

Water System Improvements & Rate Setting



Agenda:

- Water System – current status and proposed projects (OHM/Mike D.)
- Rate Model and rate structures for Council to consider (John K.)
- Water Bill perspective and value (George L.)
- Tool to manage water utilization (Mike D.)
- Water Assistance Program (George L.)

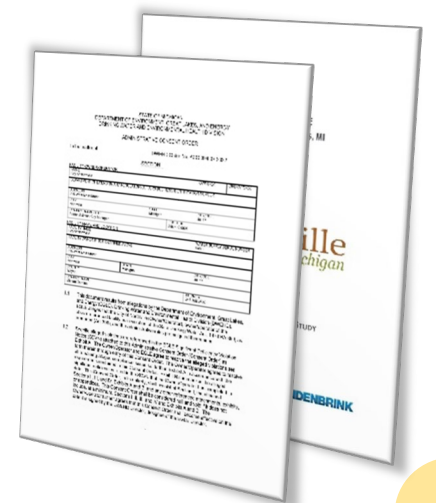


Project Needs

City of Northville

Need for the Project

- Project Needs identified in recent technical assessments
- 2021 Water Reliability Study
- Current Draft Feasibility Study as required by Administrative Consent Order from EGLE
 - Underground Storage Reservoir
 - Pressure Districts



Need for the Project

- Underground Reservoir / Pump House
 - Significant deficiencies
 - Noncompliance with current regulations
- Establish Proper Pressure Districts
 - Existing PRVs inoperable
 - Improper isolation of districts
 - Variable pressures and flows



Need for the Project

- **Water Main Replacement / Looping**
 - Water Mains 90-130 years old
 - Undersized with a history of breaks
- **Lead and galvanized service line replacement**
 - Required per the Michigan Lead and Copper Rules





Recommended Improvements

City of Northville

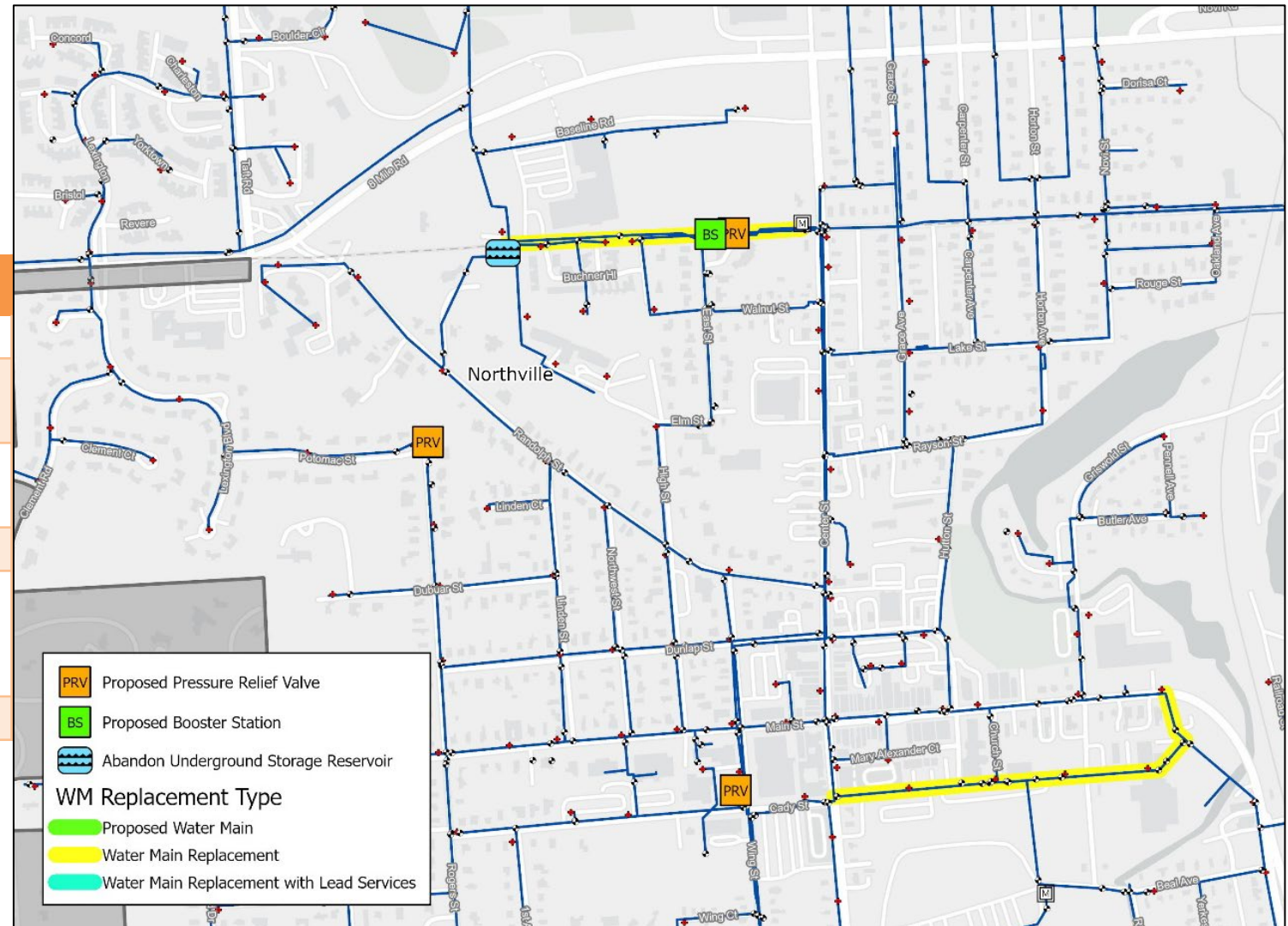
Phase 1: 2025 Distribution System Improvements

- Abandon Existing Underground Reservoir
- Install new Booster Station
- Install 3 New Pressure Reducing Valves (PRVs)
- Water Main Replacement along Baseline & Cady St



Phase 1: 2025 Distribution System Improvements

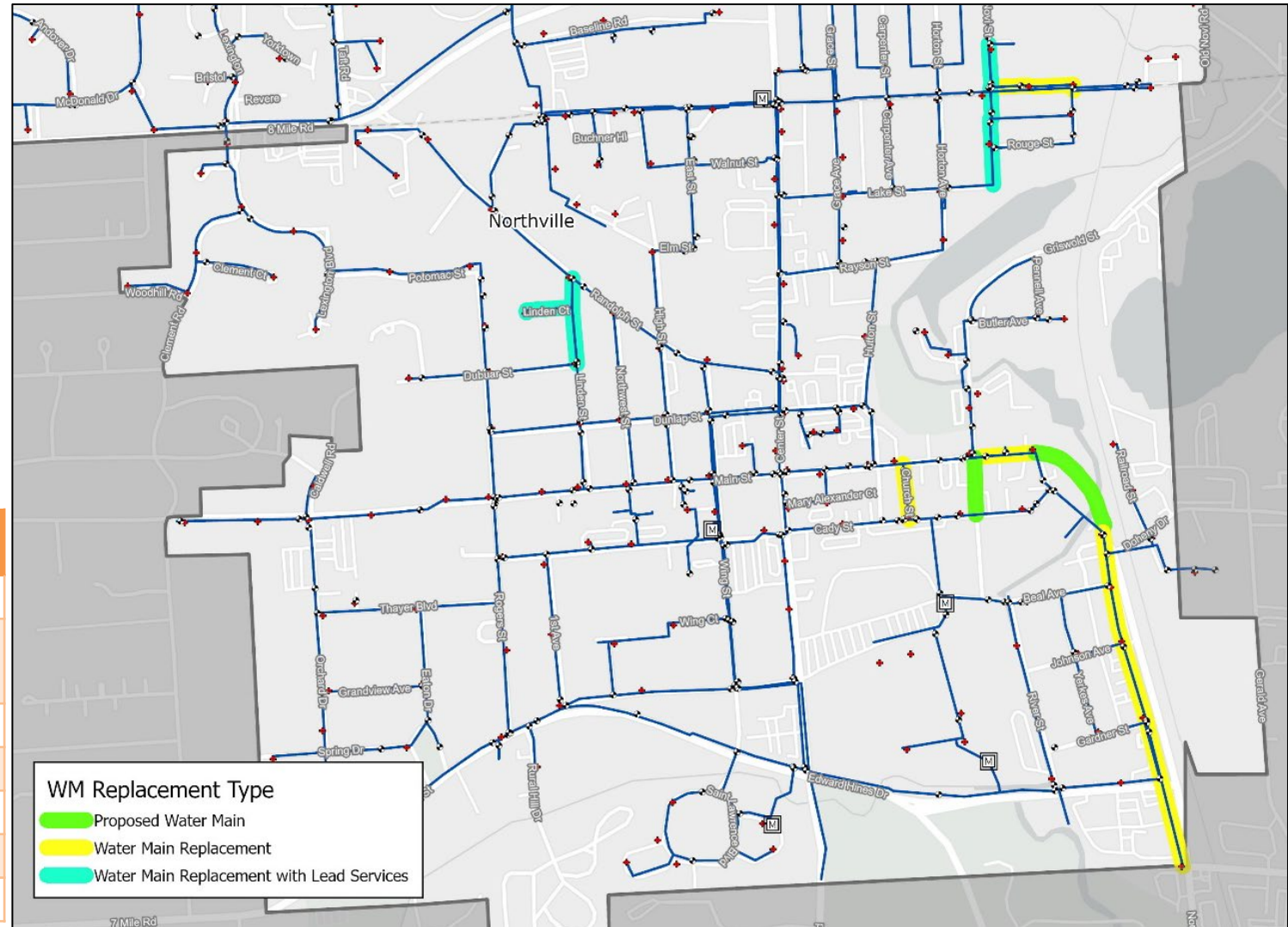
Project	Cost
Project 1 -- Cady St.	\$1,790,000
Project 2 -- Booster Station	\$3,300,000
Project 3 -- Underground Reservoir	\$350,000
Project 4 -- PRV Vaults	\$1,900,000
Project 5 -- W. Baseline Rd. to Baseline Rd. & N. Center St.	\$1,070,000
Phase 1 Subtotal	\$8,410,000



