CITY OF MAYVILLE
WASTEWATER FACILITY PLAN
PUBLIC HEARING FACT SHEET

I. Why is the project needed?

The City of Mayville Wastewater Treatment Facility (WWTF) was originally constructed in 1932 and has undergone several upgrades over the years, with the most recent major upgrade occurring in 1984. As the City has grown over the past 40 years, flows to the WWTF have increased and are expected to continue increasing past the WWTF's design rating. This has caused issues at the WWTF with handling peak flows. In addition, WWTFs are designed for 20-year periods as most process and electrical equipment only have a service life of 15-20 years. Equipment including fine screening, raw wastewater pumps, grit removal, aeration diffusers and blowers, solids digestion and storage, as well as significant structural and electrical infrastructure needs to be replaced or rehabilitated. This includes safety and building code requirements required for WWTF personnel.

To address these deficiencies, MSA Professional Services has assisted the City in preparing a Wastewater Facility Plan which has analyzed historical influent and performance data as well as a condition, capacity, and performance analysis of the sewer utility and WWTF. The needs and the requirements for the WWTF to continue operating reliably for the next 20 years or more have been identified and presented herein including cost estimates for the design, construction, and implementation of these upgrades.

II. What processes and alternatives have you considered?

Do Nothing

Failure to address WWTF deficiencies would likely result in continued operational failure of the WWTF, which would result in WPDES permit violations and eventual enforcement action by WDNR and Wisconsin Department of Justice (WDOJ). Monetary penalties and a moratorium on growth within the City would result.

Fine Screening

The existing fine screen at the WWTF is undersized for current peak flows and future operations. A replacement fine screen rated at the 20-year projected peak flow is recommended. No alternative to this option is feasible.

Raw Wastewater Pumping

The existing raw wastewater pumps at the WWTF are undersized for future operations. Replacement pumps rated at the 20-year projected peak flow are recommended as well as necessary pipe and fitting replacements. No alternative to this option is feasible.

Grit Removal

The existing aerated grit removal system at the WWTF is outdated and does not perform optimally. Replacement of aerated grit equipment including new blowers, diffusers, grit pump, and grit classifier are recommended. Other alternatives to this option are more costly, but it should be noted that this upgrade may be undertaken at a later date.

Aeration Basins

The existing aeration system at the WWTF was installed in 1984 and is past its service life. The existing equipment is prone to failure and is vastly inefficient compared to today's standards. Fine bubble aeration and blower upgrades are expected to reduce electricity demand and improve wastewater treatment performance. All options also include removal of the screening structure located after aeration basins which has caused hydraulic issues at the WWTF.

- Option 1: Fine Bubble Diffusion in All Tanks (Conventional Activated Sludge):
  Fine bubble diffusers in all 5 tanks. Additional O&M Costs include fine bubble membrane replacement, equipment replacement fund, and additional RE300 chemical use based on projected loads. New blowers to be placed in the service building where existing locker room and showers are placed. New controls and equipment (ORP analyzer, aeration control, level sensors, etc.) are also included.

- Option 2: Fine Bubble Diffusion with Enhanced Biological Nutrient Removal:
  Fine bubble diffusers in 4 tanks with the first tank as an anaerobic selector and some minor upgrades for recycle streams. Additional O&M Costs (cost savings) include fine bubble membrane replacement, equipment replacement fund, and cost savings from RE300 chemical use reduction based on current and projected loads and preliminary BioWin simulations. New blowers to be placed in the service building where existing locker room and showers are placed. New controls and equipment (ORP analyzer, aeration control, level sensors, etc.) are also included. This option also provides flexibility for future total nitrogen limits.

Secondary Clarifiers

The secondary clarifiers provide settling of solids before treated effluent is disinfected and discharged to the Rock River. Based on current and projected flows, the secondary clarifiers are undersized, and upgrades will need to be performed.

- Option 1: Storm Mode Upgrade:
  Includes density current baffles and controls for optimal clarifier performance (sludge level control, RAS/WAS control, and flexibility for additional settling in Aeration Basin #5). Based on settling curves, these upgrades paired with the existing clarifiers should provide sufficient settling despite exceedances for surface overflow rate at peak hour flows. Implementation of this upgrade is dependent on DNR approval.

- Option 2: Additional Clarifiers (2):
  Includes the upgrades mentioned above as well as (2) additional 55' diameter clarifiers, identical to the existing clarifiers. Includes clarifier tanks, RAS/WAS/Scum pumping, controls, clarifier mechanisms, etc. Given that criteria for surface overflow rate are exceeded with the existing clarifiers, (2) additional clarifiers would be required to obtain surface overflow rates below design criteria outlined in NR. 110 Wisc. Adm. Code.

UV Disinfection

UV Disinfection is the last process before treated effluent is discharged to the Rock River. While the existing unit was installed in 2009, there are some concerns regarding the controls and rated capacity.

- Option 1: UV Controls:
  Upgrade includes a new UV system control panel.

