

# Walnut Basin High Priority Issue Regional Planning for Urbanization January 2009

## Issue

Demographic shifts in the [Walnut basin](#) are influencing [land use](#) patterns, water supply and distribution infrastructure, wastewater treatment and disposal, flood damage management, and natural and biological resources. The Walnut basin is strongly influenced by demographic changes in the eastern portion of the Lower Arkansas basin which is experiencing similar demographic impacts. Municipalities seek to guide development within their boundaries or designated growth areas to maximize efficiency of providing services. Unplanned rural subdivisions can challenge the provision of services when municipal boundaries reach rural water district (RWDs) boundaries.

## Description

Since settlement, land use in the Walnut basin has been primarily farming and agriculture, dominated by [beef cattle](#) production. Oil was discovered in the area in 1915 resulting in a rapid increase in population.

The northern part of the basin, generally in Butler County, is one of the fastest growing areas in the state, with Butler County as a whole ranked ninth in population growth between 2000 and 2005. While the rural farm based [population](#) is generally declining, there has been considerable growth of non-farm residences in rural areas outside of city limits in which residents generally commute to employment in El Dorado, Wichita, or the surrounding suburban communities.

Although Sedgwick County and Wichita are in the Lower Arkansas River basin the western part of the Walnut basin is influenced by the Wichita metropolitan area economy, land use patterns, and population. The influence of the Wichita metropolitan area on population in the Walnut basin, especially in Butler County, has been apparent since the 1950s. Growth in the western parts of the counties can be attributed to an eastward expansion of the Wichita industrial and metropolitan area. This is enhanced by the well developed transportation system which makes the area accessible via a network of roads and highways. Several railroad lines and municipal airports, including the Wichita municipal airport, also provide accessibility.

Although these areas are economically and demographically connected, no integrated plan for management of water and wastewater and natural resources has been developed for the area.

## Population Trends

Figure 1 shows [population](#) trends and projections in Butler and neighboring counties from 1990 projected to 2020.

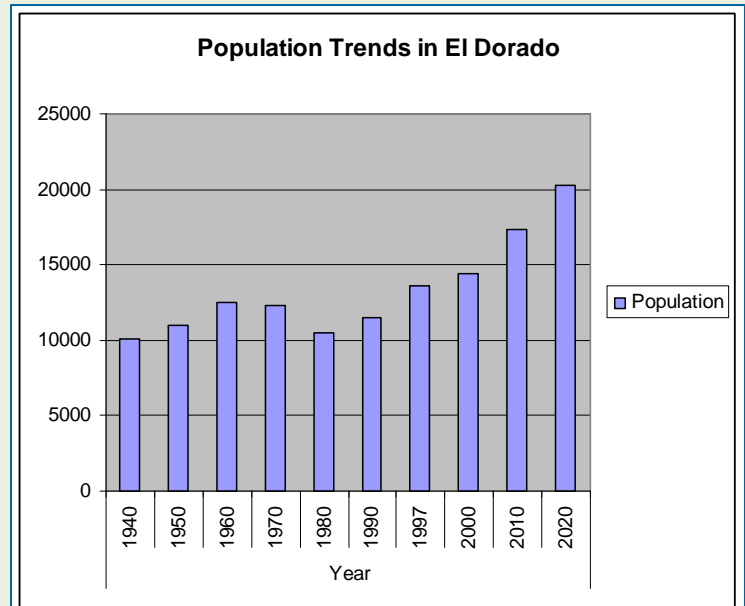


Figure 1. Population Projections for Butler and Neighboring Counties

Regionally, the population of the Wichita Metropolitan Area, which includes Butler, Sumner, Harvey and Sedgwick counties, has been both positive and steady. The population of El Dorado has increased at rates faster than the metropolitan area and the state during the past decade: 17.9% compared to 7.7 percent and five percent. The growth rate in the Wichita metropolitan area was also greater than the growth rate for the State of Kansas between 1980 and 1990.

The population of El Dorado grew by 4,387 persons between 1940 and 2000 (Figure 2). Between 1960 and 1980, El Dorado saw its largest population decrease of the past fifty years as it lost over 2,000 persons, nearly 20% of its population. Since that time, El Dorado's population has steadily increased, growing by 9.5% during the decade of the 1980's. From 1990 to 1997, it is estimated that El Dorado grew by 18%, increasing by 2,064 persons. El Dorado is projected to continue growing. It is in one of the fastest growing counties of the region and is expected to grow by about 5,847 persons in the next twenty years.<sup>(1)</sup>

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## Urbanization Impacts

Community officials are interested in growth of their respective communities. Scattered subdivisions outside of municipal service areas in this region often develop around urban centers with little or no long range planning to provide permanent, economical water and wastewater services and to avoid the creation of nuisance conditions and public health problems. Common results include failing onsite wastewater systems, overloaded sewer lines, inadequate water distribution pressure and overloaded or undersized water and wastewater treatment facilities.