Phase 2: 2026 Water Main Replacement & Looping

- Main St
- Lower Griswold St
- Church St
- Novi St & Baseline Rd
- Linden St/Ct

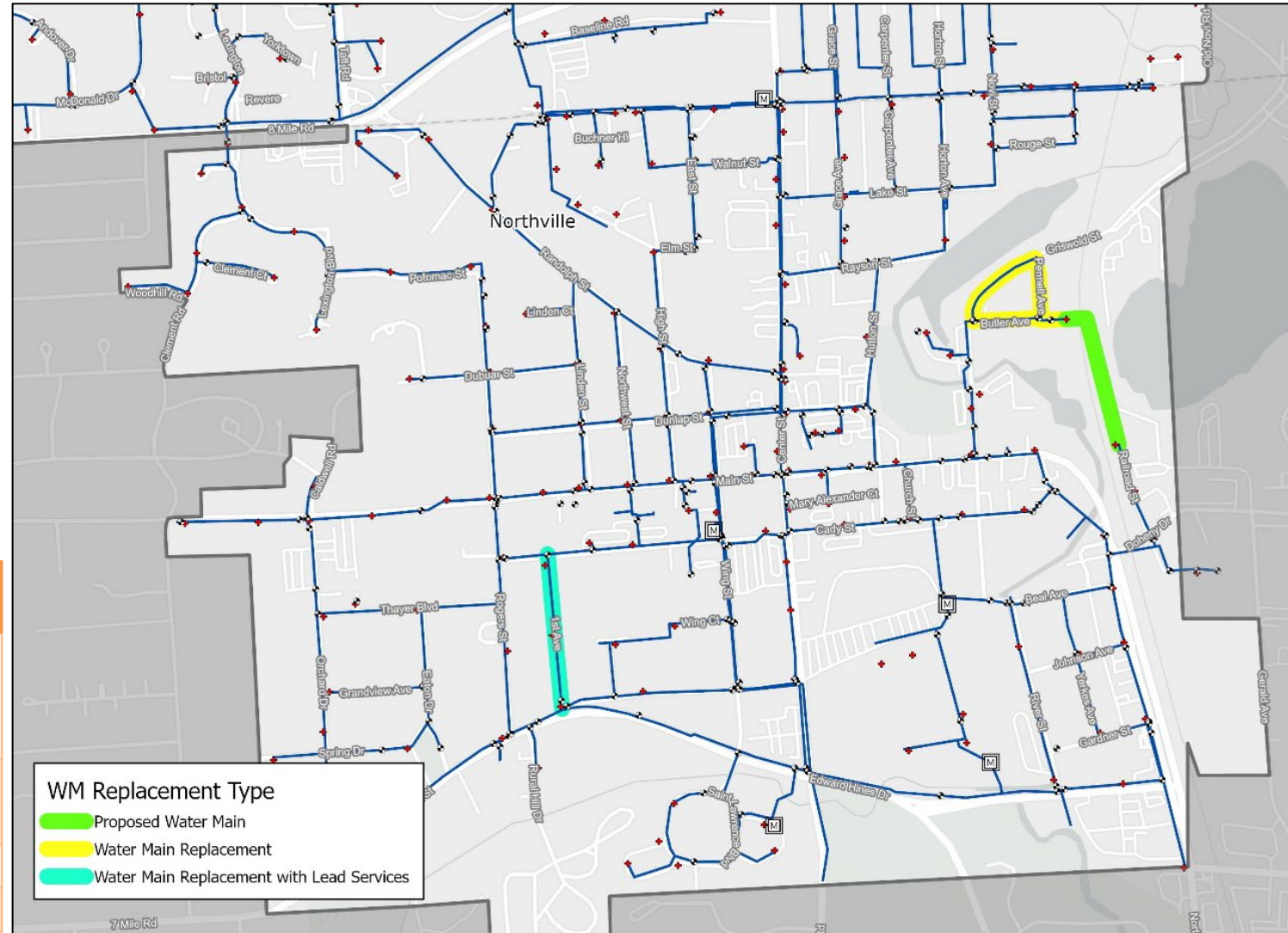
Project	Cost
Project 1 -- Main St.	\$3,000,000
Project 2 -- Lower Griswold St.	\$280,000
Project 3 -- Church St.	\$330,000
Project 4 -- Novi St.	\$1,010,000
Project 5 -- Baseline Rd.	\$570,000
Project 6 -- Linden St/Ct.	\$950,000
Phase 2 Subtotal	\$6,140,000



Phase 3: 2027 Water Main Replacement & Looping

- Upper Griswold St
- Butler Avenue
- Pennell St
- 1st Ave
- Butler to Railroad St Loop

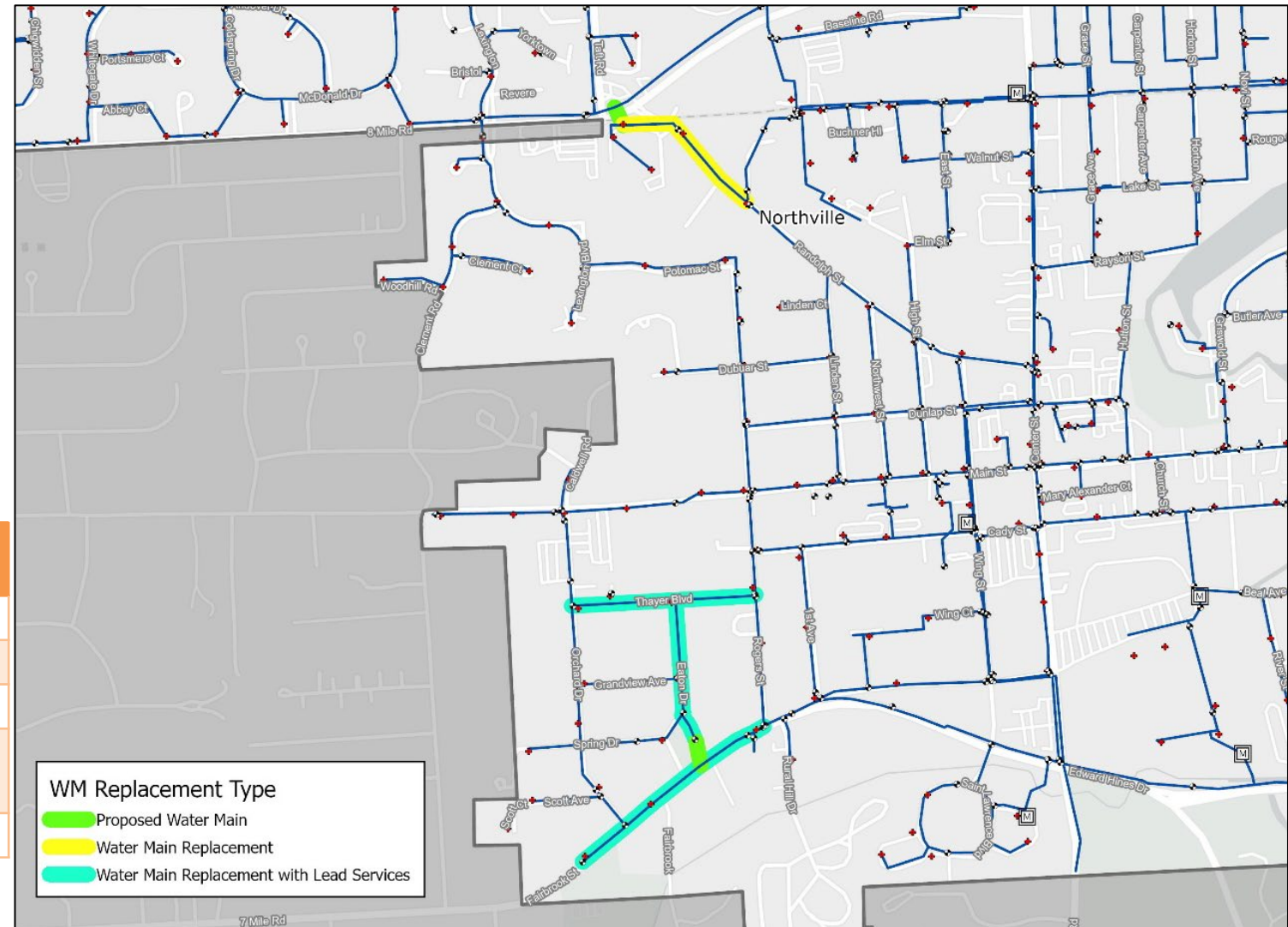
Project	Cost
Project 1 -- Upper Griswold St., Butler Ave., and Pennell St.	\$1,140,000
Project 2 -- Butler Ave. to Railroad St.	\$780,000
Project 3 -- 1st Ave.	\$780,000
Phase 3 Subtotal	\$2,700,000



