MONTGOMERY BOARD OF HEALTH
REGULATIONS FOR PRIVATE WELLS

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I. PURPOSE

The purpose of this regulation is to provide for the protection of the public health, safety, welfare and the environment by, among other things, requiring the proper siting, constructing and testing of private wells.

II. AUTHORITY

These regulations are adopted by the *[insert name of municipality]* Board of Health, pursuant to its authority under Massachusetts General Laws, Chapter 111, section 31. These regulations supersede all previous Regulations for Private Wells adopted by the Board of Health.

III. DEFINITIONS

Unless the context or subject matter requires otherwise, the following words and phrases shall, for the purposes of this document, have the meanings specified in this section.
Words and phrases used in the present tense include the future; words and phrases used in the masculine gender include the feminine and neuter; and the singular number includes the plural and the singular.
Words and phrases not defined in this section shall have their conventional meanings unless expressly stated otherwise.

Abandoned Water Well: a well that meets any of the following criteria; (1) construction was terminated prior to completion of the well, (2) the well owner has notified the local Board of Health that use of the well has been permanently discontinued, (3) the well has been out of service for at least three years, (4) the well is a potential hazard to public health or safety and the situation cannot be corrected, (5) the well is in such a state of disrepair that its continued use is impractical, or (6) the well has the potential for transmitting contaminants from the land surface into an aquifer or from one aquifer to another and the situation cannot be corrected.

Agent: Any person designated and authorized by the Board to implement, in whole or part, these regulations. To the extent provided by the Board, the agent shall have all the authority of the Board and shall be directly responsible to the Board and under its direction and control.

Alter a Well or Well Alteration: Change the structural or hydraulic characteristics of a well including but not limited to deepening, decommissioning, performing Well Yield Enhancement, or performing casing extension, replacement, perforation or repair.

Applicant: any person who applies to construct a private well.

Aquifer: a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian Aquifer: an aquifer that is bound above and below by impermeable material or materials or distinctly lower permeability than the aquifer itself. The water in an aquifer confined in this manner will rise in a drilled hole or well casing above the point of initial penetration (above the bottom of the confining, or impermeable, layer overlying the aquifer).

Bentonite: a mixture of swelling clay minerals containing at least eighty-five percent of mineral montmorillonite (predominantly sodium montmorillonite) which meets the specifications of the most recent revision of API Standard 13A.

Bentonite Grout: a mixture of bentonite (API Standard 13A) and water in a ratio of not less than one pound of bentonite per gallon of water.

Board: The Board of Health of *[insert name of municipality],* Massachusetts or its authorized agent.

Business of Well Drilling: performing for commercial purposes, the activity of Drilling or Altering a Well.

Casing: impervious durable pipe placed in a boring to prevent the walls from caving and to serve as a vertical conduit for water, other fluids, or gases in a well.

Certified Laboratory: a laboratory certified by the Department for the analysis of drinking water and required water quality analytes. Provisional certification is acceptable.

Certified Company: a person authorized by nontransferable Certification with the Department, under 310 CMR 46.00, to engage in the business of Well Drilling and Alteration, determining Well Yield and Pump Installation.

Certified Individual: an individual authorized by nontransferable Certification with the Department to Drill of Alter Wells, as specified in 310 CMR 46.03(3).

Concrete: a mixture consisting of Portland cement (ASTM Standard C150, type I or API Standard 10, Class A), sand, gravel, and water in a proportion of not more than five parts of sand plus gravel to one part cement, by volume, and not more than six gallons of water. One part cement, two parts sand, and three parts gravel are commonly used with up to six gallons of water.

Department: Massachusetts Department of Environmental Protection.

Drinking Water: water used for human consumption.

Install a Pump or Pump Installation: Install, replace, or alter a pump or any component thereof for a well.

Irrigation Well: a well used for the sole purpose of watering or irrigation. The well shall not be connected at any time to a dwelling or a building unless it meets the requirements of a Private Drinking Water Well and has the Board's written approval.

Neat Cement Grout: a mixture consisting of one bag (94 pounds) of Portland cement (ASTM Standard C 150, Type I or API Standard 10, Class A) to not more than six gallons of clean water. Bentonite (API Standard 13A), up to two percent by weight of cement, shall be added to reduce shrinkage. Other additives, as described in ASTM Standard C494, may be used to increase fluidity and/or control setting time.

Person: any agency or political subdivision of the federal government or the commonwealth, any state, public or private corporation or authority, individual, trust, firm, joint stock company, partnership, association, or other entity, and any officer, employee or agent of said person, and any group of said persons.

Private Drinking Water Well: any Private Well that is used for the purpose of supplying water used for human consumption.

Private Well: any hole or shaft drilled into the ground or inject or withdraw water, other fluids, or gasses, monitor soil gasses, monitor groundwater levels or water quality, transfer heat, or provide cathodic protection that is not regulated as a public water supply under 310 CMR 22.00.

Private Well Yield: the gallons per minute (gpm) of water that can flow or be withdrawn from a well, at a sustained rate after a minimum of 2 hours if the water level has stabilized (water level does not fluctuate more than 3 inches) for the last 30 minutes of the test.

