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# ENVIRONMENTAL Fact Sheet

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WD-DWGB-1-1

2010

## Overview of Water Supply Sources

This is the first in a series of fact sheets regarding sources of drinking water supply commonly used in New Hampshire. All of the Drinking Water and Groundwater Bureau's fact sheets can be found at <http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/index.htm>.

### Types of Water Supply Sources

#### Surface Water Sources

Approximately 60 surface water supplies are used as sources of public water supply in New Hampshire. The Department of Environmental Services strongly recommends that surface waters *not* be used as the source of drinking water for private homes due to their risk of contamination by bacteria and other disease-causing organisms. Refer to the fact sheet WD-DWGB-1-11 "Use of Lakes or Streams for Domestic Water Supply" for more information.

#### Groundwater Sources

New Hampshire is relatively water rich. Wells that take water from unconsolidated soil and rock deposits (above the bedrock) are only feasible where the soils are sufficiently porous to transmit water and where the saturated zone (the area below the water table and above the bedrock) is sufficiently thick to resist drought effects. Bedrock wells (also called drilled or artesian) are easily developed throughout the state, with a few exceptions.

Well drillers and pump installers in New Hampshire are licensed by the Water Well Board. The rules of the board are numbered We 100-900. There are no state requirements relative to water quality or quantity for private home wells. Some towns have local requirements for private water wells. State rules are available online at <http://des.nh.gov/organization/commissioner/legal/rulemaking/index.htm>.

The frequency of iron, manganese, taste and odor is approximately the same in all types of wells in New Hampshire. As noted below, some types of natural contamination are quite common in wells. For DES's testing recommendations, please see fact sheet WD-DWGB-2-1 "Suggested Water Quality Testing for Private Wells."

## **Bedrock (Artesian or Drilled) Wells**

Most wells in New Hampshire are drilled into bedrock. From 2000 to 2010, an average of about 4,350 bedrock wells were drilled annually in New Hampshire. The median depth of bedrock wells drilled in New Hampshire during that period was 365 feet and the median yield was 8 gallons per minute (gpm). The yield of bedrock wells can be improved by two processes. Before drilling, the placement of the well can be guided by fracture trace analysis, which aims to identify areas where wells are more likely to encounter high-yielding fracture zones in the bedrock. Once drilled and where outputs are low, the well's yield can often be improved by hydrofracturing. Hydrofracturing is explained in fact sheet WD-DWGB-1-3 "Bedrock Well Development by Hydrofracturing." Bedrock wells are typically the most expensive to construct. The operations of bedrock wells are also expensive because of the electrical energy needed to lift the water from deep in the ground. For more information on bedrock well design, refer to the fact sheet WD-DWGB-1-2 "Bedrock (Artesian, Drilled) Well Design."

Bedrock wells generally have few incidents of bacteria contamination, but tend to have high levels of naturally occurring contaminants, often at levels that pose a risk to human health. Approximately 55 percent of bedrock wells in New Hampshire have levels of radon gas above the DES recommended action level of 2,000 picoCuries per liter (pCi/L). Arsenic exceeding the health-based limit of 10 ug/L is present in 20 percent of bedrock wells. Hardness minerals are typically higher in bedrock wells as opposed to sand and gravel wells.

## **Wells in Soil**

**Point Wells.** These wells capture water in the loose soil deposits. Fewer than 2 percent of the wells in New Hampshire are point wells. These wells are typically 2 to 3 inches in diameter and located in fine sandy soil. For more information, refer to the fact WD-DWGB-1-6 "Point Well Design." These wells have low construction and operational costs but are subject to drought effects and to manmade contamination from many "backyard" activities. Point wells generally have few incidents of bacteria contamination.

**Dug Wells.** These wells also capture water in the upper unconsolidated soil and rock deposits. Fewer than 10 percent of all wells in New Hampshire are dug. Historically dug wells were made from fieldstone. More modern dug wells are made from precast concrete components. Refer to the fact sheet WD-DWGB-1-4 "Dug Well Design" for more information. The construction cost of a dug well is typically between those of a point well and a bedrock well. The operational cost of a dug well is low. Dug wells can be sensitive to drought effects if not sufficiently deep and they are subject to manmade chemical contamination from many "backyard" activities. Poor configuration and aging of the construction materials can contribute to frequent bacterial problems.

## **For Additional Information**

Please contact the Drinking Water and Groundwater Bureau at (603) 271-2513 or [dwgbinfo@des.nh.gov](mailto:dwgbinfo@des.nh.gov) or visit our website at <http://des.nh.gov/organization/divisions/water/dwgb/index.htm>. All of the bureau's fact sheets are available online at <http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/index.htm>.