

WELL PROTECTION SOLUTION: NEW TOOLS FOR EDUCATING INDIVIDUALS ON WELLHEAD MANAGEMENT

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Abstract. This paper presents the University of Georgia (UGA) Extension Drinking Water Team's new educational tools that teach well owners about wellhead protection and their role in safeguarding groundwater. In addition, it discusses the delivery methods identified to effectively instruct well owners on wellhead maintenance.

Ninety-five of Georgia's rural residents have their drinking water supplied by private water wells. It is critical these wells function properly and are free of pollutants to provide individuals with drinking water and prevent groundwater contamination. To address these issues, the following materials have been developed by the Georgia Extension Drinking Water Team: "Well...What Do You Know: An Introduction to Protecting Your Wells and Drinking Water" DVD/video, "Improving Drinking Water Well Condition" self-assessment, and "Solutions to Drinking Water Problems: A Clearinghouse of Drinking Water Well Information" website.

INTRODUCTION

Georgians deserve clean, safe drinking water. This means keeping groundwater free of pollutants and contaminants that could harm the environment and human health. Groundwater is a valuable resource to people, as well as the environment. Groundwater supplies many Georgians their drinking water and feeds many lakes, streams, and rivers.

Well owners can protect groundwater by increasing their knowledge of drinking water wells and properly maintaining their wells. By understanding the responsibilities associated with a drinking water well, an owner can develop skills necessary to assess the issues regarding well construction and techniques for well testing. Also with this knowledge, owners will be able to address well problems correctly and quickly, safeguarding groundwater so that it can remain pristine for their use and future generations.

The Georgia Extension Drinking Water Team ¹, a group of specialists focusing on drinking water and groundwater, is responsible for creating educational materials on drinking water well protection using effective and efficient methods for instructing individuals. These educational tools should motivate and encourage well owners to evaluate their wells by presenting information that is of value and relevant to their lives. The development of the educational tools stated in this paper provide the most up-to-date materials in Georgia and take into account the preferences of these individuals for obtaining information on wells.

BACKGROUND AND RELATED WORK

Well owners play a major role protecting groundwater. "Groundwater is susceptible to contamination from a variety of sources, including septic tanks, pesticides, and household chemicals. As hundreds of wells often tap into the same aquifer, it is essential to prevent contamination from reaching these vital underground resources" (Atilas, 2003).

Every Georgia well owner is responsible for their private drinking water well. Wells constructed after 1985 must meet the requirements stated in the 1985 Well Standards Act. This act includes regulations for well drillers and well owners (Well Standards Act 1985, 12-5-134). A way to interpret these regulations is for certified well drillers to follow specified standards such as separation distances and construction practices. Also, it states the role of a well owner in installing a well curbing to protect the well from surface contamination.

To guarantee that a well continues to function properly after its construction, the well owners must

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maintain the well, test the drinking water, check the well's condition, and maintain separation distances so that the well continues to follow regulations. The water quality of a private drinking water well is not monitored or tested by Georgia's regulatory agencies. Therefore, the only way a well owner is certain that the water is safe for drinking is to have it tested.

Educational materials on wellhead protection "need not be new or novel to maintain interest or prompt learning." More importantly, the materials and methods should be based on their relevance to a subject matter, as well as include the methods in which the user can best retain and use the information (King, 1999). Often well owners are confident in their ability to maintain their drinking water well; however, they often lack the knowledge of techniques to implement corrections when the quality of the drinking water does not meet standards and the construction of the well imposes a problem.

METHODS

The educational tools designed by the Georgia Extension Drinking Water Team were developed in a manner to best meet the needs of well owners in Georgia. To do this, team members used their knowledge of the audience, past requests for technical assistance on drinking water wells, a ten-year summary of water test results from UGA's Agricultural and Environmental Services Laboratories, research on the quality of Georgia's groundwater, and research conducted on various delivery methods.