Pumping (Aquifer) Test: a procedure used to determine the characteristics of a well and adjacent aquifer by installing and operating a pump.

Pump or Pump System: the mechanical equipment or devices used to remove water from a well. For a well with a pitless adapter, the pump system includes all piping and the pitless adapter. For a well with a submersible pump and without a pitless adapter, the pump system includes all piping up to the metering device, or if none, then up to the main control valve inside the foundation of the structure served by the well. For a well without a submersible pump and without a pitless adapter, the pump system includes all piping up to and including the wellhead. For installation or repair purposes, the pump or pump system includes all piping up to the metering device or, if none, then up to the main control valve inside the foundation of the structure served by the well.

Replace a Pump or Pump Replacement: Install a Pump of the same horsepower as the Pump that was last removed, install any component of a Pump with a component of the same size and capacity as the one that was last removed. Also, removal and replacement of a pump or any component thereof.

Sand Cement Grout: a mixture consisting of Portland cement (ASTM Standard C150, Type I or API Standard 10, Class A), sand, and water in the proportion of one part cement to three or four parts sand, by volume, and not more than six gallons of water per bag (94 pounds) of cement. Up to five percent, by weight of bentonite (API Standard 13A) shall be added to reduce shrinkage.

Static Water Level: the distance from established ground surface to the stabilized water level in a well which is neither being pumped nor under the influence of pumping.

Structure: a combination of materials assembled at a fixed location to give-support or shelter, such as a building, framework, retaining wall, fence, or the like.

Water Used for Human Consumption: water that is used for drinking, bathing, showering, cooking, dishwashing, or maintaining oral hygiene.

Well: any hole or shaft drilled into the ground to inject or withdraw water, other fluids, or gases, monitor soil gasses, monitor groundwater levels or water quality, transfer heat, or provide cathodic protection.

Wellhead: the above ground component or structure built over a well.

Well Yield Enhancement: a process to increase the production of water and yield by using water under pressure, or another substance the Department has approved for use in the process, to clean out existing fractures to allow water to flow into the well from other areas.

IV. WELL CONSTRUCTION PERMIT

(1) A Massachusetts Certified Well Driller shall obtain a permit from the Board of Health prior to the commencement of construction of a private well.

(2) Each permit application to construct a well shall include the following:

(a) the property owner's name and address
(b) the well driller's name and proof of valid Massachusetts certification
(c) a plan with a specified scale, signed by a registered surveyor or engineer, showing the location of the proposed well in relation to existing or proposed above or below ground structures.
(d) a description of prior and current land uses within two hundred (200) feet of the proposed well location, which represent a potential source of contamination, including but not limited to the following:
    1. existing and proposed structures
    2. subsurface sewage disposal systems
    3. subsurface fuel storage tanks
    4. public and private ways
    5. utility rights-of-way
    6. any other potential sources of pollution.
(e) a permit fee of $*[insert fee amount]*

(3) The permit shall be on site at all times that work is taking place. Each permit shall expire one (1) year from the date of issuance unless revoked for cause, or extended. Permits may be extended for one additional six (6) month period provided that a written explanation for the request is received by the Board prior to the one-year expiration date.

(4) Well Construction Permits are transferable within one year of initial application and upon appropriate written notice from the new certified well driller.

V. WATER SUPPLY CERTIFICATE

(1) The issuance of a Water Supply Certificate by the Board shall certify that the private well may be used as a drinking water supply. A Water Supply Certificate must be issued for the use of a private well prior to the issuance of an occupancy permit for an existing structure or prior to the issuance of a building permit for new construction which is to be served by the well.

(2) The following shall be submitted to the Board of Health to obtain a Water Supply Certificate:

(a) a well construction permit;
(b) a copy of the Well Completion Report as required by MassDEP Well Driller Program regulations (310 CMR 46.00);
(c) a copy of the Pumping Test Report required pursuant to Section VII of these regulations; and,
(d) a copy of the Water Quality Report required pursuant to Section VIII of these regulations.

(3) Upon the receipt and review of the above documents, the Board shall make a final decision on the application for a Water Supply Certificate. A final decision shall be in writing and shall comprise one of the following actions:

(a) Issue a Water Supply Certificate
(b) Deny the applicant a Water Supply Certificate and specify the reasons for the denial.
(c) Issue a conditional Water Supply Certificate with those conditions, which the Board deems necessary to ensure fitness, purity and quantity of the water, derived from that private well. These conditions may include, but not be limited to, requiring treatment and/or additional testing of the water.

VI. WELL LOCATION AND USE REQUIREMENTS

(1) In locating a well, the applicant shall identify on a plan all potential sources of contamination, which exist or are proposed within two hundred (200) feet of the site. When possible, the well shall be located upgradient of all potential sources of contamination and shall be as far away from potential sources of contamination as possible, given the layout of the property.

