

WATER RIGHT MANAGEMENT

All water within the State of Kansas is dedicated to the people of the State, subject to the control and regulation of the state, and may be appropriated for beneficial use. Kansas regulates water rights through the Water Appropriation Act (K.S.A. 82a-730) for both surface and groundwater. The date of priority of a water right, and not the purpose of use, determines the right to divert and use water at any time when supply is not sufficient to satisfy all water rights. However, when use of water for different purposes conflict in a condemnation procedure, the following order of preference is given to the beneficial use: domestic, municipal, irrigation, industrial, recreational, and waterpower (K.S.A. 82a-707). Additional beneficial uses are artificial recharge, hydraulic dredging, contamination remediation, dewatering, fire protection, and thermal exchange (K.A.R. 5-1-1). A water appropriation right does not constitute ownership of such water, and water rights remain subject to making proper and beneficial use of that water.

A long-range goal and objective of the State of Kansas for management, conservation and development of the waters of the state is the sound management, both public and private, of the atmospheric, surface, and groundwater supplies of the state (K.S.A. 82a-927 et. seq). Policies to meet the goals include: the management of the groundwaters of the state as provided by the Kansas Water Appropriation Act and the encouragement of local initiative in the planning, implementation, funding and operation of local water programs to the extent that the same are supportive of state water programs.

The Kansas Department of Agriculture, Division of Water Resources, administers the Water Appropriation Act. The Chief Engineer, Kansas Department of Agriculture/Division of Water Resources, has broad authorities to enforce and administer the laws of the state. The Chief Engineer has the regulatory authority to consider the public interest in reviewing proposed water right permit applications (K.S.A. 82a-711). Although there is no definition in the statute on what the public interest represents, it does outline several considerations that should be taken into account when determining if a proposed use would unreasonably affect the public interest. These include established minimum desirable streamflow requirements, the safe yield and recharge rate of an area, the priority and allocation of existing water rights, and all other matters pertaining to the determination (K.S.A. 82a-711). The Groundwater

Management Act (K.S.A. 82a-1020) was passed in 1972, to address stressed and declining groundwater

tables. Five Groundwater Management Districts have formed in the state, with the purpose of conservation of ground water resources, prevention of economic deterioration, and stabilization of agriculture. (K.S.A. 82a-711). The Groundwater Management Districts provide local water users the right to determine their own destiny with respect to ground water management, as long as it does not conflict with the laws and policies of the State. The Act defines an eligible voter within a district as a landowner of more than 40 contiguous acres located within the district, or a person that uses more than one acre-foot of water per year. Each municipality within a Groundwater Management District constitutes one eligible vote.

House Substitute for Senate Bill 287 directed the Kansas Water Authority to study and make recommendations to the 2001 State Legislature on five specific issues. Two of the issues relate to water right management: 1) Aquifer resources, recharge rates, availability of surface water resources and the long term prospects for any necessary transition to dryland farming in areas of the state to maintain sustainable yields and minimum streamflow levels; and 2) The potential for competing water needs for at least the next 20 years and means to address the competition. Two areas of potential user competition are minimum desirable streamflow and High Plains Aquifer declines.

Minimum desirable streamflows were established in specific reaches of the state's rivers to "preserve, maintain or enhance baseflows for instream water uses relative to water quality, fish, wildlife, aquatic life, recreation, general aesthetics and domestic uses and for the protection of existing water rights" (K.S.A. 82a-928(1)). When the minimum desirable streamflow is not met for more than seven days, administration action against junior water rights must be reviewed to restore streamflow. Daily mean discharge for many of the river stretches with minimum desirable streamflow has decreased over the past thirty years, increasing the frequency that minimum desirable streamflow is not met, and administration action on junior water rights might be necessary.

The High Plains Aquifer, the primary source of water in western Kansas, is another area of potential future water conflict. Overall, the level of the aquifer is in decline and cannot indefinitely support all the current uses. The aquifer is highly variable in the amount of ground water available and the rate of decline; some areas are experiencing shortages now, others may not face shortages for another 100 years (Kansas Geological Survey, 2000).

