STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
BUREAU OF RESOURCE INFORMATION & LAND USE PLANNING
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Comprehensive Planning Resource Package
Geologic Information from the Maine Geological Survey
RAYMOND
November 2022

Significant sand and gravel aquifer maps:

Neil, Craig D. (Compiler), and Locke, Daniel B. (Mapper), 1998, Significant sand and gravel aquifers in the Mechanic Falls quadrangle, Maine: Maine Geological Survey, Open-File Map 98-152, map, scale 1:24,000.

Neil, Craig D. (Compiler), and Hildreth, Carol T. (Mapper), 1998, Significant sand and gravel aquifers in the Naples quadrangle, Maine: Maine Geological Survey, Open-File Map 98-154, map, scale 1:24,000.

Neil, Craig D. (Compiler), and Retelle, Michael J. (Mapper), 1998, Significant sand and gravel aquifers in the Raymond quadrangle, Maine: Maine Geological Survey, Open-File Map 98-155, map, scale 1:24,000.

Neil, Craig D. (Compiler), and Hildreth, Carol T. (Mapper), 1998, Significant sand and gravel aquifers in the Sebago Lake quadrangle, Maine: Maine Geological Survey, Open-File Map 98-157, map, scale 1:24,000.

Neil, Craig D. (Compiler), Bolduc, Andree M. (Mapper), Thompson, Woodrow B. (Mapper), and Meglioli, Andres (Mapper), 1998, Significant sand and gravel aquifers in the North Windham quadrangle, Maine: Maine Geological Survey, Open-File Map 98-158, map, scale 1:24,000.

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More information from the map explanation:

WHAT IS AN AQUIFER?

Ground water, as the name implies, is water found below the land surface in the pore spaces between sand grains and in fractures in the bedrock (see diagrams below). An *aquifer* is a water-bearing geologic formation capable of yielding a usable amount of ground water to a well. In Maine there are two types of aquifers; loose soil materials (such as sand, gravel, and other sediments) and fractured bedrock. A sand and gravel deposit is considered a *significant aquifer* when a well in that deposit is capable of being continuously pumped at a rate of 10 gallons per minute (gpm) or more. To sustain a yield of 10 gpm or more, a deposit must be permeable enough for water to flow readily into the well as it is pumped (see section on *porosity* and *permeability* below), and there must be a sufficient depth of water in the well so that it will not be pumped dry.

The diagram below shows a schematic cross section of a sand and gravel aquifer in Maine. The symbols above the diagram correspond to the well symbols shown on the map at left. Information typically shown for these wells includes type of well, depth to bedrock, depth to water, and well yield. The blue line in the diagram is the *water table*. The area below the water table is called the *saturated zone*, where all pore spaces between the sediment particles are filled with water. In order to yield water, a well must extend below the water table into the saturated zone. Notice that the water table corresponds to the water level in most wells and in the stream.

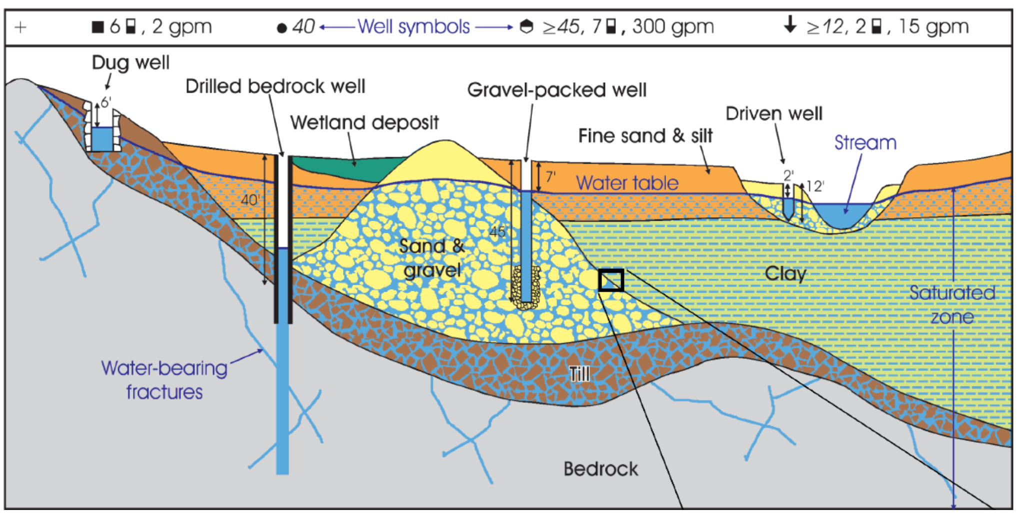
Several types of wells, common in Maine, are shown in the diagram. A *dug well* is a large diameter hole excavated by hand or backhoe. The hole is kept from caving in by installing a lining that may be stone, tile, or cement blocks. The hole must be deep enough to extend below the water table. The shallow dug well in the diagram has a yield of 2 gpm. Although the yield is often low, dug wells generally supply enough ground water for a household because of the large amount of water stored in the well.