- Option 2: UV System and Final Effluent Controls:
  Existing UV System is undersized for current and projected flows. Upgrade includes new UV system, channel modifications, and updated controls. Historically, the WWTF has met limits for fecal coliform and may continue doing so. Given this performance, this upgrade may be pursued at a later date.

Solids Handling

The WWTF currently stores and aerates sludge in a single 49 ft. diameter digester tank and then contracts the sludge to be hauled for further storage or land application in the spring. Due to the lack of storage and treatment, the WWTF does not achieve significant solids reduction leading to greater hauling volumes and fees. In addition, the existing aeration equipment is outdated and requires replacement. Several options for solids handling are presented below. Note that performance numbers and additional O&M costs are conservative and may improve after construction.

- Option 1: Decanting and Contract Haul:

  Includes upgrades to aerobic digester including new blowers, diffusers, decanting televalve, geodesic dome cover, loadout pumps, and controls. The WWTF would continue hauling ~1.5% TS sludge at a rate of $0.0745 per gallon. Based on historical data and digester performance, about 7,000 GPD on average over the 20-year analysis period would need to be hauled.

- Option 2: Decanting and New Storage Tank:

  Includes upgrades to aerobic digester including new blowers, diffusers, decanting televalve, geodesic dome cover, loadout pumps, and controls. Includes a new 70 ft. diameter covered storage tank for digested sludge which will provide 250 days of storage at current daily average loads and 180 days of storage at projected daily average loads. The WWTF would haul 2% TS sludge at a rate of $0.05 per gallon for land application hauling. Based on digester design performance, about 5,300 GPD on average over the 20-year analysis period would need to be hauled.

- Option 3: Thickening:

  Includes upgrades to aerobic digester including new blowers, diffusers, decanting televalve, geodesic dome cover, loadout pumps, and controls. Includes new thickening building (~750 SF) with sludge thickener press, polymer system, and pumps. Includes a new 45' diameter covered storage tank for thickened digested sludge which will provide 250 days of storage at current daily average loads and 180 days of storage at projected daily average loads. The WWTF would haul 5% TS sludge at a rate of $0.05 per gallon. Based on digester and thickener design performance, about 1,500 GPD on average over the 20-year analysis period would need to be hauled.

- Option 4: Dewatering:

  Includes upgrades to aerobic digester including new blowers, diffusers, decanting televalve, geodesic dome cover, loadout pumps, and controls. Includes new dewatering building (~750 SF) with sludge dewatering, polymer system, and pumps. Includes new covered drying/storage beds (~4000 SF) which will provide 250 days of storage at current daily average loads and 180 days of storage at projected daily average loads. The WWTF would haul 16% TS sludge at a rate of $0.05 per gallon. Based on digester and dewatering design performance, about 470 GPD on average over the 20-year analysis period would need to be hauled.

- Option 5/6: Dehumidifier or Drier:

  Includes upgrades to aerobic digester including new blowers, diffusers, decanting televalve, geodesic dome cover, loadout pumps, and controls. Includes new dewatering/dehumidifier building (~2000 SF) with sludge dewatering, polymer system, pumps, and sludge dehumidifier or drier. Includes new covered drying/storage beds (~900 SF) which will provide 250 days of storage at current daily average loads and 180 days of storage at projected daily average loads. The WWTF would haul 90% TS sludge at a rate of $0.05 per gallon or may potentially distribute the dried cake to the public if Class A biosolids designation is granted to the system. Based on design performance, about 83 GPD on average over the 20-year analysis period would need to be hauled.

General Site and Service Building Rehabilitation

The existing service building at the WWTF houses various process equipment, workspaces, vehicles, materials, personnel spaces and locker rooms and has had several additions since 1932. The building requires extensive rehabilitation for code compliancy and safety. The proposed upgrade includes roofing, windows, caulking and brick work, flooring repair, water damage rehabilitation, water service relocation, demolition of existing showers and lunchroom due to space use, new boilers (2) and digital control upgrades, dehumidifiers, new MAUs and exhaust fans for code compliant ventilation, and miscellaneous building code and safety items. This upgrade is required as part of the process equipment upgrades discussed above.

Electrical Upgrades

Given the age of the electrical equipment at the WWTF and the proposed upgrades above, electrical upgrades including new MCCs and panels, generator, service switch gear, LED lighting, SCADA system and integration, and various conduit and wiring are required.

New Administration Building

The existing administration building does not meet the needs of WWTF staff and the public. The existing building lacks sufficient workspace, shower and locker room facilities, independent water service and hot water system, and ADA compliant access. While the existing building can undergo rehabilitation (which will not fully address these issues), a new 10,000 SF building with garage, laboratory, office space, locker room and shower, workspace, and break rooms is requested by WWTF staff and required for efficient operation of the plant.

