



Welcome from the Directors

The City of Manhattan Public Works Department is pleased to present the 2015 Water and Wastewater Division Utilities Report. The mission of the Public Works Department is to provide essential infrastructure to the community that is secure, reliable, and cost-effective.

This report provides a snapshot of the many services that ensure the City of Manhattan's water and wastewater utilities remain efficient and environmentally sound by providing the community with a safe and reliable supply of drinking water while returning wastewater to the environment in a responsible manner.

The City of Manhattan strives to continually improve the existing water and wastewater systems that deliver these vital services to this growing community.

With the support of the engineering division, other City departments and local consultants, the Water and Wastewater Division had a successful year in 2015. In order to meet our goals and expectations, numerous

maintenance and capital improvement projects were completed, and full compliance with all local, state and federal requirements and regulations was achieved.

Financially, for the third straight year, the cumulative divisions under both the Water and Wastewater Funds continued to operate well within the annual operating budgets. Although consumption and revenues were just shy of 2015 projections, fund balances for both the Water and Wastewater Funds grew.

Finally, in recognition that the successful operations of the Public Works Department relies on the skills and commitment of our most valuable resource – our employees – City administration made significant investments in safety equipment and training, as well as creating a new safety specialist position to oversee job specific safety training for all departments within the City of Manhattan.

The Public Works Department consists of more than 100 employees that fully understand

Robert K. Ott
Director of Public Works

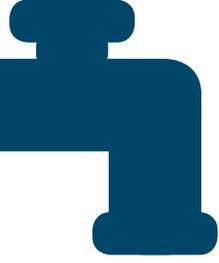
Randy D. DeWitt
Assistant Director of Public Works for Water & Wastewater



the importance of the services we provide to the community. At every level, training and development of our personnel is central to the success of our daily operations and allows us to fulfill our mission to provide the citizens of Manhattan with award-winning programs and peace of mind that essential water and wastewater services will be provided.

Mission Statement

Our mission is to provide the community with the resources to efficiently manage and maintain those services and facilities that are vital to the community's health, safety, and welfare. Public Works is committed to provide for the construction and maintenance of the City's infrastructure including street, storm sewer, traffic control, flood protection, high quality drinking water and the return of that water to the environment through the wastewater treatment process.



Water Treatment Process

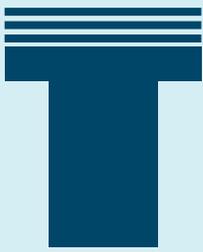
The Water Treatment Plant (WTP) is a lime softening plant with a design capacity of 30 million gallons per day. It is in full operation 24 hours a day, 365 days a year. It is staffed by two operators on each eight-hour shift.

State certified WTP operators ensure adequate water is maintained in the distribution system and test many water quality parameters.

In 2016 and 2017, significant improvements are planned at the plant include electrical improvements, addition of a backup generator and improving disinfection infrastructure.

2.4B
2.417 billion gallons of water treated in 2015

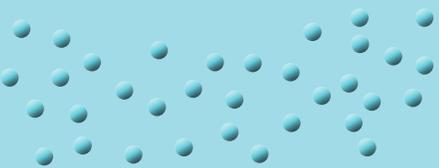
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The City uses 20 groundwater wells to supply water to the City's Water Treatment Plant.

2

Aeration removes hydrogen sulfide and volatile organic contaminants as well as oxidizes iron.



3

The water flows to 1 of 3 large settling basins where lime is added to raise the water pH and reduce hardness.



4

Liquid chlorine, fluoride and phosphate are added into the line as water flows by gravity through the dual media filters, which remove particles. Water flows to the transfer pumps and is stored on site in two underground reservoirs. Ammonia is added to form chloramines, a more stable and safer disinfectant.



7

The water storage tanks maintain adequate pressure and storage for domestic use and fire protection.



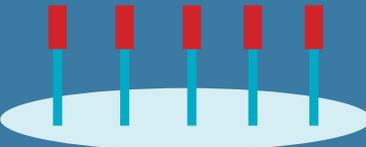
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Four booster pump stations help push water to 6 water storage tanks and maintain pressures throughout the system.



5

Water is pumped from the reservoirs into the water distribution system using large pumps and motors.



Water Quality & Monitoring

We take great care in providing the Manhattan community with only the highest quality drinking water every minute of every day. We closely monitor every stage of this process.

Samples are collected directly from our groundwater wells, through a voluntary Wellfield Water Quality Monitoring Program. These samples give us insight into the nature of our water before it even reaches the Water Treatment Plant. The City of Manhattan is proud to be the only community in Kansas that initiated and implemented such a voluntary program.

