Nebraska Wellhead Protection Network

Wednesday August 19, 2015
10:30 pm – 2:30 pm
Crofton City Auditorium, Crofton, Nebraska

Present:


Anthony Lowndes (The Groundwater Foundation) – Called the meeting to order, welcomed those present and went over the agenda.

Tom Moser – Lewis and Clark Natural Resources District, General Manager

Presentation on the history and current operation of the Cedar Knox Rural Water District.

Moser also spoke about the Hartington Water Quality Project. Presentation handouts can be found on TGF website.

Round Robin Notes:

Brian Bruckner (LENRD) – Currently Pierce County is managed as a Phase 2 – Groundwater Management Area, due to excessive nitrate conditions. LENRD is cooperating with the Upper Elkhorn, Lower Niobrara and Lewis and Clark NRDs, in addition to NDEQ, on the Bazile Groundwater Management Area Project.
The summer was focused on collection of irrigation water nitrate samples in Pierce and Knox Counties; approximately 500 individual sites within those counties. Data will be submitted to clearinghouse later this fall. Also exploring options for a new Rural Water System that would provide water to several small communities (Clarkson, Leigh, Creston and Humphrey) due to significant in-season water level declines in 2012. Currently forming an advisory committee for the project.

Marty Link (NDEQ) – In order to receive 319 grant monies a 9 element watershed plan must be approved. The application process is now located totally online. Alternative to a watershed plan would be a groundwater management plan such as the Bazile Groundwater Management Area Plan which is currently being held up by EPA for further explanation.

Jason Moudry (LLNRD) – Source water sampling and WHP plans in primary areas. Arsenic and selenium are the primary issues of focus. North Loop is looking into having their own treatment plant. Also looking into multiple community hookups.

Dick Ehrman (LPSNRD) – Currently handling nitrate management in about 8 WHP areas. Three or four areas have seen declining nitrates. As vadose sampling is conducted, also looking into selenium and arsenic in samples. Have found higher arsenic and not as much selenium. Cass county aerial mapping has been put on hold due to flooding in the district.

Craig Romary (USDA) – Working with various NRD staff on pesticide analysis project.

Russ Iwan (MUD) – Was able to get two WHP areas approved. Now working with the counties in the areas seeking overlays. Not looking to write new rules or regulation just wanting notice of land use change.

Ryan Chapman (NDEQ) – Upcoming workshops on Drinking Water Protection: October 28 in Gothenburg and November 4 in West Point. Details on NDEQ website at: http://deq.ne.gov/Press.nsf/News_PR.xsp

Nathan Roddy (Grad Student UNL) – Working with NDEQ to determine the age of groundwater, specifically in Edgar, NE. This will help determine what management practices have been working.

Mike Archer (NDEQ) – Conducts surface water sampling and is currently conducting microcystin sampling on beaches.

Doug Buresh (NE Rural Water Association) – Is now the Source Water specialist. Wahoo is down to only one well. Working on two source water plans in Knox County and Wilcox, NE.

Arden Uhlir (West Knox Rural Water) – Most problems stem from the general public not understanding what the issues are with their water.

Dan Able (West Knox Rural Water) – Construction has started on new wells that are being added to the system for more reliability. In the beginning stages of starting source water protection plan. Currently has 220 customers in two villages.

Chad Reifenrath (Cedar Knox Rural Water) – Always looking for ways to keep their Trihalomethane low. It is a constant process to ensure safe water to customers.

Tom Moser (LCNRD) – With the expansion of rural water there will be a need for more water managers and water operators. There is a serious gap in education and needs will increase in the next 10 years as older operators retire and systems expand.
Lindsey Phillips (NDEQ) – Source Water Protection grants awarded to Wilber, Coleridge, Hebron and Grisham. Focus on WHP plan, education and pushing incentive programs for BMPs.

Sam Capps (NDEQ) – Grad student, Victoria, is updating contaminant sources to begin working on guidance document and educational materials for communities to create and implement WHP plans on their own. Looking at what other states have available and how those may be adapted to assist Nebraska. Hope is to have some available in the coming months. There are some changes to the requirements for a Wellhead Protection Plan.

Annette Sudbeck (LCNRD) – Installing more test and observation wells to get better data which will assist WHP areas and communities get on the ground actions that work toward improving groundwater quality.

