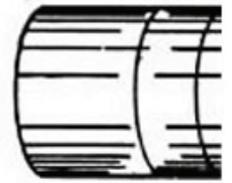


# *The Connection*

A Well Drilling Industry Newsletter



VOLUME 17 NUMBER 2

SPRING 2010

## **WELL INSTALLATION BOARD NEWS**

The Missouri Well Installation Board held its quarterly meeting Feb. 22 at the Country Club Hotel and Spa in Osage Beach in conjunction with the Missouri Water Well Association's Annual Conference. The board reviewed and made decisions on four separate permit appeals and received updates on enforcement cases, Special Area 2 and current rulemakings.

The next quarterly meeting of the Well Installation Board is scheduled for 10 a.m., Friday, May 7, at the Missouri Department of Natural Resources' Division of Geology and Land Survey at 111 Fairgrounds Road in Rolla. A subsequent meeting is scheduled for 10 a.m., Friday, Aug. 13 at the Missouri Department of Natural Resources at 2040 W. Woodland in Springfield.

## **FUNDING AVAILABLE FOR PLUGGING ABANDONED DRINKING WATER WELLS**

The Missouri Department of Natural Resources is going forward with a new round of grants for plugging wells. This provides an opportunity for community public water systems that use groundwater as their primary water source to apply for grant funds to properly plug abandoned drinking water wells within their service area.

Application packages and additional information will be emailed to the administrative contact of all eligible community water systems. In most cases this is the mayor or city administrator.

Priority will be given to applicants with approved source water protection plans and applicants with known abandoned well locations. However, applicants are not required to have an approved plan or know the locations of abandoned wells in order to apply for this funding. Successful applicants will be awarded funding to reimburse actual costs of up to \$850 per private well and up to \$10,000 or up to 75 percent of the actual cost to plug abandoned public wells. All contracted well-plugging work is required to be performed in accordance with Missouri Well Construction Rules by a Missouri-permitted well drilling or pump installation contractor.

The department initially provided funding for this purpose in 2009. Funding totaling \$240,000 was awarded to 24 community water systems to plug more than 155 abandoned drinking water wells.

If you have general questions about source water protection or would like additional information please contact Ken Tomlin, Source Water Protection Coordinator, Public Drinking Water Branch, at 573-526-0269 or by e-mail at [ken.tomlin@dnr.mo.gov](mailto:ken.tomlin@dnr.mo.gov). You may also write to the Public Drinking Water Branch, P.O. Box 176, Jefferson City, MO 65102-0176.

## **PUBLIC WATER SUPPLY LETTERS TO FORMER PRIVATE WELL OWNERS**

Periodically, the Wellhead Protection Section reviews its files on private well owners that have connected to a public water supply. These owners have completed the notification form from their public water supply district stating the existing wells would remain in use and be properly plugged when no longer in use.

We keep that information in a database and every two years send a letter to these owners asking if their well is still in use or, if they have abandoned the well. Approximately 80 percent choose to keep their well in use. If a well has been abandoned, we follow up and ask for the information concerning the method used to plug the well. We enclose a brochure with information on proper plugging procedures and a copy of the abandonment registration record to be filled out if the well has been plugged.

This process allows the owner to keep their well as long as it is being used. It also allows us to track the status of the well to ensure it is plugged properly if it is no longer in use for a period of two or more years.

## **BI-MONTHLY REPORT**

Every other month, staff from the department's Wellhead Protection Section send reports to permitted contractors listing every record received during the previous two months. This is done as a courtesy to help contractors confirm their records have been received by the department. Checking the report closely will help to prevent late fee assessments and ensure our records are correct. If a mistake is found, please let us know so we can correct it. Call 573-368-2165 to report a discrepancy.



**MISSOURI**  
DEPARTMENT OF  
NATURAL RESOURCES

## PLUGGING ABANDONED WELLS

A water supply is as important today as ever, but many things have changed since the days of the hand-dug well. Wells used decades ago may now pose a serious liability. Whether hand-dug or drilled, all abandoned wells present some type of hazard. Wells with wide openings pose a physical hazard, especially for small children or animals. Contaminates can also enter the groundwater through abandoned wells that may affect new wells being drilled nearby.