The High Plains Aquifer consists of several distinct, but hydraulically connected, water bearing

formations: the Ogallala, the Great Bend Prairie and the Equus Beds, with some connected alluvial deposits. Groundwater Management Districts #3 (Southwestern Kansas), #1 (Western Kansas) and #4 (Northwestern Kansas) overlie most of the Ogallala Aquifer (see figure 1). The Ogallala Aquifer consists of water-saturated deposits of sands, gravels, silts and clays. The depth to water varies from zero to over 300 feet below the surface. Where the aquifer is close to the surface, it naturally discharges to streams and seeps and through evapotranspiration. The saturated thickness varies from just measurable to over 300 feet in southwestern Kansas. The Great Bend Prairie and the Equus Beds aquifers form the southeastern extent of the High Plains Aquifer in Kansas. These aquifers lie mostly within the Groundwater Management Districts #5 (Big Bend) and #2 (Equus Beds). The Great Bend Prairie and the Equus Beds aquifers have a higher potential recharge rate estimated at 2 – 4 inches per year, than the Ogallala, which has an estimated potential annual recharge of 0 to 2 inches per year, with most of the area receiving less than an inch (Hansen, 1991). Most of the aquifer recharge is from precipitation. GMDs #2 and #5 are managed for sustainability. In areas where there are shortages, such as the Rattlesnake Creek subbasin, long-term sustainability may be achieved with some moderate level of reduction in the total water use.

The Ogallala Aquifer is the primary source for nearly all water uses in western Kansas, with irrigation being the major use. The installation and pumping of large capacity wells began to appear in significant numbers during the 1940's, with a rapid increase during the 1950's to mid-1980's. Ground water declines occur where the rate of withdrawal exceeds the rate of recharge. In GMD #1, the aquifer declined an average of 1.75 feet/year from 1969 - 1979. That rate of decline slowed to about 0.5 feet/year from 1989 – 1999. Similarly, the ground water levels in GMD #3 and #4 have both shown a reduction in the rate of decline over the past three decades, from approximately 2.2 feet/year to 1.1 feet/year (GMD #3) and 1.0 feet/year to 0.19 feet/year (GMD #4) (Kansas Geological Survey, 2000). The slowing of the decline rate may reflect the ground water is being used at a more sustainable level; it could also reflect areas where withdrawals have decreased as there is little water left to use. The current Ogallala water table levels show declines from predevelopment levels in all of GMD #1, 98% of GMD #3, and 86% of GMD #4 (1999 water level data¹, KWO).

One consequence of the ground water declines has been a reduction in the aquifer outflows to streams. Many perennial streams in western Kansas

are dependent on ground water for much of their flow. When the ground water table drops below the elevation of the streambed, the flow of water reverses and streams will discharge into the ground water. Many western streams have had a progressive reduction in streamflow over the past three decades.

The most extensive Ogallala Aquifer declines have occurred in GMD #1, where 80% of the aquifer has had a 30% or more decrease in saturated thickness; nearly half of the area has had declines of over 50% since predevelopment, with water table declines of 50 to 75 feet. GMD #3 has areas with water table declines of more than 150 feet; however, these areas began with a greater saturated thickness and typically still have more than 100 feet of saturated thickness. If the ground water decline trends from 1988-1998 continued, nearly 43% of GMD #1 Ogallala Aquifer is projected to reduce to a saturated thickness of 30 feet or less within 50 years. Within 25 years, about one fifth of the GMD #1 Ogallala Aquifer could reduce to a 30 foot saturated thickness. The 30 foot saturated thickness is used as an approximation of when it may be impractical to continue to pump large volume wells. If the earlier, drier, decade (1978 – 1988) water level data is used, the projections indicate nearly 60% of the Ogallala aquifer within GMD #1 could reduce to a saturated thickness of 30 feet within 50 years. During a dry decade, there is more need for irrigation and there is less recharge, both due to reduced precipitation.

By contrast, a much smaller percentage of the Ogallala within GMD #3 or #4 is projected to reach a 30 foot saturated thickness within 50 years: 13% - 22% for GMD #3 and 4% - 13% for GMD #4 (1988 - 1999, and 1978 – 1988 data, respectively). An estimated 4,900 – 5,300 square miles of the Ogallala within GMD #3 and #4, and a portion of GMD #1, is projected to last another 100 years or more, based on past water level trend data. However, there is also an estimate 570 – 740 square miles where, within 25 years, irrigation and other large volume pumping may no longer be an option due to ground water declines. It is important to caution that these projections are based on generalized, large-scale trends. The amount of irrigation is strongly dependent on climate, particularly the amount and timing of rain. The next decade will almost certainly vary from the last one in the exact precipitation pattern. In addition, the Ogallala Aquifer is highly variable, and the geographic position of any specific well may not follow the generalized trend.

