

Thinking and Acting Regionally on Water Supply



Graduate Students, Masters in Public Administration, Spring 2011

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Forward

Achievement of a Master's in Public Administration degree at Wichita State University requires participation in a capstone class on Public Decision Making. Final projects center on topics of community importance and serve to consolidate learning in valid research.

None of us attending class in the Spring semester of 2011 is an expert on water. So why develop a regional approach to water in south central Kansas? Familiarity with local governments, strong research skills, personal experience, and professional knowledge influenced us in navigating to the subject of limited supply, uncertain financial policies, and the effects of politics upon water systems.

While the south central region of Kansas includes a number of smaller communities and a large number of agricultural water users, the class elected to focus our research on the cities of Andover, Augusta, Bel Aire, Derby, El Dorado, Kechi, Mulvane, Rose Hill, and Wichita; referred to hereafter as "the region." Kansas water law provides strong protections to agricultural users, so there is little reason for them to become involved in a regional discussion. As a result, they were excluded from the research project.

As part of our research, we invited five persons to speak with us in class: Herb Llewellyn, City Manager – City of El Dorado; John Baily, P.E., Ph.D; Kurt Bookout, Director of Public Utilities – City of El Dorado; Will Johnson, County Manager – Butler County; and Joe Pajor, Interim Public Works Director – City of Wichita. Others were interviewed by individual class members.

Each component of the white paper was developed from 5 larger, comprehensive research products. The class was divided into 5 groups: supply, finance, economic development, politics, and strategy development. Each group produced a final paper on their respective topic, with the first four available for review upon request. The fifth paper, strategy, was not a standalone paper and was incorporated directly into the white paper. To obtain the comprehensive standalone projects, contact Ed Flentje at ed.flentje@wichita.edu



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Analysis of Water Supply in the Region

The communities targeted by this research effort are expected to see significant population growth up to the year 2050. This expected population increase will result in water demand increases. A community with an adequate water supply today may suffer through times of extreme shortage in the future if preparations are not taken to prepare for continued growth. As communities prepare to address the challenges growth will bring, they must build an accurate understanding of not only the current water picture, but what is likely to occur in the future.

Creating an accurate picture of supply can be difficult, as the definition of water supply can vary wildly. In the simplest terms, a community's water supply relates to the full amount of water legally appropriated to the community. However, the amount of water appropriated to a community may be inadequate due to excess demand or poor water quality. In addition, some appropriation amounts may be subject to restrictions during times of drought. Overall, water supply in its simplest terms is the legally appropriated amount of water for the designated community, but this may be subject to stipulations during periods of droughts.

In the study region, two primary water suppliers exist – Wichita and El Dorado. Wichita's water supply has two primary sources – the Equus Beds and Cheney Reservoir. Wichita provides water to eleven wholesale customers, including Bel Aire, Kechi, Derby, and Rose Hill. In 2010, Wichita sold nearly 19,000 million gallons of water. Wichita receives approximately 40-percent of its daily water supply from the Equus Beds. Wichita holds senior water rights to the Equus Beds and is appropriated 80 MGD (Millions of Gallons per Day). During dry times and diminished volumes available from Cheney Reservoir, Wichita can withdraw up to 100 MGD from the Equus Beds. Around 60-percent of Wichita's daily water supply comes from the Cheney Reservoir, which has a maximum yield of 47 MGD.

Additionally, Wichita has invested heavily into the Aquifer Storage and Recharge (ASR) project. ASR plans to cover Wichita's water demand through the year 2050. ASR stems the advancement of aquifer contaminating salt plumes and recharges the Equus Beds allowing for continued pumping. However, the high costs associated with the project put a huge monetary and political strain on the community.

El Dorado Reservoir serves as the sole water source for El Dorado. El Dorado currently uses approximately 10 MGD of water, but the reservoir has a safe yield of 22.32 MGD. In 2010, El Dorado sold 3,200 million gallons of water. El Dorado provides water to Augusta, a number of small communities and rural water districts, and one public wholesale water district. Augusta, in turns, sells water to Mulvane.



While other water sources exist within the study region, the contribution from these sources to a regional water supply solution are not substantial. El Dorado Reservoir, Cheney Reservoir, and the Equus Beds are the reliable and significant water sources that will provide water to the region well into the future. The other sources are best viewed as supplemental sources, and thus were excluded from the research.

Between 2010 and 2050, water consumption – gallons per capita per day – by municipalities within the study region will remain relatively steady. Population growth will serve as the primary driver for increased demand. Table 1 shows the projected population growth for the study area through 2050.