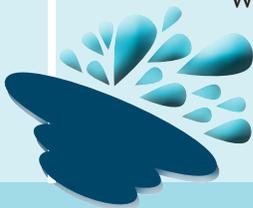
As water is treated and pumped into our storage tanks and towers, the City collects nearly 12,000 samples manually and even more sampling is done

via an automated system. Following sampling schedules outlined by Environmental Protection Agency (EPA) regulations, hundreds more samples are collected from taps throughout the distribution system and are analyzed for more than 80 potential contaminants.



We are pleased to report all of the samples collected in 2015 were well within the limits established by Kansas Department of Health and Environment and the EPA. You can view the results of these tests in our annual Water Quality Report, also referred to as the Consumer Confidence Report, at CityofMHK.com/CCR.

WATER SERVICE BY THE NUMBERS



33
water main breaks in 2015

water main services repaired in 2015

238



280
miles of water infrastructure maintained

Water distribution and meter crews maintain more than 280 miles of water main, valves, pressure-reducing valves, fire hydrants and water meters. In 2015, 6 miles of new water main were installed.

If you experience water quality or pressure concerns, you can notify staff any time of day, any day of the year by reporting the issue to:

785-587-4530 (8-5 M-F)
785-587-4550 (After Hours)

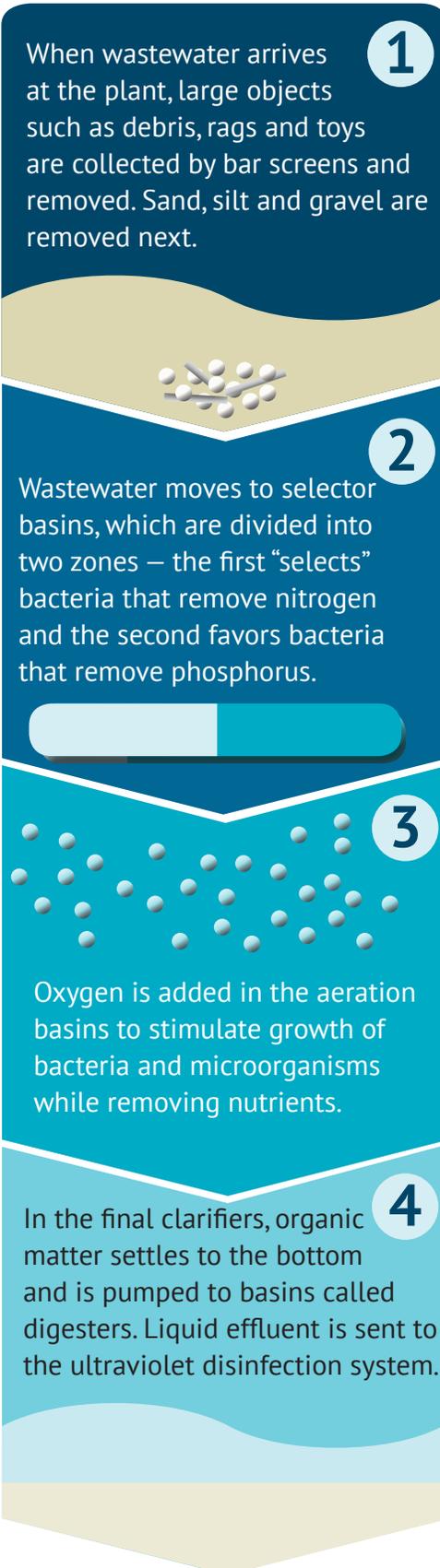
Cross Connection & Backflow Prevention

The Cross Connection and Backflow Prevention Program helps keep our water supply system safe by protecting drinking water pipes and mains from possible contamination after the water has passed the water meter or into a private system. The City tracks and monitors more than 3,500 testable backflow prevention devices. Each device requires an annual inspection.



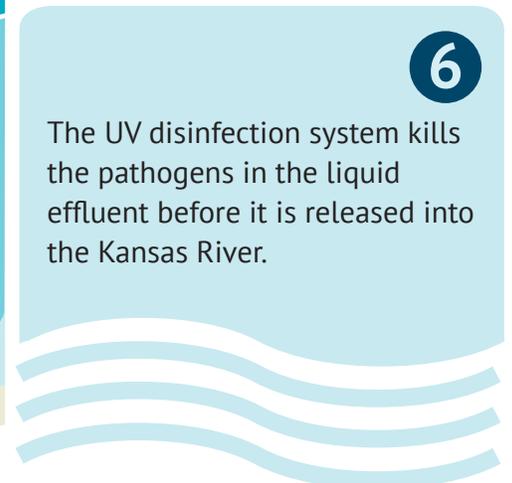
Wastewater Treatment Process

The City of Manhattan's Wastewater Treatment Plant (WWTP) is an activated sludge and biological nutrient removal plant with a design capacity of 11 million gallons per day. The plant is staffed by state certified operators 24 hours a day, 365 days a year. The City has 250 miles of sanitary sewer lines and 27 lift stations strategically located throughout the community that pump wastewater from homes and businesses to the WWTP so it can be properly treated and put back into the environment.



