

**High duty Holly pumps**

### **Pumpage**

Early records showed an average pumpage of 991 gallons per day in January, 1896. Kentucky-American pumped an average of 32,954,000 gallons per day in 1984.

In 1903 the company had two Holly pumps with a 1,500,000 gallon daily capacity each, and a High Duty Gaskill pump with a 3,000,000 gallon capacity. Today the company's 13 pumps can deliver up to 85,500,000 gallons of water to customers every day.



**Laying the pipeline**

### **Pipeline**

From 1885 to 1985, the amount of pipeline has increased from 15 miles to 1,042 miles. Kentucky-American has laid over ten miles of new pipeline each year for the past ten years. Plus, over 39 miles of pipeline have been installed to replace old or undersized pipeline since 1966.

# Richmond Road Station



**Lexington Water Works pumping station in 1919**

The original treatment plant was built adjacent to Reservoir 1 in 1885. This facility, which is located behind the company office on Richmond Road, has been renovated and is still in daily use.

The most prominent feature of the early plant was the 125-foot smokestack. The original steam engines were replaced by steam-driven turbine engines in the 1930's. These engines operated on steam pressure up to 300 pounds, compared to the approximately 100 to 200 pounds of pressure needed to operate the steam engine on a train. The steam blower was used to backwash the filters, and heat from the boilers heated the building. Coal for the engines was originally hauled by mules and wagons and later by trucks. Employees who fired the boilers to keep the steam engines going were "firemen" and those who oiled the

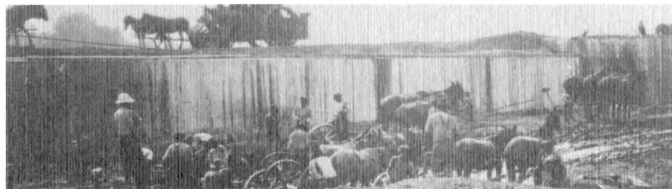
engines were classified as "oilers."

The last steam-powered water pump was removed in December, 1962. Installed in 1905, it had been used on a standby basis since 1945. With the conversion to electric power, the company no longer needed its smokestack. It was dismantled as part of the plant renovation in May, 1963.

The treatment facilities have been upgraded over the years. The original sponge filtration system was replaced in 1899 by a mechanical sand system. The company was using aeration as early as 1903 to "give life and sparkle to the water." Under the direction of Manager Willard S. Cramer, the company pioneered water filtration and sterilization



**Culvert under Richmond Road to what is now Jacobson Park**



**Removing silt from Reservoir 4**



**Excavating for spillway for Dam 4**

techniques. The company was reputed to be the first to use copper sulfate to kill algae.

The Richmond Road Treatment Station has been modernized numerous times over the 100 years of operation. The facilities were enlarged in 1954 and renovated in 1973. Today this station uses the standard treatment techniques of coagulation, sedimentation, and filtration to purify water. The treatment plant has a conventional sedimentation basin and a separate filter building with 16 rapid sand filters.

The company also has special instruments to monitor the amount of water pumped throughout the day. Bits of Lexington history are reflected in the pump house record books. These documents note every time there has been an increase in water pressure due to a fire or special operation. They also indicate special events, such as the February 2, 1902, entry which states, "Extra pressure for wedding." There are even noticeable drops in the water pressure during commercials of popular television shows.

The Richmond Road Station facilities utilize water from Reservoirs 1 and 4 to provide approximately 25 percent of Lexington's water. The plant can treat and deliver up to 20 million gallons a day.

# Kentucky River Station



Men and barge in the 1930's

Even as the Kentucky River Station treatment facilities were being built in 1958, plans were underway for expansion. Lexington's population was growing rapidly in the late 50's, and the water company had to keep up with the ever-increasing demand.

The company had planned to build two filter units, each capable of treating 2 million gallons of water a day. Before construction was completed, four units were installed for a total of 8 million gallons a day. These units have since been upgraded, and six additional units have been installed. Today the Kentucky River Station can treat up to 40 million gallons a day.



Incline to river in 1958



The filter units were the first of their kind in Kentucky. They had been introduced just 10 years earlier in Virginia by A.E. Aldridge, chief engineer of the American Water Works Service Company, of which Kentucky-American Water Company is a subsidiary.

The "Aldridge" units, as they were called, combine the sedimentation and filtration steps into one unit. The center section contains large mechanical mixers where flocculation (mixing) and sedimentation occur, and the outer section contains the filtering system.

