



Kentucky Water Well Drillers Quarterly

An Occasional Publication of the Groundwater Section
Of the Watershed Management Branch
Kentucky Division of Water
Environment and Environmental Protection Cabinet



Special points of interest:

- New Variance request Forms
- Water line Courtesy Inspections by Division of Plumbing
- Sampling Domestic Wells for UST
- Blanket Variances
- Piezometers vs. wells
- Your Groundwater Day

KWWDCB Meeting Notice

Board meeting February 28th at 9:00 AM EST

**The Kentucky Ground Water Association's (KGWA)
2013 Annual Well Driller's Tradeshow and Workshop**

February 28, 2013 and March 1, 2013



**Fern Valley Hotel & Conference Center
2715 Fern Valley Road
Louisville, KY 40213
Front Desk: 1 (502) 964-3311
Fax Number: 1 (502) 966-4874**

Don't Forget
the 2013 Kentucky
Ground Water Asso-
ciation Tradeshow
and Drillers Work-
shop, February 28th
and March 1st 2013 !!

Water Well Driller Certification Program Coordinator's Note

The last few months have been very busy for me here at the Division of Water. You would never know there is a bad economy working around here. There always seems to be something going on to keep me busy. I attended the South Atlantic Jubilee tradeshow in July, 2012.

In the last several months I have been in the field as much as I am in the office. I have video logged wells, responded to well owner complaints about their wells and the water quality they get from them. I have dealt with drought issues and contamination issues. I assisted with the emergency response to local disasters, been to two water well drillers board meetings and fielded daily calls and emails from drillers with problems and requesting variances.

So, please forgive me if I do not return your calls as timely as you expect. I will get back to you As soon as humanly possible.

The Water well Drillers Certification Board has been quite busy and had to deal with several issues as of late. This newsletter will address many of their decisions in regard to these matters. The board has been moving forward with an attempt to require certification of geothermal drillers and is receiving wide support in amending the water well drillers statute and regulation. A bill is being submitted to the Legislature in the 2013 session of the Kentucky General Assembly.

Variance request forms have been updated and added to the website for your use. If you do monitoring well drilling for the UST Branch of the Division of waste Management you will find several of the articles of use.

If you drill with sonic or reverse rotary drilling methods check out the new variance requests articles and forms.

The next KGWA Tradeshow and Drillers Workshop is slated for February 28th and March 1st 2013, in Louisville, Ky.

Volunteers Needed for Well Site Field Audits

Scotty Robertson began conducting field audits of water and monitoring well drillers this quarter. One audit has been completed thus far. These field audits are not intended to be regulatory inspections. The primary purpose is to

observe the well drilling operations and to address any problems the driller may have related to the certification program. Mr. Robertson is seeking volunteers to be audited. If you would like to volunteer to be audited please contact him if you would like to schedule a time to

meet at your well site. You may contact Scotty Robertson at 502-564-3410, ext. 4943, or e-mail scotty.robertson@ky.gov

Blanket Variances

The ***Blanket Variance*** was developed for monitoring wells installed by direct push methodologies and for wells installed around underground storage tank sites, where there are sometimes special installation requirements. Direct push and temporary wells meet the conditions specified in the blanket variance.

Monitoring wells installed in unconsolidated material <30(less than thirty-) feet thick also fall under this criteria, regardless of construction method. For these well conditions, no other justification is required.

The blanket variance letter will serve a justification if the well meets the criteria outlined on it. However, shale and weathered rock do not constitute unconsolidated materials. Unconsolidated materials consist of soil, regolith, sand, silt, and clay and combinations of these materials.

For those of you working for, or under contract with, the Division of Waste Management's (DWM) or the Underground Storage Tank Branch (USTB), if the site has received a No Further Action (NFA) letter then the NFA letter itself is regarded as written approval to abandon the monitoring well only.