A *gravel-packed* well is usually installed into coarse-grained sediment and is drilled with a much larger diameter than the final casing and screen diameter. To increase the yield and pumping efficiency of the well, the space around the well screen is filled with selected gravel that increases the permeability in the immediate vicinity of the well. The gravel-packed well in the diagram has a high yield of 300 gpm. Such high-yielding gravel-packed wells are commonly drilled for municipal or industrial water systems.

A *driven well* or *well point* can be installed into sand and gravel where the water table is within about 20 feet of the ground surface. A 2 to 3 inch diameter pipe, equipped with a well screen at its lower end, is driven into the deposit until the screen is below the water table. This pipe acts as a casing, and water is pumped directly from the aquifer. The driven well in the diagram has a significant yield of 15 gpm. Although the yield is relatively high, driven wells generally only supply a single household because very little water is stored in the well casing.

Wells of any type constructed in the other sediments shown in the diagram (clay or fine sand and silt) would yield some water, but yields would be lower than for wells in coarse-grained sand and gravel deposits.

Another type of well common in Maine is the *drilled bedrock well*. This well is drilled into the underlying rock with steel casing to isolate the well from potential surface-water contamination. In this type of well, water is found when the well hole intersects water-bearing fractures in the bedrock. Notice how the water level in this well is not the same level as the water table. The well casing isolates the bedrock well from the overlying sediments. The water level is controlled by water pressure in the fractures in the bedrock and is not related to the water table in the overlying materials.



Surficial geology maps:

Hildreth, Carol T., 2001, Surficial geology of the Mechanic Falls quadrangle, Maine: Maine Geological Survey, Open-File Map 01-478, map, scale 1:24,000.

Hildreth, Carol T., 2001, Surficial geology of the Mechanic Falls quadrangle, Androscoggin, Cumberland, and Oxford Counties, Maine: Maine Geological Survey, Open-File Report 01-479, 5 p.

Bolduc, Andree M., Thompson, Woodrow B., and Meglioli, Andres, 1997, Surficial geology of the North Windham quadrangle, Maine: Maine Geological Survey, Open-File Map 97-41, map, scale 1:24,000.

Hildreth, Carol T., 1997, Surficial geology of the Naples quadrangle, Maine: Maine Geological Survey, Open-File Map 97-50, map, scale 1:24,000.

Hildreth, Carol T., 1997, Surficial geology of the Sebago Lake quadrangle, Maine: Maine Geological Survey, Open-File Map 97-53, map, scale 1:24,000.

Retelle, Michael J., 1997, Surficial geology of the Raymond quadrangle, Maine: Maine Geological Survey, Open-File Map 97-57, map, scale 1:24,000.

Hildreth, Carol T., 1997, Surficial geology of the Naples 7.5-minute quadrangle, Cumberland County, Maine: Maine Geological Survey, Open-File Report 97-65, 9 p.

Hildreth, Carol T., 1997, Surficial geology of the Sebago Lake 7.5-minute quadrangle, Cumberland County, Maine: Maine Geological Survey, Open-File Report 97-68, 7 p.

Retelle, Michael J., 1997, Surficial geology of the Raymond 7.5-minute quadrangle, Cumberland County, Maine: Maine Geological Survey, Open-File Report 97-72, 8 p.