III. What is the difference in cost between the alternatives?

The capital, annual operating and maintenance (O&M), and 20-year present worth costs of the alternatives have been estimated and documented in detail within the Facility Plan Report. The primary basis for economic selection criteria was 20-year present worth as noted in the Facility Plan Report. The Table below summarizes the capital costs only associated with evaluated alternatives. Capital costs include design, construction, and engineering services but are based on current prices and may be updated during final design. Due to the preliminary nature of the cost estimates developed during this planning phase, it is a reasonable expectation that the actual construction costs may vary ±30% from the planning estimates presented herein. Unknown factors, inflation, changes to the global economy, fuel prices, and other unforeseen conditions may occur between the completion of this abbreviated facility plan and the time that upgrades are designed and constructed.

Table 1: Summary of Alternatives and Costs

Item	Options	Total Capital Cost
Fine Screening	New Mechanical Fine Screen & Wash Press	$1,005,000
RWW Pumping	RWW Pump Upgrades	$1,487,000
Grit Removal	Replace/Refurbish Aerated Grit Equipment	$662,000
Aeration Tanks, Blowers, and Eliminate Secondary Screening	Fine Bubble Diffusion, New Blowers in Service Building	$2,845,000
	Fine Bubble Diffusion - With Bio-P, New Blowers in Service Building	$2,755,000
Final Clarifiers and RAS/WAS Pumping	Storm Mode Controls	$407,000
	Construct Additional Clarifiers (2)	$7,814,000
Scum Pumping	New Scum Pumping Station	$251,000
UV Disinfection and Final Effluent Pumping Controls	Replace UV Control Panel	$210,000
	Replace Entire UV System	$705,000

Item	Options	Total Capital Cost
Chemical Building	Do Nothing	$0
Sludge Processing & Storage (see breakdown below)	Digester Upgrade, Contract Haul, 2% Decanted Liquid	$2,422,000
	Digester Upgrade, Storage Tank, 2% Decanted Liquid (Class B)	$4,172,000
	Thickened 5% Liquid (Class B)	$5,967,000
	Dewatered Cake 15-25% (Class B)	$5,834,000
	Dried 90+% (Class A) Shinnci Dehumidifier	$8,938,000
	Dried 90+% (Class A) Huber Solar Dryer	$10,485,000
Electrical & Controls	Upgrade Electrical System and SCADA	$6,036,500
Administrative Building	Rehabilitate Existing, New Garage	$3,500,000
	New Building and Garage	$5,100,000
Site & Service Building	Rehabilitation & Upgrades	$3,457,000

Table 2: Solids Hauling Cost

20-Year Average	Existing	Decant and Haul	Decant and Store	Thicken	Dewater	Dry
Sludge Volume (GPD)	**7,050**	**5,288**	**3,756**	**1,502**	**469**	**83**
Sludge %TS	1.5%	2%	2%	5%	16%	90%
Cost per Gallon	$0.0745	$0.0745	$0.05	$0.05	$0.05	$0.05
Daily Hauling Cost	$525.25	$393.94	$187.80	$75.12	$23.47	$4.17
Hauling Cost per Year	**$191,700**	**$143,800**	**$68,600**	**$27,400**	**$8,600**	**$1,500**

*Note that these costs only represent the average hauling costs over the 20-year analysis period. Electrical, chemical, and maintenance costs for each solids alternative are not shown here.

IV. Which alternatives are you recommending?

The recommended alternative for each process are summarized below:

- Fine Screening
  - This is required based on flows.
- Raw Wastewater Pumping
  - This is required based on flows.
- Aerated Grit Removal Rehabilitation
  - This is optional at this time but recommended to be completed as part of the proposed project.
- Aeration Basins Option 2: Fine Bubble Diffusion with Enhanced Biological Nutrient Removal
  - This is required based on age and condition of existing equipment.
- Secondary Clarifiers Option 1: Storm Mode Upgrade
  - This is required based on flows.
- UV Disinfection Option 1: UV Controls Upgrade
  - This is required based on age and condition of existing equipment.
- Solids Handling Option 2: Decanting and New Storage Tank
  - While this is not the lowest cost option as shown in Table 1, the cost of hauling and storing sludge off-site can (and has) increased, resulting in greater annual costs. By constructing on-site storage, the WWTF can avoid extra costs for off-site storage. In addition, the new storage tank would provide flexibility for WWTF operation and is preferred by WWTF staff.
- General Site and Service Building Rehabilitation
  - This is required based on age and condition of the building as well as building code and safety concerns.
- Electrical Upgrades

- This is required based on age and condition of the electrical infrastructure, installation of new and upgraded equipment, as well as electrical code and safety concerns.

- New Administration Building
  - This is a need identified by WWTF staff and highly recommended based on the deficiencies of the existing building.

