

IGI PRIVATE WATER WELL GUIDELINES

In March 2007, Institute of Geologist of Ireland published “Water Well Guidelines” compiled by a working group of the IGI

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This document aims to provide a non-technical description of groundwater: how it occurs, how it moves underground and the basic principles behind construction and operating a borehole as a sustainable source of high quality water. The aim is to demystify groundwater and boreholes and enable a private householder, in particular, to understand the principles behind siting, constructing and pumping a borehole.

The occurrence and movement of groundwater, and the design and operation of a borehole water source, depend on a simple principle- ***water below ground, like water on the surface, always tries to flow downhill.*** If water cannot flow one way because its route is blocked or constricted, then it flows another way- an easier way- always trying to move to a lower elevation under the pull of gravity. The ultimate destination (or base level) to which water moves is sea level. All water, on or under the ground, is moving back towards the sea. Some groundwater, near the coast, flows directly through the soil and rock to the sea. Further inland, groundwater flows through the soil and rock to the bottom of the nearest valley, into the stream or river on the valley floor, and thence to the sea. Much of the flow in rivers and streams is groundwater, except during, and shortly after, heavy rain. Most of the time, rivers and streams act as ‘groundwater drains’.

With this principle in mind, and the information in this document, any householder can use their common sense to understand what a driller is doing in constructing and equipping a borehole for domestic use.

OBJECTIVES

The owner of a New Water Well should be able to have confidence that the well has been constructed according to accepted standards in relation to the following:

- Equipment, materials and techniques used in construction of the well
- Verticality and straightness of the well
- Sanitary security and disinfection of the well

The owner should also be supplied with the following:

- A record of an appropriate test of the sustainable yield of the well
- Documentation of the well construction, its yield and its water quality

The adoption of these guidelines should:

- Protect the environment and public health by reducing groundwater contamination via poor well construction, abandoned boreholes and cross-contamination between aquifers.
- Reduce the need to replace contaminated wells.
- Prevent wells being located in unsuitable locations.
- Improve standards of well drilling, leading to longer-lasting and more efficient wells.

SCOPE

Two documents within the IGI Guidelines are concerned with the construction, testing and decommissioning of water wells. They draw on standard and guidance notes from other countries.

Explaining Groundwater and Water Wells provides a non-technical description of groundwater, its occurrence, the way it moves and the basic principles behind constructing and operating a borehole as a sustainable source of high quality water. It is written primarily for private householders who have a water well or who wish to have a water well drilled. Its aim is to demystify groundwater and boreholes and give the private householder enough information to understand the principles needed to site, construct and pump a borehole.

Water Well Construction Guidelines deals with the location, testing, sampling and sealing (decommissioning) of wells. It is written for well owners, well drillers, engineers, planners, architects and anyone else concerned as a practitioner or customer:

Section 1 Provides guidelines for the siting of new water wells in relation to potential sources of contamination.

Section 2 Addresses water well construction, wellhead completion and protection, well development and disinfection.

Section 3 Provides guidelines for water well pumping tests.

Section 4 Reviews analytical and analysis.

Completing a well in line with these guidelines will improve the likelihood of good groundwater quality but does not guarantee that the groundwater in the well will meet drinking water standards.

ESSENTIAL RECOMMENDATIONS AND PROPOSALS

1. Water wells should be drilled in locations which minimize the likelihood that the well will be polluted by, for example, septic tanks, farm-yard run off of slurry spreading.

Reason: so that wells will be drilled in appropriate locations, and avoid inappropriate location where pollution is likely.

2. Wellheads should be constructed so as to ensure that surface water and shallow groundwater, which are likely to be polluted, cannot enter the well. Wells must be cased and grouted to an adequate depth, the casing and grout must meet certain minimum standards and the placing of the casing and grout must meet a certain specification.

Reason: to prevent pollution of wells and protect human health.

3. Water well drillers and their equipment methods should meet certain minimum standards. The equipment should be clean, and drilling should not introduce any polluting into the ground.

Reason: to prevent pollution of wells and aquifers and protect human health.

4. Water wells should be cleaned and disinfected before being brought into use. The methods and materials should meet certain minimum standards.

Reason: to protect human health.

5. Water wells should be tested for yields and quality. A mandatory list of tested chemical and bacteriological parameters should be specified.

Reason: to protect human health and protect the consumers' interests.

6. Water well drillers should be facilitated to form a self-regulatory organisation which would certify the competence of drilling companies and individual drillers to meet the above requirements.

Reason: to ensure that drillers are trained to carry out all aspects of well construction to the required specifications, and to underpin consumer confidence.

7. Water wells no longer required for any purpose should be sealed (decommissioned) to specific standards.

Reason: to prevent pollution or aquifers.

8. Drilling of water wells should be brought within the planning system and Building Regulation, just like, for example, septic tanks.

Reason: to ensure that appropriate conditions and specifications can be attached and enforced, in order to protect human health.

These guidelines primarily address the problems of unsatisfactory siting and construction of wells for domestic and farm water supply, where (at present) no consultants are likely to be involved and no public regulation is involved except possibly the payment of a grant.

The guidelines are not concerned with observation wells or monitoring wells, since these are normally designed and supervised by competent consultant.