One of the challenges of building a station at the river location was providing a means to carry workers and materials up and down the cliff.

The company hired the Philadelphia Toboggan Company to build a 520-foot tramline along the cliff. The unusual incline car received a lot of attention. As the *Louisville Courier Journal* reported, "A tiny, slow-moving car clacks its way up and down the heart-stopping 42-degree grade, 'the steepest inclined railway in the country,' said one engineer. 'That's why we have to have a continuous chain — it was too much for a one-way chain to pull.' "

The incline car has proven to be a great help to those who monitor the intake facilities regularly. However, because of weight limitations on the car, many of the pump parts that are used at the intake pump station must be delivered to the facility by barge on the river.



**Treatment plant at the river today**

The Kentucky River Station has been expanded several times. The most recent of these was in 1982 when the company constructed additional facilities to provide another 8 million gallons a day capacity. Also included in this expansion were additional storage facilities.

Another major development at the Kentucky River Station was the building of sludge disposal facilities in 1976. These facilities, along with the ones utilized at the Richmond Road Station, put the company in compliance with the National Pollutant Discharge Elimination System.

Today the Kentucky River Station treatment facilities are Lexington's major source of purified water and a symbol of the rapid growth of the Central Kentucky area.

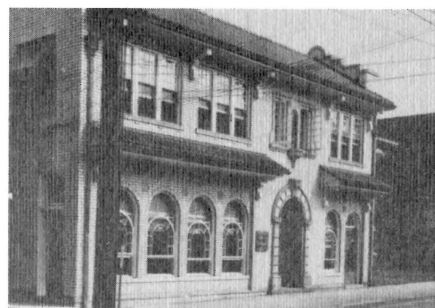
# Cost - Then And Now



**Downtown repairs**



**Laying pipeline downtown**



**Early company office on Upper Street**

## **Customer Taps**

The first customer service was tapped onto the new water system on January 8, 1885, at 113 North Broadway, in the name of Alex Pearson. At that time the average cost of the installation of a  $\frac{3}{4}$ " customer service was \$26. It costs approximately \$244 for a new customer  $\frac{3}{4}$ " service today.

## **Laying Pipelines**

Techniques of laying pipelines have advanced. Power-driven backhoes and jackhammers have replaced shoveling. Materials have also changed. An early 1900 distribution order included 800 bricks, 2 tons of rock, 1 ton of sand, 5 sacks of cement,  $\frac{1}{2}$  barrel of tar, and 1 bale of yarn.

In 1910 it cost \$1,734.56 to lay 1,250 feet of 10-inch pipe and install two fire hydrants on South Upper Street. This included \$1,316.83 for pipeline materials, \$393.38 for labor, and \$24.35 to repair the street. In 1984 Kentucky-American laid 1,464 feet of 12-inch pipe in conjunction with the South Broadway relocation and underpass project. It cost a total of \$70,769, with \$23,901 for materials, \$37,826 for labor, and \$9,042 for street repairs.

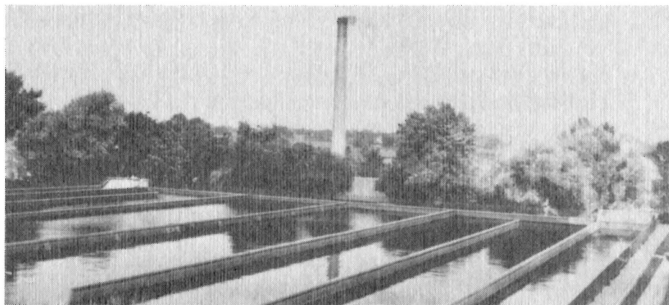
# Water Quality Control

No comparison can be made between the water quality control programs in 1885 and today. Early treatment techniques used filtration mainly to make the water look and taste better. Officials in 1885 would be amazed at the advances in the last 100 years resulting in today's water quality control program.

A record book at the turn of the century listed six tests for pure water based on simple chemistry standards. None specified amounts. Standard measurements were "put into it a few drops," or "then half fill it." Also, there was no set schedule for testing the water.

Today highly trained personnel use sophisticated equipment to conduct a minimum of 300 tests each day in the two company laboratories. Routine tests for bacteria, pH levels (acidity and alkalinity), chlorine residual, and turbidity are conducted throughout the day. The company conducts special testing procedures using complicated equipment such as the atomic absorption spectrophotometer, which can detect the presence of heavy metals, and the gas chromatograph and total organic carbon analyzer, both of which detect organic compounds.