V. What is the cost of the recommended alternative?

Table 3: Recommended Upgrades Package

Upgrade	Total Cost	Additional O&M Costs
General Site and Bldg. Rehab.	$ 3,457,000	$ -
Electrical Service and Spaces	$ 6,036,500	$ -
New Admin. Bldg.	$ 5,100,000	$ -
Fine Screen Upgrade	$ 1,005,000	$ 8,000
RWW Pumps: Upgrade Pumps	$ 1,487,000	$ 9,300
Grit Removal: Replace Aerated Grit Equipment	$ 662,000	$ 4,100
Aeration Tanks: Fine Bubble Diffusion with Bio-P	$ 2,755,000	$ (55,500)
Secondary Clarifiers: Storm Mode	$ 407,000	$ 1,900
Scum Pumping Station	$ 251,000	$ 6,300
UV Disinfection & Effluent Pumping: Upgrade Controls	$ 210,000	$ -
Solids Processing: Decanting and Contract Haul	$ 4,172,000	$ (118,200)
TOTAL	**$ 25,543,000**	**$ (144,100)**

*Capital and O&M costs are approximate and may vary after project completion.

VI. Where are we going to get the money to pay for this?

The WDNR Clean Water Fund Program (CWFP) offers low interest loans over a period of 20 years. Based on the current market interest rate for CWFP of 3.9% and economic factors, the City is eligible for a subsidized interest rate of 2.178% and 20% general principal forgiveness (PF) on the loan capped at $2,000,000. Given the nature of the phosphorus compliance upgrades, the City is also eligible to receive phosphorus PF at 50% of project costs for a maximum of $1,000,000. In total, the City is eligible to receive the maximum PF $3,000,000 of PF for the recommended upgrades.

Note that WDNR released updated affordability and funding criteria in the Intended Use Plan for funding. This plan includes an increase in several varieties of PF, including general and phosphorus related PF. However, WDNR recently announced that the data from which eligibility shall be determined will change from the historic parameters used to determine a municipality or sanitary district's PF amount and interest eligibility. Based on these recent changes, MSA Professional Services has provided the most recent data available to be used for this determination, however, this may change as new data is released and eligibility is recalculated for the City.

VII. How much am I going to be required to pay for sewer service?

The average residential sewer rates are *currently* $29/month per REU on average. Below are sewer rate calculations for the facility plan cost estimate for the recommended upgrades. A typical parameter for evaluating

sewer rates is taking the annual sewer rate as a percentage of the City's Median Household Income (MHI). Rates at or above 2% of a municipality's MHI are considered an economic burden on residents. Current sewer rates of $29/month are 0.58% of the City's MHI. Projected sewer estimates are between 1.02-1.12% of City's MHI.

Note that Principal Forgiveness is not guaranteed and is dependent on CWF's ranking and prioritization of projects. Therefore, sewer rate increase range is based upon maximum eligible principal forgiveness (low estimate) and a worst-case, unlikely scenario of $0 Principal Forgiveness (high estimate). Sewer rate calculations assume that current sewer revenues are sufficient to cover current operating costs and are presented below as the existing sewer rate in addition to the sewer rate increase required for debt and additional O&M expenses by the proposed project.

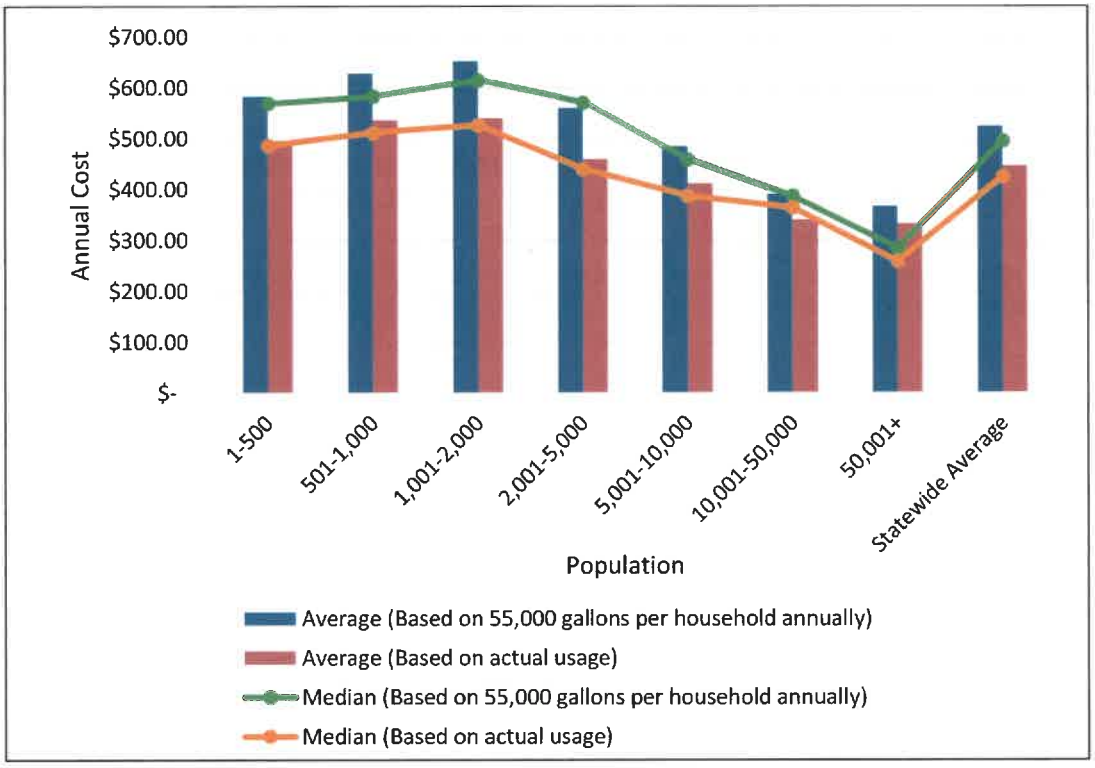
City of Mayville Sewer Rate Estimate
Wastewater Treatment Facility
Recommended Upgrades

