wellcare™ information for you about Wells

More than 15 million households in the United States use individual wells to supply water for their families. Water from modern wells is naturally filtered and is cool, natural and pure.

Three Basic Types of Wells

Bored or "Shallow" Wells are usually bored into an unconfined water source, generally found at depths of 100 ft. or less.

Consolidated or "Rock" Wells are drilled into a formation consisting entirely of a natural rock formation that contains no soil and does not collapse. Their average depth is about 250 ft.

Unconsolidated or "Sand" Wells are drilled into a formation consisting of soil, sand, gravel or clay material that collapses upon itself.

Well Construction

All private well construction is based on establishing the right location for the well, sizing the system correctly and choosing the proper construction techniques. Only a professional water well contractor should install a well! They know the hydrogeology in your area and all the local codes and regulations for wells. They also have the modern equipment and expertise needed to make sure that your well is properly constructed to meet the water needs of your family.

Your well is located on your property according to certain regulations required by the state. These regulations are designed to protect the integrity of your water supply. In addition, the well driller uses his experience and expertise to locate the well at a spot on your property that is suited to your lot size, the location of existing structures and utilities and the most likely location for a good supply of water.

Proper sizing is crucial to the construction and performance of your well system. Your system is designed to suit the needs of your household. Factors considered when sizing your system included such things as number of bathrooms, bedrooms and occupants, and anticipated water use for extras such as swimming pools, irrigation, spas or whirlpool baths.

Proper well construction is the key to operating and maintaining your well. The initial cost of a properly constructed well may be somewhat higher. However in the long run, a properly constructed well results in improved efficiency, less maintenance and longer well life.

Your Well

Your well is constructed of quality materials, designed to prolong its life and performance. The following is a list of the most important materials used in construction of your well:

Casing is used to maintain an open access in the earth while not allowing any entrance or leakage into the well from the surrounding formations. The most popular materials used for casing are black steel, galvanized steel, PVC pipe or concrete pipe.

Grout is a sealant that is used to fill in the spaces around the outside of the well. It protects the well against the intrusion of contaminants. A grout mixture can be made of neat cement, bentonite or concrete, each used separately.

Screen keeps sand and gravel out while allowing ground water and water from formations to enter into the well. Screen is available in many materials, the most popular being stainless steel and PVC. Screen is used when wells are drilled in unconsolidated materials.

Gravel Pack is placed around the outside of the screen to prevent sand from entering the well or clogging the screen and to stabilize the well assembly.

The modern drilling process makes use of sophisticated technology. Two drilling methods are commonly used for private wells:

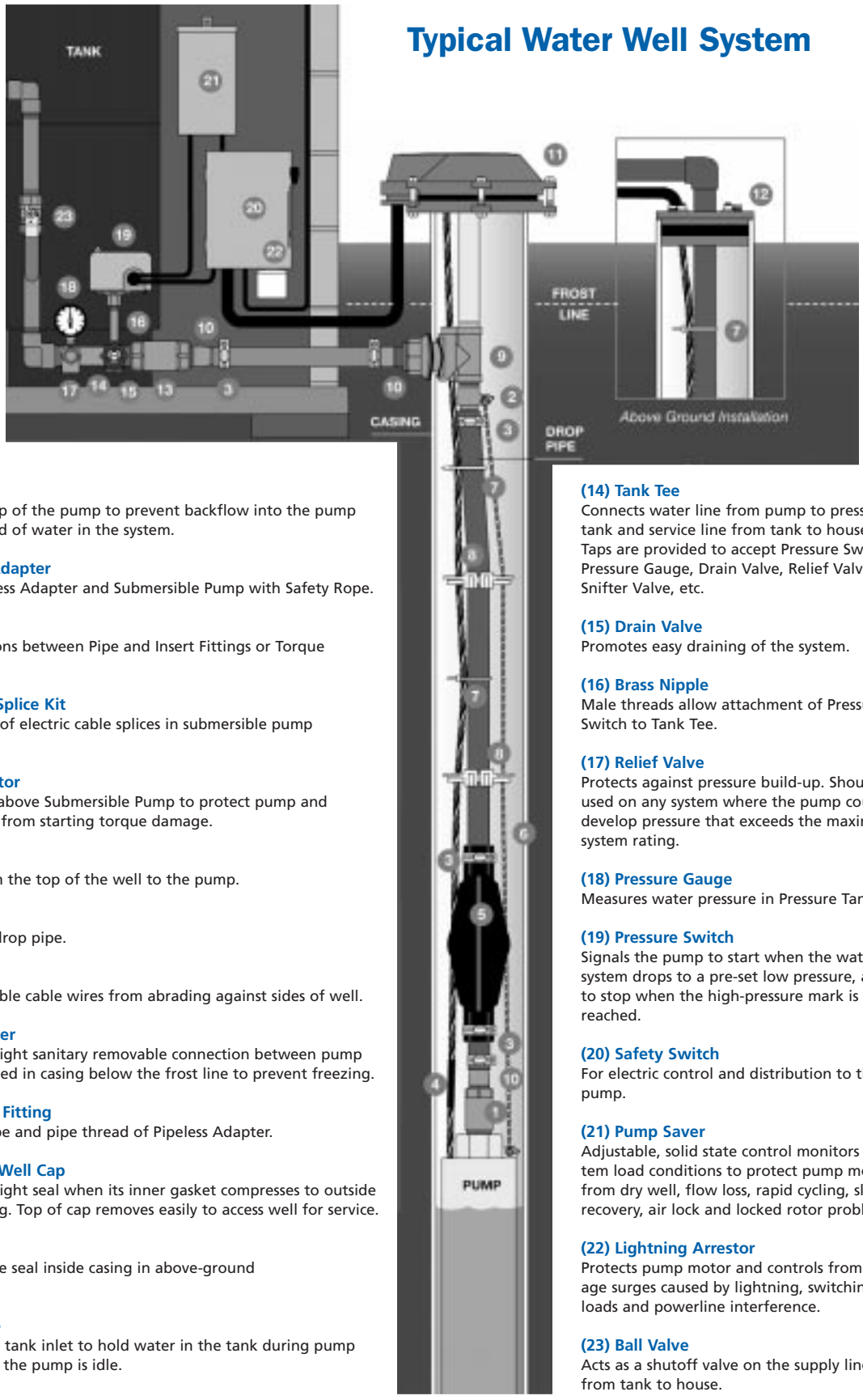
Air rotary drilling: A drill rig or truck outfitted with a large drill is driven onto the well site. The drill is lowered to the ground and turned on. As the drill spins, a hammer at its end smashes rock and soil creating the well shaft. The hammer is powered by air that is shot through the drill at very high speed.

At the same time, water is pumped around the drill to make the drilling easier. As the drill moves down, the same air that moves the hammer clears out the broken rock, dirt and excess water. When the drill hits a solid rock formation, a casing is placed in the well shaft to keep unwanted materials from entering the opening. Drilling then continues into the rock until water is found. The space between the casing and the ground is then filled with grout and the well is cleaned and capped.

Mud rotary drilling: Mud rotary drilling is used to drill where the soil is loose and sandy. It is similar to rotary drilling except that as the drill bit spins, a fluid (drilling mud) shoots down through the middle of the drill, then flows out at very high speeds at the sides and the tip of the drill. Without this fluid moving up and around the drill, the walls of the hole would cave in and the well could not be made.

The fluid and sand that come out of the hole are pumped to a pit. The fluid in the pit is pumped out and used again, while the extra sand stays put. After the drill hits an area of sand that is filled with water, the casing and screen are put in to keep things from getting in the well. When the drilling is finished, the driller grouts the well, cleans the well and puts a cap on it.

Typical Water Well System



(1) Check Valve
Located at the top of the pump to prevent backflow into the pump and hold the head of water in the system.

(2) Brass Rope Adapter
Connects the Pitless Adapter and Submersible Pump with Safety Rope.

(3) Ideal Clamps
Provide connections between Pipe and Insert Fittings or Torque Arrestor.

