Well Installation Board News

The Well Installation Board held its quarterly meeting February 15, 2016, in conjunction with the Missouri Water Well Association’s annual convention at Tan-Tar-A Resort located in Osage Beach. The Board received updates on program and section activities, rule development, proposed legislation and changes to the Special Area 2 map. Staff presented an overview of the new online test for restricted and apprentice permits.

The next quarterly meeting is scheduled for 10 a.m. May 20, 2016, in the Mozarkite Conference Room at the Department of Natural Resources’ Missouri Geological Survey, Annex Building, 1251 Gale Drive, Rolla.

Staff News

Amber Steele Joins the Wellhead Protection Section

Amber Steele accepted a position as an Environmental Specialist in the Wellhead Protection Section and began work on April 11, 2016. A Missouri native, Steele holds an undergraduate degree in Geology and Environmental Science from Southeast Missouri State University and a master’s degree in Soil Science from the University of Missouri. In her previous position with the state of Minnesota, she held the title of Wetland Specialist where she oversaw the implementation of the Wetland Conservation Act. She is a former department employee working as a Soil Scientist and Environmental Specialist in Jefferson City. Amber will assist with rule development, enforcement activities, case work and other field-related activities.

Monitoring Well Drill Logs

Monitoring well contractors now have the ability to upload documents such as drilling logs when records are submitted online. Visit dnr.mo.gov/mowells to access the department’s online services. When you reach the formation description entry screen, you may upload the drilling log instead of entering the formation description. The option to upload a drilling log for other wells types will be available in the coming months.

The McNairy Aquifer of Southeast Missouri

The McNairy Formation is one of only two Cretaceous units in Missouri, the other being the Owl Creek Formation. The Cretaceous units crop out along the northern reaches of Crowley’s Ridge and also in the Benton Hills of southeast Missouri (Figure 1). Isolated occurrences also are found up to 20 miles north and west of the Ozark Escarpment.

The McNairy is named after the county in Tennessee where the non-marine extension of the marine Ripley Formation of Mississippi was described. The McNairy Formation in Missouri formerly was divided into two members, the Commerce Member below with the overlying Ardeola Member. The member designations have since been dropped, but still can be seen in outcrops. Continued on page 2
The upper part of the McNairy (Ardeola) is composed of a succession of five alternating beds of sandstone and clay. They are in ascending order: a yellow to brown, clayey sandstone; a white to yellow, fine-grained, micaceous sandstone; a light-gray to brownish-black, lignitic clay; an interbedded, orange sandstone and gray to brown clay; and a brown, lignitic, sandy clay. In the Bootheel region, the McNairy Formation has an approximate bedding strike of N 60° E with a 0.4° dip southeast. Attitude of the formation was determined by relating three well logs intercepting the top of the McNairy, one each in Stoddard, Mississippi and Pemiscot counties. A north-south cross section (Figure 2) depicts the orientation of the McNairy and its relationship to other geologic units.

The McNairy Aquifer (also known as the Ripley Sand) is composed completely of the McNairy Formation and is a significant source of groundwater in the Bootheel region of Missouri. This aquifer underlies about 3,328 square miles in this region and is used widely as a source of drinking water mainly because of two factors. First, the McNairy is under considerable artesian pressure. The high static water levels in the wells penetrating the McNairy decrease cost for well construction by reducing both the depth pumps must be set as well as the size of pump that must be installed. Because the pumps are set at shallower depths, the pump size required to pump water to the surface can be reduced. Secondly, the McNairy typically yields very soft water that contains little dissolved calcium, magnesium and iron. Water from the shallower aquifers usually requires treatment for iron and manganese removal. The depths of wells producing from the McNairy vary greatly from less than 200 feet near the outcrop area to more than 2,000 feet in southern Dunklin and Pemiscot counties.