The government first became involved in water quality in the 1950's, when the U.S. Public Health Service recommended fluoridation of community water systems to help prevent dental cavities. On January 15, 1953, the Lexington Board of City Commissioners passed a resolution to fluoridate city water. This began in June, 1954.



**Sedimentation basin at Richmond Road Station**

Public concern in the 1960's brought attention to our water resources. Congress passed two important bills: The Federal Water Pollution Control Act (Public Law 92-500) and the Safe Drinking Water Act (Public Law 93-523). The first, passed in 1972, addressed the problem of man-made pollution of our water resources. The second, passed in 1974, authorized the Environmental Protection Agency to set up national drinking water regulations.

The biggest threat to water quality today is the pollution of our water resources. The community water system is our last line of defense, not the first, against toxics in our water. The state and federal governments must work to enforce pollution laws and control these activities at the source.

# Fire Protection

The need for fire protection was a driving force behind the initiation of a public water supply.

Prior to 1885 Lexington residents were dependent on cisterns to fight fires. These cisterns frequently ran dry and many major buildings were lost to fires. This had a great impact on fire insurance rates, which increased by 40 percent in 1883 and were reduced by 10 to 30 percent after the water works was initiated.

The Lexington Fire Department had been in existence close to 100 years when the water works was built. Beginning around 1790, it was the oldest organization west of the Allegheny Mountains. It was formed at a meeting in the original Phoenix Hotel.

Ironically, a fire, which destroyed this same hotel in 1879, was among the factors which prompted a public water system. As the *Herald-Leader* later reported, "the old Phoenix burned as fire fighters' pumps drained cistern after cistern in a futile attempt to cut the \$150,000 loss."

Early fire fighters used bucket brigades to extinguish fires. Town law stated that every home owner had to have a certain number of buckets based on the value of the home. By 1864 the town owned horse-drawn steam fire engines and had its first paid fire department. The steam engines used a boiler system to pump available water from any of the approximately 50 cisterns throughout the town.



Early fire rig in Lexington

The introduction of a public water supply in 1885 revolutionized fire fighting. It enabled fire rigs to hook onto fire hydrants and draw directly from a seemingly endless supply. The Water Works Ordinance, adopted by the city in 1885, specified that 200 double discharge Holly hydrants should be installed along 15 miles of water main throughout Lexington.

The fire streams created by these hydrants were one of the highlights of the inauguration of the Lexington Water Works on January 30, 1885. As recounted in Frances Dugan's *Rainfall Harvest*: "The great climax came at 2:30 p.m. when the crowds of firemen, using a Siamese attachment, shot a column of water as high as the weather vane on the new courthouse....the streets were deluged, and sightseers agreed that no fire could live against such an assault. By 'universal verdict,' the demonstration was declared a complete success."

Another feature of the fire protection system, which was developed in the 1880's, was the fire alarm telegraph system. Fire alarm boxes located on poles throughout town were wired with a centralized fire station. This alarm system was connected to the water works pump station when the water system was built.

A 1903 publication of the Lexington Water Works makes reference to the special alarm and proudly states the company's capacity for immediate action: "Within one minute from the reception of the alarm, the pressure will be ready for fire streams."

As the community grew, the fire protection system was expanded. In 1888 the system had 239 hydrants, 59 cisterns, and 45 alarm boxes. Fifty years later this had increased to 825 hydrants and 83 alarm boxes. At the end of 1984, Kentucky-American Water Company had 4,411 hydrants. Over the last ten years, Kentucky-American has installed approximately 100 hydrants per year. However, in 1973 the company installed over 700 hydrants to accommodate increased demands as a result of the merger of the Lexington and the Fayette County Fire Departments.

Kentucky-American personnel routinely inspect, repair, and maintain the fire hydrants. The local government pays the company a small rental fee for the availability of each public fire hydrant, but there is no charge for the water consumed fighting fires.

The water distribution system and available fire hydrants greatly affect fire insurance rates. For a city its size, Lexington residents enjoy fire insurance rates among the lowest in the country. These rates promise to be kept low as Kentucky-American and the Lexington Fire Department work together to continually upgrade Lexington's fire protection system.

The Lexington Fire Department currently has 16 fire stations and 413 employees. It has been headed by Chief Earl McDaniel for over 35 years. Under Chief "Mac's" leadership the department has become a model for the rest of the country.