Table 1. Future Projections of Population Growth

City	2010	2020	2030	2040	2050	Average
Andover	11,791	14,713	17,634	20,556	23,478	20 %
Augusta	9,274	10,240	11,206	12,172	13,138	9 %
Bel Aire	6,769	8,335	9,901	11,467	13,033	19 %
Derby	22,158	26,583	31,008	35,433	39,858	17 %
El Dorado	13,021	14,195	15,369	16,543	17,717	8 %
Kechi	1,909	2,336	2,763	3,190	3,597	19 %
Mulvane	6,111	6,692	7,273	7,854	8,435	9 %
Rose Hill	3,931	4,825	5,719	6,613	7,507	19 %
Wichita	382,368	410,472	438,576	466,680	494,784	7 %
Total	457,332	470,548	509,351	548,160	621,547	8%

2010 Census & KWO

Although enough water exists to meet the projected 2050 demand, the water supply must be redistributed in an effective manner to ensure that all communities have the opportunity to thrive. The health of the region depends upon all communities being healthy. A dependable supply of quality water is a key component to a community's health. Data provided by the Regional Economic Area Partnership (REAP) indicates that the region will maintain a net surplus – authorized water quantity minus demand – of water through 2050. Projected surpluses in millions of gallons per day for 2010, 2020, 2030, 2040, and 2050 are 59.07, 52.43, 45.79, 39.15, and 32.51 respectively. The data assumes that the communities within the study region will be capable of fully utilizing all the water that has been authorized. A 2-percent (1 in 50 years) drought or other major catastrophe may upset the balance of available water, resulting in deficits rather than surpluses.



The Current State of Water Finance

Both El Dorado and Wichita have accumulated considerable debt to secure raw water sources. El Dorado has debt equaling \$46 million for the storage space it uses in El Dorado Reservoir while Wichita has short-term financing in place now with plans to issue long-term revenue bonds for Phase II of ASR. The current cost of ASR and replacement of existing infrastructure is \$181 million. Of the \$181 million in ASR investment, \$109 million funds the increased ability to store water in the aquifer, while the remainder replaces aging infrastructure.

The water utilities of Wichita and El Dorado are paying for underutilized capacities within their respective systems, creating an opportunity to lower costs and improve the reliability of water service in the region by cooperatively using the underutilized infrastructure. El Dorado pays the Corps of Engineers for the first 49.52% of the storage space in El Dorado Reservoir and also pays into a sinking fund to purchase the last 50.48% of storage space. The current value of this unused storage space is \$47 million. Wichita is investing \$109 million in the capability to store water in the Equus Beds Aquifer, which has an unused capacity of 30 MGD 65% of the time. Wichita can avoid or delay the cost of ASR Phase III and IV by utilizing the unused storage capacity in El Dorado Reservoir, which equals approximately 40 MGD of excess water available 69% of the time. El Dorado can then utilize a resource they are committed to pay for but are unable to use.

Assuming the recharge of the aquifer only occurs 33% of the time and has a useful life of 50 years, the cost of this stored water (Phase I & II) is \$0.45 per 1000 gallons, excluding operating costs. For comparison, El Dorado's annual payment on the first half of storage space is equivalent to \$0.20 per 1000 gallons of storage. Raw water from El Dorado is 40% less expensive than raw water supplied through the Wichita system (\$0.575/1000 gal vs. \$0.99/1000 gal)

A considerable variation in the finance of water service exists between local cities. While most cities have instituted annual rate increases over the last 6 years, one city made no change, and one city made only one change. Production costs vary as a result of differences in the economies of scale, local preference of rate structures, level of maintenance, quality of water, and wholesale pricing. Based on geographic differences, variations in the cost of providing water service are expected. The creation of a regional water supply may drive costs toward the mean. At the present time, the variation in rates is not solely the result of variation in the cost of providing water service. While cities have different preferences concerning rate structures, levels of maintenance, and risk, the general trend results in not charging the rates necessary to maintain a reliable water system. Additionally, customers are charged different rates based on factors unrelated to the cost of delivering the water, such as important businesses being charged discounted rates. Some customers are charged higher or lower rates based on where they are,



even when they receive the same service. Water used for different purposes also results in different charges.

When water is a scarce resource, using water rates to force conservation is an option. Wichita uses a conservation rate structure to the greatest extent whereas El Dorado, with a flat rate structure, has no conservation in its rate structure. This is a reasonable approach for El Dorado, since it has excess capacity to store raw water in El Dorado Reservoir. Derby moved from a conservation rate structure to a more linear structure because of dissatisfaction of customers. A flat rate structure charges the same rate for each gallon of usage no matter what volume of water is used. Alternatively, conservation rates are developed around consumption blocks. Each consumption block or tier is charged a different rate.