Different types of wells have different plugging requirements and procedures. Missouri Well Construction Rules, 10 CSR 23-3.110, establish criteria for proper plugging of all types of water wells. Just filling up a well with gravel and putting a few bags of cement or bentonite at the top is not an acceptable plugging procedure. It is very important to read the rules before plugging a well. Each year many investigations are conducted by the Missouri Department of Natural Resources as the result of improperly plugged wells.

Most investigations regarding improper plugging involve bedrock wells. Before a well is plugged, the pump, pipe and liner must be removed. The department must be contacted if removal of any of these items cannot be accomplished. The critical factor when plugging a bedrock well is determining the amount of casing in the well. If no well record exists, it may be necessary to use a camera in the well to determine casing length. After the casing length has been determined, a grout plug of cement or bentonite must begin 50 feet below the bottom of the casing and extend to within two feet of ground surface. If the casing depth is not known, the well must be plugged full length. If the well has a large column of water, grout may have to be placed using a tremie pipe. If the well has 150 feet or more of casing, it is permissible to fill the well with clean fill to a point 50 feet below the casing bottom, then a grout plug must be placed at that point extending 30 feet into the casing. Clean fill may be used inside the casing with a 50 foot grout plug at the top. Any standing water in the well must be disinfected with chlorine and the casing must be cut off three feet below grade unless a variance is obtained. The department has a Microsoft® Excel® spreadsheet that can help determine the amount of grout and fill needed to plug any size of well.

After the well has been plugged, an abandonment registration form and fee (if applicable) must be submitted to the department within 60 days.

Note: This article discusses only a small portion of the plugging rules. Please become familiar with the rules or contact staff for more information in order to protect Missouri's groundwater resources.

For more information, call the department's Wellhead Protection Section at 573-368-2165.



Abandoned well in Berry County



Abandoned well in Chariton County



Abandoned well in Lawrence County

## PERMIT NUMBERS FOR 2009

For calendar year 2009, there were:

- 1,596 permitted drillers.
- 1,259 permitted machines.
- 848 permitted companies.

There were a total of 481 water well permits issued:

- 838 pump permits.
- 723 monitoring well permits.
- 325 heat pump permits.

A total of 27 people became permitted apprentices.

Permit types for the apprentice program were:

- 4 water well.
- 6 pump.
- 15 monitoring well.
- 6 heat pump.

If you have any questions regarding the apprentice program, contact Jeannie Hoyle at 573-368-2450.

## HEAT PUMP DIRECT EXCHANGE WELLS

In Missouri, at a depth of just six feet, the earth is consistently warmed by the sun to 55 to 60 degrees. In the summer and winter, the thermal energy stored by our earth can be drawn out through a carefully sized series of pipes, generally described as a vertical or a horizontal loop field.

Direct exchange refers to geothermal transfer, which is direct from the eco-safe refrigerant piped in heavy-duty copper tubing used in horizontal or vertical field loops. Other types of closed loop systems use a mix of fluid, not refrigerant, through their field loops.

To construct and use a direct exchange heat pump system in Missouri, the permitted contractor must adhere to the *Missouri Well Construction Rules* (PUB2175), Chapter 5, Heat Pump Construction Code, which specifically addresses the construction standards for closed loop heat pump systems that use refrigerants as the heat transfer fluid.

Written approval must be received from the department in advance whenever refrigerant is used and placed into a vertical well. The rules also state the ground coil must be installed by a method that prevents leakage of the refrigerant and any heat transfer fluid used in this type system must be nontoxic and non-hazardous such as HCFC-22, R407C, or others approved in advance by the department.

This written approval is given in the form of a variance. A copy of this variance must accompany the *Closed Loop Heat Pump Certification Record* (Form 780-1413) submitted to the department. The form is available on the department's Web site at [www.dnr.mo.gov/forms/780-1413.pdf](http://www.dnr.mo.gov/forms/780-1413.pdf). The report form shall also contain all the required information. This information will be reviewed and, upon approval, a certification number will be issued to the owner.

References:

- Missouri Well Construction Rules* (May 2007)
- Earthlinked Technologies Technical Bulletin* (Dec 2009)

## DEPARTMENT PROVIDES WEB PAGE TO CHECK SITE LOCATION

*Missouri Well Construction Rules* requires the geographic location of wells be formatted in degrees, minutes and seconds for latitude and longitude relative to the North American Datum 1983 (NAD83) geodetic datum. Additionally, the location accuracy shall be at least one place after the seconds decimal point: i.e., latitude 38°59'59.9"N, longitude 94° 01' 01.0"W.