(2) No well shall be permitted for use as a potable water source unless it meets the following setback requirements:

(a) 10 feet from the property line
(b) 25 feet from public or private roadway
(c) 15 feet from right of way

(d) 50 feet from building sewer line or septic tank
(e) 100 feet from leaching field or drywell
(f) 100 feet from stable, barnyard, manure storage
(g) 250 feet from an underground fuel storage or pesticide tank
(h) 25 feet from any surface water, including, but not limited to, wetlands

(3) The Board reserves the right to impose minimum setback requirements from other potential sources of contamination not listed above. All such additional setback requirements shall be listed, in writing, as a condition of the well construction permit.

(4) Each private well shall be located so that it is accessible for repair, maintenance, testing, and inspection. The well shall be completed in a water bearing formation that will produce the required volume of water under normal operating conditions.

(5) Water supply lines shall be installed at least ten (10) feet from and eighteen (18) inches above any sewer line. Whenever water supply lines must cross sewer lines, both lines shall be constructed of Class 150 pressure pipe and shall be pressure tested to assure watertightness.

(6) No private well, or its associated distribution system, shall be connected to either the distribution system of a public water supply system or any type of waste distribution system.

VII. WATER QUANTITY REQUIREMENTS

(1) The applicant shall submit to the Board for review and approval a Pumping Test Report. The Pumping Test Report shall include at a minimum: the name and address of the well owner, well location referenced to at least two permanent structures or landmarks, date the pumping test was performed, depth at which the pump was set for the test, location for the discharge line, static water level immediately before pumping commenced, discharge rate and, if applicable, the time the discharge rate changed, pumping water levels and respective times after pumping commenced, maximum drawdown during the test, duration of the test, including both the pumping time and the recovery time during which measurements were taken, recovery water levels and respective times after cessation of pumping, and reference point used for all measurements.

(2) To determine if the well can provide sufficient water to meet the average household daily demand, the following methodology should be employed:

(a) Estimate Peak Demand in gallons required to meet peak demand period of 1 hour (60 minutes) using Table 1 based on number of bedrooms and bathrooms in the house.

(Flow rate required in gallons per minute x 60 minutes = gallons needed for peak demand)

Number of bedrooms	Number of bathrooms				
	1	1.5	2	3	4
	Flow rate in gallons per minute (GPM)				
2	5	6	8		
3	7	8	9	10	12
4	8	9	10	12	13
5		11	12	13	15
6			13	15	17

Table 1

(b) Calculate the volume of water the well can produce in the peak demand period of 60 minutes based on the pumping test results.

(Well yield in gpm x 60 minutes = gallons produced)

(c) Estimate the borehole water storage using information obtained from the Well Completion Report and Table 2.

To determine the available water in feet, subtract the static water level from the Depth to the pump intake. Multiply the available water in feet times the gallons of water per foot for the well diameter to calculate the number of available gallons held in storage in the borehole (see Table 2 below.)

(Total depth to pump intake – static water level) x gallons per foot of water = available water from borehole storage)

Diameter of Well in Inches	Gallons of Water		Diameter of Well in Feet	Gallons of Water Per Foot of Water Depth
	Per Foot of Water Depth	Per 100 Feet of Water Depth		
1.5	0.092	9.2	2	23.5
2	0.163	16.3	3	52.9
3	0.367	36.7	4	94.0
4	0.653	65.3	5	146.9
5	1.020	102.0	6	211.5
6	1.469	146.9	7	287.9
8	2.611	261.1	8	376.0
10	4.080	408.0	9	475.9
12	5.876	587.6	10	587.6

Table 2

(d) Subtract gallons of water held in borehole storage (Step 3) and total amount the well is capable of producing in 60 minutes (Step 2) from the estimated peak demand (step 1) to determine if the well is capable of meeting peak demand. If the difference between the two is zero or less, the well is capable of meeting peak demand. If the difference is greater than zero, then additional volume in the form of a storage tank will be required to meet peak demand.

(3) The pumping test may be performed at whatever rate is desired. Following the pumping test, the water level in the well must be shown to recover to within eighty-five (85) percent of the pre-pumped static water level within a twenty-four (24) hour period.

Example 1: The Well Completion Report indicates that a 6-inch diameter domestic well was installed that has a pump intake set at a depth of 300 feet, with a measured static water level of 15 feet and an estimated well yield of 2 gpm.

1. For a 2 bedroom, 2 bathroom house, a peak demand rate of 8 gpm for one hour or 480 gallons is estimated from Table 3 as being required to meet the household peak demand (8 gpm x 60 minutes = 480 gallons
2. The well report indicates that the well is only capable of producing 2 gpm or 120 gallons during the 1 hour period (2 gpm x 60 mins. = 120 gallons)
3. Borehole storage is calculated to be 419 gallons [(300 foot depth to pump intake – 15 foot static water level) x 1.469 gallons/foot of 6 inch diameter casing = 419 gallons]
4. 480 gallons required to meet peak demand – 120 gallons (well yield over 1 hour) – 419 gallons (borehole storage) = - 59 gallons (surplus)

In this example the well installation can meet the daily peak demand with a surplus of 239 gallons daily.