Conflicts have arisen between RWDs and municipalities concerning water supply service areas and distribution systems. Availability of utilities outside municipal boundaries supports growth of isolated subdivisions, contributing to unmanaged growth, and the need for enhanced transportation system and other infrastructure development to move people and goods. Impacts on the efficacy of fire protection services have occurred. Unmanaged suburban development has resulted in subdivisions using onsite wastewater systems because municipal wastewater treatment is not available outside of municipal service areas.

Changes in [land use](#) from agricultural use to roads, homes and businesses have resulted in increased runoff and nonpoint source pollution into receiving waters, and fragmented habitat and natural areas. Valuable wetlands and riparian areas that buffer streams from pollutants have been lost.

In the Walnut basin, due to lack of widespread quantities of high quality ground water, development of housing in a non-dense manner is facilitated by the development and presence of rural water systems. Many rural subdivisions could not be viable if they were solely dependent upon ground water supplied water wells. Also facilitating the ability of isolated subdivisions to be viable is the availability of other utilities including electricity and phone service. Due to the remoteness of some of the outlying subdivisions that cannot be served by municipal wastewater systems, onsite systems are sometimes constructed in sensitive alluvial ground water areas, sub-

jecting them to possible pollution from wastewater.

## Local Planning Authorities

In the League of Kansas Municipalities publication "Kansas Local Government Law"<sup>(2)</sup>, an entire chapter is devoted to Kansas Planning and Zoning Laws. The document states "*The statutory scheme for planning and zoning by local governments in Kansas reflects a smorgasbord of laws that authorize cities, counties, townships, improvement districts, metropolitan planning commissions, regional planning commissions, and airport and port authorities to engage in some form of planning and zoning.*" A cornerstone of city and county planning is development of a Comprehensive Plan. These plans are to provide for the coordinated development of the city or county regarding the use of land, population and building intensity standards, public facilities, public improvement priorities, capital improvement plans, conservation of natural resources, and other elements deemed necessary to the proper development of the area. Plans are implemented by city and county zoning and subdivision regulations. In the counties most influenced by growth patterns in this region, Butler, Harvey, Reno and Sedgwick counties have zoning ordinances. Cowley County does not, except for in a small area around the community of Udall.



Rural Water Tower.  
Photo courtesy KGS.

Most counties in the area, and particularly Sedgwick and Butler counties, operate under different regulations for planning and development. Within counties, regulations also vary among cities. Subdivision regulations that could impact water and wastewater, stormwater runoff, and maintenance of valuable or sensitive

open space also differ. Long range comprehensive plans stop at county lines and do not include regional considerations. Cities can control development within a three mile radius of their boundary through inter-local agreements between the city and county. Many rural subdivisions are outside of these boundaries.

## Regional Planning

Community leaders recognized the benefits of and need for integrated planning in 1997 when the Regional Economic Area Partnership<sup>(4)</sup> (REAP), was formed. REAP is comprised of thirty-four city and county governments in

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nine counties of South Central Kansas, which include Butler, Cowley, Harper, Harvey, Kingman, McPherson, Reno, Sedgwick and Sumner counties. These jurisdictions have voluntarily joined together for two primary purposes: first, to guide state and national actions that affect economic development in the region; and second, to consider and adopt joint actions among member governments that enhance the regional economy. Figure 1 shows the member counties of REAP.

Recognizing that the availability of adequate quantities of good quality water is essential to economic growth, and that comprehensive planning is necessary to protect water and natural resources, a Water Resources Committee was established in 2003. One of the REAP goals for 2008 was to "Review progress of the REAP Water Resources Committee to ensure appropriate action that will encourage collaboration among local governments on regional issues of water quality and water supply."

Goals of the Water Resource Committee for 2008 are established in the annual work plan. These are:

- Serve as a regional conduit for dissemination to members of information and education regarding the various activities, programs, funding and initiatives as to the various federal, state, regional and local agencies involved in water quality and supply issues in the South Central Kansas Region;

- Serve as a regional voice on behalf of the members before federal, state, regional and local agencies and organize member involvement in the activities of those agencies;
- Develop and implement a regional water plan;
- Organize and coordinate collaborative efforts on regional issues of water quality and water supply; and
- Develop or organize services to member water utility operations.