Scenario	Max. Eligible PF	No PF
Estimated Capital Cost	$25,543,000	$25,543,000
Parallel Cost Ratio	0.98	0.80
Estimated Principal Forgiveness	$3,000,000	$0
Principal Loan Amount	$22,543,000	$25,543,000
Market Interest Rate	3.900%	3.900%
Subsidized Interest Rate	2.178%	2.50%
Loan Term	20 Years	20 Years
Additional Debt Service	$1,395,677	$1,630,130
Additional Annual O&M	($144,100)	($144,100)
Current Monthly Sewer User Rate	$29	$29
Proposed Monthly Sewer User Rate Increase (estimated)	**$22**	**$27**
Total Proposed Monthly Sewer User Rate	$51	$56
MHI Per Criteria (2017 – 2021 ACS)	$59,445	$59,445
Proposed Sewer Rate % of MHI	1.02%	1.12%

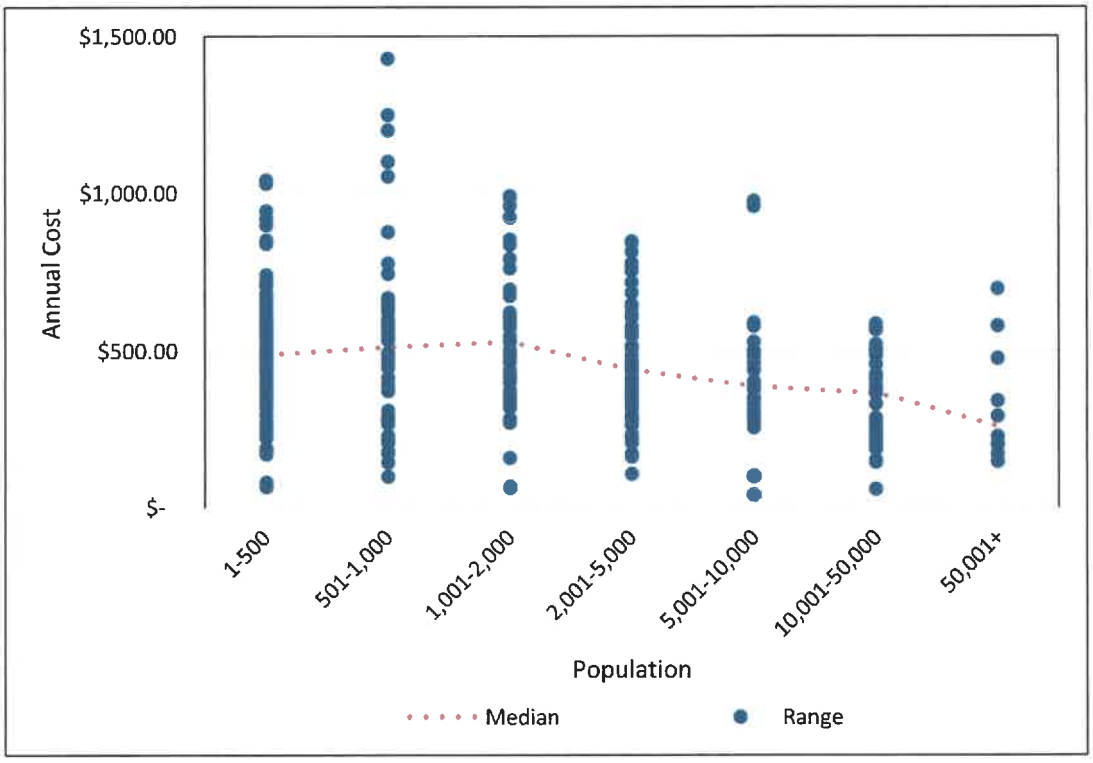
*Rates assume that existing sewer rates are sufficient to cover utility's current expenses.
**Rates are estimated using today's market and available rates. These may change in the future.
***MSA Professional Services, Inc. is not recommending a course of action with respect to any municipal financial information contained in this communication.
****Sewer rate increase range is based upon maximum eligible principal forgiveness (low) and a worst-case, unlikely scenario of $0 Principal Forgiveness.
*****Construction of additional Final Clarifiers and an updated UV System may be necessary in the future but can be postponed at this time.
******rate calculation assumes each gallon treated is equal (i.e. industrial waste = residential waste) and does not consider changes to industrial sewer rates
*******includes LeRoy-Kekoskee JSD in rate calculation

