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## **Middle Republican NRD Water Management Actions**

While the N-CORPE (Nebraska Cooperative Republican Platte Enhancement) project is destined to become the hallmark for water management in the Republican Basin, other management actions by the Middle Republican Natural Resources District (MRNRD) have helped the district meet the requirements the District's Integrated Management Plan (IMP) and assist the State of Nebraska in staying in compliance with the Republican River Compact. In the months following the settlement, the IMP were adopted and included provisions for a moratorium on new surface and ground water uses, mandatory metering on irrigation wells, certification of uses, a restriction on new development and the establishment of an annual allocation.

The Platte-Republican Conservation Reserve Enhancement Program (EQIP) had good interest and at least 12,000 acres still remain in the program. A special initiative through the federal Environmental Quality Incentives Program combined federal, state, and local dollars to permanently retire about 1,100 acres. A locally funded Acreage Reduction Program (ARP) and a new federally supported Agricultural Water Enhancement Program (AWEP) provided for the permanent retirement of about 2,500 more irrigated acres. AWEP along with EQIP funding provided for the temporary retirement of an average of 3,000 acres a year. AWEP, EQIP and local cost-share programs have also provided for various irrigation water management practices. These practices include soil moisture monitoring systems, subsurface irrigation, pivot nozzle conversions and other irrigation efficiency practices.

In 2007, the MRNRD working with the other NRDs in the basin leased surface water supplies from the Frenchman -Cambridge Irrigation District, the Frenchman Valley Irrigation District and the Riverside Irrigation Company. For \$8.5 million, approximately 24,000 acre feet of water was granted to the NRDs and used by the State of Nebraska to obtain compliance with the Republican River Compact. DNR leased additional water from the Nebraska Bostwick Irrigation District. Since 2007, Nebraska has been in compliance with the compact through cooperative efforts outlined in our IMPs.

In 2011, the MRNRD began negotiations with the Riverside Irrigation Company. Through these discussions MRNRD was able to purchase the irrigation interests in the Company and take over all administrative functions. That project permanently retired 670 surface water irrigated acres of which 305 acres were also served by ground water wells. An additional 100 groundwater acres in the immediate area were also retired. For a total purchase price of about \$2.6 million the surface water rights of Riverside provide for 1,500 to 2,000 acre feet of water each and every year that stays in the Republican River to be used by other interests or credited to the State of Nebraska in a compact call year.

The first allocation adopted in 2004 by the MRNRD was 39 inches over three years or 13 inches per year. This allocation was reduced to 60 inches over five years or 12 inches per year in 2008. Average water use in the 2005-2007 allocation period was 8.9 inches per year and use in the 2008-2012 allocation period was 10 inches per year. The average use in 2012, the driest year on record, was 17 inches. In 2003, a relatively wet year before mandatory allocations, average pumping was over 16 inches and in 2002, another extremely dry year the average pumping was nearly 24 inches. While the allocation for the 2013 through 2017 period is again set at 60 inches, the board has established a “hard cap” on pumping for 2013. This hard cap will only allow producers to pump 10.86 inches on average without being subject to significant penalties. This hard cap is in line with our IMPs and will allow the district to stay in compliance with our long term pumping standard.

Of the 1.1 million groundwater irrigated acres in the Republican River Basin, the MRNRD has about 309,000 certified acres, some of which are in CREP. There are about 95,000 surface water irrigated acres of which about 50% also have irrigation wells. Through compact accounting the surface water acres have between 25-30% of the annual consumptive use. The groundwater irrigated about have the remaining 70-75% of consumptive use. When you consider the surface water acres that are being supplemented with groundwater, less than 5% of the irrigated acres consume nearly 30% of the water. The remaining 95% of the acres use only 70 % of the annual supply. Groundwater pumping is calculated as its impact on baseflow and not as water through the pump. Restricting ground water in a dry year when there is little baseflow has very little impact on the stream.

The MR NRD is working with other NRDs, Irrigation Districts, the Nebraska Department of Natural Resources (DNR), the states of Colorado and Kansas, and the Bureau of Reclamation in a basin study to develop ideas on conjunctive management of water in the basin. Surface water is regulated by DNR, groundwater is regulated by the NRDs but in a dry year we hope to develop plans that allow us to manage these resources to the best and most efficient use. New ideas can bring about new solutions to the continuing issue of water management in the basin.

Water quantity has been an issue for the MRNRD for a number of years. The NRD began measuring water levels in 1974 and continues to track rises and declines in our static water table with a series of observation wells which are read twice a year. There are 130 observation wells that show there are some areas with a decline of 15 feet, the average decline for the district is about 5 feet. Following a decline from 2000 to 2006, the district has seen a rise in static water levels from 2007 to 2011. A decline of about one foot was seen following the extreme dry conditions of 2012. The average saturated thickness of the aquifer is 200 feet with many areas having a thickness of 300 feet or more.

Water quality issues are located primarily in the Republican River valley. Many areas have high nitrate levels and are related to the use of fertilizer in the 1960s and 1970s.

The district collects water samples from a network of over 200 irrigation and domestic wells. A special protection area was developed in the 1990s and we continue to track nitrate levels that have not increased.

The MRNRD maintains and operates 34 flood control structures in four areas of the district. These structures were built using local, state and federal funds. Significant flooding in the Medicine Creek and Blackwood Creek watersheds has not occurred since the development of the dams.

Riparian vegetation projects have removed trees along the main stem of the Republican River. These projects improve the flow and reduce consumptive uses by vegetation. The State of Nebraska, Natural Resources Conservation Service, Southwest Weed Management District, the NRD and willing landowners have all worked together to improve the flow of the Republican River.

Conservation practices have also had a significant impact in the district. This impact has been detrimental to stream flow. Terraces and small farm dams and ponds capture water that otherwise would have flowed down the canyons to tributaries or to the main stem of the river. Conservation tillage has held water in the residue of fields that also ran off in previous times. Other than the occasional drought, rainfall has not fluctuated significantly over the years. According to a Bureau of Reclamation study, intensity and duration have changed. We do not see as many heavy, long storms that used to occur, now the rains we see are more frequent but less intense.

Compact compliance is a reality and through the management actions of the MRNRD and the other NRDs in the basin compact compliance can be routine. Projects such as NCORPE and the existing Rock Creek project can augment stream flow. The Riverside Irrigation Company buyout leaves water in the stream every year. Permanent and temporary retirement programs have a benefit over the long term of reducing consumptive use. Conjunctive management projects in the future will allow us to manage supplies to meet the most reasonable and beneficial uses. Compact accounting is a confusing process and issues before the United States Supreme Court relating to imported water supply and Harlan County evaporation accounting can greatly assist Nebraska in maintaining compliance. Our current generation of IMPs will continue to provide the State of Nebraska and the NRD with the regulatory and management tools that we need to maintain compliance. DNR and the NRDs will continue to revise and update those plans to reflect the current situation. Managing our resources together can keep Nebraska in compliance over the long term.