From time to time, records with incorrect latitude and longitude information are sent back to the permitted contractor for revision.

The Missouri Department of Natural Resources has a Web site to help contractors check the latitude and longitude information to ensure the data is correct. The site is available [www.dnr.mo.gov/gisutils/](http://www.dnr.mo.gov/gisutils/). Simply type the latitude and longitude information in boxes labeled degrees, minutes and seconds and click submit. The site will then refresh and list data related to the location such as county, legal description, special well drilling area, the location in decimal degrees and Universal Transverse Mercator. A map of the location is also generated to help the user determine if the location information is correct.

**Missouri Department of Natural Resources**  
Geographic Information Systems

### Check Location

Select a coordinate format, enter a pair of coordinates in the boxes below, and then press the SUBMIT button. Please be patient, as your information is retrieved. Your coordinates will be converted to the other formats; the information on the right-hand side of the page will be filled in based on your coordinates, and a map will be generated. NOTE: All coordinates must use the North American Datum of 1983 (NAD83).

Universal Transverse Mercator  
(Zone 15 North)

Easting: 963115.6851601685 meters  
Northing: 4329254.6281786616 meters

Decimal Degrees

Latitude: 39.10109444444445  
Longitude: -94.58302777777777

Degrees, Minutes and Seconds

Latitude Degrees: 39  
Latitude Minutes: 6  
Latitude Seconds: 6.1  
Longitude Degrees: -94  
Longitude Minutes: 34  
Longitude Seconds: 58.9

UTM Zone 15N (Easting, Northing)	363115.6, 4329254.6   meters
Decimal Degrees [Lat, Lon]	[39.1010944, -94.5830277]
Deg. Min. Sec [Lat, Lon]	[39° 06' 06.1" -94° 34' 58.9"]
County Name	KANSAS
County FIPS Code	065
Legal Description	Section 05 T49N R33W
Municipality	Kansas City
House District	37
Senate District	10
Congressional District	5
MOFIPS Region	Kansas City Regional Office
USGS 1:24,000 Quadrangle	Kansas City (1805J-A5)
8 Digit Hydrologic Unit	10200101 (Lower Missouri-Loprock)
12 Digit Hydrologic Unit	102001010301 (Buckeye Creek-Missouri River)
14 Digit Hydrologic Unit	10200101010070
Special Well Drilling Area	Area 2
Query Time	3.39 s

Rows with red text indicate that the input location is too close to a boundary to produce reliable results.

NOTE: A result of 'NO VALUE' is usually an indication that no data was found for the location. For example, not every point in Missouri will lie within a municipal boundary, so some will result in a 'NO VALUE'. If 'County Name' results in 'NO VALUE', your point probably lies outside the state.

**Metadata**

- Interstate Highways
- US Highways
- State Highways
- Railroads
- Major and Minor Roads
- County Boundary
- Lakes
- Major Rivers
- Stream Segments
- Missouri River
- Mississippi River
- Municipal

Monday, January 25, 2010 8:13:04 AM CST Missouri Department of Natural Resources

View Scale 1:24,000

## VARIANCES

Missouri Well Construction Rule 10 CSR 23-1.040 states when meeting the requirements for construction of a well presents practical difficulties or unusual hardships, the department can issue a variance for that specific instance. The Missouri Department of Natural Resources may then impose certain conditions to protect groundwater and the health, safety and well-being of anyone using the groundwater supply. A variance must be requested by the well or pump contractor and approved by the department prior to construction of the well.

There are occasions when the contractor cannot meet the minimum setback distances from known contamination sources when drilling a domestic water well. Often this is due to lot size, site topography, building placement, or other site conditions. The department will then increase the minimum construction standards for domestic wells to compensate for the inability to meet the required minimum setback distances. These increased standards are uniformly applied and dependent on the distance from the contaminant source and other pertinent site information, such as type of septic system. It is important to note the department's Wellhead Protection Section has revised its policy regarding the issuance of variances regarding set back distances from potential contamination sources.

This revision is based the Missouri Department of Health and Senior Services variance guidance regarding set backs of on-site sewage systems and water wells.