Award-Winning Biosolids Program

The City of Manhattan's Biosolids Management Program was chosen Program of the Year for municipalities with 30,000 population or larger by the Kansas Water Environment Association in 2015. Biosolids refers to treated sludge that results from the wastewater treatment process. In 2015, 1,240 tons of biosolids were land applied as fertilizer and absorbed by crops growing on 462 acres of the Biosolids Farm, which includes 248 acres of the City-owned farm and 214 acres of leased land. The WWTP also received an honorable mention award for plant of the year.



Industrial Pretreatment Program

The Industrial Pretreatment Program works with area industrial contributors who discharge non-domestic waste. It protects the City's Sanitary Sewer Collection System, Wastewater Treatment Plant, Biosolids Farm as well as the environment. City staff issues discharge

permits, performs site inspections, monitors discharges, and enforces pretreatment standards and requirements. The City reports annually to both the EPA and KDHE. The number of Significant Industrial Users permitted and monitored doubled from four to eight in 2015.

SEWER SERVICE BY THE NUMBERS

52,802

feet of sewer mains televised in 2015



feet of manholes rehabilitated in 2015

573.94



16,210

feet of sanitary sewer relined at a cost of approximately \$375,000

Sewer maintenance crews maintain more than 250 miles of sanitary sewer gravity and force main sewers and more than 5,400 manholes. Annual maintenance includes televising, inspecting and cleaning more than 50 miles of sanitary sewer in order to minimize sewer blockages and potential backups in both public and private sewer lines. In 2015, City crews responded to 132 sewer calls.

The City also oversees an annual maintenance program for manhole rehabilitation and cured-

in-place-pipe (CIPP) sanitary sewer relining to reduce inflow and infiltration and rehabilitate aging infrastructure. In 2015, 3 miles of sanitary sewer were installed, as well as 74 new manholes.

If you experience a sewer backup or odor or any related concern, you can notify staff any time of day, any day of the year by reporting the issue to:

785-587-4530 (8-5 M-F)

785-587-4555 (After Hours)

Crews respond within one hour

Grease Management Permit Program

The Grease Management Permit Program requires all food service establishments that produce greasy wastes to have and maintain a grease trap or interceptor – boxes installed in the plumbing systems of such establishments – which remove grease before it reaches the sanitary sewer collection system.

The Grease Management Permit program helps

prevent damage to sewer mains from excessive buildups of cooking grease. Grease clings to the interior walls of sewer pipes and can eventually clog the pipe completely, causing the sewer to backup and overflow. Such overflows are messy, can damage private property, and can contain harmful microorganisms. The program tracks and permits more than 180 grease traps and interceptors at more than 160 food service establishments.

Improving Public Infrastructure



Blue Township Water Line Improvements

Design was completed for a \$4.8 million project that is being funded by both Pottawatomie County RWD No. 1 and the City to install a new transmission main, booster pump station and water tower that will allow the City to wholesale water to the district for the Blue Township area. Construction of the water tower and transmission main was mostly completed in 2015, and the booster pump station construction is on schedule to be completed in 2016.

Wildcat Creek Lift Station Phase II Improvements

Construction was completed on the Wildcat Creek Lift Station, Phase II Improvements, in 2015, which had an estimated cost of \$914,000 for design and construction. This project increased the pumping capacity of the City's biggest lift station, which serves roughly a third of the City's area.

Water Meter Replacement and Automation Project

Construction was completed on the \$2.5 million Water Meter Replacement and Automation Project. More than 8,000 water meter locations and meter reading infrastructure were replaced,

Eureka Valley Transmission Main

Design was completed on a \$3.8 million project to construct a high-pressure transmission main to supply adequate amounts of water and fire protection to K-18/Eureka Valley Corridor, which includes Manhattan Regional Airport, Business Park and future development in the corridor. The project is expected to be awarded in 2016.



