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**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
THE TOWN OF WEST GREENWICH**

AN ORDINANCE RELATING TO WELL TESTING AND CERTIFICATION

NO. 84

ADOPTED: MARCH 10, 2004

AMENDED: NOVEMBER 10, 2004

It is hereby ordained by the Town Council of the Town of West Greenwich that

WHEREAS, the Town Council of the Town of West Greenwich in conjunction with the West Greenwich Planning Board commissioned a study of domestic well testing protocols and reporting, the results of which are contained in the March 5, 2003 report, from Fuss & O'Neill Inc., consulting engineers, entitled *Well Testing Procedures Evaluation*; and,

WHEREAS, the Town Council and the Planning Board have determined that while the Rhode Island Department of Environmental Management has promulgated certain rules and regulations governing the enforcement of Rhode Island law relating to the drilling of drinking water wells, it is necessary to address the need of the current and future population of the Town of West Greenwich for drinking water by enhancing upon the current state regulations.

NOW THEREFORE, the Town Council of the Town of West Greenwich does hereby ordain as follows:

1.0 PURPOSE

It is the intent and purpose of this ordinance to reduce the risk of installation and approval of new domestic wells that may not be capable of producing a sufficient supply of potable water to meet the needs of a given household by instituting requirements to create consistency in the procedures and reliability of the results of quantitative tests performed on newly installed or altered domestic wells.

This ordinance does not supercede regulations promulgated by the Rhode Island Department of Environmental Management (RIDEM) Division of Groundwater and Freshwater Wetlands (Water Resources) as to Rules and Regulations Governing the Enforcement of Chapter 46-13.2 relating to the drilling of drinking water wells (Water Well Regulations). The requirements documented herein have been designed to supplement the existing RIDEM regulations.

All well owners and well installers are required to comply with all currently existing regulations promulgated by RIDEM, the Rhode Island Department of Health (RIDOH), or any other departments or organizations (local, State, Federal or private) that may have jurisdiction over the drilling, installation, testing, documentation, reporting, or treatment of new and/or existing domestic wells in addition to the requirements of this ordinance.

2.0 APPLICABILITY

The ordinance documented herein is applicable to all proposed new or altered domestic wells in the Town of West Greenwich whether or not existing prior to **March 10, 2004**. (*date of adoption of this ordinance*). Only new overburden or bedrock wells to be used as a domestic well, as defined herein, which meet the standards of the Department of Environmental Management and this ordinance shall be permitted.

3.0 DEFINITIONS

All terms utilized in this ordinance shall be consistent with the definitions published in the RIDEM Water Well Regulations, promulgated in December 1989, as may be amended from time to time, and in accordance with the following:

- 3.1 Altering a well: The deepening, reaming, casing, re-casing, perforation, re-perforation, installation of liner pipe, packers, seals, and any other material change in the design or construction of a well.
- 3.2 Domestic Well: A well used to serve one or more residence(s) for the purpose of supplying water for drinking, culinary, or household uses, and which is not a public water supply as defined by the Rhode Island Department of Health.
- 3.3 Effective Storage Capacity: The volume of standing water in a well that is available for removal and use, and is capable of being pumped from the well.
- 3.4 Effective Well Depth: The height of the water column in a well that is available for removal and use (i.e. the distance between the static water level and the pump level).
- 3.5 Recovery: The rise in static water level in a well that occurs when discharge from that well or a nearby well is stopped.
- 3.6 Required Constant Pump Rate: The Town required pumping rate to be maintained throughout the duration of the yield test.
- 3.7 Required RIDEM Well Yield: The minimum yield of a domestic well required by RIDEM, as listed in Section 4.3.1(a).
- 3.8 Well: Any artificial opening or artificially altered natural opening, however made, by which groundwater is sought, or through which groundwater flows under natural pressure, or is artificially withdrawn or injected.
- 3.9 Well Yield: The quantity of water per unit of time which may flow or be pumped continuously from a well.

4.0 REQUIREMENTS

4.1 Well Permit Required

- (a) A well permit is required from the Building Official for all newly installed or altered domestic wells servicing both existing and new residences. Alterations of existing wells that involve pump or electrical repairs or replacement only, shall not require a well permit. A well permit shall be applied for in writing on a form provided by the Building Official of the Town of West Greenwich. The receipt of said permit shall be conditioned upon the following:
1. Notice in accordance with Sections 4.1.1 and 4.1.2 shall be given to the Building Official; and,
 2. Written acknowledgment is given by the applicant of (i) receipt of a copy of this ordinance and the Town's Well Completion Report and (ii) understanding of the requirements set forth herein including but not limited to the receipt of a well certificate in accordance with Section 4.2.
- (b) If an application is being made for a well associated solely with existing residences, the owner of that residence may opt out of the requirements of Section 4.2 upon submission of a written waiver from the Town's consultant review and inspection services. An applicant electing to waive the Town's consultant review and inspection services shall comply with the other provisions of this ordinance including but not limited to the submission of both Town and RIDEM Well Completion Reports, but excluding the certification fee in Section 4.2c.

