

# Driven Wells

**Water wells must be properly located and constructed to provide safe water at all times and under all conditions. The purpose of this publication is to describe approved methods for the construction of driven wells. Driven wells as used in this publication also are referred to as sand-point wells.**

## **Description of A Driven Well**

A driven well is a small diameter well, assembled by joining lengths of steel pipe, 1¼ inches or 2 inches in diameter, with threaded couplings. Each section of steel pipe is 4 feet or 5 feet in length. A drive-point well screen, consisting of a screen 2 feet or 3 feet in length and attached to a hardened steel tip, is couple threaded to the bottom of the string of pipe. The screen allows groundwater to flow into the well, while keeping the sand out. Depending on the tightness of the soil, hand driven wells can extend to depths of about 30 feet. Driven by weighted hammers, they can extend to depths of 50 feet and further under ideal conditions.

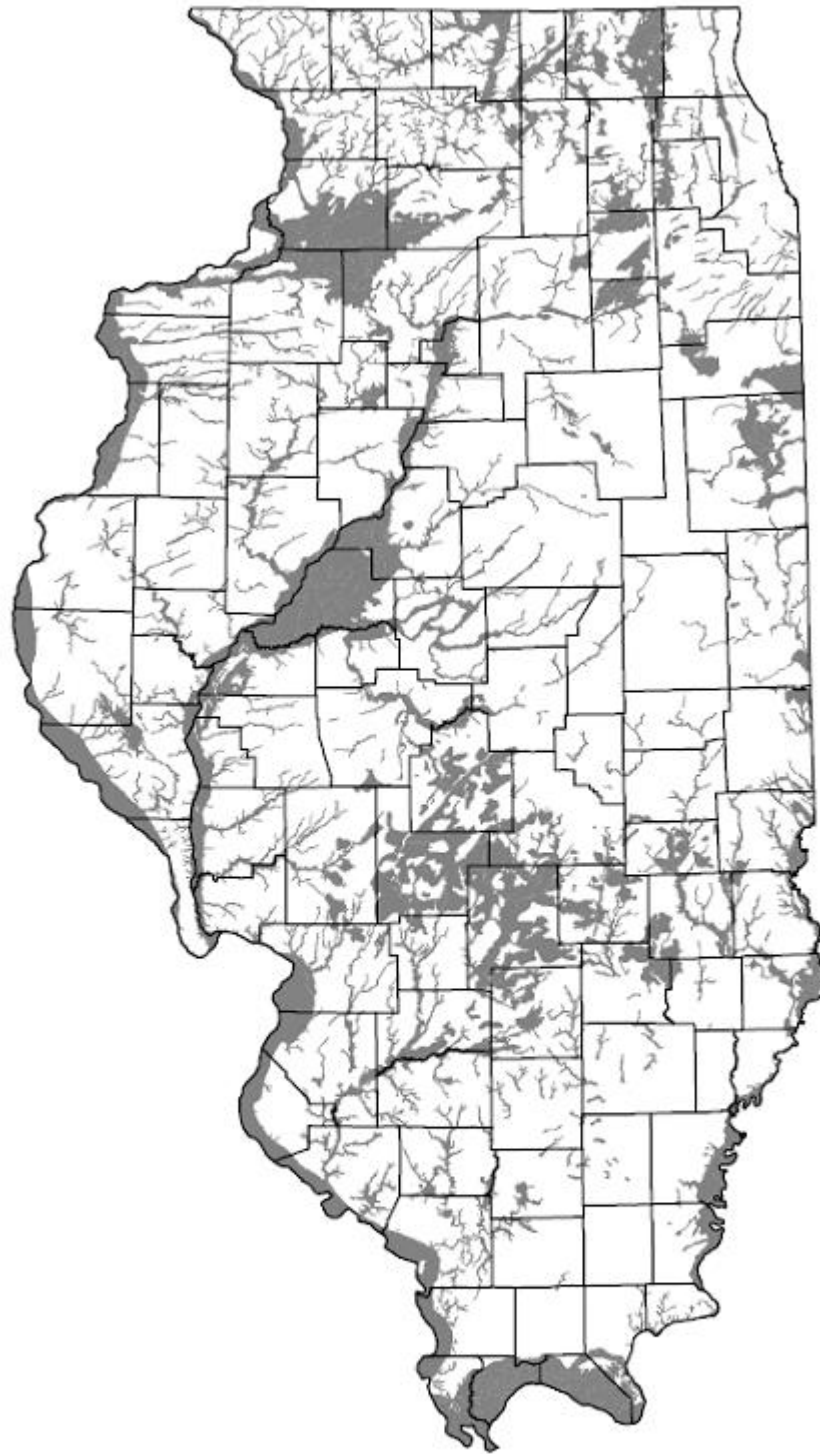
To make the starting of the driving much easier, a pilot hole is first dug or augured at the ground surface to accommodate the drive-point well screen and part of the first section of pipe. To protect the pipe threads while driving, a drive cap is threaded onto the top of the pipe. It is not uncommon to drive the pipe with a post driver, made of a short length of weighted steel pipe with handles. Weighted driving tools, suspended from a tripod or derrick are sometimes used. Some driven well installers use specially made motorized equipment to drive the pipe. Sections of steel pipe are added as the driving progresses. The driving process continues until the sand point extends far enough below the static or non-pumping water level to allow a sufficient depth for drawdown while the well is pumping.