Yields of wells penetrating the McNairy vary somewhat, but generally range between 150 and 750 gpm. Yields are lowest on and along Crowley’s Ridge where the unit is relatively thin, and also in other places where the McNairy may be thick but where interbedded clay greatly decreases the total thickness of clean, permeable sand. The direction of groundwater movement in the McNairy is generally down dip to the southeast. The quality of water from the McNairy varies with location and proximity to recharge sources. The McNairy likely receives recharge from three principal sources: Precipitation falling on the McNairy where it crops out on Crowley’s Ridge and Benton Hills; infiltration from streams where they flow directly across the McNairy; and recharge from the overlying alluvium west of Crowley’s Ridge where the unit is overlain directly by alluvial materials. Probably very little recharge to the McNairy is from either the alluvium or Wilcox Group east and south of Crowley’s Ridge. In these areas, the McNairy is overlain by thick Porters Creek Clay, which has very low hydraulic conductivity. The Porters Creek, combined with the Clayton and Owl Creek formations, form a very effective aquiclude separating shallower groundwater from the McNairy water. Water quality in the McNairy is poorest in a roughly circular area covering eastern Stoddard, southern Scott, southwestern Mississippi, and much of New Madrid counties (Figure 3). Here, total dissolved solids and chloride concentrations in the McNairy generally exceed public drinking water standards. The reason for the poor water quality in this area is not entirely clear, but may be due to faulting, which has allowed saline water from deeper Paleozoic units to move upward into the McNairy. Although the McNairy underlies an area containing about 3,328 square miles, the area of the aquifer containing water with less than 250 mg/L chloride is about 2,701 square miles. The volume of potable water stored in the McNairy Aquifer is estimated to be about 12 trillion gallons, or about 37 million acre-ft.
Variance Updates
Questions have arisen as to whether a variance issued for work on a particular site would be valid for future work on the same site. Since variances are granted to allow for deviation from regulations, it is necessary to contact the section to update the associated information and to make revisions to an existing variance. Otherwise, the submitted record may not reflect a contractor’s compliance with Missouri’s Well Construction Rules.
Since internal policies change, this may affect how Wellhead Protection staff members respond to a specific variance request even though a similar variance may already exist for the same site. Timely contact with staff to revise an existing issue or a new variance will help save public resources, avoid inconvenience and possibly avoid expensive well reconstructions.

Welcome Apprentice Contractors
The following individuals are now part of the Missouri Department of Natural Resources’ permitted apprentice contractor community:

Aqua Wells Inc. – Anthony Parks
Brown Well Drilling – Amy Nichols
Environmental Works – Ryan Harris
Jesse Yoakum Well Drlg – Matthew Yoakum
McCray’s Welding – Mason Horstman

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

Aqua Wells – James Mallonee
Atkisson Pump – James Baslee
B & H Well Drlg – Jesse Borgmeyer
Bindner, Lori
Black & Veatch – Brian Ortega
Booth Heating & Air – Brian Keith Bauer
Bradburne Briller & Johnson – Amber Cicotte
Braun Intertec – Joel Partridge
Burge Irrigation – Zach Clubb
Burns & McDonnell – Jordan Maddox
Carthage Pump Supply – Ricky Roberts
Connelly Plumbing – Brian Sothern
Drill It Well – Brent George
Environmental Science & Claim – Roger Sense
Geotechnology – Brian Fingers
Geotherm Drilling – Wade Hanks
Gilbane Federal – David Bowers
Haley & Aldrich Inc. – Ana Mora
Hampton Pump Service – Kyle Hays
HR Green Inc. – Adam Fisher
Industrial & Petroleum Env – Jacob Miller
Jackson Geothermal – Gary Sprowls
John Meade Plumbing – John Meade
Kennedy/Jenks Consultants – Martha Griffith, Joshua Sales
Kaw Valley Engineering – Richard Leeds
Kenworthy, Meredith
Leggette Brashears & Graham Inc. – Cassandra Puletapuai
Mid-America Environmental – David Greathouse
MoDNR – Alan Reinkemeyer
Mundell & Associates – Mark Breting
Murphy, Robert
Natural Resource Tech – Jacob Walczak, Troy Clausen, Patrick Hoefle
Natures Rain – Charles Fletcher
Ozark Professional Energy – Ken Hurley
Riverfront Environmental – Craig Cox
Roberts Environmental – Shawn Seymour
Roux Associates – Timothy Adams
S & L Irrigation – Alan Sollis
Schroepfer Well Drilling – Ray Wilson
Scott & Sons Drilling – Michael Harris
Shannon & Wilson – Patricia Nichols
Stantec Consulting – Andrew Riener
Superior Environmental – Kira Stevens
The Doe Run Company – Charles Seabourne Jr
Vironex – Sean Gardner
Werrink, Bryan