Phase 4: 2028 Water Main Replacement & Looping

- Eaton Dr.
- Thayer Blvd
- Fairbrook St
- 8 Mile and Upper Randolph St

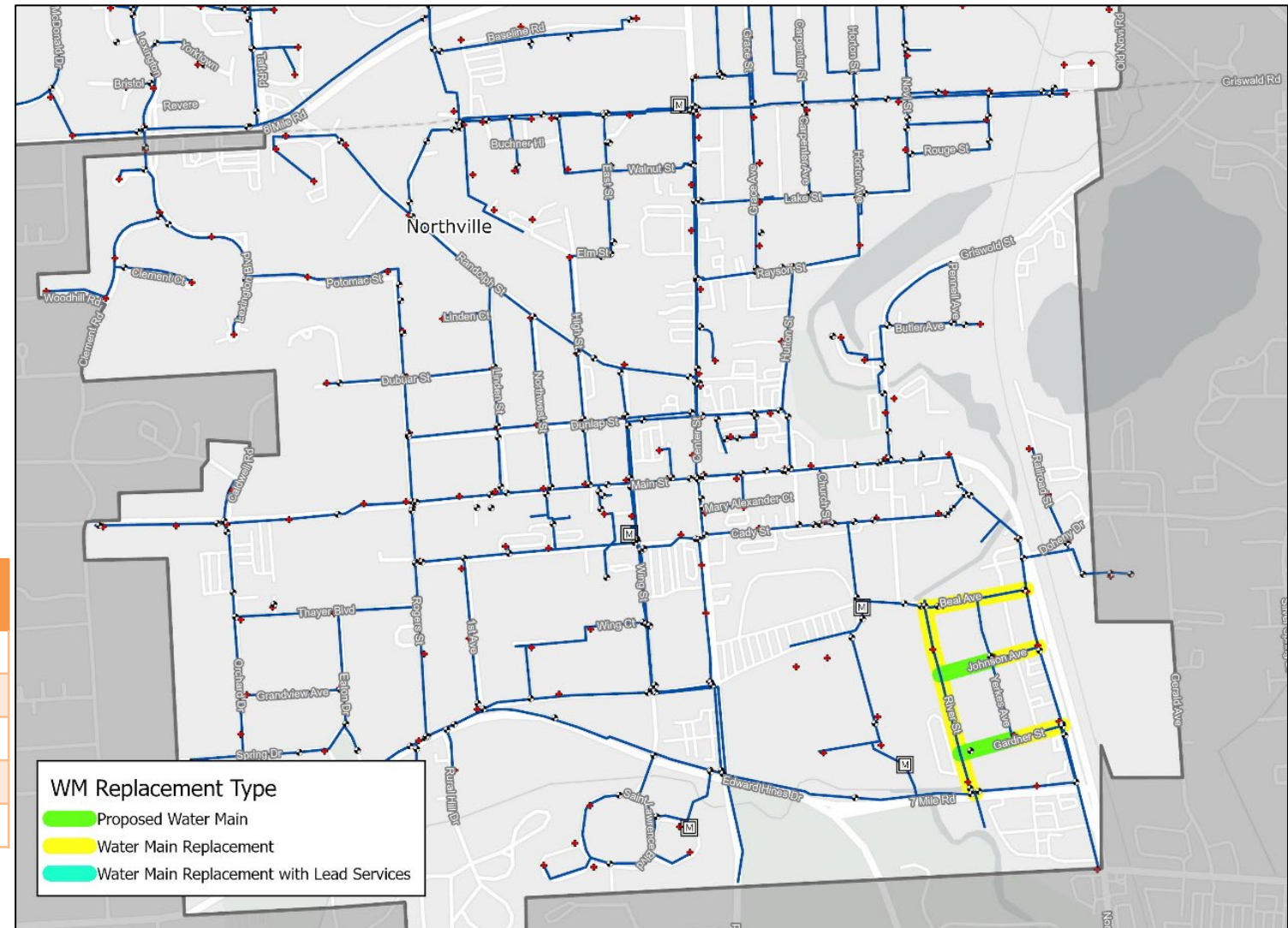
Project	Cost
Project 1 -- Eaton Dr.	\$840,000
Project 2 -- Thayer Blvd.	\$930,000
Project 3 -- Fairbrook St.	\$1,060,000
Project 4 -- 8 Mile Rd and Upper Randolph St.	\$1,150,000
Phase 4 Subtotal	\$3,980,000



Phase 5: 2029 Water Main Replacement & Looping

- Beal St
- River St
- Johnson Ave
- Gardner St

Project	Cost
Project 1 -- Beal St.	\$570,000
Project 2 -- River St.	\$1,010,000
Project 3 -- Johnson Ave.	\$530,000
Project 4 -- Gardner St.	\$500,000
Phase 5 Subtotal	\$2,610,000





Anticipated Overall Project Costs & Benefits

City of Northville

Project Costs

Projects spread over 5 phases to distribute financial burden over several years:

Category	Cost
Phase 1 Cost	\$8,410,000
Phase 2 Cost	\$6,140,000
Phase 3 Cost	\$2,700,000
Phase 4 Cost	\$3,980,000
Phase 5 Cost	\$2,610,000
Lead Service Line Replacement Cost	\$340,000
Total Project Cost	\$24,180,000

Overall Benefits

- Increased compliance with regulatory agencies
- Reduced risk to public health and water quality
- Improved system reliability
- Decreased water loss
- Reduced O&M costs /service disruptions due to water main breaks
- Reduced impacts from compounding defects and continued system neglect



City of
Northville
Michigan

Questions and Answers



Insights and applications for better financial management

City of Northville

Water and Sewer Rate Study
Summary Presentation

April 8, 2024



Project Goals & Objectives

- Prepare a financial model to forecast expenses and revenues required from rates
- Factor total costs of utilities into rate analysis
 - Operations & maintenance
 - Capital investments required to maintain systems in safe working condition
 - Existing and estimated future debt service
- Establish rates sufficient to fund full revenue and cash reserve requirements of Water and Sewer Fund
 - Explore different cost recovery options through a mix of fixed and variable charges

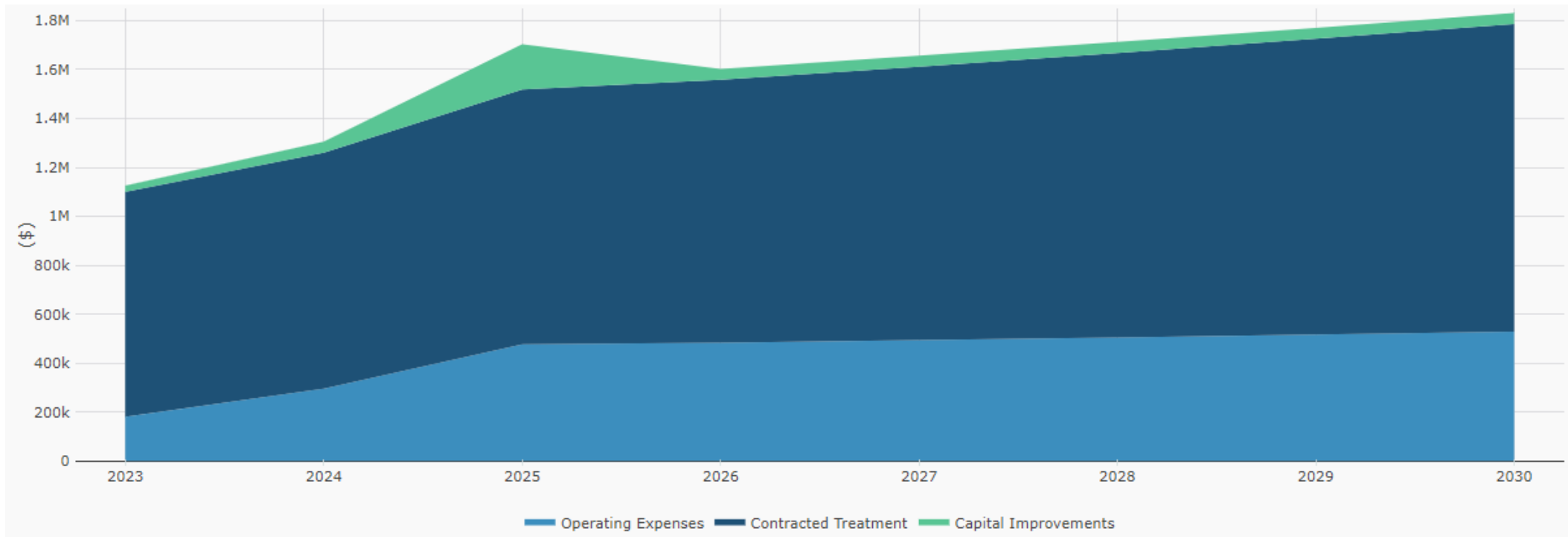
Water & Sewer Rates: What's Included?

- Utility system financial requirements
 - Operations and maintenance
 - Staffing, training, contracted services
 - Supplies, electricity, insurance, software
 - Meters, meter reading, billing
 - Water quality, regulatory compliance
 - Wholesale water and sewer costs
 - Capital
 - Mains, storage, pumping, vehicles & equipment, hydrants
 - Debt
 - Principal and interest costs to fund large capital projects