This does not mean it will get automatic approval upon submitting the variance request. The NFA letter just relinquishes the USTB of its responsibility for the well. Abandonment of the monitoring well then falls under the purview of the Kentucky Division of Water (DOW) and its regulations. The USTB is then out of the game at this point and you must justify the variance to the DOW. Submitting a variance request in which not over drilling a well is requested just to save costs, is not a suitable reason for a variance request. Requesting a variance to **Not** over drill a well due to an obstruction overhead (like an overhead power-line) or near the well (like a sewer-line or new structure) is a suitable reason for a request.

If a UST site is active the USTB must know that wells are being abandoned. A directive is viewed as written USTB approval to abandon a well or perform another specific action. Obviously, USTB doesn't want wells taken out on an active site without their knowledge. For all other potential scenarios for which USTB has failed to consider, written permission should be sought.

In your future monitoring well variance requests please send the DOW with written **justification** for the variance request and a copy of the NFA letter and or any directives in your possession. For active UST, solid waste, uncontrolled waste, or hazardous waste sites preauthorization will be required by USTB or Division of Waste Management to modify monitoring well abandonment from the regulations. This will be in the form of a directive from USTB or DWM stating that a over drilling the well or other procedure is not required. For all other type site not covered herein, the driller will need to prepare written justification for the variance request proving it is more protective of the groundwater than implementing the regulations, if not covered by the blanket variance.

Please continue to include all other documentation you are currently providing.

New variance request forms have been developed and placed on the driller's website: <http://water.ky.gov/groundwater/Pages/FormsApplications.aspx> for your use.

VARIANCE REQUEST DATA NEEDED

What is required to receive approval of a Variance Request? The variance request for water or monitoring wells, must be signed by the certified well driller and the property owner. These signatures must be obtained prior to submittal to the cabinet for approval. The certified driller must request the variance. A consultant can not submit a variance request unless he or she is a certified well driller. **NO** variance request will be approved if well installation, modification or abandonment procedure has already been started or performed.

Each variance request should include the following information:

1. A thorough description of the land use at the site and at adjacent and surrounding properties;
2. Distance between the proposed water or monitoring-well location and other existing water-supply wells or monitoring wells on adjacent properties;
3. Distance between the proposed water or monitoring-well location and potential pollution sources, both on site and on adjacent properties, including septic systems, sewers, petroleum and chemical storage tanks, or other potential pollution sources;
4. A description of the geologic conditions expected at the site, including soil thickness, type of bedrock, if present, perched water, confining zones, and depth to groundwater;
5. A summary of the provisions, including the section numbers of this administrative regulation, for which the variance is requested;
6. A justification for the variance; and
7. Proposed construction, modification, or abandonment procedures to be used in lieu of compliance with this administrative regulation and an explanation as to how the alternate well construction procedures ensure the protection of the quality of the groundwater and the protection of public health and safety."
8. Well AKGWA Numbers for each well if available
9. Ky Uniform Well Construction Records or Construction logs if available

The variance requests can be sent in via mail, fax or email to:

Scotty Robertson
Groundwater Section
Watershed management Branch
Kentucky Division of Water
200 Fair Oaks Lane
Frankfort, KY 40601
Fax # 502-564-9636
Phone # 502-564-3410
Scotty.robertson@ky.gov

New variance request forms have been developed and placed on the driller's website: <http://water.ky.gov/groundwater/Pages/FormsApplications.aspx> for your use.

Variance Request to Abandon Water Wells by Monitoring Well Driller

The Underground Storage Tank Branch's (USTB) new site closure procedures allow abandonment of a domestic use well, as a remedial measure in cleaning up a site. Removal of the domestic use well near a UST facility allows for higher concentrations of contaminants to remain in the ground and groundwater, so a site can attain closure.

These changes in procedure allowing the abandonment of domestic use wells to alleviate the need for remediation at a UST site are not the recommended remedial supported by the USTB, this is an available closure attainment method. The USTB leaves the choosing of remedial measures to the property owner and their consultant. The consultant is rarely the contractor doing the actual remediation. A monitoring well driller is normally contracted to abandon monitoring wells on the site. If removal of a domestic use water well is determined necessary, the drillers normally contracted to do this work are certified monitoring well drillers, and not certified water well drillers.