4.1.1 Notice of Intent to Construct A Well

Prior to the commencement of drilling activities at the site of a proposed domestic well, the well owner or the owner's designee shall provide notice to the Town Building Official of the owner's intent to install a well. Verbal and/or written notice will be received by the Town at least forty-eight (48) hours prior to the commencement of drilling. If, for any reason, the scheduled date(s) of drilling change, the Town will be notified of the new date of drilling at least forty-eight (48) hours in advance of such date. All times specified in this section shall not include weekends and State or Federal holidays.

4.1.2 Notice of Yield Test

Prior to the commencement of yield testing activities at a newly installed domestic well, the well owner, or the owner's designee will provide notice to the Town Building Official of the date and exact time of test commencement. Verbal notice shall be received by the Town at least forty-eight (48) hours prior to the scheduled date of the yield test, and at least two (2) hours notice will be given of the exact start time of the test. If for any reason, the scheduled time or date of the start of the yield test changes, the Town will be notified immediately. The well owner will provide notification of the new time and date in accordance with the notification requirements detailed above. All times specified in this section shall not include weekends and State or Federal holidays.

4.2 Well Certificate Required

- (a) A well certificate is required from the Building Official, prior to the issuance of a building permit for a newly constructed dwelling, for all newly installed or altered domestic wells, unless waived in accordance with Section 4.1 above. Alterations of existing wells that involve pump or electrical repairs or replacement only, shall not require a well certificate.
- (b) Prior to the issuance of a Well Certificate, Well Completion Reports as provided by the Rhode Island Department of Environmental Management and the Town of West Greenwich shall be submitted to the Building Official. Reports shall not be accepted by the Building Official unless and until all information on the report is complete and verified by the Town's consultant as accurate and as consistent with State law and this ordinance. In addition, the Building Official may require additional information from the well driller and additional certification by the Town's consultant.
- (c) Well certification shall be applied for in writing on a form provided by the Building Official of the Town of West Greenwich, and the initial fee for such certification shall be \$250.00 per well to cover expenses incurred by the Town for consultant review and inspection.
- (d) The Building Official shall maintain copies of all well information and certifications and make such information publicly available upon request.

4.3 Yield Test Requirements

A yield test will be performed on all newly installed or altered domestic wells. The yield test will be conducted in accordance with all current State requirements and industry standards, as well as the additional requirements stipulated herein. The duration of the yield test will be a minimum of five hours, and will demonstrate the well is capable of providing a sufficient supply of water for the proposed use. The yield test will be conducted at a constant flow rate for the duration of the test. Requirements supplemental to existing State requirements are discussed below.

4.3.1 Accounting for the Effective Storage Capacity of the Well

To ensure a domestic well is capable of producing the RIDEM enforceable required well yield, the removal of the effective storage capacity of the well shall be incorporate into the yield test. To incorporate the effective storage capacity of a six-inch diameter well into the yield test, the formulas detailed below shall be utilized. If a well owner or installer proposes to construct a domestic well with a diameter other than six inches in size, the following formulas shall be revised by the Town's consultant on a case by case basis. A well owner or installer proposing to install a well with a diameter other than six-inches shall submit a written request to the Town identifying the specific proposed well construction details. The Town's consultant shall then provide revised formulas to determine the well installation and testing requirements.

- a.) Determine the Required RIDEM Well Yield:

The RIDEM required Well Yield, as documented in the Water Well Regulations as may be amended from time to time. For example:

- With a yield of 5 gallons per minute a minimum well depth of 100 feet is required With a yield of 3.5 gallons per minute a minimum well depth of 150 feet is required
- With a yield of 2 gallons per minute a minimum well depth of 200 feet is required
- With a yield of 1 gallons per minute a minimum well depth of 300 feet is required
- With a yield of 0.5 gallons per minute a minimum well depth of 450 feet is required

*Note: the preceding requirements were developed by RIDEM based upon a six-inch diameter well with a static depth to water level of 25-35 feet below the ground surface.