Throughout the study region, only Derby and El Dorado have held water rates steady or even decreasing rates at some consumption levels. The remaining communities, including Wichita, have seen rate increases across consumption levels. Regionally, water charges are competitive with national averages as shown in the table below.

City	3,750 Gallons	% Change from Nat'l Avg at 3,750 Gal	7,500 Gallons	% Change from Nat'l Avg at 7,500 Gal	15,000 Gallons	% Change from Nat'l Avg at 15,000 Gal
Andover	\$17.87	+16.42%	\$32.81	+27.86%	\$78.93	+57.58%
Derby	\$14.73	-4.04%	\$22.08	-13.95%	\$42.03	-16.09%
Wichita	\$11.91	-22.41%	\$21.87	-14.77%	\$52.62	+5.05%
El Dorado	\$13.01	-15.24%	\$19.12	-25.49%	\$31.36	-37.39%
National Avg.	\$15.35	-	\$25.66	-	\$50.09	-

For most communities whose rate structure is progressive, as water usage increases the cost of water increases at a faster rate, giving the perception of a water conservation policy. In Andover, water costs are relatively competitive at 5,000 gallons and 10,000 gallons. However, as water usage increases, the cost of water significantly increases; at 30,000 gallons, the cost of water reaches nearly \$300. The same is true for Kechi; low water costs at 5,000 gallons make it



possible for all members of society to have quasi-affordable access to a basic life necessity. However, the cost of water is progressive, resulting in a water cost of nearly \$200 at 30,000 gallons.

At the opposite end of the spectrum is El Dorado, whose rate is flat for all gallon intervals, making their water bills increase linearly instead of progressively. El Dorado has substantially lower water costs at all gallon intervals, effectively eliminating any desire to conserve water. However, the dynamics of the water issue are considerably different in El Dorado than in the other surrounding communities in the water study. The City of El Dorado owns storage space in El Dorado Reservoir, between elevations 1296 ft. and 1339 ft. El Dorado has a right to all water within the bounds of this storage space. It is in El Dorado's best interest financially to minimize conservation, maximize usage, and increase revenue because they pay for the storage of water whether they use it or not. Thus, cost for water in El Dorado increases approximately \$50 between 0 and 30,000 gallons. Regardless of the water usage, water cost is cheap. The emphasis is to encourage consumption and maximize revenue.

Water revenues can be rather unpredictable due to the inconsistency in water consumption. During drought years, water consumption increases, which also increases water revenues. During rainy years with cooler summers, water consumption decreases, resulting in less water revenue. Despite fluctuations in water revenues, expenditures generally have remained steady or even increased. Derby and Wichita have experienced a steady increase in expenditures. Although revenues were low some years, expenditures did not decrease significantly. As a result, both cities experienced deficits in their water funds. The deficits are attributable to less water consumption. Consumption is vulnerable to climate fluctuations.

When water utilities use bonding, the payments are a fixed cost and do not go down when consumption is less. If most of their revenue comes from the variable part in the rate structure, the utility will experience revenue deficits. Water utilities that use a strong conservation rate structure will experience much larger variation in revenue than communities that use less conservation in their rate structure.



Water and Economic Development

As regional economies around the country face increasing threats from issues of water supply and management, water has become a critical component of economic development. As the region grows and development sprawls, the need for a sustainable supply of water will increase along with stress and inefficiencies in the water delivery system. Though economic development is not generally tied directly to water, the history of water law in Kansas demonstrates the critical role that visionary planning for the use of this resource played in shaping the regional economy.

Prior to the Kansas Water Act of 1945, water management in the state was based on riparian doctrine, which essentially authorizes landowners to use water on their land as they see fit. Essentially, water issues were really issues of property rights. Prior to the 1940's, riparian doctrine made sense in the agrarian economy of Kansas, but by the mid '40's the region's aviation industry had grown rapidly in response to World War II. As a result, development in the housing market exploded. The region needed water but expedited pumping of the Equus Beds was not allowed by water law at the time, so in 1945 a shift to prior appropriation doctrine was achieved through the Kansas Water Act. Appropriation philosophy treats water as a commodity to be allocated for society's beneficial use. Based on the Water Act of 1945 the Department of Water Resources was vested with the authority to allocate water rights. Though water management grew more responsive to economic development in 1945, the granting of too many water rights led to over pumping in the Equus Beds, a problem that now threatens the region's economic future.

Water is often perceived as a pure public good, but naturally it is a common good – rival, yet non-excludable. As a common good water is subject to the tragedy of the commons, where each user seeks to maximize the benefits of water for themselves. This manifests in over pumping and expensive lawsuits. Good water management should mitigate the depletion of water supply and quality, and maximize water's social and economic benefit. Though water rights and quality issues are managed by State and Federal agencies, the impact of water issues is more intense at the local level. Opportunities are available for local officials to optimally manage water in their communities, and local decision makers should continually evaluate supply management and delivery practices to ensure maximum benefits are achieved.