The Division of Water (DOW) will approve a variance request to abandon a water well one time and one time only to a certified monitoring well driller on occasion of him finding such a well on a site he is working on. However, it is not the intent of the regulation for a monitoring well driller to go around abandoning water wells at will. Therefore, for UST sites the DOW will approve a monitoring well driller abandoning a water well once and only once. After that, the monitoring well driller will have to become certified as a water well driller to abandon a water well or subcontract a certified water well driller to abandon any further water wells.

New variance request forms have been developed and placed on the driller's website: <http://water.ky.gov/groundwater/Pages/FormsApplications.aspx> for your use.

Friendly and Helpful Links for Drillers

The link to the Water Well Owners Guide is <http://dep.ky.gov/formslibrary/Documents/GWWaterWellOwnersGuide.pdf>

Please remember to give your water well customers a copy of the guide when you give them your bill.

New or updated **Well Reporting forms** are now available at <http://water.ky.gov/groundwater/Pages/FormsApplications.aspx>

The link to the Kentucky Geological Survey <http://www.uky.edu/KGS/> Groundwater Protection Plans and Generic Wellhead plans are available on the Groundwater Section's Web site at:

<http://water.ky.gov/groundwater/Pages/GroundwaterProtection.aspx>

Sampling Domestic Use Water Wells

The Underground Storage Tank Branch's (USTB) new site closure procedures allow for groundwater sampling of a domestic use well to aid in determining the appropriate remedial measures in cleaning up a contaminated site. USTB has left this up to the consultant to choose an appropriate sampling method.

Several consultants have come to the Division of Water (DOW) requesting that it develop an appropriate sampling methodology for domestic use wells. The DOW uses its own standard operating procedures for sampling domestic use wells, which is based on the USEPA guidelines.

Generally, DOW personnel collect groundwater samples from private wells at a sample location located prior to any water treatment system, if present. Water wells treatment systems normally are placed in line after the pressure tank that is connected to the well pump system.

Water well pump system configurations vary from residence to residence. Pumps can be internal to the well, such as a submersible pump, or external to the well like a jet pump, turbine pump, or hand pump. Sometimes there is no pump at all but a bailer or bucket is used to collect water from the well.

Waterline and piping can vary in diameter and length depending on the amount of water the residence needs to convey from location to location. Waterlines can be below or above grade from the wellhead to the residence.

Pressure tanks can vary in size from a few gallons to more than 60 gallons and maybe located at the wellhead, basement, within a closet, or underneath of a residence. They may be in a well house separate from the wellhead, buried in the ground, or it may be under the home in a crawl space or in a basement. Sometimes the pressure tank and wellhead are buried.

Sample points are selected based on the well systems construction and accessibility. A sample point can be within or outside the residence. Some wells will have a spigot at the wellhead or in line prior to the pressure tank. The DOW normally will try to sample at the spigot closest to the well that is prior to treatment. An upright frost-free hydrant is an acceptable sample point for a domestic use well as long as bacteria, is not of concern. A spigot attached to the residence that is prior to treatment system is also appropriate.

However, the DOW sometimes must sample from a faucet within the residence. Try to avoid swivel faucets and remove any aerators prior to sampling from the faucet. Many private wells in Kentucky do not have a treatment system and some just have a water softener. The DOW collects prior to treatment if at all possible.

As far as purging the well, the DOW generally allows the water to run from the tap or spigot for about 15 minutes to purge stagnant water from the pump and water lines from well to the sample point. The purge time can vary depending on how much water line is in the well, in the ground from the well to the residence and piping to the tap or spigot location. The length of line can be estimated along with the water line diameter to calculate a purge volume.

Sampling Domestic Use Water Wells Cont.

This with the discharge or pumping rate can be measured or estimated at the spigot at which the sample will be collected to calculate the required purge time. DOW personnel then obtain field measurements at the end of this purge time. Sampling personnel then reduce the discharge to fill the sample containers directly from the sample point. When sampling for volatile organic compounds or semi-volatile organic compounds, reduce the flow rate to a slow stream of water with so there will be agitation of the sample while filling the container. When full acidify if required and cap the container and complete the labeling of the sampling and place the sample on ice for transport to a laboratory. When filling a VOC vial that has been pre acidified tilt the vial into the flow and gently fill completely with no air space and cap.

