

DIAGNOSING WELL RELATED PROBLEMS UTILIZING DIGITAL CAMERA VIDEO RECORDING TECHNOLOGY

Glenn Beard¹ and Paul F. Vendrell²

AUTHORS: ¹University of Georgia ²University of Georgia, Program Coordinator, Agricultural Services Laboratory, 2300 College Station Road, Athens, Ga. 30602

REFERENCE: Proceedings of the 2007 Georgia Water Resources Conference, held March 27–29, 2007, at the University of Georgia.

Abstract. Water quality and quantity issues are important to all facets of society. For the most part, water quality and quantity is something we all take for granted until problems arise such as lack of water, cloudy or discolored water, pump problems, and safety and health issues. When these problems arise, it is necessary to look at the source of the problem for possible diagnosis. Our job as County Extension Agents is to disseminate information, utilize teachable moments, diagnose problems, and recommend possible solutions that will enhance a more healthy and prosperous life. Grant money made available through the administration of the UGA College of Agriculture and Environmental Sciences has now allowed each extension district within the state to purchase one of these video systems to be utilized in our programming. By digitally video recording the well session, we are able to upload the digital video via internet in a compressed format in order for experts from around the world to view the problem and offer possible solution.

METHOD

When water-related issues arose in Colquitt County, we utilized the WELL-VU™ Video Assistance System to inspect several wells looking at possible problems such as joint seal, leaks, grouting and sealing, casing construction, and other natural phenomenon. This system allowed the agents to lower the video camera down into the well and inspect various points as it descended. With the depth measuring component of the system, the agents were able to pin point the precise depth at which possible problems were occurring.

Inspection 1: The first well that was inspected using this system was at a Colquitt County poultry house. The problem associated with this inspection was that the filter at the well continued to clog soon after it was cleaned or replaced making it impossible to obtain clean water for the chickens. The down well system revealed that the well had collapsed below the casing at approximately

370 feet causing sediment problems which clogged up the filter system.

Inspection 2: The second well inspection initiated by the agents was at a private residence and revealed that there was some type of natural formation just below the casing at approximately 200 feet and was emitting some type of gas (possibly carbon dioxide or methane) which in turn was causing the pump to burn up because it was losing prime because of the bubbles. The gas was observed in a bubbling action that was emitted at a crack or fissure along the well wall

RESULTS

Inspection 1: After the agents determined the approximate depth (accurate to within 1 foot), the well driller re-drilled the well and cleaned out the area that had collapsed. At the depth of collapse, the well driller installed a screen which would hold back the loose sediment that was associated with that particular soil layer. Dr. Paul Vendrell, Ag Services Laboratory and water specialist, was on site during the inspection, so it was not necessary to upload the digital video for further inspection and diagnosis.

Inspection 2: After the agents determined the approximate depth to the phenomenon, they then attempted to determine the type of gas that was being emitted. A field test to trap some of the gas was initiated by installing a plastic bag over the top of the well head and sealing with black electricians tape. This device was then left in place for approximately 20 minutes. The agents observed that the bag was beginning to fill with the gas and after a period of time, atmospheric equilibrium was reached and the bag ceased to fill with the gas. The bag (with the gas trapped inside) was removed and a flame was introduced in order to determine if ignition would occur. When the flame, which was introduced into the bag, was extinguished, it led us to believe that the gas was not methane in nature. Since the flame self extinguished, our hypothesis was

that it was possibly carbon dioxide in nature since all oxygen seemed to be excluded from the test device. These are only assumptions since a lab confirmation was not completed on the gas. Once the precise depth to the fissure was discovered, the agents recommended that an additional length of casing be installed that would put the pump below the area of the fissure and the bubbling gases. The pump was then lowered an additional 20 feet below this area which allowed it to prime. Dr. Paul Vendrell, Ag Services Laboratory and water specialist, was on site during the inspection, so it was not necessary to upload the digital video for further inspection and diagnosis. This action was successful.

CONCLUSION

Through a grant provided by the administration of the UGA College of Agricultural and Environmental Sciences, each extension district now has available a digital down camera video recording device which will allow county extension agents and specialists to diagnose well related problems and make possible recommendations for solutions to the problems. Diagnosis of problems in these two wells resulted in solutions which saved the well driller and the owners the expense of drilling new wells and installing new pumps.