Examining the dynamic relationship between water and the economy in the context of a metropolitan system, a clear picture of the importance of maximizing the use of this resource is provided. This region embraces urban sprawl and low density development, and large green lawns are a social preference of the citizenry. As the economy grows, urban sprawl will increase. For decades the region has enjoyed a low cost of living and doing business, an advantage to economic development that few other metropolitan regions can beat. Water supply plays a critical role in maintaining this advantage, but inefficiencies and large capital costs (due



in large part to fringe development) threaten the low cost of service. Furthermore, a water crisis caused by unpredictable threats like weather and natural disasters, or predictable threats like deferred maintenance, could cause spikes in the cost of service due to a lack of redundancy in the region's systems. A water crisis would not only affect rates and revenue, it would have a ripple effect throughout the economy. For example, a crisis that affects revenue would make it difficult for a utility to repay debt sold for infrastructure, which could inhibit a municipality's ability to spur economic development through financial incentives. To mitigate serious risks, comprehensive planning that ties water to economic development should be a goal of local decision makers.

A regional approach to water strategy may provide the best opportunity to successfully tie water to economic development and optimize the use of common resources. In its endorsement of a regional approach to water management, the American Water Works Association defines a regional strategy as,

“A management or contractual administrative organization, or a coordinated physical system plan of two or more community water systems using common resources and facilities to their optimum advantage, to provide sustainable water resource and supply management and high quality water service to customers in a fiscally-responsible manner (2009).”

In addition to the benefit of economies of scale, a regional approach may facilitate the use of resources, like water supply, infrastructure, administrative capacity, and data management, to their optimum advantage. Metropolitan regions across the country face increasingly complex challenges to meet both current and future demand for water. This region has an opportunity to learn from the experiences of regions facing potentially crippling water challenges, like Atlanta, Fort Worth, and San Antonio, and from regions that are preemptively addressing water issues through regional strategies, like the Twin Cities, MN area. If this region can maintain its low cost of living and working while other metropolitan regions struggle to sustainably satisfy demand for water, the Wichita metropolitan area will become an increasingly attractive location for both businesses and individuals. A coordinated water strategy that ties the supply and management of common resources to economic development will go far towards ensuring a healthy economic future for this region.



The Regional Politics of Water

Throughout history, communities have recognized the need for an adequate water supply for domestic, industrial and agricultural purposes. Out of that need emerged a commitment from the City of Wichita and El Dorado to develop water resources to meet the increasing demand as population grew in the metropolitan and regional area. As demand for water resources increased, conflict and fears developed between the large suppliers and the municipalities. Conflicts arose over water rates, economic development issues, growth patterns, and limits implemented through supply agreements. Conflicts were complicated further by the number of stakeholders; public and private, local, state, and national, which to this day are involved in water discussions and oversight. Each stakeholder has their own rules, regulations, missions, focus and priorities, all of which impact consensus on water resource topics. There are several needs in play with no real agreed upon common interest. The lack of consensus and the need to maintain autonomy and control has prohibited meaningful discussion about a regional water plan.

Smaller municipalities in the region have based their water decisions upon their community's need, their current water and financial resources, their geographical locations and the quality of the water currently available. Municipalities are concerned about ensuring that their community's water demands are always met and that they have the ability to make decisions about economic development and growth. Historically, cities have been limited in these areas because of their reliance on water suppliers who have set boundaries on growth patterns and required their approval for development plans. These restrictions have been perceived as control mechanisms leading the smaller communities to hedge off the large suppliers from crossing boundaries and taking over water supply resources. Many municipalities have either fully or partially developed their own water supply plans in order to diminish their reliance on suppliers and maintain control over their community values. A municipality's greatest concern is whose need will take precedence when water supply is challenged or there is an emergency? If cities reduce their dependence on the large water suppliers they feel they can ensure water to their community. In essence, fears surrounding control have led to the creation of silos rather than a concerted effort to address regional water possibilities.

As water suppliers, Wichita and El Dorado face both benefits and drawbacks by supplying water to the region, especially those areas outside city limits. Benefits include: the ability to influence the direction of growth and establish land-use patterns; increased water sales which lowers the cost to each user and increases profits, and; the potential to foster improved intergovernmental cooperation and communication. An area-wide water utility would result in a more favorable consideration for federal government funding, and economic benefits would be extended outside the city limits. Drawbacks include: the requirement to provide services indefinitely; the potential use of limitations on supply in order to control load; challenges stemming from communities using a "master meter" then distributing water to other areas and; the effect of sprawl on the



availability of water. These elements must be understood in the context of a finite supply that must be carefully used.