REFERENCES

SAFE SAMPLING PROCEDURES, 06/08/2009; Energy and Environment Cabinet, Department of Environmental Protection, Division of Water, Watershed Management Branch, Groundwater Section, Standard Operating Procedures, GWB 100.3. DOWSOP0901, Version No. 2.0, Frankfort, KY.

POTABLE WATER SUPPLY SAMPLING, 11/01/2007; Science and Ecosystem Division Operating Procedure, U.S. E.P.A. Region 4, Atlanta, Georgia. SESDPROC-305-R1, Potable Water Supply_AF.R1

GROUNDWATER SAMPLING, 10/28/2011; Science and Ecosystem Division Operating Procedure, U.S. E.P.A. Region 4, Atlanta, Georgia. SESDPROC-301-R2, Groundwater Sampling_AF.R2

**Memorandum of Agree-
ment
Between the
KY Division of Water and KY Division of Plumbing
Concerning Waterline Installation**

The Division of Plumbing (DOP) and Division of Water (DOW) and the water well certification board (WWCB) have made a Memorandum of Agreement (MOA) in order to better define the extent of responsibility between the water well driller, pump installer (if different than driller) and plumber.

Below is the approved MOA:

When drilling a water well the driller is responsible for proper installation of a water supply well and its pump system up to the sampling valve at the expansion tank. The plumber is responsible for connecting the residence to the water supply. DOP would like for well driller to contact the plumbing inspector when laying the water and making this connection. The DOP will then perform a courtesy inspection to insure all plumbing codes are met. This courtesy inspection is free and promotes good will between the drillers and plumbers. No fees or permits are required of the driller or homeowner for this inspection. The plumbing inspector once called will come out to property as courtesy to make sure water lines are buried 30 inches and that connections are properly made.

When connecting a water well to the waterline and the water line to the expansion tank and sampling valve or a frost-free upright hydrant as a sample point. The DOP request that the driller not bury the line and connections until the courtesy inspection has been performed. If the lines must be buried then the DOP asks that the driller install stand pipe or sight pipes over the lines and connections to allow inspection. The distance between sight pipes depends on how long the waterline is but 25 feet to 50 ft intervals are normal. Electrical lines can be run along with the waterline. The DOP uses a four inch diameter PVC (sdr-35) pipe as a sight-pipe. The writing on the water line should face up so that it is visible in the sight-pipe.

