CHAPTER 10

UTILITIES

Integral to a transportation system's ability to connect various land uses and promote future development is an accompanying system of utilities. As streets and roads are constructed, it is desirable that utility lines are planned and installed simultaneously. Long-term planning for utilities is crucial to meet changing environmental standards and quantitative needs. Sufficient space for construction in utility and drainage easements or within street rights-of-way should be carefully planned. Policies on the placement of structures, fences and vegetation in utility and drainage easements should be adopted. Additionally, accurate records and mapping of existing and recently installed utilities plus policies for their installation and maintenance are important. McPherson has an on-going program for digitized computer mapping of its water, sewer, storm drainage and electric systems. Such detailed maps are on file for the sewer and storm sewer systems with the Department of Public Works and the water and electric system mapping is located with the respective Water and Electric departments of the city's Board of Public Utilities (BPU).

Without long-term planning of the utility system in a community, over time certain utilities may limit future growth as well as become a financial burden. Screening of utility equipment and service areas and increased installation of electric and telephone lines underground will reduce maintenance and some of the more undesirable aspects of the equipment. As a policy, except for rural water districts, the city does not sell water or sewer service without annexing land or requiring a waiver agreement not to oppose annexation in the future. Presently, a very limited number of pre-existing customers outside the city are served with water and sewer, although the BPU also provides water for distribution through the several rural water districts.

Information on the water supply and distribution system, sewage collection and disposal, electric generation and distribution and stormwater systems has been provided for this chapter by the Department of Public Works and the BPU.

Water Supply System . . . .

The city's potable water system is administered by the Board of Public Utilities. It serves the needs of our 5,000 commercial and residential customers as well as supplying water to four rural water districts including the City of Windom.

McPherson is located on the northern perimeter of the Equus Beds. This aquifer underlies approximately 500,000 acres in McPherson, Harvey, Reno, and Sedgwick counties. Most of the cities within these four counties receive some or all of their potable water needs from this source. There are also numerous domestic and irrigation wells making large demands on the aquifer in our Planning Area. This supply is very fresh and clean, however it does contain a high amount of carbonated hardness. The Equus Beds Groundwater Management District #2, headquartered in Halstead, Kansas, was established on August 19, 1974, to monitor and manage the area in an attempt to protect this vital resource.

Currently the BPU utilizes 12 municipal wells, within or southwest of the city, with a combined pumping capacity of approximately 17,000,000 gallons per day. Three overhead storage facilities are maintained which contain 3,000,000 gallons and provide the city with a steady 47 to 52 pounds per square inch pressure to the distribution system. With the completion of the new tower just South of the McPherson Cemetery, the city has been completely looped with large distribution mains producing adequate fire flows to the entire community.

The utility expands its distribution system to accommodate the growth of the community as the needs arise. The system is also upgraded continually as opportunities and money become available for the improvements. These improvements are funded entirely from revenues, never utilizing tax money.

The City of McPherson is in an Intensive Groundwater Use Control Area. The BPU has been acquiring irrigated farm land for the purpose of acquiring water rights for the municipality's future use. To date five farm quarters have been purchased, however management feels a minimum of five more must be acquired in order to reverse the current rate of depletion. These acquisitions are planned and should not require any condemnation procedures on the part of the city. These purchases will be financed by revenue generated through current rate structures and not utilizing any grant or tax dollars.

The BPU Board of Directors has adopted a fairly conservative and responsible policy in regards to the water supply and marketing efforts. Rural areas receiving water from the municipality are strictly regulated in their water use and finite amounts available to them are enforced. So far the idea of serving the needs of additional communities has been rejected, but this option should not be ruled out completely. Without water, communities cease to exist, but McPherson's future should not be jeopardized.

It is felt that this water supply is a most important asset and its protection a most important charge. It has and will receive our highest priority as McPherson continues to grow and prosper.

Rural Water Districts (see Figure 10-B)

RWD #1: This covers the City of Windom, Kansas.

RWD #2: This water district receives up to 2,000,000 gallons of water per month from the Board of Public Utilities of McPherson. Its service area is in the northeast part of McPherson Township and is immediately adjacent to the city limits. Several of the original customers of the district have since been annexed into McPherson and have been transferred to the BPU for service. The system was originally built to accommodate 27-30 interested landowners and has grown to its present service level of 65 customers. This level of service resulted in some very marginal water pressure levels which were exaggerated when the BPU required the installation of a backflow preventer at the main meter. In June of 1997, an in-line pump was installed to increase the line pressure. This has allowed the Board to start taking applications for additional service hookups.

RWD #3: This district is located just to the southeast of the City of McPherson.

