



SURVIVAL PAPER #SP98-7

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EMERGENCY WATER PUMP

I built this hand pump in 20 minutes for about \$20.00. It can be used in water wells that have no existing feed lines, wiring, or submersible pumps in place or in water wells with them in place by the addition of a 1-1/2 inch I.D. PVC pipe as a pump guide sleeve. The 1-1/2 inch I.D. PVC pump guide sleeve should have a cap glued on the bottom end and 1/2 inch holes drilled through the bottom pipe section above the end cap. The holes allow water to flow freely into the 1-1/2 inch I.D. sleeve when it is submerged into water. The sleeve separates the hand pump from feed lines, wiring or submersible pumps so they do not rub during pumping. It also keeps the water clearer by keeping the hand pump off the bottom of the well. The guide sleeve can be bolted to the above ground well casing area with 1/2 inch carriage bolts and nuts. Be sure to seal the bolt holes with rubber washers or caulking. The guide sleeve and pump should extend down below the water table. As the foot valve of the pump is pushed down below the water table, the water flows up through the foot valve and into the pump shaft above it. The valve is open on the down stroke and closed on the up stroke. Repeated pumping motion shoves the water up the pipe and out the hose by a hydraulic ram effect. The water flows out the hose on the down stroke only.

Pump length is based on well depth and the water table height in it. The pump should be long enough to stay submerged in at least 3 to 5 feet of water so the pump remains in the water during the pumping motion cycle. Remember that water tables may change with seasonal condition. If you know of wells that you may need to use in the future, you should get proper water samples from them and have them tested. Stagnant or unused wells should be cleaned out with a power pump and disinfected. Local health departments and well drillers maintain well records and can give you information on well depths, testing, and on keeping wells sanitary. You can also measure a well and water table with a sanitized cord and plumb bob. When using untested well water, you should use water treatments (boiling, bleach, iodine, filter, etc.) to protect you from typhoid, dysentery, diarrhea, cholera, giardia and other diseases.

You must disinfect your hands before using the well. Keep all the pump parts off of the ground and disinfect them before placing them in the well. Sick persons must not have any contact with the well area, pump, or water containers. Keep the area around the well sanitary and never drink from the hose or allow any waste water or animals near the well area. Leaving the pump in the well and keeping the well cap on when not in use will help keep the well sanitary. If no sleeve is used in your well, you can hang the pump inside the casing by a cord with a prussik knot (Scout Handbook) around the pump shaft. Install a hook below the well cap area on the inside of the casing and hang the pump from it. If you use a pump sleeve, you should make the sleeve about 2 inches shorter than the well casing top. Make the pump long enough to stand above the sleeve but still be short enough for the well cap to be replaced over the well casing. You can also wire a hook to the top of the pump shaft and hang it over the sleeve edge.

The pump can be made from copper and brass. It will cost more, be heavier, and freeze easier in cold climates but will allow the pump to be used on fuels from storage tanks. Some makes and models of brass foot valves are: Simmons Model 1402, Merril Series 810 Model FV75, Water Ace Model RFV75, and a plastic Brady Model SFV75. A plunger action check valve can be used, but you should put a 1/8th inch screen over the intake end and secure it with a ring clamp to help keep any well debris out of the valve. Foot and check valves have a closure spring which may need to be trimmed down or removed to get the best flow rate from pressures generated by hand pumping.

The weep hole is about 1/8th inch in diameter. It should be drilled through one side of the pump shaft above the foot valve, but a good distance below the frost line in your area. This allows the water in the pump shaft to slowly drain back down into the well when the pumping stops. This helps keep the well from freezing in cold weather.

The pump model displayed here is only one of an endless number of pump variations you can build. Parts are becoming harder to find in quantity due to low inventory stocking practices at stores. Other pipe types, sizes, adapters and fittings can be readily made into pumps that will work with varying efficiency levels. A functional pump only needs a foot valve, a weep hole (cold climates), a stiff hollow pipe shaft above the valve for the water to flow up in, and a hose or side pipe discharge to get the water away from the pump shaft and into a container.