## **Areas Where Driven Wells Are Constructed**

Driven wells are usually constructed in areas of sand and gravel. *Figure 1* will assist you in determining if you are in a sandy area where it is more likely to construct a driven point well. More detailed surficial geologic maps are available through the Illinois State Geological Survey. Sandy areas with deep water tables are not conducive to driven

wells. If encountered, large boulders or layers of compacted soil, e.g., clay or "hardpan," can slow or completely stop the driving process. To see if driven wells can successfully be constructed in your area, look at water well construction logs of nearby wells. Water well data is available through the Illinois Environmental Protection Agency, the Illinois State Water Survey, and the Illinois Geological Survey.

*Figure 1. Major areas of sand and gravel in Illinois*



0 25 50 100 Miles

Scale 1:3,000,000

*From the Illinois State Geological Survey*

When deciding what type of well to construct, it is important to consider how much water will be used. If the water demand is expected to be high, especially if it is accompanied with higher pressures, a drilled well with a submersible pump is often a higher yielding and more energy efficient alternative to a driven well.

## **Susceptibility of Driven Wells to Contamination**

Since driven wells are usually constructed in permeable sandy soils with a high water table, they are susceptible to contamination from land use activities, such as subsurface sewage seepage systems, and heavy use of fertilizers. Chemical contaminants can move down through permeable sandy soils, enter the groundwater and move into a well. However, if properly located and constructed, and with land use taken into consideration in the immediate area, driven wells can offer protection from most types of contaminants, especially bacteria.

## **Who May Construct a Driven Well**

The individual installing the driven well is not required to be a licensed water well contractor. The contractor who installs the pump shall be a licensed water well pump installation contractor. An unlicensed individual may install a water well pump in a well on land that is owned or leased by this individual and is used by this individual for farming purposes or as this individual's house. In all cases, a water well construction permit must be obtained from the local health department before construction.

## **Proper Location**

Appropriate location of the well reduces the possibility of contamination. The ideal well location has good drainage and is higher than the surrounding ground surface. All possible sources of contamination should be at a lower elevation than the well, and the distances to those contamination sources must be in accordance with the Illinois Water Well Construction Code, Section 920.50. Surface drainage should not allow surface water to accumulate within a 15-foot radius of the well. A well should be at least 10 feet from sewers, 50 feet from septic tanks, and 75 feet from sewage seepage fields.