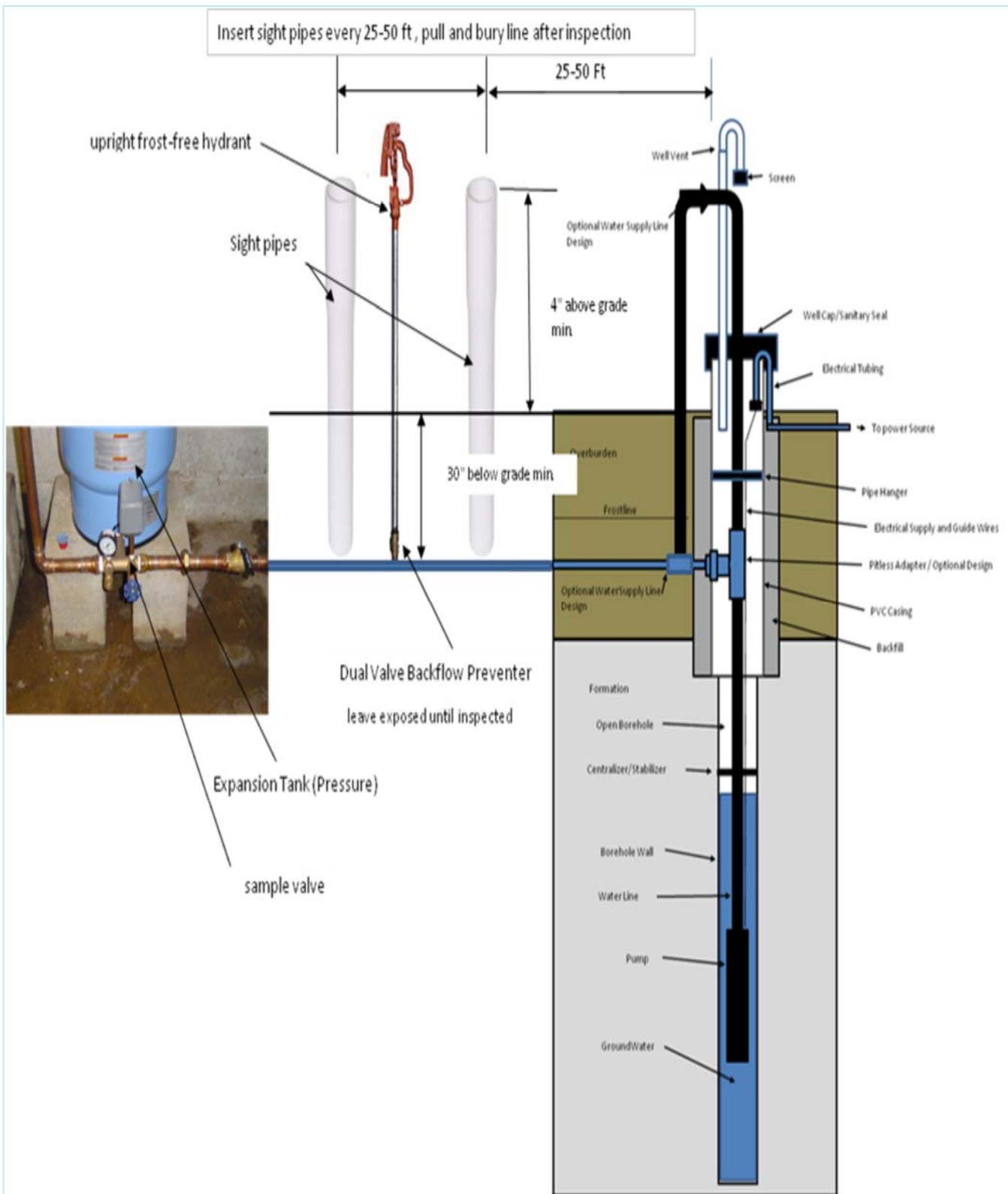
How far is the driller allowed to go with the waterline, to the expansion tank or to the pressure switch? The pump, line, pressure switch, and expansion tank are all considered as part of the well and need to be installed together as a unit. The DOP has always been of the opinion that the drillers responsibility extends to the expansion tank and valve for sampling. At this point the plumber ties into the system.

Problem arises when a driller connects the waterline to the expansion tank and then from this point runs a water line to the post hydrant at some other location. The drillers are responsible for everything up to the tank and a driller can install a spigot in the water line or a frost-free hydrant with a double check valve in the water line prior to the tank as a sample point. However, he is not to install any piping beyond the expansion tank without a plumbers license and permit. A double check valve is placed right next to the upright frost-free hydrant before it goes out of ground.

If the well driller puts the pump in basement instead of a well house or vice versa, the water well driller has jurisdiction to the expansion (pressure) tank. Regardless of where it's placed. If the driller puts expansion tank, test hydrant in the well house, then a line to the residence from the well house would be considered a service waterline and DOP has jurisdiction over it.

If the tank is put in basement of the residence the water well driller nor the home owner have to have a permit to install the waterline from the well to it, but this line needs to be inspected by DOP.

The following is a diagram illustrates the proper method for allowing inspection of the waterline.



Piezometer Vs. Well

A **piezometer** is either a device used to measure static liquid pressure in a system by measuring the height to which a column of the liquid rises against gravity, or a device which measures the pressure (more precisely, the piezometric head) of groundwater at a specific point.