Most areas of the Ogallala Aquifer cannot support the current appropriated water uses indefinitely; as long as the aquifer continues to decline, there will come a time when the aquifer can no longer meet all water de-

mands. The long term management of the Ogallala Aquifer poses a tremendous challenge to the State of Kansas to extend the usable life of the aquifer, to help areas running out of water to maintain economic stability, and to assure that water will be available to meet the needs of future generations.

KANSAS WATER PLAN 2010 OBJECTIVE

In October 1998, the Kansas Water Authority approved objectives for the year 2010 as part of the *Kansas Water Plan*. The objectives were developed to define targets to quantify achievements of the *Kansas Water Plan* long-range goals contained in K.S.A. 82a-927.

- By 2010, reduce water level decline rates within the Ogallala Aquifer and implement enhanced water management in targeted areas.

EXISTING POLICIES AND PROGRAMS

The following programs are already in place to achieve this objective.

Water Rights Administration

All water rights in Kansas are administered by the **Kansas Department of Agriculture, Division of Water Resources, Water Appropriation Program**. The Water Appropriation Program has 6 components.

1. Processing of applications received from individuals or entities desiring to appropriate the waters of the state.
2. Processing applications for changes to existing water rights. This procedure allows entities to make changes in the point of diversion, place of use, type of use or any combination thereof for an existing water right.
3. The Water Transfer Act to provide for regulatory control for the diversion and transportation of 2,000 acre-feet of water or more per year to be moved to a point of use outside a 35-mile radius from the point of diversion of such waters.
4. Issuing certificates of appropriation. A certificate is issued after a water right has been perfected in accordance with the terms, conditions and limitations of a permit. The certificate is a document, which represents a property right issued by the Chief Engineer certifying that a rate and quantity have been perfected under the terms of

the Water Appropriation Act.

5. Water Use. Owners of water rights, except for domestic water right users, are required to file an annual water use report with the Division of Water Resources. Any person failing to submit a water use report is subject to a civil penalty not to exceed \$250.00. Persons who knowingly file a document containing false information shall be guilty of a class C misdemeanor.
6. The administration and enforcement of water rights, minimum desirable streamflows and protection of releases from reservoir storage. This includes investigation of impairment and wastage complaints.

Senate Bill 237 enacted the **Kansas Water Banking Act**, which allows water banks to form. The bank provides a method to redistribute water in areas that are fully appropriated. A ground water bank's charter must ensure the operation of the bank will result in 10% or more water savings. The Chief Engineer must approve the charter before a bank is authorized to operate. SB 237 allows for one ground water bank to be established prior to July 1, 2002. The Rattlesnake Creek Subbasin and surrounding area is discussing establishing the first ground water bank. One additional bank, surface or ground water, may be established after July 1, 2002. A water bank may be chartered for up to seven years, and must be evaluated within five years as to whether it is meeting the goals and objectives of the *Kansas Water Plan*. The water bank is responsible for costs incurred by the **Division of Water Resources** and the **Kansas Water Office** for the evaluation. Water right holders may deposit all or a portion of their water rights from a hydrologic unit within the bank boundary. A water bank would be able to lease water from a water right within the bank boundary and same hydrologic unit. A water bank shall also provide safe deposit accounts where a water right holder can place unused water from a water right in the immediate past calendar year, for future withdrawals. The amount in a safe deposit account shall decrease by 10% or more each calendar year.

Senate Bill 237 also supplemented the Kansas Water Appropriation Act to establish flex accounts using five-year term permits, which are administered by the **Division of Water Resources**. Under a flex account, a ground water right holder may deposit, in advance, water from a water right not already in a water bank, for five consecutive years. The amount that may be deposited is up to 90% of their base

average (annual) usage from 1996 – 2000, or if the water right holder implemented significant water conservation measures since 1996, the five years previous to that implementation. The term permit would allow the water right holder the flexibility to divert a quantity needed for beneficial use, limited to the amount deposited. Place of use shall remain the same and the well must be metered.