Individually, cities and counties prepare comprehensive plans in order to provide for coordinated development of land, building standards, public facilities, capital improvement plans, conservation, and other elements necessary for good development. Unfortunately, long-term comprehensive water plans stop at city and county lines and do not consider regional needs. There are incentives for a regional water supply: increased efficiency through elimination of duplicative structures and investment; the shared liability of both investments and infrastructure; and combined efforts toward compliance with state and federal mandates. While there are economies of scale benefits, it is the politics that makes a solution elusive. Regional water considerations would require a change in policies about how water is sold and will require the political willingness to think outside management boundaries. There are many questions to be answered: who pays for and manages the infrastructure and on-going expenses of water development and maintenance?; who establishes policies/procedures and oversees the day-to-day water operations?; how will water rates be established?; and how are economic development, boundaries and annexation issues decided? Although regional stakeholders agree that the benefits of a regional water plan are valid, the failure to implement a plan is due to the political push back that occurs over how to answer the questions about governance.

History has produced strained relationships among the cities in this region over control and rules associated with accepting water supply, which has led to a political impasse. This is a politically complex topic because water affects community life and each city wants to shape their community without interference. This has turned the focus to self interest rather than consideration for the greater good of the region. A regional water supply system that satisfies both the real and the perceived needs of the individual communities within the region is politically hard to imagine as a reality. The issues at stake (sovereignty, power, community growth and money) are strong and divisive. However, the reality for the region is that water resources are limited and new resources must be effectively allocated in order to meet future demands. Politically there are many obstacles to developing a regional water plan; however, such a plan is not impossible. There are models that exist that could meet the needs of the region and allow each stakeholder input in to how it is developed and governed. Open discussions about potential models should provide a good opportunity to come to a consensus about water supply governance. All entities will need to balance public value and greater regional benefits against individual community values when developing agreements and governance standards. The region already agrees that a plan makes sense, now it needs to transform into a consensus that regional cooperation is also achievable.



Recommended Strategies

With each of the following recommendations, decisions will have to be made based on sound research and expertise. The authors recommend an economic analysis or feasibility study, and a stakeholder input process to strengthen a decision to implement a strategy. Regional thinking, on the part of municipalities, is needed to address the current and future problems facing the regional water system. The most efficient and effective regional plan will bring all communities to the table.

A regional water plan serves to guard the study area against future demand increases and potential drought. A regional approach provides a broad funding base to implement innovative water solutions, and it could improve efficiencies in the management of all the water resources within the region. Excess or flood flows into the reservoirs could be better utilized, limiting the loss of water downstream.

In each of the strategies, the creation of a pipeline joining the major sources of supply is recommended as it would make the delivery of water more efficient. The City of Wichita and the City of El Dorado have made significant financial investments to secure raw water for future generations. The City of El Dorado has a \$46 million debt for the storage space it controls in the El Dorado Reservoir, while Wichita owes \$181 million for ASR and infrastructure improvements. A pipeline between the two cities' supplies could allow El Dorado's reserves to be used for the Equus Beds, allowing ASR Phase II to operate at 100 percent capacity and possibly eliminate or delay the need for Phases III and IV. Surface storage is affected by drought more than an aquifer, so during extreme drought, the flow of the pipeline could be reversed to help El Dorado replenish reservoir storage. Both cities have the opportunity to lower costs for residents and improve reliability for the region.

The pipeline can also assist with redundancy issues. Wichita and El Dorado are paying for capacities they are not utilizing. El Dorado pays into a sinking fund to purchase the last 50.48% of storage space in El Dorado Lake. The current value of this unused storage space is \$47 million. Wichita invested \$109 million in ASR to ensure future supply, which has an unused capacity of 30 MGD 65% of the time. El Dorado Lake has 40 MGD of excess water available 69% of the time. Wichita can avoid or delay the cost of ASR Phase III and IV by utilizing the unused storage capacity in El Dorado Lake. El Dorado can sell a resource they are committed to pay for, but are unable to use. Moving water from El Dorado Lake to the treatment plant at ASR through an estimated \$40 million pipeline is a move that benefits the region as a whole and is possible through recognition of mutual benefits and the unnecessary costs that will follow if not brought to realization.



While the pipeline helps solve some infrastructure and redundancy issues, it does not address a regional approach to the governance of water supply within the study area. A true regional approach to water management can better equip the region to deal with problems in the future. The following three recommendations all address the governance issue, as well as solve additional problems. Any one of the three strategy recommendations would be a step in the right direction, although they are listed from best to worst in terms of their ability to adequately deal with regional water supply.