Example 2: Assume same well completion information as Example 1 above

1. For a 3 bedroom, 3 bathroom house, a peak demand rate of 10 gpm for one hour or 600 gallons is estimated from Table 3 as being required to meet the household peak demand (10 gpm x 60 minutes = 600 gallons)
2. The well report indicates that the well is only capable of producing 2 gpm or 120 gallons during the 1 hour period (2 gpm x 60 mins. = 120 gallons)
3. Borehole storage is calculated to be 419 gallons (300 foot depth to pump intake – 15 foot static level x 1.469 gallons/foot of 6 inch diameter casing = 419 gallons
4. 600 gallons required to meet peak demand – 120 gallons (well yield over 2 hours) – 419 gallons (borehole storage) = + 61 gallons (deficit)

In this example the well installation does not meet the daily peak demand and an additional 61 gallons will be required daily in the form of tank storage.

In instances where the above methodology indicates that peak demand can be met by a combination of well yield and borehole storage, the well yield alone should also be able to refill the borehole storage volume over a 12-hour time period. Minimum well yields of between 0.5 gpm to 1.5 gpm

would be needed to accomplish this for the 1-hour peak demand volumes calculated using the recommended peak flow rates provided in Table 3. These minimum well yields would be necessary in order to sufficiently replenish the borehole storage between peak demands events.

VIII. WATER QUALITY TESTING REQUIREMENTS

(1) After the construction of the well has been completed and disinfected, and prior to using it as a private drinking water well, baseline water quality testing shall be conducted.

(2) A water sample shall be collected either after purging three (3) well volumes or following the stabilization of the pH, temperature and specific conductance in the pumped well. The water sample to be tested shall be collected at the pump discharge or from a disinfected tap in the pump discharge line. In no event shall a water treatment device be installed prior to sampling.

(3) Water quality testing of the private drinking water well, utilizing the applicable US EPA approved method for public drinking water testing, shall be conducted by a Massachusetts or EPA certified laboratory and shall include analyses for the following parameters:

- Arsenic
- Chloride
- Copper
- Fluoride
- Hardness
- Iron
- Lead
- Manganese
- pH
- Sodium
- Total Coliform bacteria
- E. coli bacteria
- Nitrate/Nitrite
- PFAS (Per- and polyfluoroalkyl substances) including the following six PFAS chemicals referred to as PFAS6:
    - perfluorooctane sulfonic acid (PFOS)
    - perfluorooctanoic acid (PFOA)
    - perfluorohexane sulfonic acid (PFHxS)
    - perfluorononanoic acid (PFNA)
    - perfluoroheptanoic acid (PFHpA)
    - perfluorodecanoic acid (PFDA)

(4) In wells drilled into bedrock the Board of Health requires that in addition to the parameters listed above, a Gross Alpha Screen and Radon test be performed. If the Gross Alpha screen detects radiation of 15 pCi/L or more, then the water must be analyzed for Uranium concentrations. If the Gross Alpha screen detects radiation of 5 pCi/L or more, then the water must be analyzed for Radium and Uranium concentrations.

(5) Testing for water quality parameters not listed in VIII.(3) and (4) for which there is a US EPA or MassDEP approved method for public drinking water testing, shall be conducted by a MassDEP or EPA certified laboratory or any other certification authority approved by MassDEP.

(6) The owner of every well used for drinking water including those serving a property which is rented or leased shall have its water tested at a Massachusetts certified laboratory for the following chemical and bacteriological parameters at a minimum of once a year: total coliform bacteria, e. coli bacteria, nitrate, nitrite, pH, conductivity, sodium, and iron. All other required chemical parameters listed in VIII.(3) should be tested at a minimum of every ten (10) years. Wells installed in bedrock aquifers should also be tested at a minimum of every ten (10) years for the radiological parameters described in VIII.(4). The Board of Health may require more frequent testing, or testing for additional parameters, where other water quality problems are known or suspected to exist.

(7) The owner of a rental property shall make results of all water quality tests available to all tenants of the property and the Board of Health. In cases where the well water does not meet the water quality standards outlined above, the Board of Health may require the property owner to provide an alternative approved source of drinking water for the tenants.

(8) Prior to selling, conveying, or transferring title to real property, the owner shall have tested the water of every private drinking water well serving that property. A water sample from each well shall be submitted to a Massachusetts certified laboratory for testing for the parameters listed in the Water Quality section of this document. This water quality testing shall have been performed not more than one (1) year prior to transfer of the property. Results of the water quality testing shall be submitted to the Board of Health prior to property transfer.

(9) In addition, the owner shall give copies of all available water quality test results of which he/she has knowledge (regardless of age of results) for the private well in question to any buyer and/or broker involved in the transfer. In the event that there is no buyer at the time the water is tested, a copy of all water test results must be given by the owner to the buyer before the property is put under agreement.

(10) For irrigation wells, the Board requires annual testing for E. coli bacteria and Nitrate/Nitrite, as accidental consumption could result in acute exposure.

(11) The Board reserves the right to require retesting of the above parameters, or testing for additional parameters when, in the opinion of the Board, it is necessary due to local conditions or for the protection of public health, safety, welfare and the environment. All costs and laboratory arrangements for the water testing are the responsibility of the applicant.