(4) Heat Shrink Splice Kit
Enables waterproof electric cable splices in submersible pump installations.

(5) Torque Arrestor
Installed directly above Submersible Pump to protect pump and well components from starting torque damage.

(6) Safety Rope
A safety line from the top of the well to the pump.

(7) Cable Tie
Fastens cable to drop pipe.

(8) Cable Guard
Protects submersible cable wires from abrading against sides of well.

(9) Pitless Adapter
Provides a watertight sanitary removable connection between pump and house. Installed in casing below the frost line to prevent freezing.

(10) Brass Insert Fitting
Connects poly pipe and pipe thread of Pipeless Adapter.

(11) Watertight Well Cap
Provides a watertight seal when its inner gasket compresses to outside diameter of casing. Top of cap removes easily to access well for service.

(12) Well Seal
Provides a positive seal inside casing in above-ground installations.

(13) Check Valve
Installed near the tank inlet to hold water in the tank during pump installation when the pump is idle.

(14) Tank Tee
Connects water line from pump to pressure tank and service line from tank to house. Taps are provided to accept Pressure Switch, Pressure Gauge, Drain Valve, Relief Valve, Snifter Valve, etc.

(15) Drain Valve
Promotes easy draining of the system.

(16) Brass Nipple
Male threads allow attachment of Pressure Switch to Tank Tee.

(17) Relief Valve
Protects against pressure build-up. Should be used on any system where the pump could develop pressure that exceeds the maximum system rating.

(18) Pressure Gauge
Measures water pressure in Pressure Tank.

(19) Pressure Switch
Signals the pump to start when the water system drops to a pre-set low pressure, and to stop when the high-pressure mark is reached.

(20) Safety Switch
For electric control and distribution to the pump.

(21) Pump Saver
Adjustable, solid state control monitors system load conditions to protect pump motor from dry well, flow loss, rapid cycling, slow recovery, air lock and locked rotor problems.

(22) Lightning Arrestor
Protects pump motor and controls from voltage surges caused by lightning, switching loads and powerline interference.

(23) Ball Valve
Acts as a shutoff valve on the supply line from tank to house.

**This list and schematic are not intended as installation guides.
Check local codes for actual requirements and restrictions.**

WATER SYSTEMS COUNCIL

Well Pumps and Tanks

Your private water system has two important components in addition to the well itself – a pump and a pressure tank.

Pumps: There are many types, kinds and sizes of pumps for water systems. Some are only designed to remove water from a source. Others not only remove the water, but also force it through the rest of the water system. Some pumps are for special jobs such as boosting pressure or supplying a special outlet. If your pumping installation is not properly planned, you will not receive satisfactory water service.

Pressure tanks: Pressure tanks provide storage for your water system. There are three general types of water storage tanks: (1) diaphragm bladder tanks with permanent separation between the air and water; (2) tanks with a float or water separating the air from the water; and (3) plain steel tanks. Each kind of tank serves a specific purpose. If your water supply provides plenty of water for your needs and you have selected the proper pump, it is easy to select the right size and type of tank. The amount of stored water in the pressure tank is equal to the pump discharge in gallons per minute.

Additional storage: Some well owners like to make arrangements for additional water storage tanks. Generally speaking, additional storage capacity of one day's water supply is sufficient. Additional water storage is useful when there are power outages and other emergencies. Be sure to have the installer provide manual access to your storage unit.

For information on your well

Contact the well contractor who installed your well. Or find a water well contractor in your area by looking in your local telephone directory. Many states maintain lists of licensed or registered well drillers. Contact your local health department to find out where in your state you can locate a list. Most states also have state water well associations, state well driller associations or state ground water associations. To get a list of these associations, you can contact the National Ground Water Association at 800-551-7379 or www.ngwa.org.

For more information about wells and other wellcare™ publications

wellcare™ is a program of the **Water Systems Council (WSC). WSC** is a national nonprofit organization dedicated to promote the wider use of wells as modern and affordable safe drinking water systems and to protect ground water resources nationwide.

Contact us at 888-395-1033 or visit www.watersystemscouncil.org

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