

WEST VIRGINIA DEPARTMENT OF HEALTH
PROMULGATION HISTORY ABSTRACT

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Section 7. Related: Chapter 16,
Article 1, Sections 9 and 9a

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EFFECTIVE DATE: These interpretive rules become effective on the effective date of West Virginia Board of Health Water Well Regulations, Chapter 16-1, Series XIX as authorized by the State Legislature and filed with the Secretary of State.

FILED IN THE OFFICE OF
A. JAMES MANCHIN
SECRETARY OF STATE

THIS DATE Jan. 12, 1984
Administrative Law Division

WEST VIRGINIA INTERPRETIVE RULES
BOARD OF HEALTH

Water Well Design Standards

Chapter 16-1
Series 46
(1984)

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FILED IN THE OFFICE OF
A. JAMES MANCHIN
SECRETARY OF STATE

THIS DATE 1-12-84
Administrative Law Division

WEST VIRGINIA INTERPRETIVE RULES
BOARD OF HEALTH

Chapter 16-1
Series 46
(1984)

Subject: Water Well Design Standards

Section 1. General

1.1. Scope - These interpretive rules establish the design standards for the installation of water wells to provide adequate protection of the public health and groundwater aquifers from contamination and pollution.

1.2. Authority - These interpretive rules are issued under the authority of Chapter 16, Article 1, Section 7, and are related to Chapter 16, Article 1, Section 9 and Section 9a of the West Virginia Code.

1.3. Filing Date - These interpretive rules were promulgated on the 19th day of August 1983, and were filed on the 12th day of January 1984, in the Secretary of State's office.

1.4. Effective Date - These interpretive rules become effective on the effective date of West Virginia Board of Health Water Well Regulations, Chapter 16-1, Series XIX as authorized by the State Legislature and filed with the Secretary of State. *June 8, 1984*

Section 2. Application - These interpretive rules shall apply to all water wells other than those used to supply public water supplies. Water wells for public water supplies shall be installed, altered and deepened in accordance with the West Virginia state health department's Public Water Supply Regulations and Design Standards for Public Water Supply Systems (Bulletin EW-99).

Section 3. Definitions

3.1. Adequate Protection - Any methods which provide protection of the aquifer from contamination.

3.2. Annular Opening - The water well opening.

- 3.3. ASTM - American Society of Testing Materials.
- 3.4. Aquifer - A geological formation, group of formations, or part of a formation that is capable of yielding a usable amount of water to a well.
- 3.5. Bedrock - Solid rock underlying soil, unconsolidated or weathered material. Bedrock is defined in absolute terms as materials that a six-inch auger, equipped with carbide cutting teeth, penetrates at a rate of less than one inch in three minutes.
- 3.6. Consolidated Formation - Rock that is firm and coherent, solidified or cemented, such as granite, gneiss, limestone, slate or sandstone that has not been decomposed by weathering.
- 3.7. Director - Director of the state department of health or his lawful designee.
- 3.8. Installation - The installation, alteration and deepening of a water well.
- 3.9. Location - The designation of the well site.
- 3.10. NSF - The National Sanitation Foundation.
- 3.11. Pitless Well Adapter - A device approved by the director for attachment to one or more openings through a well casing.
- 3.12. Pitless Well Cap - An approved watertight, sanitary device, approved by the director, that covers and encloses the upper termination of a pitless well unit or the well casing.
- 3.13. Pitless Well Unit - A pre-assembled device approved by the director which extends from the upper end of a well casing to above grade, provided with an approved pitless well cap.
- 3.14. Public Water System or Supply - A public water system is any

water supply or system which regularly supplies or offers to supply piped water to the public for human consumption, if serving at least an average of twenty-five individuals per day for at least sixty days per year, or which has at least fifteen service connections, and shall include: (1) any collection, treatment, storage, and distribution facilities under the control of the owner or operator of such system and used primarily in connection with such system, and (2) any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system.

3.15. Water Well - Any excavation or penetration in the ground, whether drilled, bored, cored, driven, or jetted for a water supply, for the exploration for water, or for removal of water to dewater construction site(s).