## Water Supplies

As land was settled in the past centuries by families and entities that farmed the land, private water wells and location of residences in proximity to reliable surface or ground water were the primary mechanisms of obtaining a safe drinking water supply. Most homesteads were located on a sufficient tract of land to be able to provide enough food for the family and to sell the excess as cash crops, along with livestock production. As time progressed, the rural residents periodically experienced drought conditions which led to dry wells and/or creeks for some period of time. Some wells, if they were capable of reliable production, produced poor quality water. Innovations such as cisterns to store water provided some back up infrastructure during times of scarce water availability. Even so, the reliable availability of adequate water for normal domestic use remained inconsistent.

Kansas state law established the authority of county commissioners to form RWDs in 1941. RWDs were intended to make available safe drinking water throughout the rural landscape, to residences that were typically spaced widely apart. Because the original districts served residences that were not densely located and many miles of delivery lines had to be laid, standards for pipes were less than in more densely populated urban areas.

Once formed, management of the rural water systems is generally performed by the RWD Board

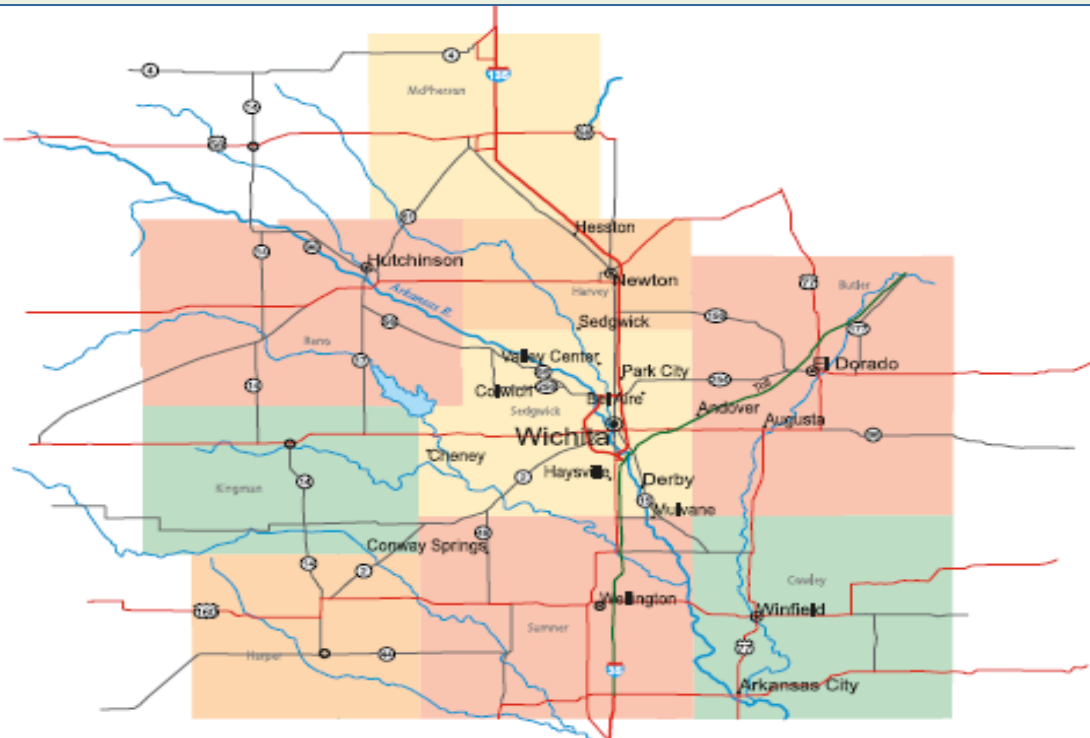


Figure 1. Regional Economic Area Partnership Participating Counties

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of Directors, and the Boards have no mandate for planning; rather they are service agencies that supply water within their territories where there is a need for a reliable supply of safe drinking water for domestic purposes. RWDs were not intended to support urban densities and demands. Building permits, zoning requirements and subdivision regulations are the responsibility of city and county governments. If a development is approved within the boundaries of a RWD, the district simply provides the domestic water supply. Lack of regional comprehensive planning can lead to case by case decision making for approval of rural subdivisions and other development that may not be in the best interest of the water and natural resources of the area.

Federally indebted RWDs have protection from competition from adjacent municipalities under Title 7, United States Code, Section 1926(b)2. Federally indebted rural water districts are those with a federal loan used to finance aspects of the system. The U.S. Congress intended §1926(b) to protect “federally” indebted water districts from competition for two reasons: (1) Congress wanted to better insure that the federal debt would be repaid, and (2) Congress desired to promote the development of rural water systems to make water available to rural residents that is both economical and safe. This federal law protects RWDs from being incorporated into municipal boundaries, If a RWD is incorporated into a municipality, the law requires cities to pay for lost future revenue of the RWD plus the infrastructure that is often incompatible with city standards. A key element of these standards is fire protection and RWDs infrastructure is often inadequate to perform this function.