(12) Following a receipt of the water quality test results, the well owner shall submit a Water Quality Report to the Board, which includes:

(a) a copy of the certified laboratory's test results
(b) the name and contact information of the individual who performed the sampling
(c) where in the system the water sample was obtained

(13) This regulation requires that private drinking water wells meet all current Massachusetts' Primary and Secondary Drinking Water Standards and Guidelines adopted by the MassDEP Office of Research and Standards (ORS). In any case where a private drinking water well does not meet such Standards or Guidelines, as it deems necessary for the protection of public health, safety or welfare, that the Board may take action, but not limited to, requiring the property owner to provide an alternative source of drinking water.

IX. WELL CONSTRUCTION REQUIREMENTS

(1) Pursuant to 310 CMR 46.02 (1), no person in the business of digging or drilling shall construct a well unless certified by the MassDEP Well Drillers Program.

(2) Any work involving the connection of the private well to the distribution system of the residence must conform to the local plumbing code. All electrical connections between the well and the pump controls and all piping between the well and the storage and/or pressure tank in the house must be made by a pump installer or certified well driller, including the installation of the pump and appurtenance(s) in the well or house.

(3) A physical connection is not permitted between a water supply, which satisfies the requirements of these regulations, and another water supply that does not meet the requirements of these regulations without prior approval of the Board.

(4) General Well Design and Construction
(a) All private wells shall be designed and constructed such that:
1. the materials used for the permanent construction are durable in the specific hydrogeologic environment that occurs at the well site
2. no unsealed opening is being left around the well that could conduct surface water or contaminated groundwater vertically to the intake portion of the well or transfer water from one formation to another.

(b) Permanent construction materials shall not leach or contribute toxic substances, taste, odors, or bacterial contamination to the water in the well.

(c) The driller shall operate all equipment according to generally accepted standards in the industry and shall take appropriate precautions to prevent damage, injury or other loss to persons and property at the drilling site.

(d) Well construction design shall ensure that surface water does not enter the well through the opening or by seepage through the ground surface. Construction site waste and materials shall be disposed of in such a way as to avoid contamination of the well, any surface water or the aquifer. During any time that the well is unattended, the contractor

shall secure the well in a way as to prevent either tampering with the well and/or the introduction of foreign material into the well.

(e) All water used for drilling, well development, or to mix a drilling fluid shall be obtained from a source, which will not result in contamination of the well or the water bearing zones penetrated by the well. Water from wetlands, swamps, ponds and other similar surface features shall not be used.

(f) Water shall be conveyed in clear sanitary containers or water lines and shall be chlorinated to an initial concentration between 50 milligrams per liter (mg/L) and 100 mg/L. All drilling equipment including pumps and down hole tools, shall be cleaned and disinfected prior to drilling each new well or test hole.

(g) All drilling fluids shall be nontoxic. Drilling fluid additives shall be stored in clean containers and shall be free of material that may adversely affect the well, the aquifer, or the quality of the water to be pumped from the well. Surfactants shall be biodegradable. The use of biodegradable organic polymers shall, when possible, be avoided.

(h) All wells, including those that have been hydrofractured, shall be developed in order to remove fine materials introduced into the pore spaces or fractures during construction. One or more of the following methods shall be used for development: over pumping, backwashing, surging, jetting, air-lift pumping.

(i) The completed well shall be sufficiently straight so that there will be no interference with installation, alignment, operation or future removal of the permanent well pump.

(5) Well casing

(a) Private water supply wells shall be constructed using either steel or thermoplastic well casing. The casing shall be of adequate strength and durability to withstand anticipated formation and hydrostatic pressures, the forces imposed on it during installation, and the corrosive effects of the local hydrogeologic environment.

(b) All casing used in the construction of private wells shall be free of pits, breaks, gouges, deep scratches and other defects. If previously used casing is installed, it shall be decontaminated and disinfected prior to installation.

(c) Installation of water well casing shall be done in a manner that does not alter the shape, size, or strength of the casing and does not damage any of the joints or couplings connecting sections of the casing. A standard drive shoe shall be used when casing is installed. The drive shoe shall be either welded or threaded to the lower end of the string of casing and shall have a beveled metal cutting edge forged, cast, or fabricated for this specific purpose.

(d) Upon completion of the installation procedure, the entire length of the casing above the intake shall be watertight.

(e) Well casing shall not be cut off below the land surface unless a pitless adapter or a pitless unit is installed or an abandoned well is being permanently plugged. Well casing terminating above-grade shall extend at least twelve (12) inches above the predetermined ground surface at the wellhead except when the well is located in a floodplain. When a well is located in a floodplain, the well casing shall extend at least two (2) feet above the level of the highest recorded flood. The top of the well casing shall be reasonably smooth and level.

(6) Well screen

(a) A well screen is required for all drilled wells that are completed in unconsolidated formations. All well screens shall be of Grade 304 stainless steel. Wells completed in bedrock do not require a screen unless the bedrock formation is brittle in nature or has a potential for collapse. The well screen aperture openings, screen length, and diameter shall be selected so as not to limit the aquifer's water yielding characteristics while preventing access of soil particles that would detract from well efficiency and yield.