VIII. How does this compare to other communities?

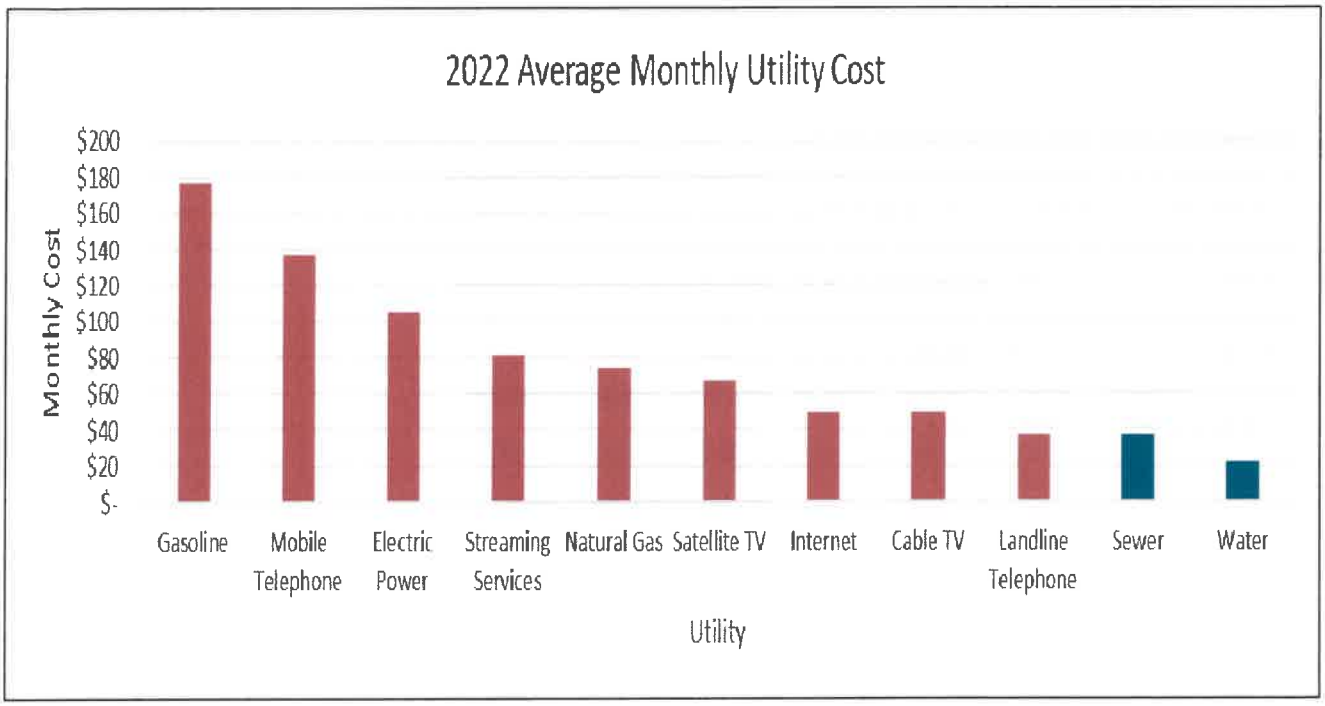
In general, residents of smaller communities or sanitary districts pay significantly more than those living in larger communities. MSA's 2022 Sewer User Charge Survey illustrates this trend.