Water and Sewer Rates: Purpose & Design

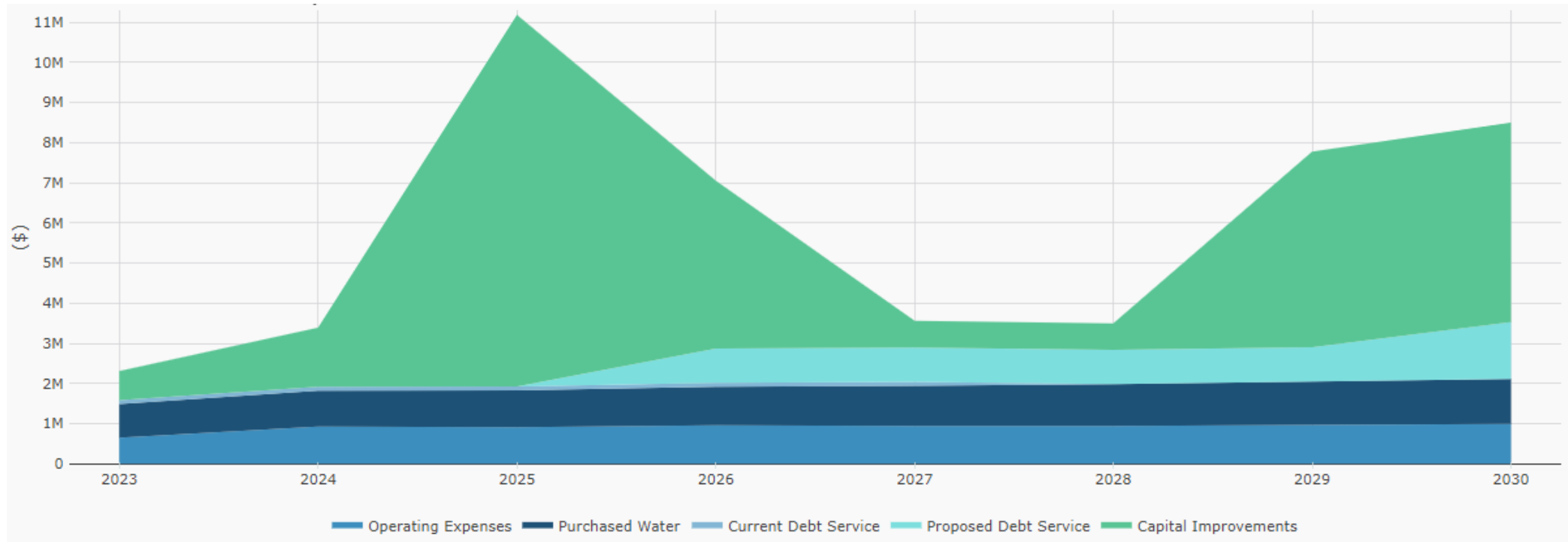
- Enterprise funds recover costs through user fees and charges
- Rates should be sufficient to recover costs
 - Usage charges: generally recover variable costs
 - Costs that change as usage varies (electricity, chemicals, portion of wholesale water, some staffing, etc.)
 - Rates based on metered usage (1,000 gallons = 1 unit)
 - Capacity/availability charges: generally recover fixed costs
 - Costs that must be paid regardless usage (debt, some capital, labor, insurance, etc.)
 - Rates based on demand capacity of each customer
 - Sewer costs: nearly 100% fixed
 - Water costs: at least 60% fixed

Summary Sewer Expenses



- Minimal capital investment anticipated
- No existing City debt
- O&M increase due to planned sewer lining projects
- Contracted sewer disposal costs estimated to increase 4% per year

Summary Water Expenses



- Significant capital investment anticipated over next 10 years
- Minimal existing debt on City water system; future debt service will be impactful
- O&M expenses show modest increases
- Wholesale water costs estimated to increase 4% per year

Rate Analysis

- Current water rates
 - Flat bimonthly service charge and meter replacement charge (same for all customers)
 - Usage charge based on actual metered water volumes
- Current sewer rates
 - Based entirely on metered water usage
- This rate design does not align with industry standards, best practices, or optimal cost recovery
 - Nearly 100% of sewer costs are fixed, yet rate is 100% variable
 - Over 60% of water costs are fixed; only 7% of revenue is fixed
 - Rates do not recognize proportionate costs of serving larger customers

Rate Development

- Forecasted O&M costs
- Layered in capital improvement plans and debt service
 - Over \$26M in water capital between current FY and FY 29-30
 - \$14.5M bond next FY; \$8.0M bond FY 28-29
- Established cash reserve targets
- Tested rates required to fund all costs and meet reserve targets
 - Reserve targets: 17% O&M, 100% debt service, 5% rate stabilization, \$750,000 water capital, \$500,000 sewer capital
- Explored alternative capital investment strategies
- Smoothed rates over 6-year forecast period
- Tested various levels of fixed charges to increase revenue stability

Final Rate Strategy

- Eliminate flat water service and meter replacement charges
- Eliminate dual meter sewer charge (50% rate for irrigation meters)
- Maintain commodity charge based on metered usage
- Implement a readiness-to-serve (RTS) charge, based on meter size
 - Intended to recover a portion of fixed costs
 - Based on the demand capacity of each customer, which is determined by meter size
 - Applied AWWA standard meter ratios based on capacity
 - Separate RTS charges for water and sewer
 - Minimum bill would be RTS charge, regardless of usage

Rate Options

- Maintain a minimum fixed charge to recover 6%-8.5% of costs
- Gradually increase the fixed charge to 25% of cost recovery over 5 years
- Recover 15% of costs from a fixed charge in year 1 and maintain this level
- Recover 25% of costs from a fixed charge in year 1 and maintain this level

MINIMAL FIXED CHARGE												
	FY 23-24		FY 24-25		FY 25-26		FY 26-27		FY 27-28		FY 28-29	
	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer
Usage	\$11.85	\$8.85	\$13.05	\$9.20	\$14.35	\$9.35	\$15.60	\$9.50	\$17.05	\$9.75	\$18.75	\$10.10
Dual Meter		\$4.78										
Fixed												
5/8"	\$11.51	\$0.00	\$12.65	\$6.00	\$13.95	\$7.00	\$15.70	\$8.00	\$17.50	\$9.00	\$19.50	\$10.00
3/4"	\$11.51	\$0.00	\$12.65	\$6.00	\$13.95	\$7.00	\$15.70	\$8.00	\$17.50	\$9.00	\$19.50	\$10.00
1"	\$11.51	\$0.00	\$12.65	\$6.00	\$13.95	\$7.00	\$15.70	\$8.00	\$17.50	\$9.00	\$19.50	\$10.00
1.5"	\$11.51	\$0.00	\$25.30	\$12.00	\$27.90	\$14.00	\$31.40	\$16.00	\$35.00	\$18.00	\$39.00	\$20.00
2"	\$11.51	\$0.00	\$40.48	\$19.20	\$44.64	\$22.40	\$50.24	\$25.60	\$56.00	\$28.80	\$62.40	\$32.00
3"	\$11.51	\$0.00	\$75.90	\$36.00	\$83.70	\$42.00	\$94.20	\$48.00	\$105.00	\$54.00	\$117.00	\$60.00
4"	\$11.51	\$0.00	\$126.50	\$60.00	\$139.50	\$70.00	\$157.00	\$80.00	\$175.00	\$90.00	\$195.00	\$100.00
6"	\$11.51	\$0.00	\$253.00	\$120.00	\$279.00	\$140.00	\$314.00	\$160.00	\$350.00	\$180.00	\$390.00	\$200.00

FIXED CHARGE RECOVERS 15% OF COSTS												
	FY 23-24		FY 24-25		FY 25-26		FY 26-27		FY 27-28		FY 28-29	
	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer
Usage	\$11.85	\$8.85	\$12.15	\$8.30	\$13.36	\$8.47	\$14.69	\$8.65	\$16.16	\$9.00	\$17.76	\$9.35
Dual Meter		\$4.78										
Fixed												
5/8"	\$11.51	\$0.00	\$22.50	\$15.25	\$24.85	\$15.50	\$27.25	\$15.75	\$30.00	\$16.50	\$32.85	\$17.25
3/4"	\$11.51	\$0.00	\$22.50	\$15.25	\$24.85	\$15.50	\$27.25	\$15.75	\$30.00	\$16.50	\$32.85	\$17.25
1"	\$11.51	\$0.00	\$22.50	\$15.25	\$24.85	\$15.50	\$27.25	\$15.75	\$30.00	\$16.50	\$32.85	\$17.25
1.5"	\$11.51	\$0.00	\$45.00	\$30.50	\$49.70	\$31.00	\$54.50	\$31.50	\$60.00	\$33.00	\$65.70	\$34.50
2"	\$11.51	\$0.00	\$72.00	\$48.80	\$79.52	\$49.60	\$87.20	\$50.40	\$96.00	\$52.80	\$105.12	\$55.20
3"	\$11.51	\$0.00	\$135.00	\$91.50	\$149.10	\$93.00	\$163.50	\$94.50	\$180.00	\$99.00	\$197.10	\$103.50
4"	\$11.51	\$0.00	\$225.00	\$152.50	\$248.50	\$155.00	\$272.50	\$157.50	\$300.00	\$165.00	\$328.50	\$172.50
6"	\$11.51	\$0.00	\$450.00	\$305.00	\$497.00	\$310.00	\$545.00	\$315.00	\$600.00	\$330.00	\$657.00	\$345.00