The first piezometers in geotechnical engineering were open wells or standpipes (sometimes called **Casagrande piezometers**) installed into an aquifer. A Casagrande piezometer will typically have a solid casing down to the depth of interest, and a slotted or screened casing within the zone where water pressure is being measured. The casing is sealed into the drill-hole with clay, bentonite or concrete to prevent groundwater leaking to the surface. In an unconfined aquifer, the water level in the piezometer would be coincident with the water table. In a confined aquifer under artesian conditions, the water level in the piezometer indicates the pressure in the aquifer, but not necessarily the water table. Piezometer wells can be much smaller in diameter than production wells, and a 5cm diameter standpipe is common.

In recent decades, piezometers have been developed which are pressure gauges of various types in durable casings which can be buried or pushed into the ground and which will measure the groundwater pressure at the point of installation. The pressure gauges can be vibrating-wire, pneumatic, or strain-gauge in operation. These piezometers are cabled to the surface where they can be read by data loggers or portable readout units, allowing faster and/or more frequent reading than is possible with open standpipe piezometers.

In the Kentucky Regulatory Statutes, (KRS) **223.400**, a “**Well**” or “**Water Well**”, is defined as meaning any excavation or opening in the surface of the earth that is drilled, cored, bored, washed, driven, jetted, or otherwise constructed, when the actual or intended use in whole or part of an excavation is the removal of water for any purpose, including but not limited to culinary and household purposes, animal consumption, food manufacture, use of geothermal resources for domestic heating purposes and industrial, irrigation, and dewatering purposes, but not including wells to be used for watering stock or for general farmstead use if the wells do not provide water for human consumption. Wells are tagged with AKGWA #s Piezometers do not have to be tagged unless water is withdrawn from it for any purpose.

Governor urges citizens to protect groundwater

Groundwater protection begins at home

FRANKFORT, Ky. (Sept. 11, 2012) – Governor Steven Beshear has proclaimed Sept. 11 as “Protect Your Groundwater Day” in the Commonwealth of Kentucky to draw attention to the importance of preventing contamination and waste of this valuable resource.

Individuals can take action to protect groundwater by recognizing the causes of preventable groundwater contamination, advised Sandy Gruzesky, director of the Kentucky Division of Water, which is charged with protecting the Commonwealth’s groundwater resources.

“More than 900,000 people in Kentucky draw all or part of their domestic-use water from groundwater supplies and use more than 200 million gallons a day,” said Gruzesky. “It is important that we learn how to protect our groundwater.”

Most household water use occurs in a few areas around the home where potentially hazardous substances such as fertilizers and pesticides are often used. Homeowners with a water well should ensure wellheads are a safe distance from possible contamination. They should also contact a professional water well specialist to schedule annual well system inspections and to properly decommission any abandoned wells. An improperly sealed well can be a direct pathway for contamination into an aquifer. Nothing should ever be disposed of down an abandoned water well.

Septic system malfunctions also can pollute groundwater. Septic systems should be checked every one to two years, and pumped every three to five years by a professional contractor. Also, roof drains, sump pump drains and other rain or surface water drainage systems should be kept away from the septic absorption field. Flooding can keep the soil from naturally cleansing the waste water.

Everyone should properly use, store and dispose of hazardous household substances, including gasoline, oil, paint, paint thinner, fertilizer, weed killer, pesticides and cleaning products. Proper use of such substances means following the manufacturer’s instructions. Fertilizers, pesticides and weed killers should not be over-applied, nor should any such substances be mixed or applied near wellheads. Proper storage means keeping hazardous household substances in sealed containers in a secure place. Proper disposal of such substances means they should not be dumped on the ground, poured down drains or flushed down toilets. Homeowners should contact local waste authorities about proper disposal.