RWD #4: This district was formed for agricultural use in the mid 1970s and began serving 140 patrons in May 1977. The district consists of 100 miles of line located east of I-135 and north, east and south of the City of Galva. Water is purchased from the Board of Public Utilities with the average use being 2,000,000 gallons per month. Three major improvements have been made over the last 20 years: looping lines, adding larger capacity pumps and adding a second standpipe. At the present time, 235 customers are being served.

Sanitary Sewer System . . . . (See Figure 10-C)

The sanitary sewer collection system consists of approximately 41 miles of clay pipe varying in size from 6 inch to 24 inches in diameter, placed between 1906 and 1960, and 41 miles of 8-inch to 18-inch polyvinyl chloride (PVC) plastic pipe placed since 1959. There are approximately 1500 manholes which vary in depth to about 20 feet. McPherson's flat ground caused much of the system to be laid at minimum slopes, thereby limiting capacity of lines without the aid of force mains or lift stations. There are 6 force mains and 6 lift stations currently in use.

The collection system lines are cleaned at least once every two years with a water jetting hose using a pressure of about 3,000 psi. Some lines are cleaned more frequently and are continually being assessed for repairs or replacement. Annual television surveying of problem areas to assess the backup causes and make recommendations is performed as budgeting allows. Budgeted annual root control applications in portions of the clay pipe system are performed to extend the life of the system (14,000 feet in 2012). About 99% of the collection system was smoke tested in 1996 to determine areas requiring rehabilitation. As a result, the downtown mains were lined, manholes are being lined annually, and continuing assessment of the collection system with annual budgeting is being managed.

The city contracted with an engineering firm and completed an extensive citywide study of the sanitary sewer system in 2014. This resulted in the building of a detailed computer model that will be used to anticipate sewer system needs as the city continues to grow both in population and industry.

The two main sewer interceptors that run from the southern end of town to the treatment facility (one 15" and one 17" line) are being replaced with a single new 24" line approximately 4,000 feet in length. This will greatly reduce the amount of inflow and infiltration (I&I) into the sanitary sewer system during rain events. By reducing this I&I the ultimate capacity and capabilities of the treatment facility will be extended thereby saving the city in capital improvements to maintain proper wastewater treatment.

Wastewater Treatment Plant

The wastewater treatment facility is located south of Avenue A and west of the Turkey Creek additions. The facility utilizes Sequencing Batch Reactor (SBR) technology. This system went on-line in April 1990, and was the first municipal facility in Kansas to try this technology for the treatment of wastewater. Achievements since the start-up of the facility include American Consulting Engineers Council national finalist for facility design, 1991; Kansas Water Environment Association award winner for best large facility in the state, 1994 and 1995; Environmental Protection Agency Operation and Maintenance Excellence Award for Region VII, 1996; Environmental Protection Agency Operation and Maintenance Excellence Award for best medium advanced facility in the nation, 1996; Environmental Protection Agency Pretreatment Excellence Award, 4th place nationally in 1996; and the Environmental Protection Agency Biosolids Excellence Award for Region VII in 1998.

Minor expansions in 2000 and 2010 have increased the treatment capabilities of the facility to meet increasingly stringent EPA and KDHE effluent quality requirements.

The facility has a design treatment capacity of two million gallons per day. In addition to the SBR, there was also modification to the influent flow handling, sludge handling, and effluent reuse. The handling of the influent, or raw wastewater, presently consists of a two perforated drum screenings channels, two centrifugal grit removal tanks, and a four pump main lift station.

The SBR system is a modification to the activated sludge process. The SBR process is controlled by a computer and a series of programmable logic controllers (PLC's). This equipment allows for the control of valves, pumps, blowers, and other related activities within each basin which would be too labor intensive otherwise.

The sludge handling process consists of a four-cell aerobic digester complex, a centrifuge thickener, and an off-site sludge storage facility. The digester accepts excess sludge from the SBR's. After digestion, the sludge is pumped to the centrifuge thickener where it is further dewatered to a dryness of approximately 22%. This dewatered sludge is transported to the off-site storage facility where it awaits being applied to agricultural land. The dried sludge, now known as biosolids, is applied in December and/or January to city owned agricultural ground which is planted in brome grass.

The effluent, or treated wastewater, is discharged from the SBR's to a reaeration basin for the addition of oxygen. It exits the re-aeration basin and passes through the ultra violet disinfection unit before being discharged to Dry Turkey Creek. A portion of this effluent is diverted prior to the outfall for use within the treatment facility and as irrigation for Turkey Creek Golf Course.

In 2014 the city entered into an agreement with CHS refineries to purchase treated wastewater from the city to be used in their refining process. This allowed CHS to expand their operation while conserving valuable ground water resources.