Dennis Naslund (Village of Coleridge) – Currently working on WHP plan. There is an irrigation well within the 1000 foot radius of a future well for the city and a WHP plan could help the community protect its water resource.
Cedar-Knox Rural Water Project

Lewis & Clark Natural Resources District

Chemical Additives

Lime (Water Softener)
Ferric Chloride (Coagulant—Removes Silts)
Polymer (Coagulant Aid)

Water Treatment Plant Operation:

Lake water is pulled through screens to keep out fish, leaves, and organics matter, then pumped to the plant. Chlorine Dioxide and Carbon are added to adjust taste and odor. Lime and chemicals are added at the plant to remove silt and soften water, before it goes through a large sand filter. The cleaned water is then disinfected to kill bacteria or microorganisms before it is pumped out to storage tanks and pipelines to serve customers.
Cedar-Knox Rural Water Project

The source of drinking water used by CKRWP is surface water from Lewis & Clark Lake. The rural water treatment plant at Devils Nest in Knox County softens water to around 8 grains of hardness without raising the sodium level. All drinking water, including bottled water, can be expected to obtain at least small amounts of contaminants. That does not mean the water poses a health risk.

To meet state and federal standards, the CKRWP tests its water for over 100 possible contaminants, some several times per year. Those that may be present before treatment include:

- **Microbial** virus or bacteria from livestock, septic or wildlife.
- **Inorganic** salts or metals that may be natural or from industry or mining sources
- **Pesticides/herbicides** agriculture or urban chemical runoffs
- **Organic** synthetic or volatile chemicals from industry, petroleum, or septic systems
- **Radioactive** naturally occurring or result of oil, gas, or mining activities.

The CKRWP routinely monitors for over 100 contaminants. The following report show all detections found in 2015 for the most common concerns of untreated water and disinfection byproducts (THM’s) samples of treated water.

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Results</th>
<th>Allowable MCL</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coliform Bacteria</td>
<td>0</td>
<td>0</td>
<td>naturally present</td>
</tr>
<tr>
<td>Gross Alpha Radionuchides</td>
<td>2.9 pCi/L</td>
<td>15</td>
<td>naturally present</td>
</tr>
<tr>
<td>Fluoride</td>
<td>1.15 ppm</td>
<td>4</td>
<td>water additive for healthy teeth</td>
</tr>
<tr>
<td>Nitrate-Nitrite</td>
<td>0.542 ppm</td>
<td>10</td>
<td>fertilizer, septic leaching, erosion</td>
</tr>
<tr>
<td>Chromium</td>
<td>1.45 ppb</td>
<td>100</td>
<td>natural erosion</td>
</tr>
<tr>
<td>Sodium</td>
<td>86 ppm</td>
<td>500</td>
<td>naturally present</td>
</tr>
<tr>
<td>Copper</td>
<td>.125 ppm</td>
<td>1300</td>
<td>naturally present, pipe leaching</td>
</tr>
<tr>
<td>Lead</td>
<td>2.22 ppb</td>
<td>15</td>
<td>naturally present, pipe leaching</td>
</tr>
<tr>
<td>Volatile Organic Contaminants</td>
<td>0</td>
<td>0</td>
<td>no contaminants found</td>
</tr>
<tr>
<td>Pesticides/Herbicides</td>
<td>0</td>
<td>0</td>
<td>no contaminants found</td>
</tr>
<tr>
<td>Trihalomethane (THM’s)</td>
<td>57.8 ppb</td>
<td>80</td>
<td>by-product of chlorine disinfection</td>
</tr>
</tbody>
</table>

Some people may be more vulnerable to contaminants than the general population. People with compromised immune systems should seek advice from their health providers. Questions on Safe Drinking Water can be directed to a Hotline (800-426-4791) or call the CKRWP office in Hartington at 402-254-6758.
Overview of the system

Cedar Knox Rural Water Project was started in 1977 mainly because of the water quality in northern Cedar and Knox counties. Ground water was high in sulfates and hardness; in some areas the hardness was as high as 40 grains and dissolved solids up to 789 ppm. A suitable ground water source within the service area could not be located, so the surface water treatment plant in the bankrupt Devils Nest Development was purchased. Lewis & Clark Lake is the water source.