Bolduc, Andreé M., Thompson, Woodrow B., and Meglioli, Andres, 1997, Surficial geology of the North Windham 7.5-minute quadrangle, Cumberland County, Maine: Maine Geological Survey, Open-File Report 97-75, 7 p.

Hanley, John Bernard, 1959, Surficial geology of the Poland [15-minute] quadrangle, Maine: U. S. Geological Survey, Geologic Quadrangle Map GQ-120, map, descriptive text, scale 1:62,500.

Surficial geology information

Surficial deposits are the unconsolidated earth materials that overlie bedrock. They cover a large percentage of the State and include sediments deposited by wind, water, and glacial ice. Glacial deposits are by far the most abundant surficial materials in Maine. Consideration of surficial materials is important for land-use planning. The properties of these materials affect their values as aquifers, landfill or sewage disposal sites, construction sites, and sources of gravel and other resources.

Glacial sand and gravel deposits: These coarse-grained deposits are often good groundwater aquifers; sources of gravel aggregate

Glacial marine mud and lake deposits: these fine-grained deposits are poorly drained and are the material in which most landslides occur in Maine.

Further information can be found in Bulletin 44: Surficial geology handbook for southern Maine.

General ground water information:

Caswell, W. Bradford, 1987, Ground water handbook for the State of Maine: Maine Geological Survey, Bulletin 39, 2nd edition, 135 p., 78 figs., 5 tables. Maine Geological Survey Publications. 180. http://digitalmaine.com/mgs_publications/180.

Potential zones of high ground water transmissivity (bedrock) maps:

There are no transmissivity maps for the town.

Additional information

https://www.maine.gov/dacf/mgs/pubs/digital/transmissivity.htm

Water well data base:

Web page: https://www.maine.gov/dacf/mgs/pubs/digital/well.htm

The Water Well Information Law, passed in 1987, requires the Maine Geological Survey to collect information on new water wells in Maine. This information is essential to any effort aimed at understanding Maine's ground water resources. In addition, the information is useful to communities considering new water supplies or in their planning efforts, to developers and businesses, to consultants investigating water supply or quality issues, to drillers, and to agricultural irrigators.

Landslide susceptibility:

There are no landslide susceptibility maps for the town.

Additional information

http://www.maine.gov/dacf/mgs/pubs/mapuse/series/descrip-slide-suscep.htm

Landslide Sites and Areas of Landslide Susceptibility Maps

Read the map sidebar (pdf).
Read the map explanation (pdf).
List of **ONLINE** landslide susceptibility maps

What are areas of landslide susceptibility?

Landslides are a common geologic hazard in Maine. Although they usually occur on a small scale and cause minimal damage, recent increased damage from landslide activity in the state has raised awareness of this hazard and has demonstrated the need to examine the landslide threat on a regional basis. Areas susceptible to future landslides are mapped based on geologic and terrain-related risk factors. The primary geologic factor influencing landslide susceptibility is sediment grain size. Geologic mapping shows that a majority of earth movements occur in fine-grained sediments such as clay, silt, and mud, which are prone to move by slumping, sliding, or creep when saturated with water. The most important terrain-related risk factor influencing slope stability is the steepness of the slope. Additional terrain-related risk factors that increase landslide susceptibility include slope aspect, slope curvature, and local relief.

Landslide Sites and Areas of Landslide Susceptibility Maps

Landslide Susceptibility Maps show locations and types of known landslides and areas susceptible to future landslide activity in southern Maine. The map explanation (pdf) and map sidebar (pdf) contain additional information describing geologic and terrain-related factors influencing landslide risk.

Uses of landslide susceptibility information

This map can be used to identify areas with historical landslide activity and to identify areas that are susceptible to future landslide activity. In these areas, additional steps should be undertaken before construction or other development is started that could be at risk due to a future landslide.

Landslides in Maine: An Introductory Guide:
https://storymaps.arcgis.com/stories/a7d6d4f20bcc4b8daf9822177b671f91

All maps, reports, and digital data are available from the Maine Geological Survey at:
http://www.maine.gov/dacf/mgs/.
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