**In Memory of
Mr. Homer Pearson,**

Mr. Homer Pearson, 77, of Mayfield passed away Thursday, 8/23/12 at Lourdes Hospital. Mr. Pearson was the retired owner/operator of Pearson Well Drilling & Repair; a faithful member of West Broadway Baptist Church in Mayfield; the former President of Kentucky Water Well Association; a member of the National Water Well Association; and an avid sportsman who enjoyed his beagles. He is survived by his wife, Patricia Pearson; four sons, Terry (Claudia) Pearson of Sedalia; Gary (Sheila) Pearson of Wingo; Kevin (Alisa) Pearson of Mayfield; and Ed (Mary Ann) Richard of Mayfield; one daughter, Debbie (Danny) Young of Paducah; one sister, Iva Flood of Farmington; six grandchildren and 12 great-grandchildren. He was preceded by his four brothers, Aubert, Rufus, Emmett, and Milton Pearson; and his parents, Edward and Leone Brower Pearson. Services for Mr. Homer Pearson were held on Monday, August 27, 2012



<http://www.KentuckyUnbridledSpirit.com>

The Energy and Environment Cabinet does not discriminate on the basis of race, color, national origin, sex, age, religion or disability and provides, on request, reasonable accommodations including auxiliary aids and services necessary to afford an individual with a disability an equal opportunity to participate in all services, programs and activities.

Got an Interesting or Funny Drilling Story or Picture you would like to Share? Then send it to scotty.robertson@ky.gov and you may see it here.

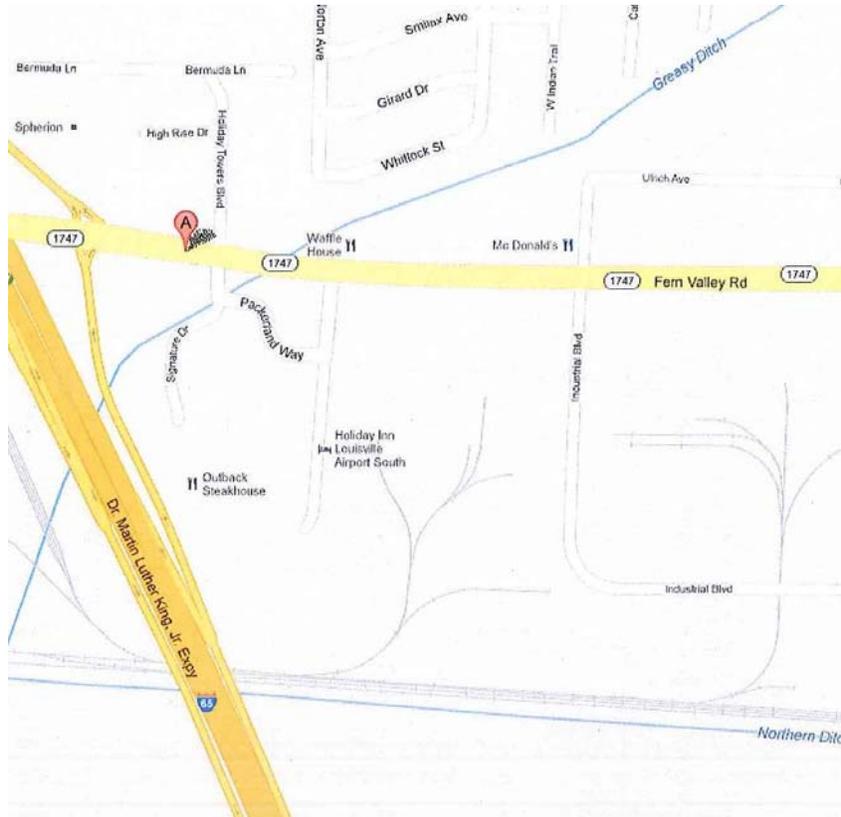
Continuing education training hours required for Kentucky well driller certification renewal can be attained at:

**The Kentucky Ground Water Association's (KGWA)
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February 28, 2013 and March 1, 2013

Board meeting February 28th at 9:00 AM EST

**Training Classes Begin 3:00 PM in the Conference Center on February 28th
Training Classes Begin 9:00 AM in the Conference Center on March 1st**



Located directly off Interstate 65, Exit 128, Fern Valley Rd. Minutes from downtown Louisville, Kentucky Fair and Exposition Center, and Churchill Downs.

**Fern Valley Hotel & Conference Center
2715 Fern Valley Road
Louisville, KY 40213
Front Desk: 1 (502) 964-3311
Fax Number: 1 (502) 966-4874**