### 1. THE WELL WILL BE LOCATED SO THAT THE SETBACK DISTANCE WILL BE WITHIN 40 PERCENT (%) OF THE MINIMUM REQUIRED SETBACK DISTANCE.

For example, if the minimum required setback distance from a contamination source is 100 feet, and the only available place to locate the well is 75 feet from that contamination source. A variance must be requested and approved, and at a minimum will include:

- The casing annular space will be required to be grouted full length using slurry grout material placed by the tremie or positive displacement method.

### 2. THE WELL WILL BE PLACED CLOSER THAN 60 PERCENT (%) OF THE REQUIRED DISTANCE.

For example, if the minimum required setback distance from a contamination source is 100 feet and the only available place to locate the well is 50 feet from the contamination source.

While it is generally not our practice to place a well closer than 60 percent of the required distance, we will consider these requests on a case by case basis. Depending on the individual site conditions, the enhanced construction standards may include several or all of the following:

- A site inspection by division staff.
- Increasing the minimum amount of casing.

## FROM THE DESK OF ERIC L. HOHL

### GRAVITY GROUTING

The following table is from the *Missouri Well Construction Rules* (PUB2175) and shows the maximum depths grout can be placed



using the gravity method. These amounts are based on the annular space achieved depending on the diameter of the drill hole and the outside diameter of the casing being installed.

If the grouting depth is greater than those shown in the gravity grouting table, grout must be placed using a different method. Methods such as the tremie, pressure grouting through tremie or casing, open-hole and positive displacement are all good alternatives to gravity grouting. Additional information about grouting and approved methods is available on pages 3-7 and 3-8 of the *Missouri Well Construction Rules*. The rules are available on the department's Web site at [www.dnr.mo.gov/pubs/pub2175.pdf](http://www.dnr.mo.gov/pubs/pub2175.pdf).

**GRAVITY GROUTING TABLE**

Size Hole (in.)	Outside Diameter of Casing (in.)	Annular Space (in.)	Gravity Feed Depth (ft.)
8 <sup>5</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	1	100
8 <sup>3</sup> / <sub>4</sub>	6 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>6</sub>	106
8 <sup>7</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	112
9	6 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	119
9 <sup>1</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	125
9 <sup>1</sup> / <sub>4</sub>	6 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	131
9 <sup>3</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	137
9 <sup>1</sup> / <sub>2</sub>	6 <sup>5</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>16</sub>	144
9 <sup>5</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	150
9 <sup>3</sup> / <sub>4</sub>	6 <sup>5</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	156
9 <sup>7</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	162
10	6 <sup>5</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	169
10 <sup>1</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>4</sub>	175
10 <sup>1</sup> / <sub>4</sub>	6 <sup>5</sup> / <sub>8</sub>	1 <sup>13</sup> / <sub>16</sub>	181
10 <sup>3</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	187
10 <sup>1</sup> / <sub>2</sub>	6 <sup>5</sup> / <sub>8</sub>	1 <sup>15</sup> / <sub>16</sub>	193
10 <sup>5</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	2	200

- Including the requirement that liner cannot be used in place of casing to the casing point.
- Increasing the borehole diameter for the casing.
- The casing annular space being grouted full length using slurry grout material placed by the tremie or positive displacement method.

## SPECIAL AREA 2

Each year the Wellhead Protection Section reviews and updates the casing depth map for Special Area 2.

Data that may effect an area is collected by the well or pump contractor when a new well is drilled or an old well deepened. Data is also collected by EPA in areas within Newton and Jasper counties. This data is collected for both new and old wells. If required, new impact areas are added and, if available, any published updates for the area roads are added into the newly revised map.

It is important to remember the current map is valid from Jan. 1, 2010 through Dec. 31, 2010. The map is reviewed and updated in November and early December each year, and the new map is then issued by Jan. 1 of the following year. You must be certain to use the correct map when drilling in Newton and Jasper counties, as an older version may not have all the known impact areas highlighted.

The map for 2010 contains new impact areas listed below:

Location	Required Casing Depth
Twn 26 N, Rng 34 West, Sec 36, SE ¼	425 feet
Twn 28 N, Rng 32 West, Sec 17, NW ¼	450 feet
Twn 28 N, Rng 32 West, Sec 17, SW ¼	460 feet

If a contractor or homeowner wishes to have a sample of their well water analyzed for lead or cadmium, the Wellhead Protection Section can provide a list of individuals qualified and properly trained to take the sample. Staff can also provide a list of laboratories certified to perform the needed analysis. An electronic copy of the Special Area 2 map is located on the Wellhead Protection Section's publications Web page at [www.dnr.mo.gov/env/wpp/wellhd/wellpub.htm](http://www.dnr.mo.gov/env/wpp/wellhd/wellpub.htm), or call 573-368-2165 to request a hard copy of the map.