(7) Grouting and sealing

(a) Private wells drilled in bedrock shall be grouted from the ground surface or from the bottom of the pitless adaptor (if present) to fifteen (15) feet into competent bedrock. Neat cement grout, sand cement grout, or Bentonite grout shall be used. It shall have a permeability of at least 1 x 10-7 and be emplaced using standard grouting techniques as described in the MassDEP Private Well Guidelines, as amended.

(b) All wells completed with the casing extending above grade shall have a surface seal designed to eliminate the possibility of surface water flowing down the annular space between the well casing and the surrounding backfilled materials. The surface seal shall extend to a depth below the local frost line.

(8) Wellhead completion

(a) All wells shall be equipped with a sanitary seal or watertight cap designed to prevent surface water and foreign matter from entering the well.

(b) All wells except flowing artesian and dug wells shall be vented. The opening of the vent pipe shall be covered with a 24-mesh corrosion resistant screen and shall be large enough to prevent water from being drawn into the well through electrical conduits or leaks in the seal around the pump when the pump is turned on. The vent pipe shall terminate in a downward position at or above the top of the casing.

(c) All connections to a well casing made below ground shall be protected by either a pitless adapter or a pitless unit that complies with the most recent revision of National Sanitation Foundation Standard Number 56, entitled "Pitless Well Adapters."

(d) Above-grade connections into the top or side of a well casing shall be at least twelve (12) inches above the established ground surface or two (2) feet above the level of the highest known flood, whichever is higher. Above-grade connections shall be sealed so that they are watertight.

(e) The ground immediately surrounding the well casing shall be sloped downward and away from the well in all directions to eliminate the possibility of surface water ponding.

(9) Disinfection

(a) Upon completion of well construction, the well driller shall disinfect the well. If a pump is to be installed immediately upon completion of the well, the pump installer shall disinfect the well and the pumping equipment after the pump has been installed.

(b) If the pump is not installed upon completion of the well, the pump installer shall, upon installation, disinfect the well and the pumping equipment. The pump installer shall also disinfect the entire water supply system immediately after any maintenance or repair work is done on the pump.

(c) When a well is disinfected, the initial chlorine concentration shall be 100 mg/L throughout the entire water column.

(d) For newly constructed or altered wells in which the pump is not immediately installed, the chlorine concentration used to disinfect the well shall be 100 mg/L. Upon installation of the pump, the well, the pumping equipment, and the distribution system, if connected, shall be disinfected with a chlorine concentration of 100 mg/L.

(e) The disinfectant solution shall remain undisturbed in the well for a minimum of two (2) hours. After all the chlorine has been flushed from the water supply system, a water sample shall be collected and submitted to a Massachusetts certified laboratory. For new wells, the sample shall be tested pursuant to Section VI of these regulations.

(f) Only certified well drillers are authorized to physically alter, or repair a well. For wells, that have undergone repair, a sample shall be tested for total coliform bacteria and any other parameters deemed appropriate by the Board, prior to being put back in use.

X. DECOMMISSIONING REQUIREMENTS

(1) Abandoned wells, test holes, and borings shall be decommissioned so as to prevent the well, including the annular space outside the casing, from being a channel allowing the vertical movement of water.

(2) The owner of a private well shall decommission the well if any of the following criteria are met:

(a) Construction of the well is terminated prior to completion of the well.
(b) The well owner notifies the Board that the use of the well is to be permanently discontinued.
(c) The well has been out of service for at least three (3) years.
(d) The well is a potential hazard to public health or safety and the situation cannot be corrected.
(e) The well is in such a state of disrepair that its continued use is impractical or unsafe.
(f) The well has the potential for transmitting contaminants from the land surface into an aquifer or from one aquifer to another and the situation cannot be corrected.

(3) The property owner shall ensure that that all abandoned wells and test holes or borings associated with the well installation are properly plugged before work at the site is completed. Only certified well drillers may plug abandoned wells, test holes, and borings.

(4) Abandoned overburden wells or borings shall be completely filled with a low permeability grout, which cures with a final permeability of less than 1x10-7 cm/sec. Wells shall be plugged with neat cement grout, sand cement grout, concrete, or bentonite grout.

(5) Regardless of the type used, the grout used for plugging shall:

(a) be sufficiently fluid so that it can be applied through a tremie pipe from the bottom of the well upward;
(b) remain as a homogeneous fluid when applied to the subsurface rather than disaggregating by gravity into a two phase substance;
(c) be resistant to chemical or physical deterioration; and,
(d) not leach chemicals, either organic or inorganic, that will affect the quality of the groundwater where it is applied.

(6) The plugging materials shall be introduced at the bottom of the well or boring and placed progressively upward to a level approximately four (4) feet below the ground surface. Sealing materials shall not be poured from the land surface into the well, borehole, or annular space being sealed.

