

Peaks Mill Water District
Qualified Infrastructure Improvement Plan
Prepared by BlueWater Kentucky
January 2, 2025

1.0 - BACKGROUND

The Peaks Mill Water District (PMWD) filed an application for a rate increase in Kentucky Public Service Commission (PSC) Case # 2023-00401 on December 4, 2023. The KY PSC issued its order on September 4, 2024, that included a 28.28 percent rate increase, effective with water bills issued in October 2024. In addition, the PSC ordered a Water Loss Surcharge of \$3.09 per customer. The Water Loss Surcharge is projected to generate \$44,977 annually, and \$179,764 over four years. The PSC Order in Case # 23-00401 requires a Qualified Infrastructure Improvement Plan (QIIP) and Water Loss Reduction Plan (WLRP) to be submitted to the PSC within 120 days of the PSC order dated September 4, 2024. This document serves as the QIIP and WLRP for the Peaks Mill Water District.

The QIIP includes the following sections:

- 1.0 - Background.
- 2.0 - System Configuration and Operations.
- 3.0 - System Water Use.
- 4.0 - Capital Improvement Plan.
- 5.0 - Water Loss Reduction Plan.
- 6.0 - Request for Approval of QIIP and WLRP.

In Section 6.0, PMWD requests approval of the Qualified Infrastructure Improvement Plan and Water Loss Reduction Plan.

END OF SECTION 1.0.

2.0 - SYSTEM CONFIGURATION

2.1 - Water System History: The Peaks Mill Water District was created on March 3, 1961, by order of Franklin County Fiscal Court. The initial system was constructed in the late 1960’s and began operation circa 1970.

2.2 - Customers: As of December 31, 2024, PMWD serves approximately 1,230 customers serving a population of approximately 2,950 (using a multiplier of 2.4 persons per household) and is considered a small rural water system with low density (11.8 customers per mile compared to 22 customers per mile average for Kentucky).

2.3 - Distribution System Piping: PMWD distributes water through approximately 105 miles of water distribution mains, that vary in size from 3-inches to 8-inches as shown in Exhibit 2.1. The original system was built predominately with Asbestos Cement pipe (also called Transite pipe) in sizes 4-inch and 6-inch. Since the 1980s PVC pipe has been used in sizes 2-inch to 8-inch.

Exhibit 2.1					
Peaks Mill Water Distribution System					
Size - Diameter (inches)	Miles of Pipe by Pressure Zone				Total
	PZ-1	PZ-2	PZ-3	PZ-4	
3	7.9	9.8	0.0	2.1	19.8
4	3.1	15.6	2.0	0.0	20.7
6	7.8	8.6	43.0	0.0	59.3
8	4.8	0.0	0.0	0.0	4.8
Total	23.5	33.9	45.0	2.1	104.6
# Customers (12/19/24)	561	474	185	12	1,232
Customers/Mile	23.9	14.0	4.1	5.7	11.8

2.4 - Valves: PMWD has approximately 220 valves of sizes 1-inch to 8-inch. Gatewood Water Service (PMWD’s contractor operator prior to 2023) created valve cards for the District, including street location, valve locations and GPS coordinates. Some valve sizes are noted. An example of a valve card is shown in Exhibit 2.2. PMWD is currently building a GIS mapping system (ESRI ARC GIS platform) in partnership with KRWA, and the system will include a valve inventory with field verified valve locations and updated GPS coordinates.

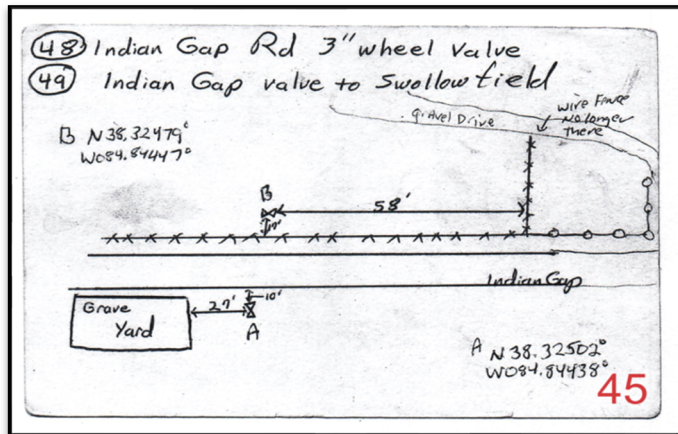


Exhibit 2.2

2.5 - Hydrants: PMWD has approximately 30 fire hydrants (2.5” or larger outlets) and approximately 50 flush hydrants (1.5” or smaller outlets). The Franklin County Fire Department conducts annual flow testing of hydrants and reports the results to the PMWD.

