The annular space or any opening surrounding a well casing shall be completely filled with neat Portland cement grout or with approved bentonite clay/cement grout from an elevation above the established grade of the surface at the well into a continuous impervious formation, or to a safe depth below the probable present or future operating water level. The minimum width of the annular space for grouting shall provide a clearance of at least one and one-half inches. Grouting space shall be at least three inches larger than the outside diameter of the casing.

(b) The annular space between the inner or protective casing and the outer casing or hole shall be filled with cement or approved bentonite grout. Any outer casing installed shall be

removed during the grouting procedure unless approved by the Health Director prior to the grouting procedure.

(1) Cement grout shall be proportioned of cement and the minimum quantity of water (five to six and one-half gallons per cubic feet of cement) required to give a mixture of such consistency that it can be forced through the grout pipe.

(2) Bentonite clay2 grout may be used when installed by a method approved by the Virginia Department of Health.

Grouting shall be done by a method which forces the grout from the bottom of the space to be grouted towards the surf ace. The method of mixing and the consistency of the grout shall insure that the grout fills the annual space. A suitable retainer, packer or plug shall be provided at the lower terminus of the grouting so that grout will not leak through into the water-bearing formation. The grouting shall be done continuously and in such a manner as will insure the entire filling of the annular space in one operation. No drilling operation or other work in the well shall be permitted within seventy-two hours after the cement grouting of casings. If high early strength Portland cement is used, this period may be reduced to twenty-four hours.

DISINFECTION AND TESTING PRIOR TO USE.

General specifications for disinfecting wells, water service pipe lines, pneumatic storage tanks and other water conveying or storage devices shall be as follows:

(a) Before placing a new system in service, all of the interior surfaces of pipelines and tanks, including the well, shall be disinfected according to the following procedure. The entire system

shall be disinfected with enough of the bactericidal solution to produce fifty ppm of chlorine or equivalent. The solution shall be allowed to stand at least twenty-four hours and shall be flushed with potable water.

(b) After operating the pump and after removal of disinfection residual, a sample shall be collected for bacterial examination and, prior to placing the system into service, shall be found negative for coliform bacteria.

Disinfection shall be performed by the person who installs the

2Bentonite clay must be specified by manufacturer for purpose of grouting water wells.

pumping equipment, and shall additionally be performed by a licensed plumber upon completion of plumbing fixture installation when water system and plumbing system installation are not concurrent.

(d) If testing for safe water after drilling the well identified the presence of primary (harmful) contaminants a test for that contaminant shall be conducted to confirm the adequacy of treatment; and the treatment method found to reduce the occurrence of the contaminant below maximum acceptable levels prior to placing the system into service.

VARIANCES

The Lord, Fairfax Health District Sanitation Manager shall have authority to grant variances to the provisions of this Ordinance. Variances should be consistent with the intent of this Ordinance, and the Clarke County Board of Supervisors shall receive written notification of any proposed variance at least fifteen (15) working days prior to granting the variance.

NOTICE TO CORRECT.

If, upon any inspection, the Health Director or his authorized agent finds a violation of any of the provisions of this chapter and/or the provisions of the permit issued under it, he shall direct the person to whom the permit was issued and/or the installer of the system, and/or the current owner, by written notice, to make the necessary corrections within such reasonable period as is specified therein. No person shall fail to comply with such notice within such period.

EQUITABLE REMEDIES.

In addition to the penalty provided by local code on state statute, the Health Director may initiate injunction, mandamus, abatement or any other appropriate action to prevent, enjoin, abate or remove a violation of any of' the provisions of this chapter.

PENALTY

Fines and other penalties may be levied for violations of any of the provisions of this chapter.

APPENDIX I

FEES SCHEDULE

Filing Fees

Application to construct a private well water supply (Includes permit renewals)	$80.00
Application to construct a public well water supply	$115.00

APPENDIX II - TABLES

Table I
MINIMUM SAFE DISTANCES
LOCATION OF WELLS

SOURCES OF POLLUTION	MINIMUM DISTANCE (Ft.)
CLASS II	
Chemical Storage Tanks	100
Feed Lots, Hog Lots, Poultry Houses	100
(Petroleum) storage tanks	100
Roads Surface (Public)	25
Septic Tanks	100
Absorption Field	100
Cesspools, Pit Privies, etc.	150
Other Sewers	35
Property Lines	10
Foundation of Buildings of Solid Masonry	15
Foundation of Buildings of Wood Framing or Exterior	50
Sinkholes and cave entrances	100
Termite Treated Foundations	100
Cemetery	100

In such installations where Class I wells are constructed, the distance between the potential sources of pollution may be reduced, provided that geological conditions indicate that such would be satisfactory and in accordance with the Division of Engineering, State Health Department, standards for location of public supplies in relation to potential sources of pollution.