(7) The well driller shall install a surface seal after the well or boring has been plugged. Before the surface seal is placed, casing remaining in the hole shall be cut off. The remaining four (4) feet at the top of the well or boring shall then be filled with concrete. The top of the seal shall comprise a concrete slab above the top of the plugged well or boring. This concrete slab shall be at least six (6) inches thick and shall be at least two (2) feet greater in diameter than the well casing or borehole wall.

XI. ENFORCEMENT

(1) The Board has authority to investigate suspected or known violations of these regulations and/or violations of any Water Supply Certificate conditions. The Board may take actions, as it deems appropriate, within its authority for the protection of public health, safety welfare, or the environment, and to enforce any of the provisions of this regulation.

(2) If any investigation reveals a violation of these regulations or the Water Supply Certificate Conditions, the Board may order the private well owner to comply with the violated provision(s), and/or take other action within its authority as the Board deems appropriate.

(3) Any Order the Board issues shall be in writing and served in the following manner:

(a) personally, by any person authorized to serve civil process;
(b) by any person authorized to serve civic process by leaving a copy of the Order at the property owner's address;
(c) by sending the property owner a copy of the Order by registered or certified mail, return receipt requested; or,
(d) by posting a copy of the Order in a conspicuous place on or about the premises and by advertising it for at least three (3) out of five (5) consecutive days in one or more newspapers of general circulation within the municipality where the private well is located, if the property owner's last and usual place of residence is unknown or outside the Commonwealth.

XII. HEARING

(1) Any person to whom the Board issues an Order may request a hearing before the Board by filing with the Board within seven (7) days after the day the Order was served a written request for a hearing. Upon receipt of a hearing request, the Board shall set a time and place for the hearing and shall inform the well owner in writing. The hearing shall commence within thirty (30) days from the day on which the written request was made, unless a later time is agreed to in writing by the Board and the person requesting the hearing. At the hearing the person requesting the hearing shall be given an opportunity to be heard and show why the Order should be modified or withdrawn. After the close of the hearing, the Board shall issue a written decision to sustain, modify, or withdraw the Order and shall mail a copy of the decision, by certified mail, return receipt requested, to the person who requested the hearing. If the Board sustains or modifies the Order, it shall be carried out within the time period allotted in the original order or in the modification.

(2) Every notice, order, or other record prepared by the Board in connection with the hearing shall be entered as a matter of public record in the office of the clerk of the city or town, or in the office of the Board.

(3) If a request for a hearing is not filed with the Board within seven (7) days after the day an Order has been served or if after a hearing, the Order has been sustained in whole or any part, each day's failure to comply with the order as issued or sustained shall constitute a separate violation.

XIII. APPEAL

(1) Any person aggrieved by the final Order, Variance, Well Construction Permit, or Certificate of Water Supply determination of the Board may appeal to any court of competent jurisdiction as provided by the laws of the Commonwealth.

XIV. PENALTIES

(1) Any person who violates any provision of these regulations, or who fails to comply with any final Order of the Board, for which a penalty is not otherwise provided in any of the Massachusetts General Laws, shall upon conviction be fined not less than ten (10) nor more than five hundred (500) dollars. Each day's failure to comply with a final Order or any provision of this regulation shall constitute a separate violation.

XV. VARIANCE

(1) The Board may, grant a variance to any provision of this regulation when, in its opinion, the enforcement would result in manifest injustice, and the applicant has demonstrated that the equivalent degree of protection will be provided without strict application of the particular provision(s) sought to be varied.

(2) Every request for a variance shall be in writing shall state the specific provision of this regulation from which variance is sought, the reasons for seeking the variance and proof of the notice required below. The request shall also contain the information to establish manifest injustice and equivalent degree of protection. At least ten (10) days prior submission of the application to the Board, the applicant shall provide notice of their intent to the request a variance as follows: a) by certified mail, return receipt requested to all abutters of the property upon which the private well will be or is located and b) publication in a newspaper of general circulation in the town or city in which the private well will be or is located. The notice shall include at a minimum: the name and address of the applicant, a statement of the provision(s) of this regulation from which a variance is sought, and the reason for seeking the variance. Any grant or denial of a variance shall be in writing and shall contain a brief statement of the reasons for approving or denying the variance. A copy of each variance shall be conspicuously posted for thirty (30) days following its issuance and shall be available to the public at all reasonable hours in the Office of the Town Clerk or Office of the Board of Health. No work shall be done under any variance until thirty (30) days elapse from its issuance, unless the Board certifies in writing that an emergency exists.

(3) The Board may issue a variance subject to such conditions as it deems necessary to public health, safety, welfare or the environment. Any such conditions shall be stated in writing in the Board's grant of the variance. The Board may revoke, modify or suspend, in whole or in part, a variance after the property owner has been notified in writing and is afforded an opportunity to be heard, pursuant to Section XI of these regulations.

XVI. SEVERABILITY:

(1) If any provision of these regulations or the application thereof is held to be invalid by a court of competent jurisdiction, the invalidity shall be limited to said provision(s) and the remainder of these regulations shall remain valid and effective. Any part of these regulations subsequently invalidated by a new state law or modification of an existing state law shall automatically be brought into conformity with the new or amended law and shall

be deemed to be effective immediately, without recourse to a public hearing and the customary procedures for amendment or repeal of such regulation.