Recommendation 1: Create a regional public utility responsible for the management and distribution of water.

A regional public utility would be responsible for maintaining the basic infrastructure of water, including operation and maintenance of facilities. Pricing decisions, as well as the management of billing and revenue collection would also be the responsibility of the utility. Furthermore, the utility would be responsible for management of payments to employees or contractors, financial and risk management, and the establishment, monitoring and enforcement of water quality.

Should the region chose to, a public utility allows for contracting with private organizations to run either components of the water utility, or the utility as a whole. This management-contract form of privatization would allow the regional public utility to retain control over the system, while taking advantage of the expertise provided by private management. The services provided by a private organization would be stipulated in a formal agreement between the business and government entities.

An example of the type of regional public utility this paper recommends is WaterOne in Johnson County, Kansas. WaterOne was created in 1954 and serves 400,000 people in 16 different cities. It encompasses over 270 square miles within Johnson County as well as a small part of Miami County. (Album 2009: 3) WaterOne was created in an effort to address regional water supply issues, and is now credited with aiding in the expansion of the Metropolitan-Kansas City area by coordinating all water distribution. This increase helped support economic and population growth in Johnson County.

As the area continued to grow, so did the capacity of WaterOne. In 1972 the area expanded its production to 55 MGD. In 1984 the area added a new intake on the Missouri River that allowed them to produce 80 MGD. In 1990 WaterOne expanded and was able to hold 105 MGD and then acquired 3 new rural water systems. In 1992 WaterOne had expanded to 149 MGD and in 1998 it grew to be able to handle 165 MGD. According to its website, WaterOne is expected to expand its resources to a 180 MGD capacity. This model demonstrates the ability of a public water authority to accommodate growth and meet demand by increasing production.



Sub-recommendation 1: The public utility should be its own separate entity.

The water utility should not be part of the municipalities in the region; rather, it should be a separate entity. Smaller adjacent communities that lack the water rights, infrastructure, and resources to build and operate their own water supply would then be independent of El Dorado and Wichita. As a separate entity, the utility would make choices based on what is best for the region as a whole.

The primary sources of revenue for the water utility should come from water sales and system development charges. The organization would have no taxing authority, and would rely solely on the service it provides.

Sub-recommendation 2: The governing body should consist of elected representatives.

The structure of the regional water authority should consist of elected representatives from the region. The region would be broken into districts based on population. This would provide equitable representation across the region. The board would be responsible for deciding on the annual budget, deciding on internal matters pertinent to the organization and furthermore, the board would have the opportunity to discuss the implications of raising water rates.

This structure of governance would be a benefit of the regional public water utility. The politics of water would be removed from local government elected officials and placed on the utility board. City council members will no longer set water rates, as the public utility will handle all matters of water supply and distribution. The governing body also allows for equity among communities since each has equal representation.

Sub-recommendation 3: The public utility should purchase all water rights, supply, and infrastructure owned by communities in the region.

With a public utility like WaterOne, jurisdictions in the region would no longer own their water rights. These will be purchased by the utility, as well as infrastructure that are seen as necessary. Infrastructure not needed by the utility will not be purchased. This may include some existing treatment facilities.



Recommendation 2: Create a Public Wholesale Water Supply District to be responsible for distributing water supply and regional planning.

A regional plan does not have to mean a loss of control or a merger of current supply; a regional water plan that allows autonomy while focusing partners on a regional picture is possible. This can be accomplished through the creation of a Public Wholesale Water Supply District (PWWSA).

The PWWSA Act, passed in 1977, allows for formal cooperation in the wholesale supply of water (K.S.A. 19-3545 to 19-3556). According to the Act, the purpose of a wholesale water supply district is to secure a source of water on a scale larger than one single water system could secure on its own and to sell water at wholesale to other public water supply districts, municipalities, and public and private water distribution systems (Helmke, 2007: 91). According to the Kansas Water Plan, PWWSAs are comprised of a combination of municipalities or Rural Water Districts (RWD) to supplement their current water sources or to provide for their entire supply (Public Water Supply Policy & Institutional Framework, 2009: 4).

There is strong support for the formation of PWWSA at the state level. KDHE believes that PWWSA are an efficient solution for a safe and sufficient quantity of water for public water supply systems (Helmke, 2007: 93). The population increase in the region is a concern for public officials, particularly how it affects water supply. PWWSA's allow for municipalities to resolve this issue together. A PWWSA is more financially viable than individual cities to purchase water rights or develop the necessary projects to ensure a sustainable water supply for the region (Helmke, 2007: 93).