Central Basin Sanitary Sewer Improvements

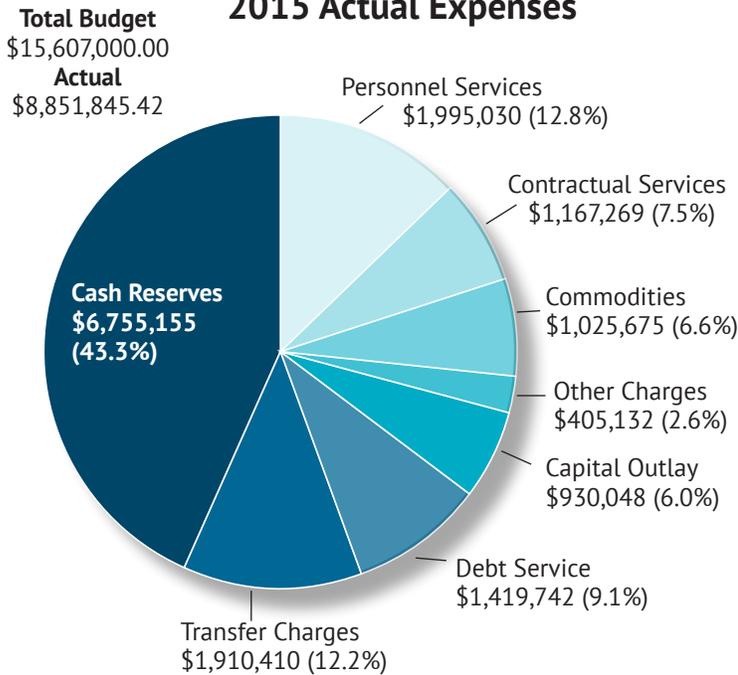
Design and construction was completed for the \$1.1 million Central Basin Sanitary Sewer Improvements, which included projects to alleviate wet weather sanitary sewer capacity issues in the Bluemont Avenue Interceptor and to provide additional capacity for future development within the basin surrounding Kansas State University by diverting flows to the Thurston Avenue and Poyntz Avenue Interceptors, which contain extra capacity to convey the additional flows.

and the meter reading system was nearly completely automated. This project was funded with a Kansas Department of Health and Environment Kansas Public Water Supply Loan that has 40% principal forgiveness.

Water Fund

Revenue	2015 Budget	2015 Actuals
Beginning Fund Balance	\$5,700,000	\$6,191,801
Service and Sales	\$9,354,000	\$8,939,622
Other Revenue	\$553,000	\$693,558
Total	\$15,607,000	\$15,825,091

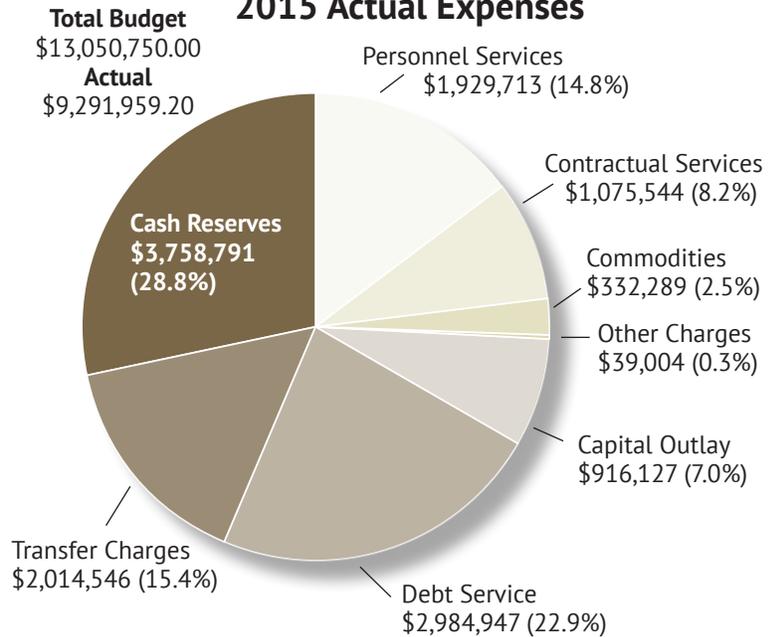
2015 Actual Expenses



Wastewater Fund

Revenue	2015 Budget	2015 Actuals
Beginning Fund Balance	\$3,200,000	\$3,164,965
Service and Sales	\$9,792,750	\$9,537,636
Other Revenue	\$58,000	\$124,946
Total	\$13,050,750	\$12,827,547

2015 Actual Expenses



Cost of Services Study Analyzes Rates

In 2014, the City initiated the process of performing a cost of services study. A consultant was hired to help assess the City's past, current and future expenses and revenues to determine the adequacy and fairness of the current rate structures.

The goal is to optimize funding levels to accomplish system growth, capital improvement, maintenance and operation while still charging customers a fairly structured rate.

In the first phase of the study, the consultant determined the Water and Wastewater Funds are currently "good" with "adequate" reserves; however, several areas require improvement to ensure the City

Average Monthly Water Bill

22 surveyed cities.....\$36.28
Manhattan.....\$19.66

Average Monthly Sewer Bill

22 surveyed cities.....\$40.21
Manhattan.....\$29.64

maintains adequate funds.

As part of the study, 22 comparable cities were surveyed to determine an affordability index, taking into account the average water and sewer bill and average household income.

Manhattan's index was 0.6 for water and 0.9 for wastewater. An affordability index of 1.0 is considered excellent.

A second phase of the study is expected to be complete in July 2016. Recommendations will then be presented to the City Commission for potential modifications to water and sewer fees, rates and rate structures to fulfill the goals of the study.