TABLE II

CASING PIPE WEIGHTS AND DIMENSIONS

	Weight (lbs./ft.)		Pipe Diameter (in.)	
Size (in.)	Threads and Couplings	Thickness (in.)	External	Internal

4	10.89	.237	4.500	4.026
*6	13.00	.188	6.625	6.25
6	19.18	.280	6.625	6.065
*8	17.80	.188	8.625	8.249
16				
8	29.35	.322	8. 625	7.981
*10	32.75	.279	10. 750	10.192
10	41.85	.365	10. 750	10.020
*12	45.45	.330	12. 750	12.090
12	51.15	.375	12. 750	12.00

APPENDIX III

MAXIMUM CONTAMINANT LEVELS

The drinking water standards listed below, exclusive of the eight volatile chemicals, are maximum contaminant levels contained in the Commonwealth of Virginia/State Board of Health, Waterworks Regulations, Section 4, Tables 4.1 and 4.2 of Appendix B. Th eight volatile organic chemicals (VOC's) are based on maximum contaminant levels promulgated as a final rule by the United States Environmental Protection Agency in the July 8, 1987, Federal Register, pp. 25689-25717.

Inorganic Chemicals

Substance	Primary Maximum Contaminant Level (mg/L)
Arsenic (AS)	0.05
Barium (Ba)	1.0
Cadmium (Cd)	0.010
Chromium (Cr)	0.05
Fluoride (F)	1.8
Lead (Pb)	0.05
Mercury (Hg)	0.002
Nitrate (as N)	10.0
Selenium (Se)	0.01
Silver (Ag)	0.05

Substance	Secondary Maximum Contaminant Level (mg/L)
Chloride (Cl)	250.0
Copper (Cu)	1.0
Corrosivity	Non-Corrosive
Foaming Agents	0.5*
Iron (Fe)	0.3
Manganese (Mn)	0.05
Sulfate (S04)	250.0

Zinc (Zn) 5.0

*Note. Concentration reported in terms of Methylene Blue Active Substances.

Organic Chemicals

Substance	Primary Maximum Contaminant Level (mg/L)
Chlorinated Hydrocarbon Insecticides	
Endrin	0.0002
Lindane	0.004
Methoxychlor	0.1
Toxaphene	0.005
Chlorophenoxy Herbicides	
2, 4-Dichlorophenoxyacetic Acid (2, 4-D)	0.1
2, 4, 5-Trichlorophenoxypropionic Acid (2, 4D 5-TP or Silvex)	0.01
Total Trihalomethanes	0.10
Volatile organic Chemicals (VOC'S)	
Benzene	0.005
Vinyl Chloride	0.002
Carbon Tetrachloride	0.005
1, 2-Dichloroethane	0.005
Tnchioroethylene	0.005
1, 1-Dichioroethylene	0.007
1, 1, 1-Trichloroethane	0.20
Para-Dichlorobenzene	0.075

Appendix IV

Wells shall be constructed and tested according to the following:

A. Well Development. The permittee shall develop a well according to the following requirements:

1. Well development shall consist of cyclic or intermittent pumping or surging, or both, either mechanically or by using water or air under pressure. Development shall continue until all formation cuttings, mud, drilling fluids and additives are removed from the well.

2. Every well, shall be developed by the well driller in order to obtain the full yield of the

well and a water quality that meets all of the following requirements:

B. The well driller shall conduct yield and when appropriate drawdown tests as specified in "Rules for the Construction of Groundwater Wells", Virginia Water Control Board and shall report results on Form GW2 to the Health Director.

C. Pumping Equipment.

1. The pump capacity shall be consistent with the intended use and yield characteristics of the well.

2. A lightning protective device shall be provided for submersible pumps.

3. Installation of the pump shall be in accordance with manufacturer's recommendations and in accordance with "Water Systems Handbook", Water Systems Council.