In a PWWSA, public agencies retain their water rights and a sense of control, while the management of those rights gains a regional focus. A regional water supply is vital to support the growth of the area and meet future needs. However, a PWWSA is governed by a body comprised of the members of the wholesale district, with limitations on the number of members allowed to serve from each representative body. While a smaller community may have to rely on a larger entity for its water supply, they still have input on how the water is sold and distributed. All municipalities in the region will have more equitable access to water while the larger suppliers maintain their control.

There is a large amount of flexibility allowed in a PWWSA, which gives the communities involved the ability to negotiate what is best for the region. A PWWSA forms a new legal entity. Agreements are entered into by ordinance, resolution or otherwise pursuant to law of the governing bodies of the participating water suppliers (KDHE 2003: 1). The following are suggestions for what a PWWSA in this region should look like.



Sub-recommendation 1: The PWWSD for this region should be governed by a representative body of the district members.

According to state statute, there are limitations on the number of members allowed to serve from each representative body, with at least one for every member but no more than two. Representatives can be nominated, voted, or named by action of the city. As the predominant suppliers in the region, El Dorado and Wichita should each have two representatives on the board, the other members should have one representative. While smaller communities still relies in some way on a larger entity for its water supply, they still have input on the distribution and sale of water, as well as more vested interest in the supply sources themselves. While the City of Wichita and El Dorado are giving up some control of how they sell their water, they benefit from having one contract with the wholesale district, as opposed to several contracts with the different communities they currently supply. They also have larger representation on the board, which allows for more control while maintaining the voice of smaller communities. A PWWSD allows for shared governance of water without sacrificing the independence of communities.

While there is a separate governing body for a PWWSD, it does not remove the political strain of water supply and rates on local elected officials. Different opinions and perspectives make long-term planning difficult, and this will not change with a more regional approach like a PWWSD. The wholesale district is solely a supply source for water. Municipalities will still be responsible for the distribution of water and the rates charged to their users. However, the wholesale district will ensure a more equitable cost of water among the different local governments in the region. Also, the PWWSD is a vehicle for regional planning and ensures that water supply needs will be met in the future.

Sub-recommendation 2: All members will be allowed to retain their current water and use the wholesale district for supplemental purposes.

The ownership of supply for a wholesale district varies across the state. While some PWWSD own their own supply, others purchase it from other sources. In order for the wholesale district to truly be a regional plan for water supply, El Dorado and Wichita must be active members. Unlike the regional public utility option, members that currently have their own supply will not need to sell those rights. Instead, the PWWSD can be used for supplemental purposes. It is unnecessary for any member to give up full control of their supply. However, they may sell it to the wholesale district if they choose to do so.

An example of a PWWSD that operates in this manner is PWWSD #17, which serves the communities of Halstead, Newton, North Newton and Sedgwick. Since February of 2001, PWWSD #17 has produced water from 4 wells in Harvey County for four different water supply systems. Currently, the District serves a population of 23,202 individuals. PWWSD #17 was



created when North Newton, Halstead and Sedgwick needed to increase their current water supplies, while Newton was looking for future supply for growth (Heinicke, 2011). The state encouraged these communities to enter into PWWSDs because it was easier for them to obtain water rights. Newton still owns wells and water rights while belonging to the wholesale district, and sells retail water to individual customers as well as wholesale to the district. However, each municipality remains responsible for its water distribution system, with distribution among members occurring through the Newton Treatment Facility (Heinicke, 2011). Like PWWSD #17, a wholesale district for this region can purchase water from El Dorado and Wichita to supply its members while also focusing on future supplies for the region.

Sub-recommendation 3: Costs should be shared based on each member's water supply need.

There are costs associated with the creation of a PWWSD, including additional water lines, infrastructure, and supply, as well as hiring a general manager and operating staff. Once again, the region should look to PWWSD #17 for a model on how to divide costs. For PWWSD #17, these costs were divided among the members based on the amount of water they would need.

City	Acre-Feet Needed from WWSD*	Percent of Total
Newton	1,553	68.23%
North Newton	46	2.02%
Halstead	229	10.06%
Sedgwick	448	19.68%
Total	2,276	100.00%

As shown in the PWWSD #17 Cost Authorization and Allocation Agreement, Newton is the largest user of the wholesale district; therefore Newton is responsible for a larger percent of the total cost of the PWWSD at 68.23%. North Newton, as the smallest user, is only responsible for 2.02%.

An example of shared infrastructure costs for the PWWSD in this region would be additional lines and connections. These costs would be divided among the members based on the percent of total supply they use.

Sub-recommendation 4: The wholesale district should own treatment facilities.