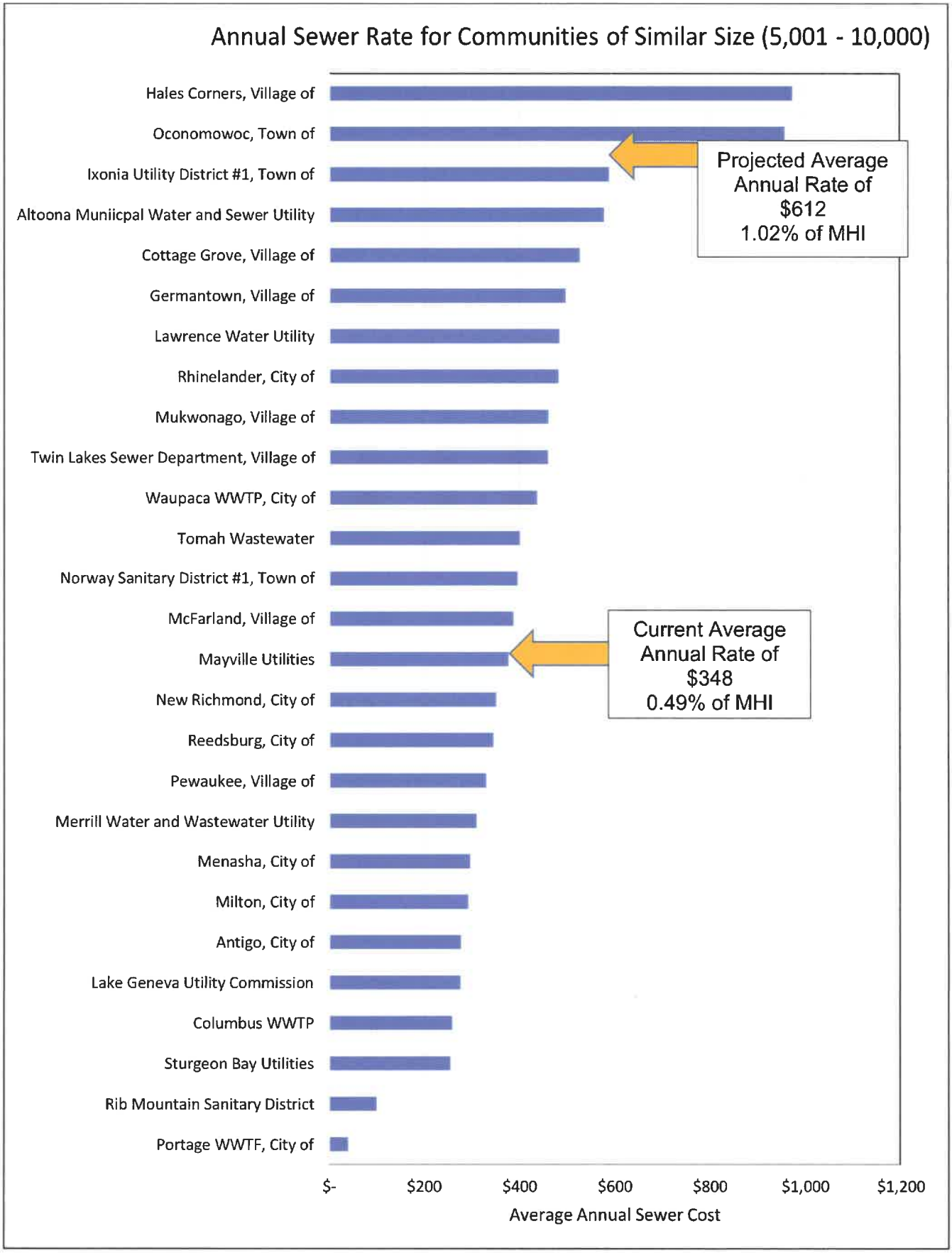


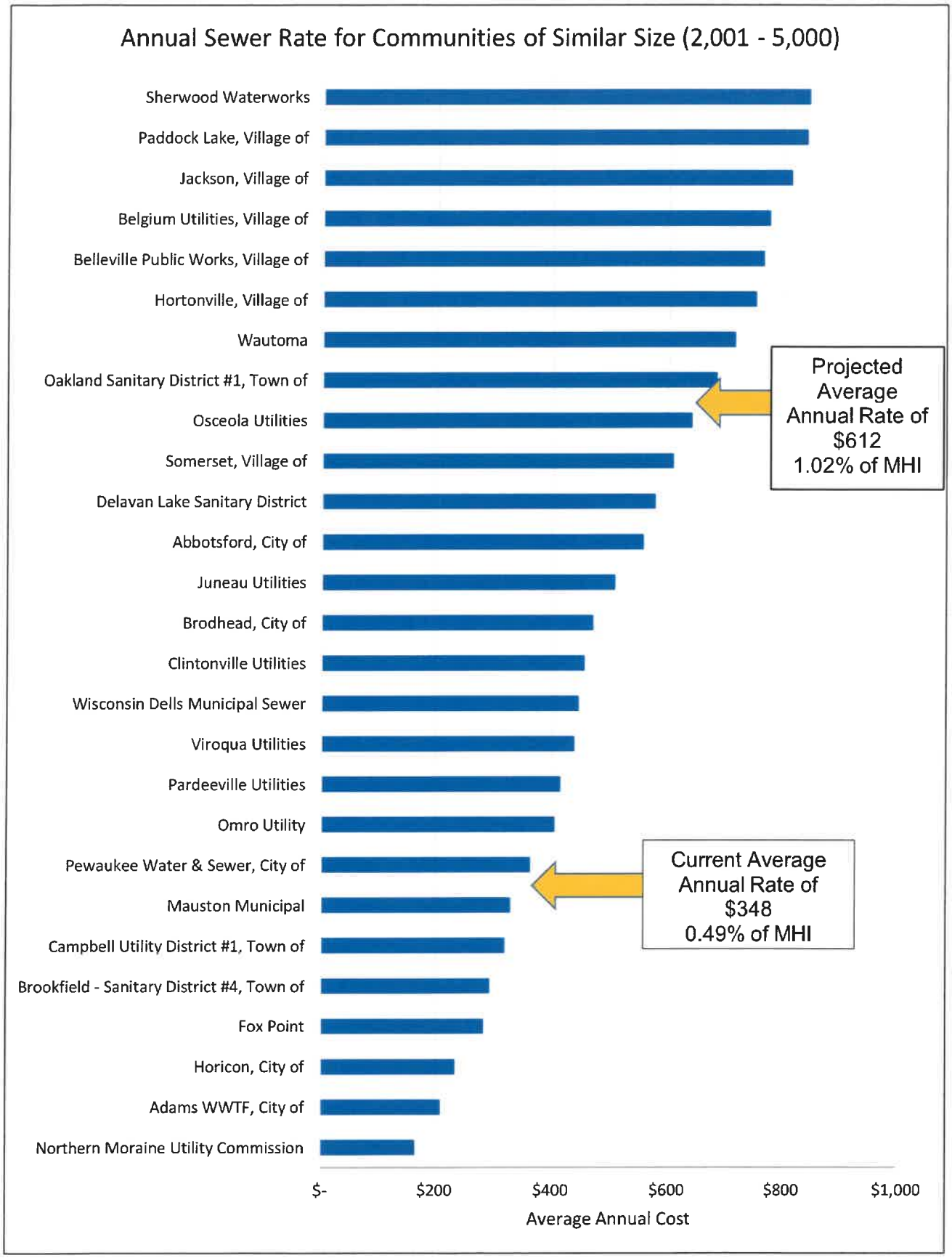
At an average annual cost of about $347 per household and an estimated population of 5,144, the City's current sewer rates are slightly below the average of $413 and median value of $388 per year for similarly sized communities. However, as with any average value, a significant spread in the data exists. Annual sewer rates of individual similarly sized communities ranged from $40 - $975. This is shown in the figure that follows, which is also taken from MSA's 2022 Wisconsin Sewer User Charge Survey.