City boundaries in the region continue to expand to meet the demands of new residents, businesses and industries. Some cities may be unable to expand their boundaries when they intersect RWD territorial boundaries. Municipalities are required to provide fire protection services and standards for pipes and other infrastructure to insure that they have sufficient capacity.

In recent years there has been an increase in rural residences and subdivisions that are not agriculturally based. Some urban residents desire a more rural experience and migrate outside of city limits to tracts of land covering from one acre to ten or more acres. Often the size of rural single family development lots is dictated by county sanitary codes that prescribe a minimum lot size for which onsite wastewater systems can be utilized. These developments are likely to be served by RWDs that are already established, rather than by private water wells. The districts were historically established to pro-

vide water to widely spaced residents, and as agricultural land is sub-divided, the new developments are added to the service lines.

RWDs serve a much needed purpose: to insure that rural residents have access to clean water for domestic purposes. Keeping RWDs viable to fulfill that purpose is



**Cowley County Courthouse, Winfield, KS**  
Photo courtesy Kansas Geological Survey.

vital to rural community health and well being. Municipal water systems are designed to bring the full range of water utility services to urban density and/or commercial/industrial development including water for domestic use, fire protection and high level commercial/industrial demands. In many cases RWDs may not be able to meet those requirements as they were designed to provide basic domestic level services only. Recognizing the difference in the missions of RWDs and municipal utility systems is key to successful resolution of the boundary concerns.

## **County Water and Wastewater Management Plans <sup>(5)</sup>**

In 1979, by adoption of Senate Concurrent Resolution No. 1640, the State of Kansas adopted the Kansas Water Quality Management Plan. One of the specific plan elements called for the control of pollutants from municipal and domestic sources and included a program requiring the development of water and wastewater management plans in urban or high growth counties. In 1980, and again in 1981, the Kansas Legislature passed statutes that required counties to develop countywide water/wastewater management plans to address the provision of acceptable wastewater management contingencies in developing areas of the respective counties.

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Counties with populations less than 30,000 could apply to the Secretary of the Kansas Department of Health and Environment (KDHE) for an exemption from preparing a plan. Coordination of water and sewage service was required both by statutes and by regulations developed by the Kansas Department of Health and Environment (K.A.R. 28-16-80). The statutes also included a provision that the plans were required only if federal funds were available to assist local governments in their preparation. In addition to the 75% federal share for plan preparation, the Kansas Legislature provided 12.5% state money to assist the counties, leaving a 12.5% local share.

As a result of the statutory screening process conducted in 1980 which addressed both population and potential water and sewerage problems, 19 counties were identified with immediate needs to prepare plans. Of the counties in the REAP area, Butler, Cowley, Harvey, Reno, and Sedgwick counties were included. Of the 19 counties identified, only eight received federal grants and began their planning efforts. In the REAP area, these included Butler, Cowley and Harvey counties. No planning was started in the others. The 1981 amendments to the Federal Clean Water Act removed the availability of federal planning money from the Act. Therefore, the unavailability of federal funds negated the state requirement to prepare the plans.

The countywide water/wastewater management plans were required to include [population](#) projections for 25 years beginning in 1980, and to define areas where water and wastewater systems would be constructed to meet the population growth. The plans were also to define areas where onsite wastewater systems would not be allowed. The regulations also required that the plans be updated every five years. No permits for discharge of waste and no permits for construction of wastewater facilities would have been issued in the county unless the improvements were consistent with the approved plan. This, in effect, required the county and municipal officials to coordinate provision of water and wastewater services with other county development planning.

In a 1985 policy issue of the *Kansas Water Plan* adopted by the Kansas Water Authority, it is noted that the state statute made the development of countywide water/wastewater management plans contingent upon federal funding. A lack of federal funds essentially stopped the program, but the need for planning still existed. The policy recommended modification of the statute to remove the provision requiring plans only if federal funds are available. It further recommended careful review of the statute and regulations to determine if further revisions were necessary. The final recommendation in the policy was that K.S.A. 65-3308 should be revised by the legislature to require preparation of countywide water/wastewater management plans without federal financial support. All counties with populations greater than 30,000 without a plan would be required to prepare a plan. The state would participate in 50-50 cost sharing with amendment of the statute.

After several unsuccessful attempts at legislative action on amending the statute, the policy section was withdrawn from the Kansas Water Plan in 1993 without being implemented.