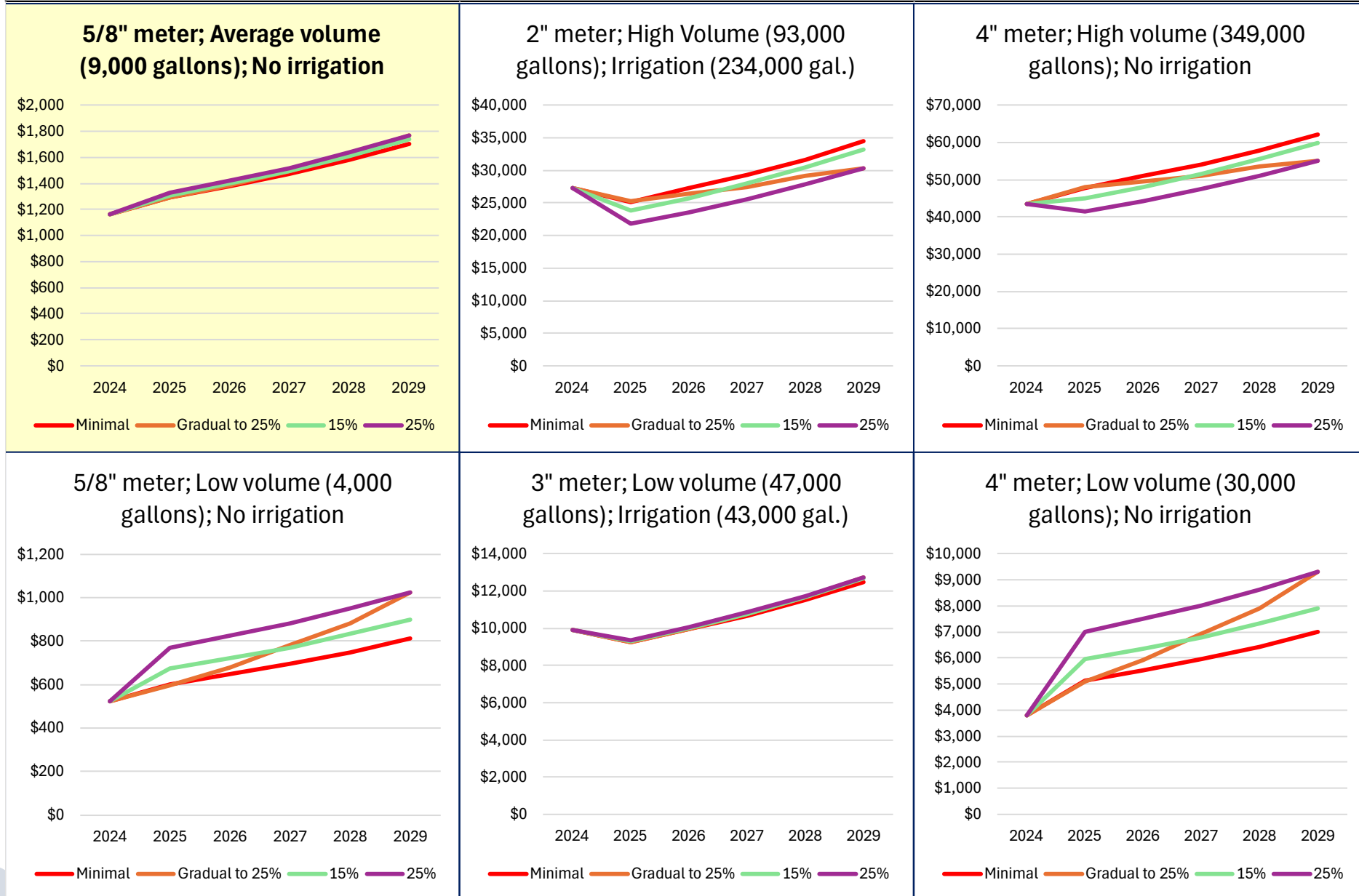
GRADUAL INCREASE OF FIXED CHARGE TO 25% COST RECOVERY												
	FY 23-24		FY 24-25		FY 25-26		FY 26-27		FY 27-28		FY 28-29	
	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer
Usage	\$11.85	\$8.85	\$13.14	\$9.28	\$13.67	\$9.17	\$14.18	\$8.84	\$15.21	\$8.67	\$15.66	\$8.24
Dual Meter		\$4.78										
Fixed												
5/8"	\$11.51	\$0.00	\$12.15	\$5.15	\$21.40	\$8.25	\$32.65	\$13.65	\$39.85	\$19.65	\$54.80	\$28.50
3/4"	\$11.51	\$0.00	\$12.15	\$5.15	\$21.40	\$8.25	\$32.65	\$13.65	\$39.85	\$19.65	\$54.80	\$28.50
1"	\$11.51	\$0.00	\$12.15	\$5.15	\$21.40	\$8.25	\$32.65	\$13.65	\$39.85	\$19.65	\$54.80	\$28.50
1.5"	\$11.51	\$0.00	\$24.30	\$10.30	\$42.80	\$16.50	\$65.30	\$27.30	\$79.70	\$39.30	\$109.60	\$57.00
2"	\$11.51	\$0.00	\$38.88	\$16.48	\$68.48	\$26.40	\$104.48	\$43.68	\$127.52	\$62.88	\$175.36	\$91.20
3"	\$11.51	\$0.00	\$72.90	\$30.90	\$128.40	\$49.50	\$195.90	\$81.90	\$239.10	\$117.90	\$328.80	\$171.00
4"	\$11.51	\$0.00	\$121.50	\$51.50	\$214.00	\$82.50	\$326.50	\$136.50	\$398.50	\$196.50	\$548.00	\$285.00
6"	\$11.51	\$0.00	\$243.00	\$103.00	\$428.00	\$165.00	\$653.00	\$273.00	\$797.00	\$393.00	\$1,096.00	\$570.00

FIXED CHARGE RECOVERS 25% OF COSTS												
	FY 23-24		FY 24-25		FY 25-26		FY 26-27		FY 27-28		FY 28-29	
	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water	Sewer
Usage	\$11.85	\$8.85	\$10.71	\$7.32	\$11.77	\$7.47	\$12.95	\$7.62	\$14.24	\$7.93	\$15.66	\$8.24
Dual Meter		\$4.78										
Fixed												
5/8"	\$11.51	\$0.00	\$37.35	\$25.25	\$41.00	\$25.85	\$45.20	\$26.25	\$49.75	\$27.40	\$54.80	\$28.50
3/4"	\$11.51	\$0.00	\$37.35	\$25.25	\$41.00	\$25.85	\$45.20	\$26.25	\$49.75	\$27.40	\$54.80	\$28.50
1"	\$11.51	\$0.00	\$37.35	\$25.25	\$41.00	\$25.85	\$45.20	\$26.25	\$49.75	\$27.40	\$54.80	\$28.50
1.5"	\$11.51	\$0.00	\$74.70	\$50.50	\$82.00	\$51.70	\$90.40	\$52.50	\$99.50	\$54.80	\$109.60	\$57.00
2"	\$11.51	\$0.00	\$119.52	\$80.80	\$131.20	\$82.72	\$144.64	\$84.00	\$159.20	\$87.68	\$175.36	\$91.20
3"	\$11.51	\$0.00	\$224.10	\$151.50	\$246.00	\$155.10	\$271.20	\$157.50	\$298.50	\$164.40	\$328.80	\$171.00
4"	\$11.51	\$0.00	\$373.50	\$252.50	\$410.00	\$258.50	\$452.00	\$262.50	\$497.50	\$274.00	\$548.00	\$285.00
6"	\$11.51	\$0.00	\$747.00	\$505.00	\$820.00	\$517.00	\$904.00	\$525.00	\$995.00	\$548.00	\$1,096.00	\$570.00

Customer Impacts

- Each customer's bill will be impacted differently, based on meter size, usage, irrigation
- Initial year of implementation will be most volatile
 - Subsequent years all customers will see about the same impact
- Additional grant funding may reduce revenue required from rates
- As new customers are added, costs will be spread over more bills, which will lessen burden on existing customers
- Some customers may choose to reduce consumption as rates increase
 - Heavy reliance on usage charges compromises revenue stability as usage patterns change

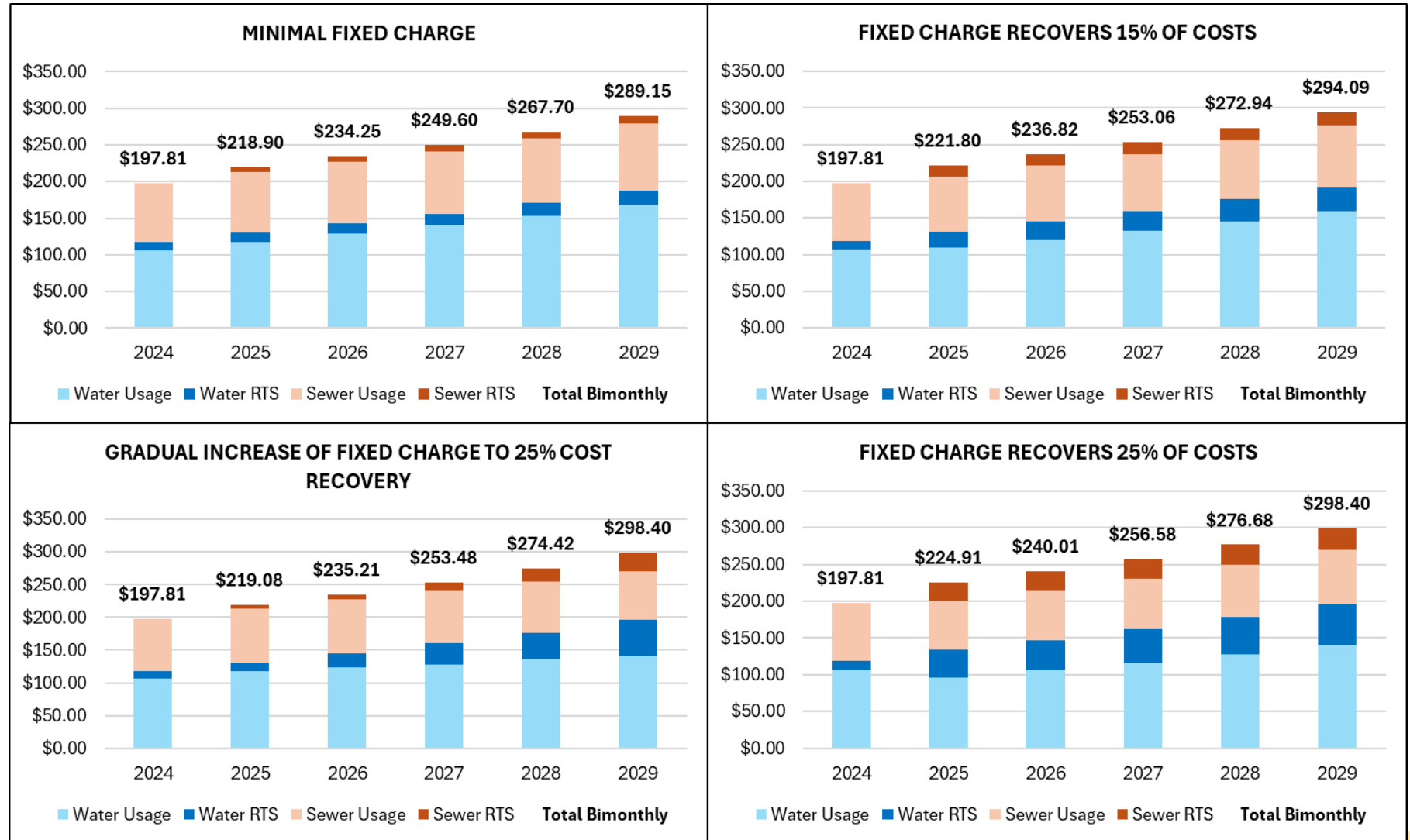
Annual Water and Sewer Costs for Different Customer Profiles With Varying Fixed Charge Cost Recovery Options



- Initial year has largest impact on all customers
- Lower total costs for irrigation customers
- Higher costs for low volume users
- Largest impact on customers with larger meter & low volumes

Water and Sewer Rates Forecast

Bimonthly water and sewer bill for a typical residential customer with a 5/8" – 1" meter and 9,000 gallons of metered water every two months.



