



# Grouting of Water Wells

## Subjects

Grouting of water wells, well construction, groundwater use, groundwater protection

## Audience

Homeowners, legislators, governmental officials, building contractors, water well contractors

## Background

Sealing or grouting a well consists of filling the annular space, created during the well construction between the underground geological formations and the casing, with an impervious material. The principal reasons for grouting are (1) protection of the groundwater resource from surface and/or subsurface contamination, (2) preservation of the hydraulic characteristics of an artesian aquifer, and (3) sanitary protection of the water supply. In addition, secondary reasons include the protection of casing from corrosive waters, and increased structural integrity of the casing.

Forty-six percent of the U.S. population uses groundwater for their drinking water source. Approximately 95 percent of rural residents depend entirely on this resource for their domestic uses. Census figures indicate that during 2007 there were 13,249,000 occupied households served by private water wells. The federal Safe Drinking Water Act's provisions, which are intended to protect public drinking water, do not extend to private household wells.

The Michigan Department of Health has identified cases where improper grouting practices or lack of grouting in unconsolidated materials is suspected of causing leakage of contaminants downward along the well casing into lower potable aquifers. In addition, many cases have been documented in Michigan showing that a lack of grouting or improper grouting has contributed to the contamination of bedrock aquifers.

Proper grouting of wells, on the other hand, can prevent contamination. In the *Gateway Area Development District Water Well Study*, the Kentucky Division of Water and the Kentucky Geological Survey report: “It was noted that the majority of wells which appeared to be properly constructed and had proper wellhead seals did not have a bacterial contamination problem.”

## Issue

Should all water wells be grouted? Should laws and regulations be adopted to this effect?

## Position

The National Ground Water Association believes that the grouting of water wells is an effective and necessary measure to protect public health and the quality of our groundwater supplies.

Requirements for the grouting of all water wells should be an integral part of a state’s well construction code. As a follow-up to this, enforcement of the code must be carried out by governmental agencies in an aggressive manner with sufficient funding provided by the state legislature to support this effort.

**The grouting of water wells is an effective and necessary measure to protect public health and the quality of our groundwater supplies.**

To protect against contamination by surface or shallow subsurface waters, an annular space of appropriate size should be constructed and grouted to whatever depth is necessary to protect the groundwater resource. In determining the grouting requirements of a specific well, consideration must be given to existing surface conditions, especially the location of potential pollution sources, and to subsurface geologic and hydrologic conditions. The surface seal depth may vary from as little as 10 feet to more than 100 feet depending upon conditions.

Subsurface formations that yield water of undesirable quality must be adequately sealed off to prevent contamination of the overlying or underlying water-bearing zones. To accomplish this, an annular space of appropriate size should be constructed and grouted.

Where the grout is to be placed under water or where the annular space to be sealed is not easily accessible from the surface, positive emplacement of grout by tremie, pumping, or pressure is recommended.

For information on grouting techniques, refer to the *Manual of Water Well Construction Practices*, U.S. EPA, 1975, and the *Michigan Water Well Grouting Manual*, Michigan Department of Public Health, 1988.

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## References

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## Dates

*Originally adopted by the NGWA Board of Directors on October 28, 1989, NGWA issue briefs are updated as needed to reflect changes in information, as noted here: technical amendment made February 4, 1992; brief reformatted August 2009; contact updated April 19, 2012; technical update March 26, 2015; technical update February 24, 2016.*

The National Ground Water Association is a not-for-profit professional society and trade association for the global groundwater industry. Our members around the world include leading public and private sector groundwater scientists, engineers, water well system professionals, manufacturers, and suppliers of groundwater-related products and services. The Association's vision is to be the leading groundwater association advocating for responsible development, management, and use of water.



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