## WELL PLUGGING PERMIT

At the last two Well Installation Board Meetings, Gary Webber, from the Missouri Rural Water Association, or MRWA, discussed the possibility of creating a special class of permit to plug abandoned wells. The MRWA sent the board a letter with their proposal. Webber asked the board to consider establishing a new type of permit that would apply only to persons who plug wells. He stated training could be provided to ensure the person knew how to properly plug a well. Much discussion followed with some attendees indicating they oppose the proposal because the existing contractor types adequately provide for the plugging of wells and that training alone will not give a person the knowledge needed to plug a well. A copy of the letter was available to the board members and attendees.

Steve Sturgess, chief of the department's Public Drinking Water Branch and staff director to the board, indicated at the meeting the department's primary concern is that abandoned wells be properly abandoned for the protection of Missouri's groundwater. He added there does not appear to be a shortage of contractors to plug wells, and the existing contractor types have, to date, been able to

keep up with the workload. He also stated there may not necessarily be any problems with the establishment of a new class of contractor for plugging wells, as long as these new contractors have adequate experience and training. The board took no action at either meeting.

## PERMITTED CONTRACTORS

The following individuals are now part of the Department of Natural Resources permitted contractor community:

- Air Design Heating & Cooling - R Scott Hackler.
- Anton's Air Conditioning and Heating - Craig Denton.
- Balkenbush Mechanical Inc - Todd Balkenbush.
- Brandt Heating and Cooling - Darren Brandt.
- DNS Equipment/Ridge Hill Contractors - Daniel Dyck.
- Lakebrink Heating and AC - Allen Eaker.
- Maciejewski Plumbing & Heating - Dusten Binkhoelter.
- Ozark Well Drilling - Curtis Sanders.
- Sparks Maintance Contracting - Brad Sparks.
- Tom's Heating and Cooling - Thomas Hulse.
- TRS Group - Lynette Stauch, Steven Koester Jr.
- UHMC LLC - Larry Motley Sr., Joshua Motley.

## PERMITTED APPRENTICE CONTRACTORS

The following individuals are now part of the Department of Natural Resources permitted apprentice contractor community:

- B & H Well Drilling - Danny Schnieders.
- Balke Pump Service - Justin Balke.
- Lefty's Pump and Drilling - Joe Webb, John Hicks.

## CONTRACTORS NO LONGER PERMITTED TO OPERATE

The people addressed below are no longer permitted to operate as contractors according to the Water Well Drillers Act and Well Construction Regulations:

- Anthony Schulte Electric and Pump – Anthony Schulte.
- Bob Dillard and Well Drilling – Bobby Dillard.
- Clark Drilling and Pump – Gregory Clark.
- Environmental Strategies – Scott Haitz.
- Gredell Engineering Resources – Ashley Coffman.
- Herst and Associates – Nicholas Bauer.
- Jody Schmidt Well Service – Bob Schmidt, David Johnson.
- Lewis Environmental Drilling - Donna Lewis.
- Petermann Sales & Service – Scott Peterman Stephen Pitman.
- Prairie Rose Management – Ross Lowden.
- Precision Drilling – Richard Williams.
- PSC Industrial Outsourcing – Erika Thompson.
- Real Cool/Jungmeyer Heating – Glen Jungmeyer.
- SCI Engineering – Michelle Eaton.
- Terracon – Matthew Council, Carrie Stull.
- Tichenor Drilling – H Jean Tichenor.
- Tinnin Drilling Service – Harris Tinnin Jr., Paul Traynor.

Editor's Note: The Connection is published quarterly by the Missouri Department of Natural Resources, Division of Environmental Quality. If you have any suggestions, ideas or comments concerning this newsletter, please let us know. Send comments to: Missouri Department of Natural Resources, Wellhead Protection Section. P.O. Box 250, Rolla, MO 65402-0250, Phone: 573-368-2165 or FAX: 573-368-2317.

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