After the final funding package is established and the new sewer rates are set, the City's projected sewer rates would be above the average of $413, likely in the range of $624/year if funding is awarded through the WDNR CWFP and the aforementioned PF is granted. It should be pointed out that municipal utility service is still a relative bargain. A comparison of sewer rates to other necessary and optional services shows that clean and safe water is still a bargain.




Annual Sewer Rate for Communities of Similar Size (5,001 - 10,000)
Hales Corners, Village of
Oconomowoc, Town of
Ixonia Utility District #1, Town of
Altoona Muniicpal Water and Sewer Utility
Cottage Grove, Village of
Germantown, Village of
Lawrence Water Utility
Rhinelander, City of
Mukwonago, Village of
Twin Lakes Sewer Department, Village of
Waupaca WWTP, City of
Tomah Wastewater
Norway Sanitary District #1, Town of
McFarland, Village of
Mayville Utilities
New Richmond, City of
Reedsburg, City of
Pewaukee, Village of
Merrill Water and Wastewater Utility
Menasha, City of
Milton, City of
Antigo, City of
Lake Geneva Utility Commission
Columbus WWTP
Sturgeon Bay Utilities
Rib Mountain Sanitary District
Portage WWTF, City of
Projected Average Annual Rate of $612 1.02% of MHI
Current Average Annual Rate of $348 0.49% of MHI
$-
$200
$400
$600
$800
$1,000
$1,200
Average Annual Sewer Cost


Annual Sewer Rate for Communities of Similar Size (2,001 - 5,000)
Sherwood Waterworks
Paddock Lake, Village of
Jackson, Village of
Belgium Utilities, Village of
Belleville Public Works, Village of
Hortonville, Village of
Wautoma
Oakland Sanitary District #1, Town of
Osceola Utilities
Somerset, Village of
Delavan Lake Sanitary District
Abbotsford, City of
Juneau Utilities
Brodhead, City of
Clintonville Utilities
Wisconsin Dells Municipal Sewer
Viroqua Utilities
Pardeeville Utilities
Omro Utility
Pewaukee Water & Sewer, City of
Mauston Municipal
Campbell Utility District #1, Town of
Brookfield - Sanitary District #4, Town of
Fox Point
Horicon, City of
Adams WWTF, City of
Northern Moraine Utility Commission
Projected Average Annual Rate of $612 1.02% of MHI
Current Average Annual Rate of $348 0.49% of MHI
$-
$200
$400
$600
$800
$1,000
Average Annual Cost

IX. What is the schedule for the proposed project?

Item	Approximate Date
Public Hearing for Facility Plan & Submit Facility Plan to DNR	June 2023
WDNR Review Comments / WDNR Approval of Plan	September 2023
Commission Review/Approval of MSA Design Contract	September 2023
Submit Plans and Specs for Upgrades to WDNR	July 2024
Submit Funding Application to DNR Clean Water Fund	September 2024
WDNR Approval of Plans and Specs & Bid Project	November 2024
Commence Construction	January 2025
Complete Construction	December 2027