Water Right Management

The Kansas Department of Agriculture, Division of Water Resources, Subbasin Water Resource Management Program gathers data to characterize the hydrology of a specific basin to develop management plans. Management strategies may include mandatory metering, aggressive enforcement of water right limitations, shutting down wells which cannot be permitted, mandatory conservation plans, reduction in annual allocation, 5-year allocation and long term phase out of junior water rights.

The finalized Rattlesnake Creek Management Plan was accepted by the Chief Engineer in July 2000, and is the first subbasin plan completed. The plan has a wide range of management strategies, some of which could be implemented through existing programs and resources; others require consideration of new or modified rules and regulations, enactment of new statutes and availability of funding (see Lower Arkansas Basin section Priority Issue #1).

The Kansas Department of Agriculture, Division of Water Resources, Technical Services Section, is involved in management activities to address the wide variety of water resource related problems in the State of Kansas. These activities include: 1) Groundwater Management District Act. This Act, provides for more local input into the management of groundwater resources. 2) Intensive groundwater use control area (IGUCA). It allows for areas experiencing severe declines or that require special management considerations, such as water quality issues, to be specifically identified for these management programs and authorizes additional tools not provided in the Water Appropriation Act to correct problems identified. 3) The observation well network is a joint program with the Kansas Geological Survey. There are approximately 1,500 observation wells at which water level measurements are taken. 4) Water Assurance District Act. The Division has several responsibilities under the Act including determination of eligible municipal and industrial water right holders, approval of reservoir releases made for water users pursuant to any contract between the District and the Kansas Water Office for use of reservoir storage. 5) Review and approve

water conservation plans required of applicants for new permits or certain changes to existing water rights for consistency with approved guidelines.

The Kansas Water Office coordinates development of recommendations regarding **Minimum Desirable Streamflows** as well as monitoring streamflow at established locations. The **Division of Water Resources** administers water rights junior to minimum desirable streamflow during dry periods. Minimum desirable streamflows have been established at 33 sites on 23 streams and rivers. Minimum desirable streamflows have been established to preserve, maintain or enhance baseflows for in-stream water uses relative to water quality, fish, wildlife, aquatic life, recreation, general aesthetics and domestic uses and for the protection of existing waters rights. (82a-928(i)). The Chief Engineer shall withhold from appropriation an amount of water deemed necessary so that minimum desirable streamflows can be maintained (K.S.A. 82a-703a). Minimum desirable streamflows do not have priority over vested and senior appropriation rights filed prior to April 12, 1984 nor are they maintained through all drought conditions. The Kansas Water Office monitors U.S. Geological Survey stream gages to track streamflows. When a violation occurs, the Kansas Water Office requests administrative action. The Chief Engineer checks for unauthorized use, compliance with existing permits and, if necessary, initiates administration of junior water rights.

The State Conservation Commission, Water Right Purchase Program, allows for a holder of a water right who is willing to voluntarily return all or a part of the water right to the state be eligible for a grant not to exceed 80% of the total purchase price for such a water right (K.S.A. 2-1915). The purchase and retirement of a water right would be to restore base flows in designated streams and/or slow or reverse declining groundwater levels.

Interstate Water Matters

Through the **Kansas Department of Agriculture, Division of Water Resources, Interstate Water Issues Program**, the Chief Engineer, represents the State of Kansas on four interstate compacts pertaining to the apportionment of waters in rivers, which flow through Kansas, and one or more other states. These compacts are as follows: Republican River Compact (Colorado, Kansas, Nebraska) K.S.A. 82a-518; Arkansas River Compact (Kansas, Colorado) K.S.A. 82a-420; Arkansas River Basin Compact (Kansas, Oklahoma) K.S.A. 82a-528; Big Blue River Compact (Kansas, Nebraska) K.S.A. 821-529. The Chief Engineer also serves as the Kansas director to

the Missouri River Basin Association, an organization of the states, which share in the drainage of the Missouri River. Appointment is by the Governor.

The **Kansas Water Office** is responsible for negotiating and entering into agreements on interstate water issues on behalf of the State of Kansas, and for interstate water planning and management activities.

The **Kansas Water Office** appointed an ad hoc committee ("Mayo Committee") to prepare a report on recommended federal action to conserve the High Plains Aquifer. The 11-person committee presented the report "Federal Actions Necessary for the Conservation and Environmental Preservation of the High Plains Aquifer" to the Director of the Kansas Water Office in October 2000. Recommendations include state and federal incentive programs to reduce irrigation, expansion of economic development initiatives, and research on the aquifer system and agricultural crops and practices to reduce water use. The report is supported by the Governor.