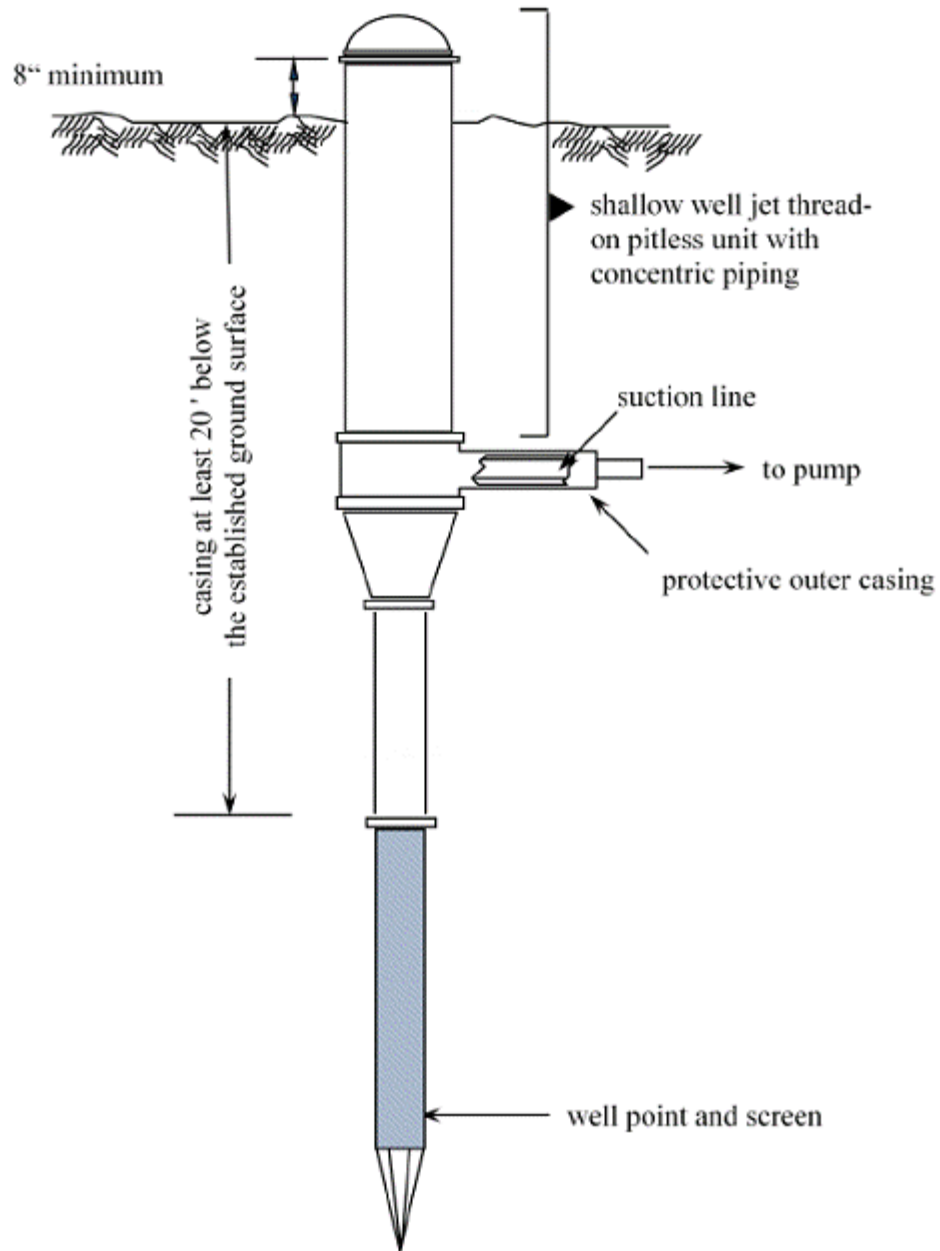
## **Proper Construction (Illinois Water Well Construction Code and the Illinois Water Well Pump Installation Code)**

**(See Figure 2)**

Driven wells shall be constructed in accordance with the Illinois Water Well Construction Code and the Illinois Water Well Pump Installation Code.

The drive-point well screen, drive pipe, and joints must be structurally suitable to prevent rupture during the driving of the well. Steel piping for driven wells shall be a minimum of schedule 40. If aids to driving are used, such as an augured starting hole or water jetting, the annular space around the drive pipe must be sealed with cement grout or puddle clay. The type of pump proposed will determine how the top 10 feet or more of the well shall be completed. A minimum of 20 feet of casing must be provided for the pump drop pipe.

Figure 2. Driven well with shallow well jet thread-on pitless unit



Driven wells shall not be constructed in basements or pits; however, pumps and pressure tanks may be located in basements.

The well casing must terminate at least 8 inches above ground level. An approved well cap or seal must be installed at the top of the well casing to prevent any contamination from entering the well at the surface. A watertight seal must be used when suction, pressure, and electric lines exit the well through the top of the casing. Frost protection

should be provided by use of an insulated pump house, if the discharge pipe exits the well above grade. An approved pitless adapter must be used when the discharge pipe exits the well below grade.

Suction and jet pumps are the more common types of pumps installed on driven wells. If the pump is located away from the well, the buried pipe leading to the pump from the well must be encased in another pipe maintained at system pressure. Hand pumps equipped with a packing gland around the pump rod; an enclosed, turned-down spout; and a bell-type, one piece base made as a part of the pump stand or attached to the pump column in a watertight manner, are approved for this use. A down-turned smooth nose sampling faucet shall be installed not less than 18 inches above the floor in a convenient location between the water well and the pressure tank or as near to the well as possible.

The Illinois Water Well Construction Code and the Illinois Water Well Pump Installation Code are available on the Internet

at <http://www.ilga.gov/commission/jcar/admincode/077/07700920sections.html>,

and <http://www.ilga.gov/commission/jcar/admincode/077/07700925sections.html>.

Copies also can be obtained from your local health department or from one of the regional offices listed below.