The best way to survive a power outage or any emergency is to prepare before it occurs. You need shelter, heat for cooking and warmth, water, food, medicines, medical supplies, hygiene items, and other things. These will not be easy to get in a power outage or emergency. Build a pump now while you can (maybe) still get parts. After a power outage it will be too late.

PARTS LIST:

- A) 5/8 OR LARGER I.D. GARDEN HOSE
- B) 3/4 NPT TO GARDEN HOSE ADAPTER
- C) OPEN EYE HOOK, WASHERS, NUTS
- D) WELL CAP
- E) 1/8TH INCH NYLON HANGING CORD
- F) 3/4 PVC SCHEDULE 40 TO 3/4 NPT ADAPTER
- G) 1/2 INCH CARRIAGE BOLTS, WASHERS, NUTS
- H) 1-1/2 IN. I.D. PVC SCHEDULE 40 COLLAR.
- I) GROUND LEVEL.

J) ELECTRIC POWER PUMP WIRING

- K) 3/4 IN. I.D. PVC SCHEDULE 40 PIPE COLLAR
- L) 3/4 IN. I.D. PVC SCHEDULE 40 PIPE SECTION
- M) ELECTRIC POWER PUMP FEED LINE
- N) WATER TABLE
- O) 1-1/2 INC. I.D. PVC SCHEDULE 40 PIPE
- P) 1/2 INCH HOLES IN 1-1/2 PVC PIPE SLEEVE
- Q) 1/8TH INCH DIAMETER WEEP HOLE
- R) 3/4 INCH FOOT VALVE
- S) 1-1/2 PVC SCHEDULE 40 PIPE CAP
- T) METAL WELL CASING

PVC SOLVENT, PVC GLUE, RAGS, PIPE TAPE OR COMPOUND.

DRILL, DRILL BITS FOR WEEP HOLE, EYE HOOK HOLE, SLEEVE BOLT HOLES, CRESCENT WRENCHES, PIPE WRENCHES, ALLEN WRENCHES FOR WELL CAPS.

THESE PARTS ARE FOR THIS MODEL ONLY: YOU CAN VARY THE PARTS AND ADAPTERS. THE ONLY THING NECESSARY FOR A WORKING PUMP IS A FOOT VALVE, A WEEP HOLE (COLD CLIMATES), A STIFF HOLLOW SHAFT ABOVE THE FOOT VALVE AND A HOSE OR SIDE PIPE DISCHARGE FOR THE WATER AS IT COMES OUT.

POWER OUTAGES ARE BECOMING MORE COMMON DUE TO STORMS, AGING TRANSMISSION GRIDS, ACCIDENTS, AND CRIMINAL ACTS. THIS HAND PUMP CAN HELP CITIZENS MAINTAIN A PORTABLE WATER SUPPLY. THE MORE SELF-SUFFICIENT CITIZENS ARE IN HAVING WATER, FOOD, MEDICINE, MEDICAL SUPPLIES AND OTHER BASIC NEEDS, THE LESS LIKELY THEY WILL OVERLOAD THE LOCAL EMERGENCY SERVICES AGENCIES IN A POWER OUTAGE OR OTHER WIDESPREAD EMERGENCY.

PLEASE COPY THIS DOCUMENT AND DISTRIBUTE IT TO YOUR LOCAL COMMUNITY VIA SCHOOL ACTIVITIES, CHURCHES, CIVIC CLUBS, OR LOCAL BUSINESSES.

BUY THE PARTS AND BUILD A PUMP NOW. THE PARTS ARE ALREADY SCARCE DUE TO LOW INVENTORY STOCK MANAGEMENT PRACTICES BY STORES.

IN SUCH AN EMERGENCY, THE FATE OF YOURSELF, YOUR FAMILY, AND YOUR COMMUNITY IS IN YOUR HANDS. WILL YOU BE PREPARED TO SURVIVE IT?

