

Bethel College Mennonite Church Creation Care Committee
Creation Stewardship Notes # 29, July 2008
Our Tap Water
Raymond Regier

Stewardship Notes # 28 dealt with the problems of bottled water. Now let's have a look at our prime source of water: good reliable **tap water**.

The city of North Newton, as well as the cities of Newton, Hesston, Goessel, Moundridge, Halstead, McPherson, Inman, Buhler and others, get excellent quality water from a common source: the Equus Beds aquifer. The city of Wichita also gets much of its water from this same place. Where is this aquifer? How did it get there? How reliable is it? Can we continue to be able to count on it to supply us with this precious resource? What laws govern its use? To answer some of these questions, below is information taken from several sources. First, Kansas Water Law:

The Kansas Department of Agriculture Handbook of Water Rights states: *Water, like other natural resources enjoyed so bountifully by Kansans, is protected for the use and benefit of the citizens of this state. Water should be used wisely and good conservation measures should be practiced by all water users. . . .*

Kansas laws allow the establishment of Groundwater Management Districts (GMDs). The Equus Beds Groundwater Management District, with offices in Halstead, establishes rules and practices for the use and protection of water in this area. Some of the information below is taken from their website.

HIGH PLAINS AQUIFER (taken from the GMD website)

"The Equus Beds aquifer is part of a regional aquifer system known as the High Plains aquifer system. The regional aquifer extends into Colorado, Nebraska, New Mexico, Oklahoma, South Dakota, Texas and Wyoming. The Equus Beds aquifer forms the eastern most portion of the regional aquifer system in Kansas. It derives its name from Equine fossils found in unconsolidated deposits underlying the entire District.

The Equus Beds aquifer was formed during the Quaternary Period between 700,000 to 1,000,000 years ago. Depositional, erosional and structural processes were the main forces that formed it.

Erosion from through-flowing rivers or streams and subsidence from the solution of portions of the underlying Hutchinson Salt member reshaped the ancestral land surface. Deep troughs or channels were cut into bedrock. Later deposition by streams, rivers and wind filled the channels with unconsolidated deposits of clay, silt, sand and gravel. The thickness of the deposits range from 300 feet in the McPherson Channel to almost 350 feet in the Ancestral Arkansas River Channel. . . .

FORMATION OF THE AQUIFER (taken from the book ROADSIDE KANSAS)

"Much of this alluvium was laid down by the Smoky Hill River during the Ice Age, when it flowed south to the Arkansas River. During the late stages of the Ice Age, streams in the Kansas River basin to the north were cutting down through their beds and flowing at lower levels than the ancestral Smoky Hill. These streams were also eroding headward, attacking the limits of their drainage basins. Eventually, in northern McPherson County, one of these headward-eroding tributaries of the Kansas River system cut into the Smoky Hill River and captured its flow. This process is called stream piracy, and it accounts for the U-turn in the present-day Smoky Hill River in northern McPherson County. Although it enters the county as a southeast flowing stream, it exits flowing to the north."

RECHARGE (taken from the GMD website)

"Recharge is a continuous process that adds water directly to the aquifer. Several natural sources of water make up the total recharge supply for the Equus Beds aquifer. Of these sources, precipitation contributes the greatest amount to groundwater recharge. Annually, 30 inches of precipitation fall on the land surface overlying the Equus Beds aquifer. Due to geologic, hydrologic and climatic conditions, about

80 to 90 percent of annual precipitation will either drain into streams or rivers, evaporate back to the atmosphere or be used by plants or people. . . .”

DISCHARGE (taken from the GMD website)

“Groundwater discharges are continuous natural and man-made processes including outflow, baseflow, evaporation, transpiration, and withdrawals by wells. . . .

Baseflow is groundwater that seeps, flows or is naturally discharged from the aquifer to rivers or streams. Baseflow conditions exist when the water table is higher than the water level in the rivers or streams. Previous studies by the Kansas and U.S. Geological Surveys, concluded that low flows in the Arkansas, Little Arkansas, and the North Fork Ninnescah Rivers are maintained by discharge from the Equus Beds aquifer. . . .”

WATER QUALITY (taken from the GMD website)

In general, the inorganic quality of groundwater in the District is good and suitable for most uses. However, groundwater contamination from natural and man-made sources has occurred in the District.

USE (data from the GMD website)

Groundwater is the principal source of fresh water for most uses in the District. These include industrial (15%), irrigation (50%), municipal (34%), and other uses (1%).

PROTECTION OF OUR WATER SUPPLY

During oil development in the area from Burrton to McPherson in the 1930s, salt-water brine which accompanied the oil pumping was left in open pits and seeped into the aquifer. Particularly in an area north of Burrton, water in the aquifer is unsuitable for most uses. In the contaminated areas chloride concentrations range from 500 mg/l to 8,000 mg/l compared to 150 mg/l before contamination. The city of Wichita together with other entities is developing an Aquifer Storage and Recharge (ASR) project to inhibit the movement of this saltwater plume into the area with city water well fields.

Water is being pumped out of the Little Arkansas River just southeast of the Harvey County West Park whenever the river flow exceeds the normal dry weather flow, processed to clean it and then is pumped into injection wells to provide a barricade to keep the polluted salt water from making its slow migration from north of Burrton to the city water well fields. This project will also enhance the total supply of water available. There is a series of water injection sites located a mile apart, starting at the intersection of West 12th Street and Willow Lake Road (5 miles east of the western county border).

North Newton’s two city wells are located just southeast of the intersection of 12th Street and Essex Heights (6 miles west of Meridian and 7 miles east of the first injection well). Water from these North Newton wells is pumped into the City of Newton water system further southeast; the two cities, then, have a common water supply.

The ASR program is being enlarged to divert water from the Little Arkansas River at Sedgwick, cleaning it and injecting it into wells in southern Harvey and northern Sedgwick Counties.

We are fortunate to have an excellent, reliable source of water in this area. Water is a precious gift that we must never forget to appreciate and protect – both in quantity and quality.

Sources:

Groundwater Management District #2 website www.gmd2.org/AboutUs.html

Kansas Department of Agriculture: Kansas Handbook of Water Rights www.ksda.gov/appropriation/?ie=240&txt=true

[Roadside Kansas. A Traveler’s Guide to Its Geology and Landmarks](#) by Rex C. Buchanan and James R. McCauley

U.S. Geological Survey Kansas Water Science Center