# Management: Innovative Leadership



**Directors: Rudolph Harding, Dr. David Barrow, J. Will Stoll, Ernest Ellis, W. S. Cramer, John G. Stoll, Simon Wolf, Hector Hillenmeyer**

The Lexington community water system has always been investor-owned and operated. The name has changed several times over the last 100 years, but the commitment to leadership within the water utility industry has been consistent.

The original company, called the Lexing-

ton Hydraulic and Manufacturing Company, was chartered on February 27, 1885, by three Lexingtonians: Gilbert Hinds King, General William Preston, and Colonel R. H. S. Thompson. By 1903 the company was referred to as the Lexington Water Works. The name was officially changed to the Lexington

Water Company in 1922.

The current name of Kentucky-American Water Company was adopted in 1973 to better describe the company which serves customers in five counties in the Central Kentucky area.

**Stephen A. Charles** came to Lexington in 1884 to help build the water works and stayed to become its first superintendent. During his tenure, Reservoirs 2 and 3 were completed and plans were underway for the fourth. Charles' leadership paved the way for years to come.

Charles was born in Rochester, New York, where he received a civil engineering degree in 1848. Prior to coming to Covington, Kentucky, he supervised work on the Erie and Champlain Canals in New York. He helped design and served as the first superintendent of the suspension bridge between Cincinnati and Covington.

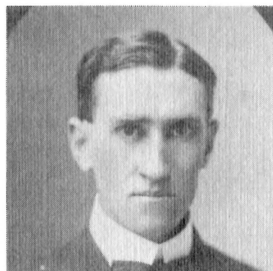
In Lexington, Charles was prominent in business circles. He helped organize the Lexington Brick Company and served as its secretary-treasurer for many years. He also designed and laid out Fayette and Elsmere Parks.

His wife, Sophia, was one of the pioneers in social work in Lexington and was active in the women's rights movement.

Charles died in 1909 in San Pedro, CA.



**Stephen A. Charles**  
(1885-1906)



**Howard K. Bell (1906-1910)**

**Howard K. Bell** was chief engineer prior to being named manager. He supervised the construction of a major addition to the pumping plant and the building of Reservoir 4.

A native of Scott County, Bell received a B.S. degree from Georgetown College in 1893 and spent his early years farming and teaching school. He joined the water works in 1902 while working toward a degree in civil engineering from the College of Engineering at U.K.

Creative design was Bell's major interest, and in 1910 he resigned to become part owner of the Central Construction Company. In 1914 he founded an engineering firm, Howard K. Bell Consulting Engineers, specializing in water supply and purification. His firm handled many major projects for the Lexington Water Company, including the first pipeline to the Kentucky River in 1930.

Bell was married to the former Mary Lee Stone. They had two children, Florence Bell Hambrick and Grant S. Bell.

He died in Lexington in 1939.

**Willard S. Cramer** and his father came to Lexington in 1884 to help build the water works. When service began, the elder Cramer became chief engineer, and Will Cramer became engineer for the pumping station. Will later served as chief engineer and then general manager.

A pioneer in filtration and sterilization equipment, he was probably the first to use copper sulfate to kill algae. Cramer was considered the first superintendent in the U.S. to have an all-metered water system. He also directed the construction of the first water line from the Kentucky River in 1930.

In 1922 he served as president of the American Water Works Association, a nationwide water utility trade association.

He was married to the former Matilda Johnson. They had five children: Mary Elizabeth Cramer, Grace Cramer Webber, Hugh Cramer, Hiram Cabell Cramer and Clark J. Cramer, who like his father and grandfather worked for the company and served as chief engineer.

Cramer died in Lexington in 1933.



**Willard S. Cramer (1910-1931)**



**Frederick E. Beck (1931-1936)**

**Frederick E. Beck** succeeded Willard S. Cramer as general manager. During his tenure the company completed the pipeline to the river. This water line, which augmented the supply of water to Reservoir 4, was one of the most important expansion projects in the company's history.

Beck served as manager during the depression years and helped to keep the company solvent during some of Lexington's most difficult times. While the city was struggling with "bank holidays" and companies like the Kentucky Traction and Terminal Company, which provided the electric interurban railway lines in Lexington, were going bankrupt, the water company continued to expand.

Also under his management, the company made plans for a major renovation of its offices on North Upper Street. The entire interior was modernized and rearranged to facilitate the employees in serving the public. These renovations were completed in 1937.

Beck's tenure was an important transitional point in the company's history.