Storm Drainage System . . . . (See Figure 10-D)

Small municipalities with storm sewer systems in Kansas that generally serve populations less than 100,000 in urbanized areas are classified as Municipalities with separate storm sewer systems (MS4)'s Phase II. McPherson falls under the National Pollutant Discharge Elimination System (NPDES) general stormwater permit for Municipal Separate Storm Sewer System's (MS4)'s. The Permit Program is an EPA regulatory program administered in Kansas by the Kansas Department of Health and Environment (KDHE). The program is intended to reduce and eliminate pollution from rainfall runoff, which flows through storm drain systems to local streams, ponds, and other waterways. Specifically, the goal of the MS4 Permit program is to restore and maintain the chemical, physical, and biological integrity of the nation's waters, as defined in the Clean Water Act, by controlling previously uncontrolled sources of pollution across the landscape that are transported by rainfall runoff or stormwater. The general permit also requires the City to develop, implement, and enforce a stormwater management plan (SMP) designed to reduce the discharge of pollutants from the MS4 to the maximum extent practicable, to protect the water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act.

The City's storm drainage system includes approximately twenty and on half miles of storm sewers, which are shown graphically in Figure 10-D. This system does not adequately serve the City's drainage needs and continued urban growth will probably worsen the problems unless this growth is accompanied by storm sewer improvements. In 1997 the City adopted the "Stormwater Policies and Design Criteria for the City of McPherson, Kansas" which places a significant portion of the burden of stormwater design and control on new developments. This document was also revised in October of 2007, implementing Erosion/Sediment Control permitting processes for new residential construction. Also, in January of 2012 the Public Works Department updated stormwater management enforcement processes, which included: new permitting processes, field inspections reports, and holds on residential building inspections if contractors failed to use their Best Management Practices (BMP) at their construction sites. A major goal of these policies is to restrict stormwater runoff from new developments that have property in the undeveloped/ or construction stage to save the integrity of our storm systems. Additionally, detention structures are becoming more common in new developments which should positively affect existing downstream properties.

The need to be concerned about the quality and quantity of pollutants on the ground, where rainstorms wash them into creeks and ground water aquifers, is significant to the City of McPherson. The City has land uses such as salvage yards, stockpile areas, and large trucking concentrations that necessitate containment efforts, but the daily accumulation of small particles such as oil, the wear of tires, chemicals, leaves, grass clippings, litter, construction debris, animal droppings, pavement disintegration, deicing compounds, and sand all contribute to stormwater pollution. Regular street cleaning service, pavement management, public stormwater education, and contractor stormwater education is a continuing part of the effort to reduce such stormwater pollution in our City.

Storm Drainage Needs:

The existing system is extensive; however, there are several areas of town where storm drainage facilities are inadequate by today's standards. In general, problem areas tend to be in the older sections of town. The City is systematically addressing these areas. Major storm drainage improvements have been completed in recent years, generally in conjunction with street improvements, and by requiring stormwater detention in new developments, and addressing back-of-lot drainage design in new developments. Major storm drainage improvements include: Kansas Ave from Maple to Eby (which also enhanced the downtown business district drainage system); Maxwell from First to Ave A (which eliminated open ditches); Woodside from Main to Cedar (which included channel improvements downstream of storms ewer outfalls); the Eagles Wings development in north McPherson; and, various other smaller projects

In addition, some improvements to major structures are needed due to insufficient flow characteristics. Of particular importance would be the south Main Street bridge and Union Pacific Railroad bridge which cross Bull Creek. If these two bridges were enlarged, it might also be possible to modify the bridge on south K-153 (old Highway 81 Bypass) which crosses Bull Creek although the downstream effects of these changes would need to be carefully studied. The proposed North Bypass/North Interchange should be designed to include stormwater detention areas as part of the project, if possible. This could have a significant positive impact on several of the drainage basins within the city and the newly developing areas to the north of the present city limits.

Solid Waste Management System . . . .

In 1991, McPherson County, the City of McPherson, and the smaller cities in McPherson County created the McPherson Area Solid Waste Utility (MASWU) to operate the landfill and refuse pickup services provided within the county boundaries. This involved taking over several operations that were previously run by private contractors. The services provided are county-wide, with a full range of services available to McPherson City residents under a general contract with the MASWU. Curbside service is provided to residential customers on a once-a-week basis with a separate pickup provided for yard waste on a fee basis. Curbside service also include a bi-weekly pickup of recyclable materials. Billing is handled by the Board of Public Utilities as part of the monthly utility service billing. Special bag tags are available for yard waste at an additional fee. Additionally, household hazardous waste disposal facilities are located at the county landfill site. Commercial customers contract directly with the MASWU and have the availability of from one to six pickups per week in various sized containers with recyclable material pickup also available by request. The utility also provides container rental and roll-off container services if needed. Similar services are also provided on a contract basis to homeowners or building contractors engaged in new construction, remodeling, or demolition activities.