- b.) Determine the **Effective Storage Capacity**:

$$(\text{Depth to top of pump (ft)} - \text{Measured depth to water (ft)}) = \text{Effective Well Depth (ft)}$$

$$\text{Effective Well Depth(ft)} \times 1.5 \text{ (gal/ft)} = \text{Effective Storage Capacity (gal)}$$

- c.) Determine the **Required Constant Pump Rate** to be pumped from the well during the yield test

$$\frac{\text{Effective Storage Capacity (gal)}}{\text{Yield Test Duration (hr)} \times 60 \text{ (min)}} + \frac{\text{Required RIDEM Yield (gpm)}}{\text{gpm}} = \text{Required Constant Pump Rate (gpm)}$$

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** Five hour minimum*

The Required Constant Pump Rate shall be pumped from the well for the duration of the Yield Test.

4.3.2 Location of the Discharge Line

The pump discharge line shall be located so as to eliminate re-circulation of pumped water during the yield test. The discharge point for water pumped during yield tests shall be located at least 50 feet away and topographically lower than the production well.

4.3.3 Collection of Depth to Water Measurements

Depth to water measurements, accurate to within one tenth of one foot, shall be collected at key points during the yield test. Key points include immediately prior and subsequent to the start of the yield test, immediately prior and subsequent to the finish of the yield test, and at a minimum every one half hour during the yield test.

Sufficient depth to water measurements shall also be collected to demonstrate compliance with the Recovery Requirement discussed below.

4.3.4 Recovery Requirement

For wells with an effective well depth of 450 feet or less, the well owner shall demonstrate that the water level in the well has recovered to at least 85% of the static water level (water level measured prior to commencement of the yield test) within 18 hours of the end of the yield test. To demonstrate compliance with the recovery requirement one water level measurement documenting a minimum of 85% recovery shall be collected no more than 18 hours after the end of the yield test. The following formula shall be used to demonstrate compliance with this requirement:

$$\frac{\text{Effective Well Depth @ } \leq 18 \text{th hour}}{\text{Effective Well Depth Static}} \times 100 \geq 85$$

For wells with an effective well depth greater than 450 feet, the well owner shall demonstrate that the well recovers to 85% of the static water level, as detailed above, or that the well recovers at a rate of 20 feet per hour for a period of eighteen hours. To demonstrate compliance with the recovery requirement, one water level measurement collected immediately after the end of the yield test shall be compared to a water level measurement collected no less than 12 and no more than 18 hours after the end of the yield test. The following formula shall be used to demonstrate compliance with this requirement:

$$\frac{\text{Effective Well Depth @ } \# \text{ Hour} - \text{Effective Well Depth @ end of yield test}}{\# \text{ Hours}} \geq 20 \text{ feet}$$

Note # Hour = The number of hours between the end of yield test and the final water level measurement (must be between 12 and 18 to ensure that the average recovery rate of the well is not skewed by rapid recovery immediately following the completion of the yield test).

4.4 Inspections

The Town's consultant may perform un-announced spot inspections during the yield test. During inspections, the Town's consultant may observe the yield testing procedures, discharge location, well location, well depth, and pumping rate, or any other aspect of the well construction or testing procedure deemed relevant by the consultant to verify compliance with RIDEM and Town regulations. The latitude and longitude of the well may also be recorded through the use of a handheld global positioning system (GPS) unit, or other acceptable means.

4.5 RIDEM Well Completion Report

The RIDEM Well Completion Report shall be completed and received by RIDEM and the Town Building Official within fifteen (15) business days of completion of the yield test. The Well Completion Report shall be reviewed by the Town's consultant to assess the accuracy, completeness, and acceptability of the well construction and yield test, and the ability of the well

to provide a sufficient water supply to meet the intended use of the property. Issuance of a building permit from the Town Building Official shall be dependent upon submission and approval of the Well Completion Report by the Town and the Town's consultant.

4.6 Town Well Completion Form

In addition to the RIDEM Well Completion Report, the well owner shall complete the Town of West Greenwich Well Completion Form. The Town Well Completion Form shall be completed and received by the Town Building Official within fifteen (15) business days of completion of the yield test. The Town Well Completion Form shall be reviewed by the Town's consultant to assess the accuracy, completeness, and acceptability of the well construction and yield test. Issuance of a building permit from the Town Building Official shall be dependent upon submission and approval of the Town Well Completion Form by the Town and the Town's consultant.

4.7 Additional Requirements

The Town reserves the right to request additional testing or assessment of any well if any of the RIDEM or Town requirements have not been met to the satisfaction of the Town or the Town's consultant. Incomplete or otherwise deficient Well Completion Reports or questionable yield testing results or construction details may warrant a request for additional testing or assessment.

4.8 Emergency Provisions

Nothing in this ordinance shall preclude the emergency drilling of a drinking water well for a homeowner or tenant on an interim basis in the event a residence loses its water supply. If a well is drilled and installed under this provision, then the homeowner or tenant shall notify the Town Building Official no later than the next business day and will comply with all other provisions of section 4 of this ordinance as soon as possible.