4. The well shall be vented at the well head to allow for pressure changes within the well due to pumping. Well vents shall be positioned to prevent the entrance of surface water, dust, insects, or other foreign material.

5. Upon completion of installation, the person installing the pump (i.e., well driller, pump installer, or plumber) should disinfect the well, pump, and water supply system. The water supply system shall be disinfected immediately upon completion of construction.

D. Observation Wells. The Health director may specify special construction standards for wells installed for the sole purpose of monitoring water quality or water levels.

E. Domestic Water Supply System Standard.

1. A well or double well system shall produce at least 1

gallon per minute.

2. The water supply system shall produce not less than 500 gallons of water in a 2-hour period, at least once each day.

3. If the sustained yield of the well is not capable of meeting the total water supply standard, sufficient storage shall be provided.

4. Well Storage.

a. If well storage is selected, the amount of storage is calculated by subtracting the well yield, as determined in (E 2) above, over a 2-hour period, from 500 gallons.

b. The quantity of water in storage in the well is equal to the number of feet between the unpumped static water level and the level of drawdown as determined in the pump test, at F.2,C, multiplied times 1.5 gallons per foot for a 6 inch well or 0.65 gallons per foot for a 4 inch well.

c. Example of Determining Required Storage. If a 6 inch well produces a constant 1 gallon per minute, it will produce 120 gallons in a 2 hour period. The well storage, therefore, shall provide 380 gallons (500 gallons - 120 gallons = 380 gallons). To provide this quantity the well shall contain 253 feet of water in storage (380 gallons - 1.5 gallons per foot = 253).

d. Table I has been provided to assist in determining the number of feet of water contained in well storage that is required to meeting the well water supply standard.

F. Minimum Yield for Domestic Wells.

1. Each well shall be tested and approved for yield in accordance with (F2) below. Replacement wells, servicing an existing improved property, are exempt from this requirement.

2. Yield Test. All wells drilled with a yield determine to be less than 5 gallons per minute by (B) above shall be tested as provided below:

a. The pump and related equipment shall be placed in the well and the static water level measurement recorded:

b. Pumping shall begin at rate of withdrawal greater than 5 gallons per minute until the water level drops to a point close to the bottom of the well;

c. When the water level reaches this point, the pump rate shall be adjusted so that the water level remains constant (in effect, pumping out any water which is flowing into the well);

d. Measure and record the volume of water discharged (flow meter reading) and water level (with an electric tape) at 15 minute intervals throughout the test;

e. Discharge water at least 50 feet from the well and on-site disposal systems:

f. A single interruption of pumping of up to 15 minutes due to equipment failure or other unusual circumstances will be permitted, but the amount of downtime shall be made up by additional pumping at the end of the test.

3. The criteria for approval shall be a minimum yield of 1 gallon per minute for 6 hours continuous pumping after the well has been pumped out as provided in (F 2b) above.

4. The pump test can be terminated early and the well yield will be considered adequate if:

a. A well cannot be pumped out after 3 hours pumping as provided in (F 2b);

b. A well yields an average of 2.5 gallons per minute or greater for 3 hours continuous pumping, after the well has been pumped out as provided in (F 2b).

5. The Health Director may permit two wells to be connected to meet the minimum yield requirement. The well to be connected shall be tested in accordance with the procedure described in (F 2) above, and each shall demonstrate a yield of 0.5 gallons per minute or greater throughout the entire uninterrupted drawdown phase.

6. All samples to be analyzed for constituents described in Appendix III shall be taken by representatives of the Lord Fairfax Health District.

Table I

Feet of Storage Required in Well to Meet Total Well Water Supply Standard

Nominal Well Sizes-Inches							
	2	3	4	5	6	7	8
1.0	--	--	--	375	255	190	150
1.5	--	--	--	315	220	160	125
2.0	--	--	400	255	180	130	100
2.5	--	--	310	200	140	100	80
3.0	--	380	220	140	95	70	55
3.5	--	220	125	80	55	40	35
4.0	125	53	35	15	15	10	10

*Caution Table I is intended to aid in determining minimum well storage requirements. Additional storage may be necessary to adequately protect the pump during normal operation.