XVII. EFFECTIVE DATE

XVIII. These regulations were adopted by vote of the TOWN of MONTGOMERY, Massachusetts Board of Health, at their regularly scheduled meeting held on _____, 20__ and are to be in full force and effect on and after _____, 20__. Before said date, these regulations shall be published and a copy placed on file in the Board of Health Offices and filed with the Department of Environmental Protection, Division of Wastewater Management in Boston. These regulations or any portions thereof may be amended, supplemented or repealed from time to time by the Board, as provided by law and applicable regulations.

XVIII. DISCLAIMER

(1) The issuance of a well permit shall not be construed as a guarantee or certification by the Board or its agents that the water system will function satisfactorily or that the water supply will be of sufficient quality or quantity for its intended use.

Attachment
Additional Subjects for Regulatory Consideration

You may also consider incorporating the following additional requirements into your local regulation:

Section IV: Well Construction Permit

The Board may require that applicants for well construction permits obtain additional local permits, e.g. plumbing and/or building permits.

Section VI: Well Location and Use Requirements

The Board may choose to require additional information pertaining to the location of hazardous waste sites, underground storage tanks, agricultural land uses, permitted groundwater discharges and/or utility rights-of-way that are within 500-1000 feet of the well site.

It is prohibited by 310 CMR 22.22(2)(j) to have a cross connection between a public water system and a private well used for either drinking water or irrigation purposes.

Section VII: Water Quantity Requirements

The MassDEP Private Well Guidelines section entitled "Water Quantity" provides a table of values listing gallons of water per foot of water column length for various casing or hole diameters and a table of flow volumes in gallons per minute and corresponding flow volumes in gallons per day.

Section VIII: Water Quality Testing Requirements

MassDEP recommends that Board of Health regulations require that potable wells meet Massachusetts primary and secondary drinking water standards and guidelines. These standards and guidelines for private wells are excerpted and noted in the most recent update of MassDEP's recommended "Parameters and Testing Frequency for Private Wells." MassDEP recommends that Board of Health regulations specify the parameters for which water is required to be tested rather than generally stating that the water must meet drinking water standards. Such general statements could provide a loophole whereby an applicant could test the well water for only one or two parameters and as long as the water meets drinking water standards for those parameters, the well would pass the water quality test. MassDEP recommends that the Board of Health regulations do not include the Maximum Contaminant Level (MCL) or the Secondary MCL values for particular contaminants because these standards are subject to change, unless the BOH decides to adopt a standard more stringent than the current MassDEP standard for public drinking water.

For the MassDEP's recommended list of water quality testing parameters for which a potable private well should be tested, the Board of Health is referred to the MassDEP website:
https://www.mass.gov/service-details/protect-your-family-a-guide-to-water-quality-testing-for-private-wells

Additional test requirements for volatile organic compounds (VOCs) and synthetic organic compounds (SOCs) should be required in areas known to be, or suspected as being, impacted by other pollutants listed in the MassDEP/ORS Standards and Guidelines for Chemicals in Massachusetts Drinking Waters. To check for DEP classified hazardous waste sites in your town, you can use the EEA Data Portal at:
https://eeaonline.eea.state.ma.us/portal#!/search/wastesite

Water quality sampling for geothermal wells is not required under this regulation. Parameters required for these types of wells are specified in the MassDEP Ground Source Heat Pump permitting requirements.

Section IX: Well Construction Requirements

MassDEP does not recommend Boards of Health allow dug wells as these types of wells are shallow, making them especially susceptible to contamination and seasonally fluctuating water tables. In communities where they are allowed, they should be permitted only as a last resort.

You may choose to adopt more detailed construction requirements than contained in this model regulation. The MassDEP Private Well Guidelines, contain additional information on well construction, well screen, pump installation, grouting and wellhead completion that can be incorporated into the locally adopted regulation.

Section X: Decommissioning Requirements

The MassDEP Private Well Guidelines section entitled "Decommissioning Abandoned Wells, Test Holes, and Dry or Inadequate Borings" contains a more comprehensive discussion of plugging procedures and other aspects of decommissioning and contains specific recommendations for the contents of a Well Decommissioning Report which the Board may choose to require a well driller to submit.

Add Section regarding ground source heat pump (geothermal) wells

The requirements for siting, constructing and water quality sampling, necessary to obtain MassDEP registration approval for these types of Underground Injection Control (UIC) wells are specified in the MassDEP Guidelines for Ground Source Heat Pump Wells. Parcels of land that are only used for a single unit residential dwelling with no additional non-residential uses are exempt from the MassDEP UIC registration requirement for ground source heat pump wells. Closed-loop geothermal wells are also exempt from the UIC registration requirement regardless of the land use, provided that they adhere to the Guidelines for Ground Source Heat Pump Wells https://www.mass.gov/doc/guidelines-for-ground-source-heat-pump-wells .

The Board may require its own geothermal well regulations. Of particular interest to the Board may be Section 6.0 of the Guidelines for Ground Source Heat Pump Wells which addresses dual use (open-loop and private potable water supply) wells.