Household refuse is trucked to the newly improved 80-acre landfill located six miles north of McPherson. Yard waste, whether picked up by the service or transported by residents, is taken to the newly developed composting facility, which is a part of the new waste transfer station site, where it is treated in a composting operation. Recycling facilities are also available at this site in conjunction with the curbside service and are available to the general public during limited hours.

Due to increased regulations pertaining to the landfilling of refuse materials, MASWU hauled refuse to out-of-county landfills for several years. However, with the completion of the new up-to-date expansion at the McPherson landfill, McPherson County solid waste is now being disposed of there. This site also includes a large construction and demolition disposal site and an area for disposal of large quantities of tree debris. This latter area has proved useful for cleanup resulting from wind and ice storms.

Electric System . . . .

McPherson's electric service is provided and administered by the city's Board of Public Utilities (BPU). Approximately 8,000 meters are served in and around the city as well as providing electric service to the cities of Galva and Moundridge. In 1996, the net system sales were in excess of 580,000,000 Kwh with gross revenues of nearly $20,000,000. The single largest customer class was the industrial sector making up nearly 65% of these totals.

In December of 1995, the utility financed a capital improvement project, the construction of a new power plant, by issuing $27,000,000 worth of non-tax supported revenue bonds. This project when added to existing plants will provide the municipality with 260,000 Kw of generation capacity, and is instrumental in continuing the long term contractual relationship with our neighboring investor owned utility, Western Resources. This contract, now in place to the year 2027, will provide the area with not only a reliable source of power but also relatively low costs. The McPherson plants provide a source of generation to Western Resources who in turn provides the majority of electricity to the BPU for resale. BPU generation capacity is used mainly during times of peak load.

The peak demand established by the Board of Public Utilities in the summer of 1996 was 100,000 Kw, and has been growing at a steady pace for the last 27 years. BPU currently has three generating plant locations to assist in meeting that demand. Plant No. 1 is located at 414 West Elizabeth and has recently been decommissioned. Plant No. 2, located at 1128 West Avenue A, is currently the primary production facility with a 182,200 kw maximum capacity. Plant No. 3, which is mentioned above, is under construction at 1486 17th Avenue and will be capable of adding 83,000 Kw to the production capacity. In addition to its generation equipment the utility supports two ties with Western Resources, two 115 kV substations, a 115 kV transmission loop around the municipality, and numerous distribution substations to enhance reliability.

The utility has positioned itself to provide low cost power to the community in a reliable fashion for many years to come. Retail wheeling legislation, which would have the effect of deregulating the sale of electricity, is being discussed at the state and national levels at this time. The possible effects of this legislation are not known at this time.

Gas Service . . . .

Natural gas is distributed within the city through a franchise agreement with Kansas Gas Service. The gas is transported to McPherson via several town border stations fed by the Mid-Continent Market Center's gas transmission system. Current supplies are adequate to handle the city's gas load for the foreseeable future. New customers will be served by piping connected to the existing low-pressure distribution system. A project to install electronic flow measurement equipment which would allow remote monitoring of gas pressure was completed in 2014.

Telephone Service . . . .

Franchised Telephone Service

Southwestern Bell Telephone provides telephone services to the community of McPherson. Services are provided through an electronic digital switch and interconnects to outside communities through fiber optics which are backed-up on a sonnet ring. Generally all new developing areas will be served by underground cables which have the advantage of not detracting from the visual environment.

Cellular Telephone

Several companies are currently providing cellular telephone service for McPherson and the Planning Area. This service, along with mobile paging, is an area of communications which is in a very fast growth stage. It is also an area with the potential to greatly affect future development since one of the prime needs of the business are numerous, sometimes very tall, broadcasting antennas that require line-of-sight connection to the receiving devices. These antennas, if not properly situated and constructed, may adversely affect planned development patterns and aesthetics. However, it is felt that the majority of the antenna needed for this service are currently in place or are in the final construction stages. Due to policies in place within McPherson, all new towers are required to be available for use by multiple service providers so as to help minimize the number of towers required.

Cable Television . . . . (Bryan King)

Cox Communications Kansas, LLC, dba Multimedia Cablevision of McPherson, is the current franchise provider for cable television service within the city. Cox Communications operates an advanced communications network within the City pursuant to a state-issued certificate and provides video, voice and data services to residents and businesses. Current services include digital telephone. Competitors include satellite video providers and traditional telephone providers.

The city is currently undergoing the installation of numerous fiber optic lines which will upgrade the speed and availability of various type of data service throughout the service area. Participants in the upgrades include: Wildflower (Ideatek Systems, Inc.), Sage Telecom, Birch Telecom, and Sprint (Nextel).