Current and Proposed Bi-monthly Rates

The average household using nine units of water currently is billed \$198 bi-monthly. Below are the changes under the four scenarios.

- Minimal Fixed Charge – \$219 bi-monthly; \$21 or 10.7% increase
- Gradual Increase to 25% cost recovery - \$220 bi-monthly; \$22 or 10.75% increase
- Fixed Charge to Recover 15% of Costs – \$222 bi-monthly; \$24 or 12.1% increase
- Fixed Charge to Recover 25% of Costs - \$225 bi-monthly; \$27 or 13.7% increase

Current and Proposed Bi-monthly Rates

- FY 24-25 reflects 25% recovery of costs through fixed charge
- Usage rates decrease for both water and sewer
- Sewer Dual Meter charge eliminated
- Fixed charge changed from uniform for all customers to a meter-based RTS charge
 - 5/8" – 1" same rate class

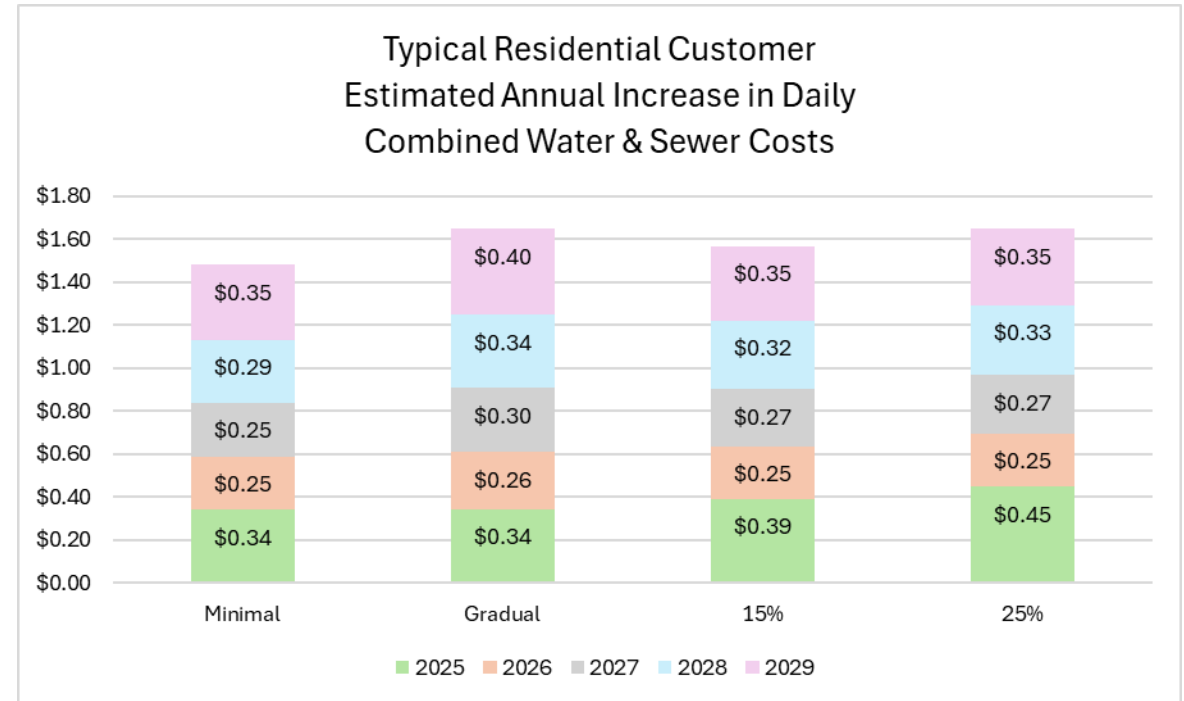
	FY 23-24		FY 24-25	
	Water	Sewer	Water	Sewer
Usage*	\$11.85	\$8.85	\$10.71	\$7.32
Dual Meter		\$4.78		
Fixed**				
5/8"	\$11.51	\$0.00	\$37.35	\$25.25
3/4"	\$11.51	\$0.00	\$37.35	\$25.25
1"	\$11.51	\$0.00	\$37.35	\$25.25
1.5"	\$11.51	\$0.00	\$74.70	\$50.50
2"	\$11.51	\$0.00	\$119.52	\$80.80
3"	\$11.51	\$0.00	\$224.10	\$151.50
4"	\$11.51	\$0.00	\$373.50	\$252.50
6"	\$11.51	\$0.00	\$747.00	\$505.00

*Rate per 1,000 gallons of metered water

** Bimonthly fixed charges (service charge, meter replacement)

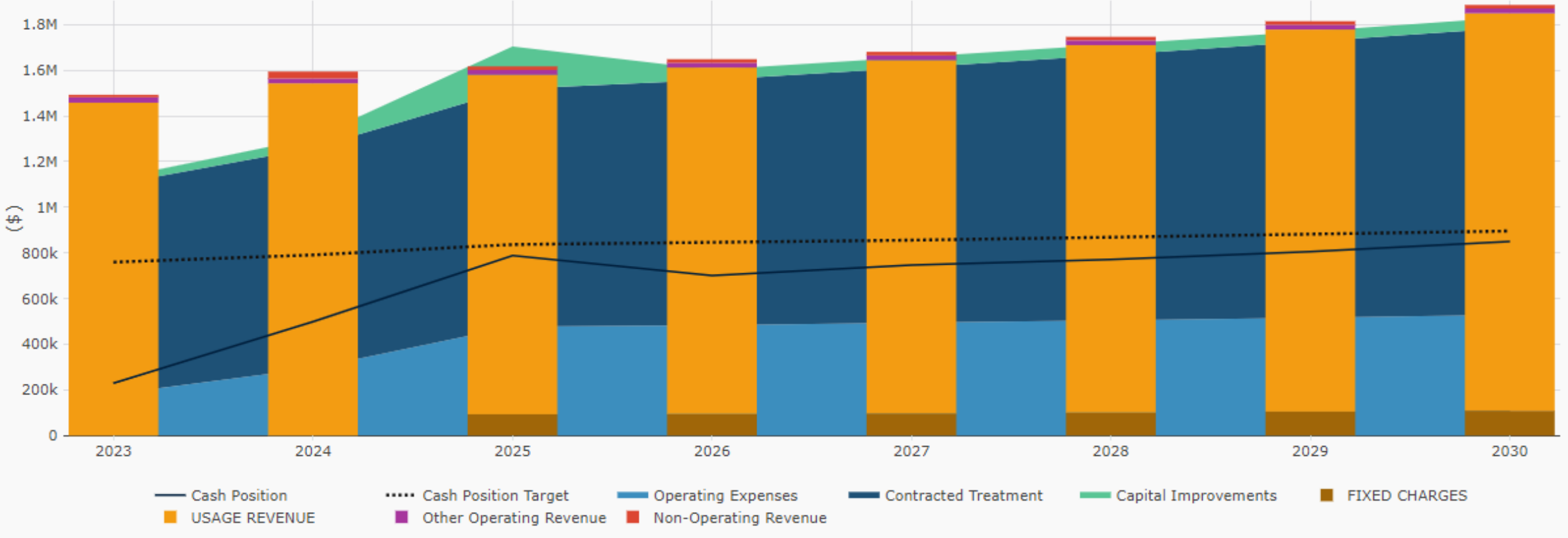
Future Rate Requirements

- The daily cost of water and sewer could increase between 25 cents and 45 cents, over the next 5 years.
- Other customer profiles would be impacted differently, depending on meter size, usage and irrigation meter status.