Work on the distribution system and refurbishing the treatment plant began on April 21, 1981 and the first water went out to the customers on October 1st of that same year. 165 miles of pipe and one booster station served 283 rural users and two towns (Crofton & St Helena).

Three additions have been made to the original project since 1981. We now serve 860 service connections, which includes 4 villages, 3 housing subdivisions, Gavin’s Point Dam facilities, Lakeview Golf Course and Lewis & Clark State Recreation Area. The project goes as far east as Obert and south to the edge of Hartington with a total of 392 miles of pipeline. The system now has a total storage capacity of 579,000 gallons, 3 storage tanks, 2 clearwells, 4 booster stations and 8 pressure reducing stations. The system is computer monitored 24 hours a day to maintain health compliance at the plant and distribution system.

The treatment plant uses the excess lime treatment process to clarify the water pumped from Lewis & Clark Lake. The process also softens the raw water down to between 6-8 grains hardness.

The system has passed all water quality tests required by Dept. of Health. Carbon Filtration is used to control taste and odor. The water is fluoridated and chlorinated and the Project has won several awards for Water Fluoridation Quality.

Our field and plant staff are all Dept of Health certified operators and attend continuing education and training classes.

Monthly Water Rates
(October 1, 2012)

Original and Menominee South

$25.00 Minimum Charge
$ 5.00 Maintenance Fee
$ 4.50 per 1000 gallons used

Bow Creek

$31.00 Minimum Charge
$ 5.00 Maintenance Fee
$ 4.50 per 1000 gallons used

Water Use Estimates

gpd = gallons per day.

Residential 50-100 gpd per person
Beef, Yearlings - 20 gpd
Cattle or Steers - 12 gpd
Dairy - 15 gpd
Dairy Sanitation - 500 gpd
Floor Flushing (100 sq ft) - 10 gpd
Heifers - 15 gpd
Hogs/Swine - 4 gpd
Brood Sows, Nursing - 6 gpd
Goat or Sheep - 2 gpd
Horse or Mule - 12 gpd
Chicken (per 100 birds) - 5-10 gpd
Ducks (per 100 birds) - 22 gpd
Turkey (per 100 birds) - 10-25 gpd
Hooking Up to the System

To make an application for rural water service you need to:

1. Apply to have an engineering study done to determine if a hookup is feasible. The cost for this is $25 and is non-refundable. (After engineering approval, the Rural Water Advisory Board considers for approval and the office prepares a cost estimate if needed)

2. A Water Use Agreement for Water Service is completed by the applicant also an easement for access to the property for line maintenance. A water service payment is made.

3. The applicant coordinates with the rural water office on location of meter and our plumber is contacted to do the installation. (meter is put at edge of your property, you pay cost to run to house)

Hookup Costs:

- Original Project
  - $6500

- Bow Creek Project
  (southeast end of system)
  - $7000

(hookup cost includes a meter pit and pit installation along existing water line)
Hartington Water Quality and Flood Control Project

Pictures of Water Flow

#1 – Picture of lower farm pond that has no discharge tube prior to new reservoir being constructed on the same site.

#2 – The upper pond to eventually be taken out to make room for a new Industrial Park site. The lower pond that was removed is in the distance.

#3 – Looking from downstream back at the new reservoir dike with 30” outlet tube

#4 – New reservoir looking at it from upstream

#5 – Bottom riser has 12” tube to begin discharging water as it rises to a level 7’ above pond floor. The upper riser has a 30” tube that begins to discharge water when it gets to that level. An auxiliary spillway takes water out of the reservoir if and when the amount of water cannot be handled by the 30” tube to prevent a reservoir failure.

#6 – 2 acre water detention cell that catches the water flowing out of the reservoir and slowing the water down by flowing through or over the concrete wier and downstream. Normal full drainage of the detention pond occurs in 48 hours.

#7 & #8 – Water passage downstream along the side and in front of the nursing home and assisted living facilities where the flooding risk is the greatest

#9 – Water makes it way past the nursing home and under Hwy 57 picking up additional water draining from the north and south from city storm sewer intakes before flowing a city block through a rip rap rock ditch and dumping into a box culvert that runs under the city for one mile before discharging into the Norwegian Bow Creek on the northeast part of the city.

#10 – New extended and enlarged box culvert where the water traveling under Hartington discharges and travels 200 yards through a large drainage ditch before dumping into the Norwegian Bow Creek.