Across the country, several examples exist in which comprehensive water and wastewater planning and implementation has been successfully implemented. Two of these are in the Baltimore Metropolitan Area and the Durham North Carolina Metropolitan Area.

## **Water Supply and Demand**

See the [Surface Water Supply and Conservation Issue](#) in this basin section. In 2005, the Bureau of Reclamation (Bureau), through a Planning Assistance to States grant, began a process of gathering, interpreting and consolidating water supply and demand information throughout the nine county region contained as part of the REAP, which includes Butler and Cowley counties. In March 2008, the Bureau released a draft report of the study titled "*Walnut and Lower Arkansas River Basins Water Supply Special Study-Kansas*."<sup>(3)</sup> The purpose of the study was to provide information for the formulation of



Confluence of Little Arkansas & Arkansas River at Wichita.  
Photo courtesy Kansas Geological Survey.

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alternative opportunities to meet the future municipal and industrial demands and usage within the study area by investigating various supply sources and associated water treatment and distribution alternatives and opportunities. Local water users are encouraged to explore inter-local efforts to meet future water demands in the most cost effective manner. The information contained in this report is comprehensive and generally follows the requirements of the County Water and Wastewater Management Plans described earlier.

In 2007, the Kansas Water Office (KWO) initiated an analysis of water supply and demand in five Kansas river basins. The analysis utilized historic climate and flow, and current census information to predict the total water supply and demand in the basin over time. The preliminary finding for the Walnut basin counties is that in Butler County, which is primarily served by El Dorado Reservoir, demand could exceed supply during a 2 percent probability drought by the year 2025. If other sources of water in the basin are included, the projection for shortages is in the year 2052. This evaluation did not include ground water availability from the Wellington formation, or sources from outside of the basin that are or could be used to supply water in the [Walnut basin](#). However, the Bureau study concluded that ground water in the Wellington formation is not of sufficient quality or quantity to provide a reliable long term source of water supply. Groundwater does occur in alluvial aquifers of the basin.

The KWO analysis did not account for water that is used in the Walnut Basin that originates in the [Lower Arkansas basin](#) and is distributed across basin lines by the City of Wichita and RWDs. Because the northern part of the Walnut basin is strongly influenced by regional growth patterns to the west, long term water supply issues will be best addressed by planning with cities and RWDs in the eastern part of the Lower Arkansas basin. The foundation exists to build on the information in these studies to develop long term water supply plans for the region.

## **Coordination with Priority Issues in the Lower Arkansas Basin**

The Lower Arkansas Basin Advisory Committee has also identified water supply as a concern and has developed two issues related to this: *The [Role of Reuse in Water Conservation](#)* and *[Long Term Public Water Supply](#)*. The City of Wichita and Sedgwick County are developing a regional Watershed Restoration and Protection Strategy (WRAPS) to address water quality and natural resource issues in the area. This group can provide additional re-

sources and expertise for development of a regional comprehensive plan to avoid negative impacts of urbanization and preserve the quality and quantity of water supplies and other resources. Coordination with activities, studies, and planning in the Lower Arkansas basin will complement efforts in the Walnut basin.

## **Recommended Actions**

1. The KWO, the KDHE, and other resource agencies should support local stakeholders in providing leadership in developing a comprehensive regional watershed based plan to manage urbanization and minimize impacts on water resources in the area.
2. Plan development should seek consensus among regional stakeholders, including RWDs, on needed changes to local authorities to implement a comprehensive regional watershed based plan.
3. Determine the feasibility of using the model of County Comprehensive Water and Wastewater plans as a template for plan development. Consider recommending modification of existing, or development of new state legislation to provide additional appropriate state oversight in plan development and or implementation.
4. Coordinate planning efforts with the Lower Arkansas basin to assure that these issues are addressed in a comprehensive manner.
5. Include consideration of the impacts of urbanization on water quality, public water supply, inter-basin transfers, flooding, resource protection and related issues.

## **Resources**

1. City of Eldorado. 2001. City of Eldorado Comprehensive Plan. <http://www.eldoks.com/compch5b.html>
2. Michael R. Heim. 2001. Kansas Local Government Law. Second Edition. League of Kansas Municipalities.
3. United States Bureau of Reclamation. 2008. *Walnut and Lower Arkansas River Basins Water Supply Special Study – Kansas*.
4. Regional Economic Area Partnership. 2008.

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[www.reap-ks.org](http://www.reap-ks.org)

5. Kansas Water Authority. 1985. *Kansas Water Plan Quality Section. Sub-section: Countywide Water/Wastewater Management Plans.*
6. KDHE. 2006. *Kansas Source Water Assessment Report*