3.16. Water Well Log - A log accurately kept, at the time of drilling, showing the depth, thickness, character of the different strata penetrated, location of water bearing strata, water level, depth, size, type and amount of casing installed, together with any other data or information required by the director.

3.17. Well Liner - Piping installed without driving which may be standard pipe weight or lighter and shall be of such minimum thickness as is required to withstand the structural load imposed by conditions inside and outside the well. Liner refers to piping placed inside or outside the well casing and may be required due to conditions encountered during and after drilling.

Section 4. Location of the Water Well

4.1. The water well shall be located as far as possible from any

existing or potential sources of pollution or contamination in accordance with the following:

4.1.1. The required minimum horizontal distance between a water well serving a public water system and a source or potential source of pollution or contamination shall be determined by the director.

4.1.2. The required minimum horizontal distance between a water well, other than a well serving a public water system, and a source or potential source of pollution or contamination shall be as follows:

Septic Tanks	50 feet (100 feet) ¹
Sewage Holding Tanks	50 feet (100 feet) ¹
Sewage Absorption Fields	100 feet
Sewers and Drains (Hydrostatically Tested)	10 feet ²
Sewers and Drains (Non Watertight)	50 feet (100 feet) ¹
Privies (Vault)	50 feet (100 feet) ¹
Barnyard/Feeding and Watering Areas	100 feet
Streams, Rivers and Impoundments	25 feet ³

¹The distance noted in parenthesis shall be required when a water well is lower in elevation than the source of pollution or contamination referenced.

²Sewer and drain materials shall be of potable water main standards and installed and hydrostatically tested as approved by the director.

³Where possible, the upper well casing shall extend above the 50 year flood level. When this level is not known, the flood level shall be that level that is six (6) feet above the normal water level of the surface.

4.1.3. Under extenuating circumstances, where the provisions of 4.1.2 can not be met, the director may waive such requirements.

Section 5. Materials

5.1. Well casing may be of iron, steel or plastic material.

5.2. The casing's minimum inside diameter shall be 5½ inches.

5.3. Metal well casing shall have welded or threaded pipe joints and shall be watertight. Metal well casing shall have a minimum wall thickness of 0.142 inches, unless otherwise approved by the director.

5.4. Plastic well casing, couplings and solvents shall be approved by the NSF or otherwise approved by the director.

5.5. Plastic well casing shall not be driven during the well installation and shall be installed in accordance with the manufacturer's specifications.

5.6. When permanent metal well casing is driven, a standard drive shoe shall be welded or threaded on the lower end of the casing. The shoe shall have a beveled and tempered cutting edge of metal forged, cast or fabricated for this purpose.

5.7. The use of plastic pipe for well liners and temporary casings shall be permitted provided that the casing or liner meets the requirements for permanent plastic well casing and the well is not used for electrical grounding.

5.8. Pitless adapters, pitless units, well caps and related accessories shall be those recommended by the Water Systems Council, approved by the NSF or otherwise approved by the director.

5.9. Well Screens shall be fabricated from plastic or metal materials approved by the director.

5.9.1. Plastic well screens shall be Schedule 40 (minimum) or equal as specified in ASTM D 1785 and ASTM D 1537 or the latest revision thereto, NSF approved or otherwise approved by the director.

5.9.2. Well screen openings shall provide the maximum amount of open area consistent with the strength of the screen material and sediment grain size of the water bearing formation or any sand or gravel pack placed adjacent to the screen. The screen shall be designed to permit maximum water transmission without clogging.

5.9.3. Well screens, other than those made commercially are prohibited.

5.9.4. Well screens shall be provided with such fittings as are necessary to close the bottom of the screen.

5.9.5. Well screens and fittings shall be composed of materials that are compatible with the chemical characteristics of the water.

Section 6. Installation

6.1. The minimum length of casing placed in a water well shall be eleven (11) feet. This length includes an extension of twelve (12) inches above graded ground level or six (6) inches above the well house floor.