Prenotification for Heat Pump Systems
Amendments to the heat pump rule were approved by the Well Installation Board and became effective January 1, 2014. Prenotification is required for any heat pump well using 5-foot grout plugs every 40 feet. Heat pump wells that are grouted full length are not required to prenotify. Prenotification must be completed 48 hours prior to installation of the heat pump system. The 48-hour notice may be submitted by email, fax, phone message, and mail, in person or by using the online notification form at dnr.mo.gov/forms/780-2167.htm. Notification will require the owner name and address, GPS location, date work is to begin, primary contractor name and permit number and drilling contractor name and permit number. We recommend prenotification take place when the required Missouri One Call (DIG-RITE) notification is made. It only takes a few minutes. Coordination or approvals are not needed from the department; just provide notification and, after 48 hours, begin working. Staff members are making periodic site visits to witness the installation of grout plugs.

Local Restrictions for Residential Water Wells
A quick reminder: County, city and other regulated communities may have stricter laws and regulations concerning the drilling and location of wells within their jurisdictions. The department recommends checking with county, city and other local offices for any drilling restrictions or applicable ordinances prior to installing wells.

Welcome Contractors
The following individuals are now part of the Missouri Department of Natural Resources’ permitted contractor community:

Aqua Services LLC – Allen Breuer
ATC Group Service – Garrett Westland
Geosyntec – Edward Jones
Robinson Mechanical – Robert Lorey
Wellhead Protection Section Staff

573-368-2165

• Kyle Rollins – Section Chief
  Management of section, regulations, policy
  and rulemaking.
  573-368-2171 • kyle.rollins@dnr.mo.gov

• Justin Davis – Investigation and Remediation Unit Chief
  Field investigation and remediation, variances, casing
  depths, well construction and abandonment information.
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• Karen Smith – Processing Unit Chief
  Information regarding pending enforcement letters,
  permitting and testing.
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• MaLinda Bassett – Section Secretary
  General information, fee letters, requests for
  forms and publications.
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• Andrew Combs – Environmental Specialist
  Field investigation, well plugging, heat pump records.
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• Airin Haselwander – Geologist
  Public Water Systems, pilot holes, casing depths
  and variances.
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• Eric Hohl – Technical Assistant
  Water well construction and certification information
  and abandonment registration information.
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• Jeannie Hoyle – Permitting Clerk
  Permitting, testing and apprentice information.
  573-368-2450 • jeannie.hoyle@dnr.mo.gov

• Lori Miller – Correspondence Clerk
  Matching of well and pump records, correspondence
  requesting information.
  573-368-2318 • lori.miller@dnr.mo.gov

• Brad Mitchell – Geologist
  Field investigation, well construction information,
  variances and casing depths.
  573-368-2116 • brad.mitchell@dnr.mo.gov

• Matt Parker – Geologist
  Field investigation, well construction, Special Area 2, variances and casing depths.
  573-368-2170 • matt.parker@dnr.mo.gov

• Amber Steele – Environmental Specialist
  Regulations, enforcement, policy, rulemaking
  and legislation.
  573-368-2115 amber.steele@dnr.mo.gov

• Vacant – Office Support Assistant
  General information, data entry and receptionist.
  573-368-2375

Staff Website:  dnr.mo.gov/geology/geoasv/wellhdjob.htm
Well Online Services:  dnr.mo.gov/mowells/