## **Eliminating Existing Pits**

Existing well pits that are not structurally sound and watertight or do not have well casing that extends at least 12 inches above the pit floor should be eliminated. Breaking or removing the floor or one wall of the pit accomplishes this task. The well casing must be extended to at least 8 inches above the finished grade. Fill in the pit with compacted earth. If the pump discharge line exits the top of the well, a well seal and insulated pump house are necessary. If the pump discharge line passes through the well casing underground, an approved pitless adapter must be installed.

Rehabilitation, reconstruction or repair of wells shall be done in compliance with the Illinois Water Well Construction Code.

## **Disinfection**

A new, cleaned or a repaired well normally contains contamination that may remain for weeks unless the well is thoroughly disinfected. This may be accomplished by the use of ordinary laundry bleach in a solution concentration of 100 parts per million (ppm) of chlorine. To give a dosage of 100 ppm, the amount of laundry bleach (5.25% chlorine) required for each 100 gallons of water equals three 8-ounce cups. The amount of bleach required is determined by the amount of water in the well and the water distribution system.

When working with chlorine, you should always be in an open or well-ventilated place. Do not allow the strong liquid to remain in contact with the skin or clothing. Solutions are best handled in plastic containers since strong chlorine solutions corrode metal containers.

## **Directions for Disinfection**

Since the capacity of most driven wells and their water distribution systems is 50 gallons to 100 gallons of water, assume that the total water system contains 100 gallons of water.

Disinfect the well as follows:

- Flush the well.
- Mix three 8-ounce cups of liquid laundry bleach in about 1 gallon of water and stir thoroughly.
- Remove the well cap and pour this solution into the top of the well between the casing and the drop pipe.
- Connect a hose from a faucet on the discharge side of the pressure tank to the top of the well casing and start the pump, recirculating the water back into the well for at least 15 minutes. Then open each faucet in the system until a chlorine smell is noticeable. Close all faucets.
- Rinse chlorine solution off any wires and the pitless adapter in the well casing. Seal the top of the casing with a sanitary well seal and let stand for several hours, preferably overnight.



- After standing, operate the pump, and discharge water from all outlets until all chlorine odor disappears. After several days use, submit a sample of the water to a laboratory for analysis.

## **Bacterial Analyses and Samples**

To obtain bacterial and nitrate analyses of drinking water, submit well samples to a laboratory certified for coliform bacteria by the Illinois Department of Public Health, and certified for nitrate testing by the Illinois Environmental Protection Agency.

## **Water Well Data Bases**

[Illinois Environmental Protection Agency](#)

[Illinois State Water Survey](#)

[Illinois State Geological Survey](#)

## **Driven Well Related Internet Sites**

Illinois Department of Public Health

[Private Water Systems Program](#)

Illinois Environmental Protection Agency

[What You Need to Know About Private Drinking Water Wells](#)

Illinois State Geological Survey

[Maps – Surficial Geology and Features](#)

Illinois State Water Survey

[Domestic Well General Information](#)

University of Minnesota Extension

[Driving a Wellpoint](#)

U.S. Environmental Protection Agency

[Private Drinking Water Wells](#)

U.S. Geological Survey

[Groundwater and the Rural Homeowner](#)

Wisconsin Department of Natural Resources

[Driven Point \(Sand-Point\) Wells](#)

## **Selected References**

- Driscoll, Fletcher G., 1986, *Groundwater and Wells*. Johnson Division, St. Paul, MN, 1089 p.
- Masters, John M., 1983, *Geology of Sand and Gravel Aggregate Resources of Illinois*: Illinois State Geological Survey Illinois Mineral Notes 88, 10 p.
- Berg, Richard C., and John P. Kempton, 1983, *Stack-unit mapping of geologic materials in Illinois to a depth of 15 meters*. Illinois State Geological Survey Circular 542, 23 p.

## **Regional Offices**

### **ROCKFORD REGION**

4302 N. Main St.  
Rockford, IL 61103-1209  
815-987-7511

### **PEORIA REGION**

5415 N. University St.  
Peoria, IL 61614-4784  
309-693-5360

### **CHAMPAIGN REGION**

2125 S. First St.  
Champaign, IL 61820-7944  
217-278-5900

### **MARION REGION**

2309 W. Main St., Suite 106  
Marion, IL 62959-1195  
618-993-7010

### **EDWARDSVILLE REGION**

#22 Kettle River Drive  
Glen Carbon, IL 62034  
618-656-6680

### **WEST CHICAGO REGION**

245 W. Roosevelt Road, Building 5  
West Chicago, IL 6018-4803  
630-293-6800

*Illinois Department of Public Health, Division of Environmental Health, 525 W. Jefferson St., Springfield, IL 62761, 217-782-5830, TTY (hearing impaired use only) 800-547-0466. Questions may be directed to your local health department, to one of the Illinois Department of Public Health regional offices or to the Department's central office in Springfield.*

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