Specific considerations were given for the following tools:

(a.) *Well... What Do You Know: An Introduction to Protecting Your Wells and Drinking Water* is a 20-minute video used to familiarize individuals about drinking water wells. It covers the basic knowledge of groundwater, construction of drinking water wells, testing of drinking water, and wellhead maintenance. In 2003, UGA purchased a down-well camera. The camera captures images from inside wells and checks the well's casing, depth of casing, seepage at joints, corrosion problems, leaks, foreign material, tree roots, and water depth. As time passed, it was evident that the footage from the camera was a valuable educational tool for Georgia well owners. By using "real" examples of problems and local footage of wells, well owners relate similar problems to their wells. The down-well camera footage is presented as part of the video. Also, instructions are given for proper wellhead maintenance.

(b.) *Improving Drinking Water Well Condition, Georgia Farm*A*Syst*, is a self-assessment tool that guides well owners through a questionnaire identifying high-risks associated with their wells. These assessments

are voluntary and confidential allowing a well owner to inspect their own well or use the assistance of a specialist. This self-assessment takes into account new information on drinking water wells. It uses photographs to illustrate the "good, bad, and ugly" of drinking water wells. In addition, it allows an individual to assess other conditions that were a result of new findings obtained by the down-well camera. Now, the self-assessment evaluates casing type as one of the factors potentially impacting drinking water. For example, the casing type ranked as a "high risk" for causing health and environmental problems would be an old and corroded steel casing that cases a well into a confined aquifer such as Georgia's Floridan.

The self-assessment provides well owners a good way to learn. The assessment chart asks well owners to answer a series of questions. A range of answers, which correlates to a risk rankings, is provided as a response to each question. By selecting a response, the well owner can determine where the well ranks on the scale and if they have a low, moderate or high risk situation. Therefore, if a well owner has a high risk situation, reading across the chart quickly indicates to the well owner the best scenario for the well. The assessment also provides technical information on correcting moderate to high risk situations.

(c.) *Solutions to Drinking Water Problems: A Clearinghouse of Drinking Water Well Information* website is under development. The website will use the latest interactive technology allowing well owners to investigate potential problems with their well. The program utilizes the responses of the user to evaluate the physical characteristics of their drinking water and well. By completing the on-line questionnaire, well owners obtain information on potential concerns and find a specialist to help with a problem. Most importantly, the well owners benefit from results being relevant and specific to their situation. For example, if a well owner has blue staining on plumbing fixtures, the program will provide the user with information on copper in water and its impacts. To help address the problem, the user may wish to have the results of the questionnaire sent to their local county Extension agent. If they request additional assistance, local county agents will be able to contact the individual and conduct an on-site visit without having to describe the concern again.

The tools stated above are designed to be used by Georgia's well owners. The resources provide basic information and a foundation on well construction, maintenance, and testing. The *Well... What Do You Know: An Introduction to Protecting Your Wells and Drinking Water* DVD and *Improving Drinking Water Well Condition* self-assessment were available beginning in March 2005. The Georgia Extension Drinking Water Team plans to publicize the materials as part of the County Extension network. These tools can be used

individually or together as part of a large-scale wellhead education program. Work is underway in developing a marketing plan and method to evaluate the success of the educational tools.

The Georgia Extension Drinking Water Team includes county Extension agents. The agents' input is being used to develop these resources into a county-based training program. For example, a county Extension agent or specialist may wish to show the *Well...What Do You Know: An Introduction to Protecting Your Wells and Drinking Water* DVD at the beginning of the training followed by the *Improving Drinking Water Well Condition* self-assessment. The assessment can be distributed or conducted in a group setting with those attending the training.

CONCLUSION

By using their knowledge and understanding of Georgia's well owners and drinking water wells, the Georgia Extension Drinking Water Team has developed useful educational tools to train well owners and protect our groundwater resource. The use of various delivery methods, based on the well owner's preferences for educational resources, provide Georgians with the knowledge they can use and the motivation to maintain their drinking water wells.

If you would like to know more about the resources listed in this paper or receive a copy of the materials, please contact Tina Pagan at 706.542.7661 or email tpagan@engr.uga.edu.

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