While the flexibility of a wholesale district agreement allows for it to sell treated or untreated water, it is recommended that the PWWSD for this region purchase existing treatment facilities, and construct others if demand for treated water cannot be met. According to Margaret Fast, from the Regional Water Supply Planning Division of the Kansas Water Office, strategic locations for additional treatment plants would be necessary to minimize costly building of additional pipelines and connections.

Selling only treated water also provides an incentive for communities within the region to be members of the wholesale district. Most PWWSD are formed to assist smaller communities that



cannot afford to have their own water supply system. This regional plan ensures that small systems “attain and maintain technical, financial and managerial capacity” (Kansas Water Plan).

Sub-recommendation 5: Members should look for additional sources of funding from state or federal agencies.

The entire cost of a PWWSD does not have to be incurred by the participating members. There are numerous opportunities for funding regional water projects. According to the Kansas Water Plan, the state encourages the development of regional public water supply systems and regionalization is encouraged by Kansas statutes. There are several financial assistance options through various state and federal agencies, as well as planning and technical assistance. Wholesale districts have authority to obtain loans and grants, issue bonds, acquire land (by gift, purchase, lease, through exchange, or by eminent domain), and construct, install and operate such facilities as necessary to carry out the purposes of the organization. Generally, though, a PWWSD needs to be formally created before funding can be secured. The requirement to go through the formal creation process before being able to obtain outside funding is one of the main reasons that so many wholesale districts have been formed but remain inactive or have dissolved (Helmke, 2007: 91).

Sub-recommendation 6: The district should help pay for a pipeline connecting the El Dorado Reservoir to the Equus Beds.

Wichita and El Dorado’s ability to retain the rights to their current supply serves as an incentive to join the wholesale district, but additional incentives will help their commitment to a regional water supply plan. This can be accomplished by the PWWSD committing to pay for the pipeline between El Dorado Reservoir and the Equus Beds. The pipeline will benefit the ASR project, while also assisting El Dorado by providing a purchaser to increase the amount of water they are allowed to withdrawal. Currently approved for 11 MGD, El Dorado must have a buyer in order for them to go through the process of increasing the legal amount they may take. Without this increase, El Dorado will not be able to sell much more than their current level because they already use 9 MGD. The Equus Beds, as well as the wholesale district, can be that buyer.

The redundancy of the ASR project and the pipeline connecting the two supplies fits within the primary goal of any PWWSD. The mission of a PWWSD is to ensure public water supply for the members it serves.

While a regional public utility is more ideal, a PWWSD provides an option that brings a more regional focus to water management, while allowing communities to retain their water rights. The politics of rate setting and tough decisions regarding water supply that plague many elected officials will not be alleviated, but the wholesale district at least provides some relief by making

the cost of water more equitable throughout the region. From this PWWSD, there is potential for the region to eventually create a regional public utility.

Recommendation 3: Pursue a bi-lateral agreement between El Dorado and Wichita to connect water supplies.

As of June 2010, El Dorado owes the Corp of Engineers \$9.5 million for the first half of the storage capacity payments. By June 2012, El Dorado will have a total debt of \$47 million for the storage in El Dorado Lake. The debt increase is due to the structure of the debt, the second 50 percent is larger than the principle payments on the first 50 percent of the storage. El Dorado created a sinking fund to pay this debt from current water rates. However, the debt El Dorado carries creates pressure for the community to sell water in order to bring in the revenue necessary to make payments to the Corp of Engineers.

In Wichita, construction of ASR Phase I cost \$27 million to and it pumped 10 million gallons per day (MGD) into the Equus Beds, this phase is not currently operational. Phase II is under construction and will give 30 MGD in additional storage capacity at an estimated cost of \$110 million. The construction has been financed through the issuance of temporary notes totaling \$144 million. Wichita intends to issue revenue bonds upon completion of construction, leading one to surmise current rate increases are not being used to pay off debt and that additional increases will be necessary in the future.

The creation of a bilateral agreement between Wichita and El Dorado is not only mutually beneficial, but would benefit the entire region if conducted properly. This is the most plausible solution to regional water supply concerns. This option is more likely to come to fruition because there are less players involved and it can be ensured both are satisfied with the implemented agreement. Both Wichita and El Dorado have incurred a significant amount of debt in their own missions of procuring water reserves. Both cities must recognize the dilemma of possible rate increases if they continue on their current path. All parties must work together if they wish to retain the region's low water rates. The creation of a pipeline between El Dorado and Wichita would allow for the most effective use of existing infrastructure and simultaneously improve the reliability of regional water supplies.

The bi-lateral agreement does not offer a fully encompassing solution to regional water supply. However, it does provide financial relief to El Dorado and Wichita, as well as help increase the longevity of current supplies. A bi-lateral agreement has the potential to serve as a starting point for discussions to move towards a PWWSD, and eventually a regional public utility.



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