ASSESSMENT OF THE OBJECTIVE

- By 2010, reduce water level decline rates within the Ogallala Aquifer and implement enhanced water management in targeted areas.

The primary database to be used in order to assess this objective will be the Kansas Geological Survey's Water Information Storage and Retrieval Database (WIZARD). WIZARD is based on the United States Geological Survey Ground Water Site Inventory database and contains water level and other information for water wells in Kansas that are measured annually by the Kansas Geological Survey and Division of Water Resources. Based on ground water elevations, the rate of decline and both the actual and percent change in saturated thickness of the Ogallala aquifer will be identified. Using data that represents current trends in the aquifer's water levels, projections based on regression analyses to the year 2010 will be made. Analyses of the historic trends and the geographic locations of those changes on the rate of decline and saturated thickness of the aquifer will be dependent on the availability and location of the data monitoring points. The objective will be reassessed periodically, using additional years of data, in order to determine in advance of 2010 if adequate progress in meeting the objective is being made.

IMPLEMENTATION REQUIREMENTS OF EXISTING POLICIES

- **Kansas Department of Agriculture, Division of**

Water Resources: Interstate Water Issues Program

1. Provide research, analysis and support to the Chief Engineer as Compact Commissioner for Kansas, and the Attorney General's office as requested on water related issues.

- **Kansas Water Office: Public Water Supply Program**

1. The Kansas Water Office will work with other State and Federal agencies to protect the State's interests in the Kansas-Lower Republican and Missouri Basins in response to implementation of the Missouri River Biological Opinion.

- **Kansas Water Office: State Water Planning Program**

1. Under direction of the Governor, and in coordination with other interested state agencies, is to assist federal delegates and coordinate with other states overlying the High Plains Aquifer, in developing federal legislation to implement provisions of the report "Federal Actions Necessary for the Conservation and Environmental Preservation of the High Plains Aquifer." This may include changing federal farm policy to encourage voluntary, incentive based programs to reduce irrigation water usage.

IMPLEMENTATION OF H.S. FOR S.B. 287 REPORT RECOMMENDATIONS

The **Kansas Water Authority** report for House Substitute for Senate Bill 287 made recommendations to alleviate the potential for competing water needs. Recommendations included increasing educational and public awareness on regional water resource conditions, trends and management strategies, and to use the water planning process to develop state policy for water usage and management of depleting ground water resources.

The Kansas Water Authority requested the Kansas Water Office appoint a Management Advisory Committee and Technical Advisory Committee to explore management ideas for the Ogallala Aquifer. Recommendations will be made to the Kansas Water Authority. No changes to the current water right management are proposed. Any proposed changes to future Kansas Water Plans would be discussed at public meetings and public hearings.

The Kansas Water Authority also recommends efforts to increase participation in the water planning

process.

ISSUES FOR FUTURE ACTION

1. The need for an interstate compact agreement with the State of Missouri that addresses water quality and shared ground water resources should be examined.

REFERENCES

Hansen, Christi, 1991, *Estimate of Freshwater Storage and Potential Natural Recharge for principal Aquifer in Kansas*, U.S. Geologic Survey Water Resource Irrigation Report 87-4230

Kansas Geologic Survey and Kansas Water Office, *Atlas of the Kansas High Plains Aquifer*, Kansas Water Authority report for 2001 State Legislature, in fulfilling request from House Substitute for Senate Bill 287. (www.kgs.ukans.edu/HighPlains/atlas)

Kansas Water Plan. Management Section, Subsection: Stream Recovery; Aquifer Restoration (1986)

Kansas Water Plan. Management Section, Subsection: Water Right Banking (1995)

Report of the Water Banking Task Force (June 1999)

Kansas Water Office "The potential for competing water needs for at least the next 20 years and the means of addressing the competition." Kansas Water Authority report for 2001 State Legislature, in fulfilling request from House Substitute for Senate Bill 287. (www.kwo.org/new/legislation)

¹ The percentages are taken from the total GMD aquifer area with data. Approximately 11% - 15% of the Ogallala Aquifer area in GMDs 1, 3 and 4 have insufficient or no data for various comparisons.