Contoocook Artesian Well Co.
COMPLETE WATER SYSTEMS

Artesian Wells and Dug Wells: What's the difference?

LEARN ABOUT THE CONSTRUCTION AND WATER QUALITY OF BOTH WELL TYPES

It's important to share with you, the reader, that Contoocook Artesian Well does not construct dug or shallow wells. We drill only artesian wells, because we consider them superior in construction and water quality to a dug or shallow well. Artesian wells reach deep into ground water sources that have been filtered through great depths of rock and sand to reach underground aquifers. An aquifer is an underground reservoir of water that is pumped through wells to homes, businesses, cities, crops, and landscapes.

Artesian wells are deeper, allowing water to be filtered naturally through stone. Half of the population drinks groundwater rising from underground reservoirs. The area filled with water is called the saturated zone. The top of the water is called the water table. The water table may be very near the ground surface or hundreds of feet below it.

In Artesian wells, a steel casing pipe is set in solid ledge to contain the well hole. Most dug wells are shallow and lack continuous casing. The lack of casing makes them subject to contamination from nearby surface sources.

Historically, dug wells were excavated by hand shovel. The dug hole extends below the water table until incoming water exceeded the digger's bailing rate. Stones, brick, tile, and other material line the well to prevent collapse. A cap of wood, stone or concrete covers the hole.

A dug well is more likely to go dry during periods of drought if the water table drops below the well bottom. An Artesian well is capable of holding a great amount of water in its borehole, and can reach deeper underground into aquifers that are below the water table.

Artesian wells drilled into bedrock can sometimes experience the same taste and odor problems that dug wells do. Dug wells experience iron, manganese, and taste and odor conditions approximately as often as bedrock wells. Dug wells are more likely to experience bacterial problems cause by poor design and construction materials.

HOW IS AN ARTESIAN WELL DRILLED IN THE GROUND?

Drilled wells probe deep into underground water sources that have benefited from nature's filtration system. Bacteria and viruses are removed when the water percolates down through the soil layers.

Drilled wells can be constructed by one of two methods. The rotary method is fastest. It uses a rotating shaft and drill bit to bore through compacted sand, gravel, clay or glacial till. Mud slurry is mixed with drilled materials, and flows to the surface.

Once the topsoils are drilled through into solid bedrock, a steel pipe is inserted into the borehole. This pipe extends from the land surface into bedrock. This process, known as casing out the borehole, prevents overlying materials from caving in. This also stops well contamination from surface water.

To prevent contamination by water draining from the surface downward around the outside of the casing, the space around the casing is sealed. Then a well cap is tightly secured onto the casing, over the well opening.

When a drilled well reached into an aquifer, it can supply water as quickly as it is pumped through a submersible pump. Pumps are sized by horsepower according to the depth and volume of water in the well.

Drilled wells are constructed by either pounder or rotary-drilling machines. Contoocook Artesian Well drills with rotary drilling machines made by Ingersoll Rand. The wells we drill with rotary machines penetrate stone formations called ledge, which keep out over burden sediment and adds backbone to the structure underground.

LARGE CASING MEANS MORE READILY AVAILABLE WATER

Contoocook Artesian Well constructs its wells with a 6½ inch hold, because of the exponentially higher volume the borehole can hold in the well. The half-inch accumulates over hundreds of feed of holding water that's available for immediate use. A standard small diameter well casing, or steel pipe is 4 to 6 inches.

A well's yield may change with time. A seasonal variation or long-term trend can affect the depth greatly. It is not uncommon to have a 500-plus foot variation between early Spring and late Fall ground water levels in certain towns in New Hampshire. A well that has a greater storage maximizes its volume of water available for immediate use.

HOW POLLUTED IS MOST GROUNDWATER?

Groundwater comes from rain, snow, sleet and hail once it soaks into the ground. Gravity moves the water into the ground between particles of soil, sand, gravel, or rock. The moisture continues until it reaches a depth where the ground is filled, or saturated, with water.

Most groundwater is clean, but groundwater can become polluted or contaminated. It can become polluted from leaky underground tanks that store gasoline, leaky landfills, or when people apply too much fertilizer or pesticides of their fields or lawns. When pollutants leak, spill, or dump on the ground they too move through the soil.

Because it is deep in the ground, groundwater pollution is generally difficult and expensive to clean up. Sometimes people have to find new places to dig a well because their own became contaminated.

ARE DUG WELLS MORE SUSCEPTIBLE TO DROUGHT?

Yes, they are more susceptible to drying up during droughts. The seasonal high water table is determined based on color change of the soil by soil experts. However, it can be difficult to determine the seasonal low water table from year to year.

According to the Vermont Department of Health in Burlington, VT, a dug well is generally more vulnerable to surface water contamination because it draws from shallow water tables. The guidelines in New Hampshire different from those in Vermont, but it is helpful to consider guidelines from the Department of Environmental Safety:

- The well should be located at least 100 feet from all sources of contamination
- If the soil, geology, and slope of the land dictate the need, an even greater distance may be required.
- The well should be located uphill of septic systems, barnyards, livestock pastures, and fuel tanks.
- It must be at least 25 feed from streams and ponds
- Dug wells should not be located in extremely wet areas
- Disinfect all newly dug or repaired wells

HOW ABOUT SPILLS OF FERTILIZERS, PESTICIDES, AND CHEMICALS NEAR A DUG WELL?

Since dug wells take water from the highest water table, they are extremely sensitive to activities that take place in the immediate vicinity of the well. Chemical hazards to a well include spillage of fertilizer, pesticides, and inappropriate disposal of old crankcase oil, antifreeze or solvents, or waste salt brine from water softeners.

The use of chemicals in your backyard, or by uphill neighbors, may negatively affect the quality of the water table from which your dug well draws. Laboratory test for these chemicals can be costly. The best and least costly approach to protect water quality is prevention of pollution rather than treatment after the fact.

- Be careful with use and disposal of chemicals near and upstream of your well
- Since most zoning codes require a 10-foot setback, this distance is effectively 65 feet.
- A well should not be placed in location subject to ANY flooding unless the immediate vicinity (25 foot radius) of the well is built up above the maximum flood level.
- If the placement is made necessary within 75 feet, a set back reduction form must be signed by the well owner and given to the Department of Environmental Sciences (DES), the town health officer and the registry of deeds.

HOW DO I KNOW HOW MUCH WATER MY WELL IS PRODUCING?

What a well can produce is measured by a pump test. The accurate yield of a newly completed well can be determined (and the well can be flushed) by pumping water continuously over 24 or more hours.

The pumping rate should be measured by noting the number of minutes required to fill a known volume container (such as a 5 gallon bucket). The water level in the well should be measured as the pumping continues. Measuring the drawdown is the most difficult portion of the pump test.

The pump test measure the equilibrium between the amount of water being pumped out of the well and the amount that is replenished naturally from the ground.

WHICH WELL DO I CHOOSE?

Contoocook Artesian Well drills artesian wells, so it is only natural that we would like for you to choose an artesian well.