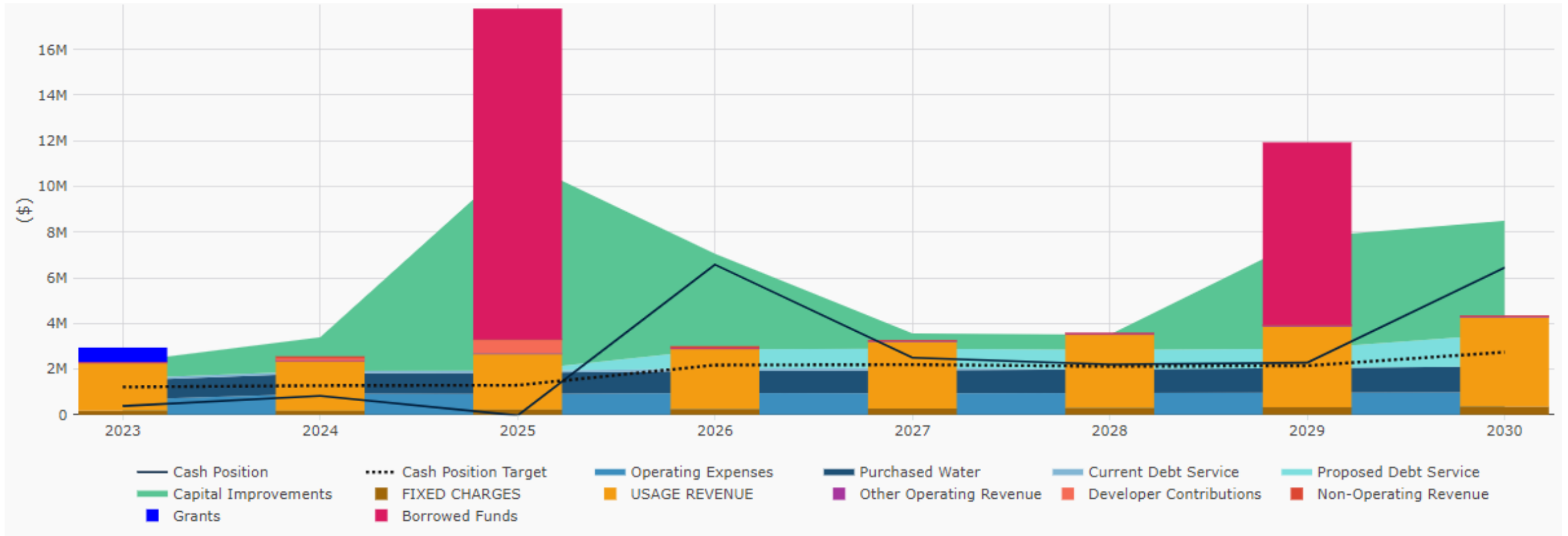
- Steady rate increases will be required to fund operations, capital and debt service
- Inflation, regulations, emergencies, changes in water usage, etc., can impact future rate requirements

Sewer Summary Dashboard



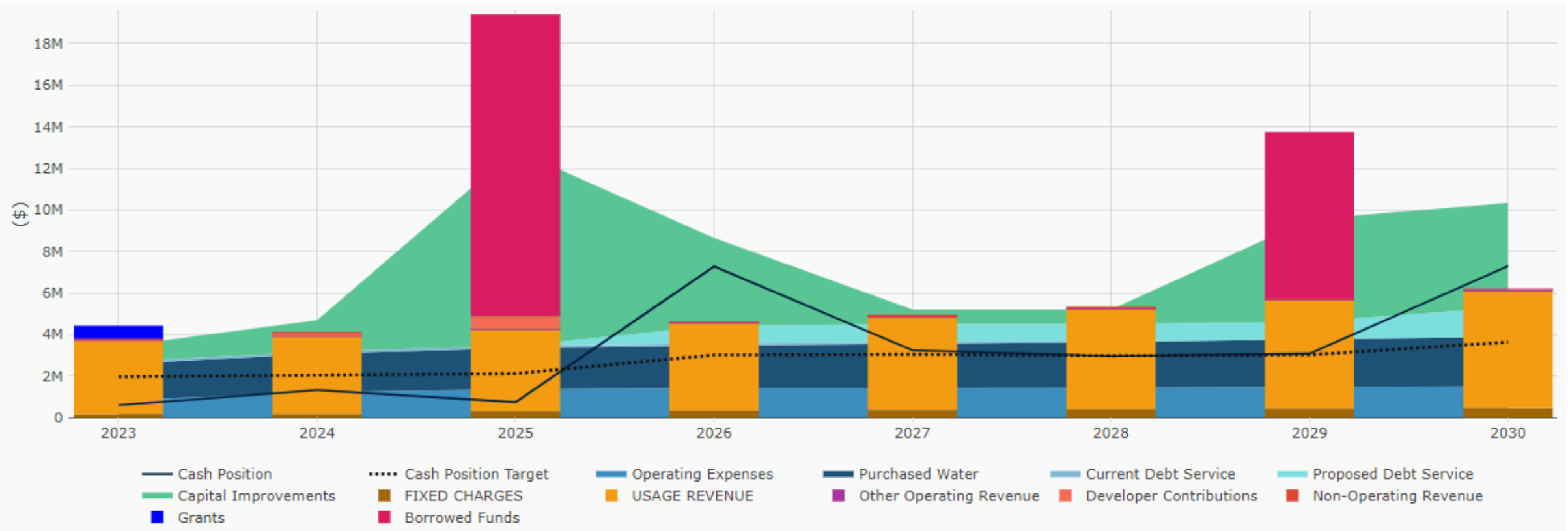
- Estimated revenues, expenditures, reserve targets, cash balance
 - Only minimal capital expenditures included at this time
- Slowly build cash to target level

Water Summary Dashboard



- Estimated revenues, expenditures, reserve targets, cash balance
 - Includes debt-funded capital and proceeds from borrowing
- Cash reserves will be maintained close to target level

Combined Water and Sewer Dashboard



- Water capital and borrowing dominate the combined finances
- Future cash balances are consistent with the reserve targets

Next Steps & Moving Forward

- Municipal Analytics will train staff on use of rate model
- Rate recommendations will be presented as part of the budget process
- Regularly update rate model to monitor & maintain utility finances and rate requirements
 - Customer billing data
 - Budget, capital plan, debt schedules
- Annually update rates based on long-range financial plans
 - Smooths rates year-to-year
 - Best chance of keeping rates as low as possible

Discussion and Questions



Insights and applications for better financial management

Water & Sewer Bill Perspective and Value

Monthly Bill (Avg, US - 2024)	Average Amount per Month
Cable & Internet	\$142
Electric	\$137
Cell Phone	\$114
Water & Sewer (residential – 9 units, bi-monthly)	\$112 (per month cost for comparison)
Gas	\$78

Volume of Water – Avg Household

- Avg Household Uses Nine Units (9,000 gallons) of Water Every two months or 4,500 gallons every month.
- A 20' Round, four foot depth, above ground swimming pool holds approximately 9,000 gallons of water.
- That water is delivered to your house and taken away after use, treated and recycled back into the environment.
- The average cost for each gallon delivered, and taken away for treatment is approximately 2.5 cents per gallon.

Water Management Portal

- The City utilizes advanced water meters that with technology permits continuous monitoring of water usage by residents.
- Management Portal will enhance residents service by providing a convenient, proactive way to monitor their own water consumption 24/7. Residents no longer must wait for a bill to detect possible issues.



Monthly Consumption Analysis

CITY OF NORTHVILLE*

Account Status | Active

Account Number

DOHE-000650-0000-01

Address

650 DOHENY DR ⓘ

Latest Reading ↻

00856034

04/04/2024 9:32:32 PM

Current Meter Information

MIU ID [More MIUs >>](#)

1564529024

Meter Number [More Meters >>](#)

1564529024

Meter Size

1 1/2"

MIU Status

Active

Meter Type

0002

Unit of Measure

Gallons

From: 4/1/2023 ⓘ

To: 4/5/2024 ⓘ

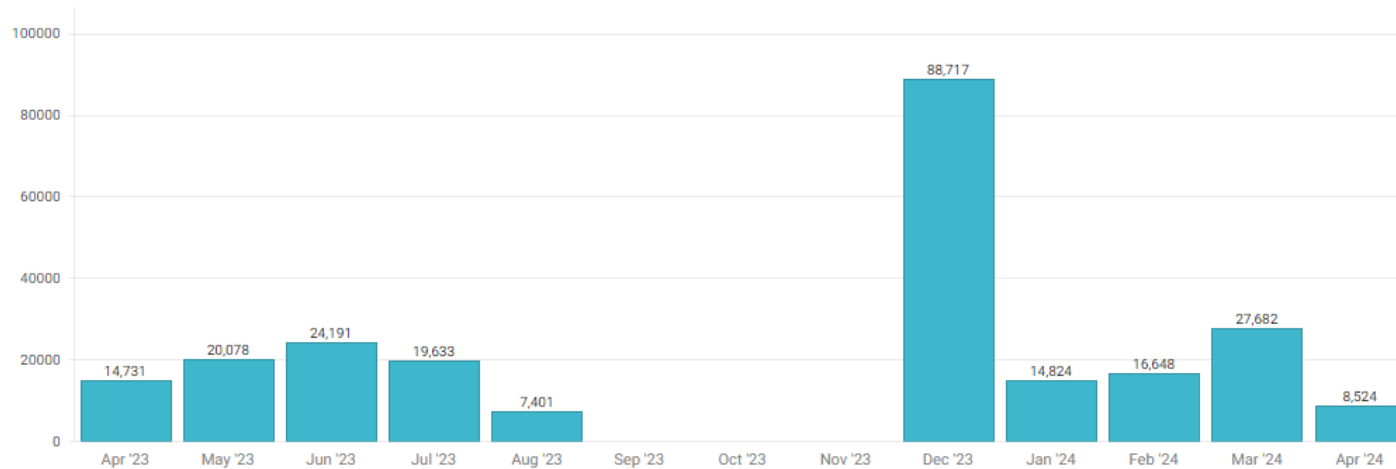
Actual

Estimated

Readings



Monthly Consumption Analysis



Daily Consumption Analysis

CITY OF NORTHVILLE*

Account Status | Active

Account Number

DOHE-000650-0000-01

Address

650 DOHENY DR

Latest Reading

00856034

04/04/2024 9:32:32 PM

Current Meter Information

MIU ID [More MIUs >>](#)

1564529024

Meter Number [More Meters >>](#)

1564529024

Meter Size

1 1/2"