6.1.1. Where bedrock is encountered at the well's lower termination, the casing shall be driven or inserted into the bedrock a minimum of five (5) feet.

6.1.2. Immediately prior to placing the casing into the well in consolidated formations, one bag of cement (94 pounds) shall be mixed with 5 to 7 gallons of water and placed in the bottom of the well.

6.2. The well head shall be installed to assure adequate protection of the well.

6.2.1. The upper termination of the casing shall comply with Section 6.1 of these rules.

6.2.2. The installation of pits and below grade well houses is prohibited.

6.2.3. The well casing shall be provided with either a pitless unit or adapter and well cap unit for outside installation or a sanitary well seal approved by the director for an indoor (well house) installation. The use of sanitary well seals for outside installations is prohibited.

6.2.4. Well vents shall be installed as approved by the director. Well vents shall be installed with a downward facing elbow or mushroom type head located at least six (6) inches above the well house floor, or twelve (12) inches above ground level and in accordance with Section 4.1.2 of these rules. The opening of the vent shall be screened or otherwise protected.

6.2.5. Wells shall be capped or otherwise protected during installation.

6.3. The pitless unit installation shall consist of either a pitless well unit or pitless well adapter and well cap.

6.3.1. The pitless well unit installation cap shall be not less than six (6) inches above the well house floor, or twelve (12) inches above the ground surface, and above the 50 year flood elevation where practical.

6.3.2. The exterior connection between the adapter and well casing may be welded, or may be of the threaded or clamp-on gasket design. Extreme care shall be exercised when the connection is welded to assure a complete watertight seal. A clamp-on gasket adapter shall be installed only on a smooth, clean surface.

6.3.3. The exterior connection between the pitless well unit and well

casing may be welded, threaded or of the slip-on design and an O-ring gasket and shall be watertight.

6.3.4. If a field weld connection is made, the pitless well unit must be specifically approved by the manufacturer for such welding. The only field welding permitted is that required to attach the pitless well unit to the casing. Water tightness of the weld shall be assured by pressurized air testing.

6.3.5. All connections between the pitless well unit and the lateral discharge line shall be threaded, flanged or mechanical joint and shall be watertight.

6.3.6. Jet pumps utilizing buried suction lines shall be equipped with pitless units approved by the Water Systems Council or otherwise approved by the director. The pump's suction line may be contained within the buried pressure line or encased within a watertight conduit.

6.3.7. The lateral discharge line shall be installed with a minimum of three (3) feet of earth cover or otherwise insulated or protected against freezing.

6.4. A concrete pad must be provided, by either the well driller or owner, for all outside installations and well house installations without concrete floors.

6.4.1. The upper termination of the water well casing must project through the center of a concrete pad which is a minimum of four (4) inches thick and extends at least two (2) feet in each direction from the center of the casing. All openings between the casing and cured pad must be grouted or filled with a flexible non-toxic material acceptable to the director.

6.4.2. The concrete pad may be placed at ground level or directly below the pitless unit installation. Pads shall be sloped away from the casing in all directions. The surface of grade level pads shall be above finished ground level.

6.4.3. In the case of an underground pad installation, the well driller or owner shall affix a metal tag to the underside of the well cap stating that the well has been installed with an underground platform and the date of installation.

Section 7. Well Log - A completed well log shall be submitted to the director within thirty (30) days after installation of a water well. The well log shall be submitted on forms prescribed by the director.

Section 8. Well Abandonment

8.1. All test wells and water wells not in use shall be filled and sealed by such measures necessary to restore the control geological conditions which existed prior to well construction.

8.2. Water wells that are abandoned shall be capped by filling the upper ten (10) feet of the casing (flush with the end of the casing) with concrete to prevent aquifer contamination.

8.3. Notice of water well abandonment shall be provided to the director on forms prescribed by the director within thirty (30) days after abandonment.

Section 9. Additional Requirements - All installations and operations shall meet or exceed relevant requirements of national, state, local or trades good practices or codes, whichever has jurisdiction.