MIU Status

Active

Meter Type

0002

Unit of Measure

Gallons

From: 4/1/2023

To: 4/5/2024

Actual

Estimated

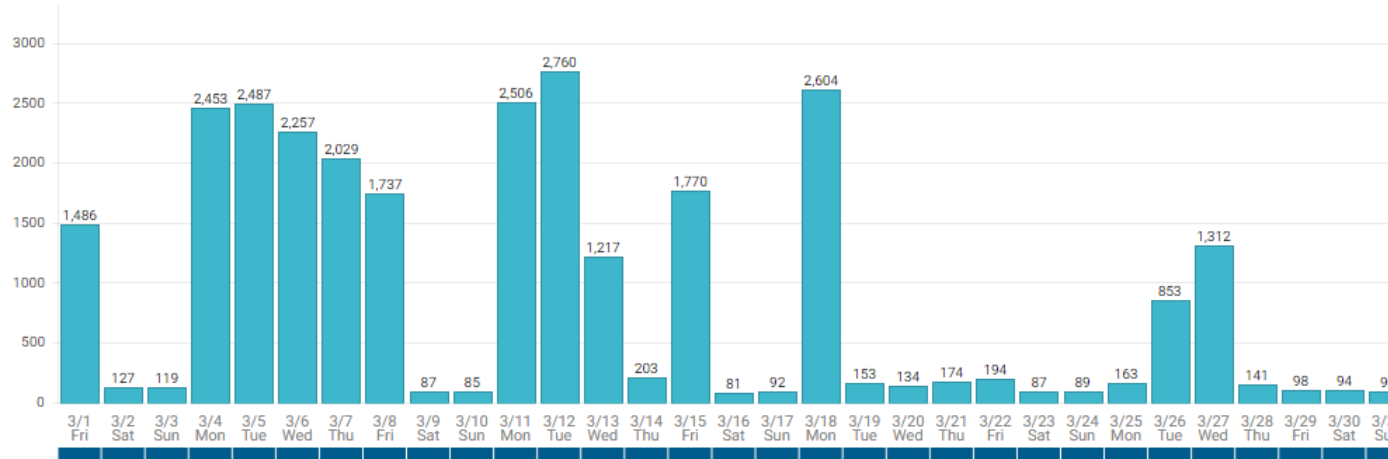
Readings



Monthly

Daily Consumption Analysis

■ Register Change Out
 ■ Major Reverse
 ■ Minor Reverse
 ■ Continuous Consumption
 ■ Intermittent Consumption
 ■ No Flow



Hourly Consumption Analysis

CITY OF NORTHVILLE* Account Status | Active

Account Number
DOHE-000650-0000-01

Address
650 DOHENY DR ⓘ

Latest Reading ↻
00856034
04/04/2024 9:32:32 PM

Current Meter Information

MIU ID [More MIUs >>](#)
1564529024

Meter Number [More Meters >>](#)
1564529024

Meter Size
1 1/2"

MIU Status
Active

Meter Type
0002

Unit of Measure
Gallons



From: 4/1/2023 To: 4/5/2024

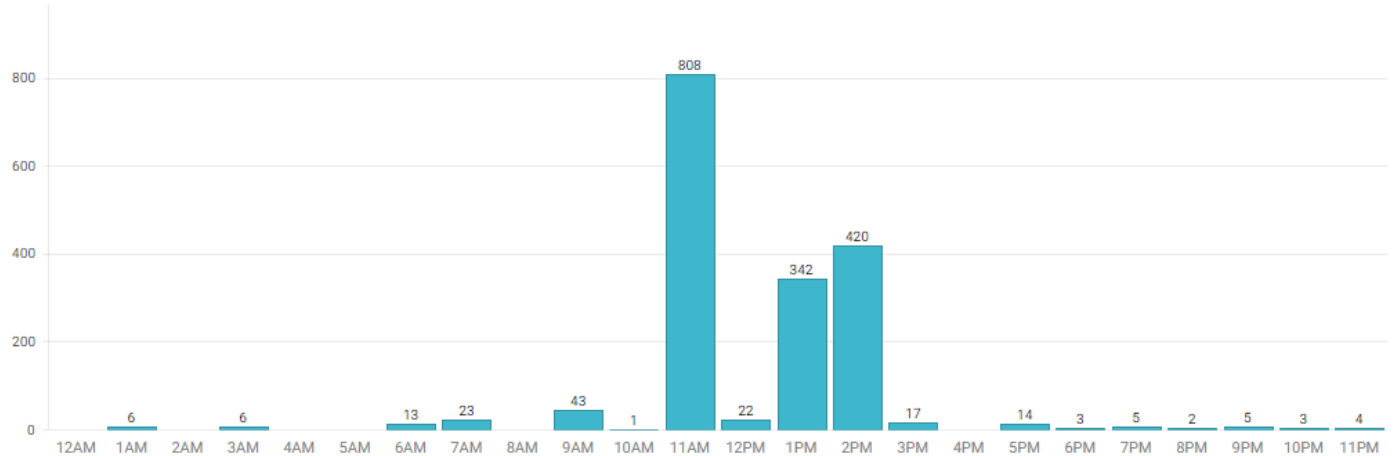
Actual
 Estimated

Readings



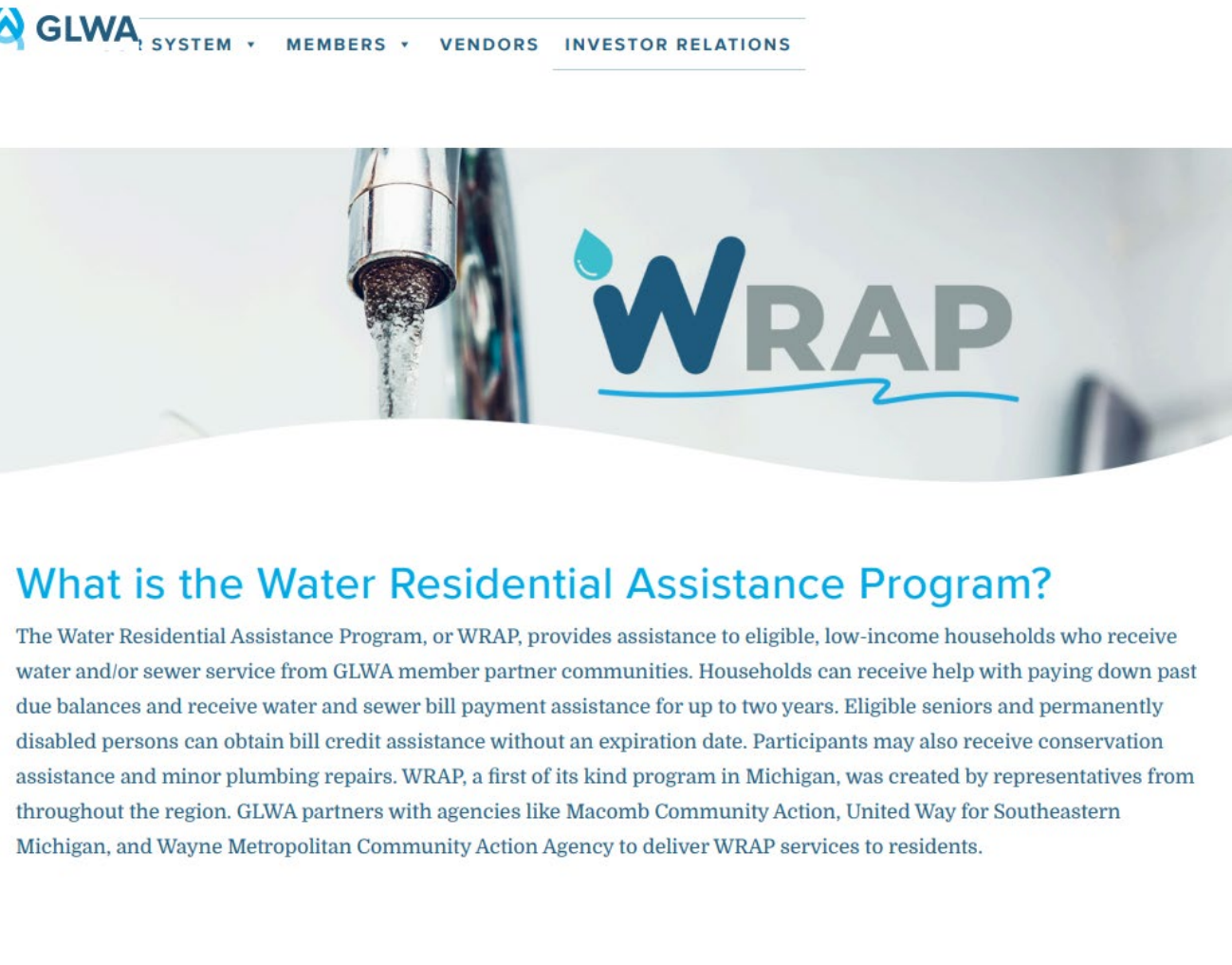
Daily

Hourly Consumption Analysis
3/8/2024



Trouble Paying your Bill?

- Assistance is Available if you are having trouble paying your water bill.
- Visit www.glwater.org/assistance/ for program eligibility and information.



The screenshot shows the top navigation bar of the GLWA website with links for SYSTEM, MEMBERS, VENDORS, and INVESTOR RELATIONS. Below the navigation is a banner image featuring a close-up of a water faucet with water dripping, and the WRAP logo (a blue water drop above the letters WRAP) overlaid on the right. Below the banner is the heading "What is the Water Residential Assistance Program?" followed by a paragraph of text describing the program's purpose and eligibility criteria.

GLWA SYSTEM ▾ MEMBERS ▾ VENDORS INVESTOR RELATIONS

What is the Water Residential Assistance Program?

The Water Residential Assistance Program, or WRAP, provides assistance to eligible, low-income households who receive water and/or sewer service from GLWA member partner communities. Households can receive help with paying down past due balances and receive water and sewer bill payment assistance for up to two years. Eligible seniors and permanently disabled persons can obtain bill credit assistance without an expiration date. Participants may also receive conservation assistance and minor plumbing repairs. WRAP, a first of its kind program in Michigan, was created by representatives from throughout the region. GLWA partners with agencies like Macomb Community Action, United Way for Southeastern Michigan, and Wayne Metropolitan Community Action Agency to deliver WRAP services to residents.