2.6 - Master Meter Supplies (Purchase Water Meters): In 2024 PMWD purchased approximately 72 percent of its water from the Frankfort Plant Board (FPB) through two (2) master meter sites and 28 percent from Kentucky American Water Company (KAWC) through two (2) master meter sites.

The master meter sites are summarized below.

Frankfort Master Meters:

Frankfort 3” and 5/8” Compound Meter:

- Buffalo Trace Distillery Visitor Parking Lot
- Account #30329
- 3” Meter # 20220366
- 5/8” Meter # 20216191

Frankfort 4” Turbine Meter:

- 103 Peaks Mill Road and Guy Lane (Cedar Cove Road) across from Peaks Mill Elementary School)
- Account #28600
- 4” Meter # 72040989

Kentucky American Master Meters:

Ky American 2” Meter:

- US Hwy 127 North at Owen County Line
- Account #210009446813
- Meter # 211109767

Ky American 3” Turbine Meter:

- Peaks Mill Road (at Old Elementary School)
- Account 220032244816
- Meter # 55858881

2.7 - Distribution System Mapping: PMWD is currently building a GIS mapping system on an ESRI ARC GIS platform with assistance from the Kentucky Rural Water Association (KRWA). KRWA imported the metering database and the Kentucky WRIS mapping data of the District into the ARC GIS software. PMWD staff uses the GIS mapping system on a daily basis and updates records in the field using an Apple iPhone and iPad to capture GIS coordinates, field conditions and site photos. As time allows the mapping system will be updated and the asset management and mapping tools will be used for system operation and reporting. PMWD proposes to use a portion of the Water Loss Surcharge funds to update the GIS mapping system. Exhibit 2.3 illustrates a portion of the system shown in the ARC GIS mapping portal.

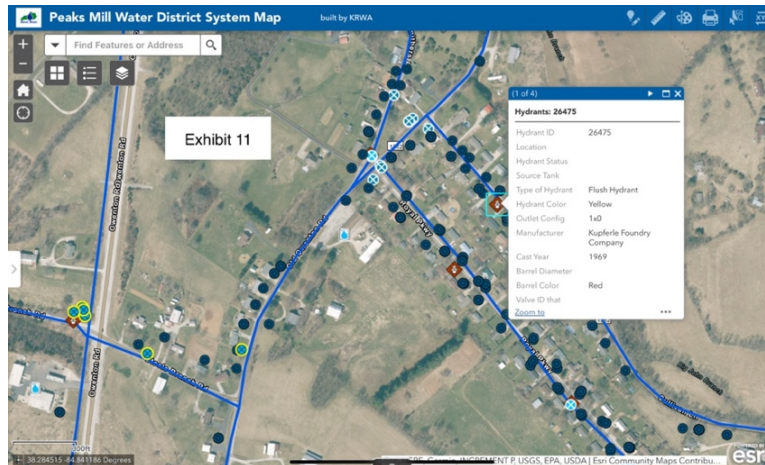


Exhibit 2.3

2.8 - System Schematics: Over the past three years, PMWD has developed systems schematics to assist with operations of the water systems. The schematics are created from information on valve cards, as-built record drawings, and field collection of piping configurations. Exhibit 2.4 is an example of a piping schematic for the Sullivan Lane PRV supply.

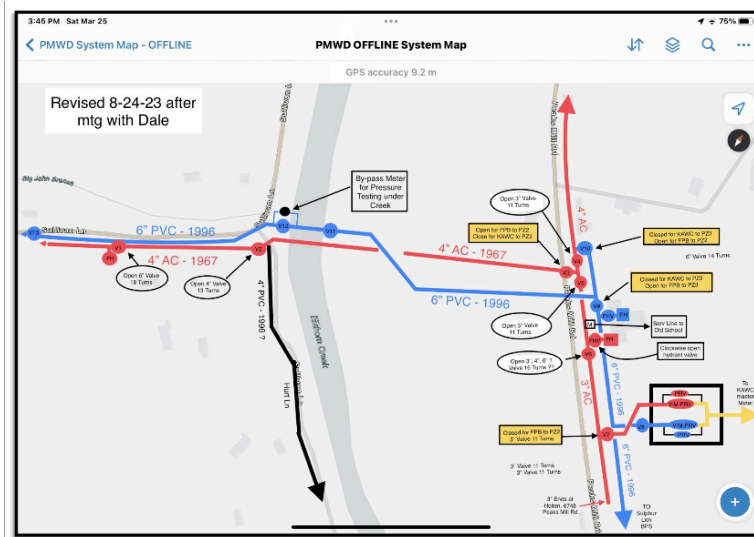


Exhibit 2.4

2.8 - System Mapping: PMWD developed a system wide map (Exhibit 2.5) in 2022 to illustrate the overall piping system and the primary pressure zones. This map is used for system wide management, field operations and customer presentations.

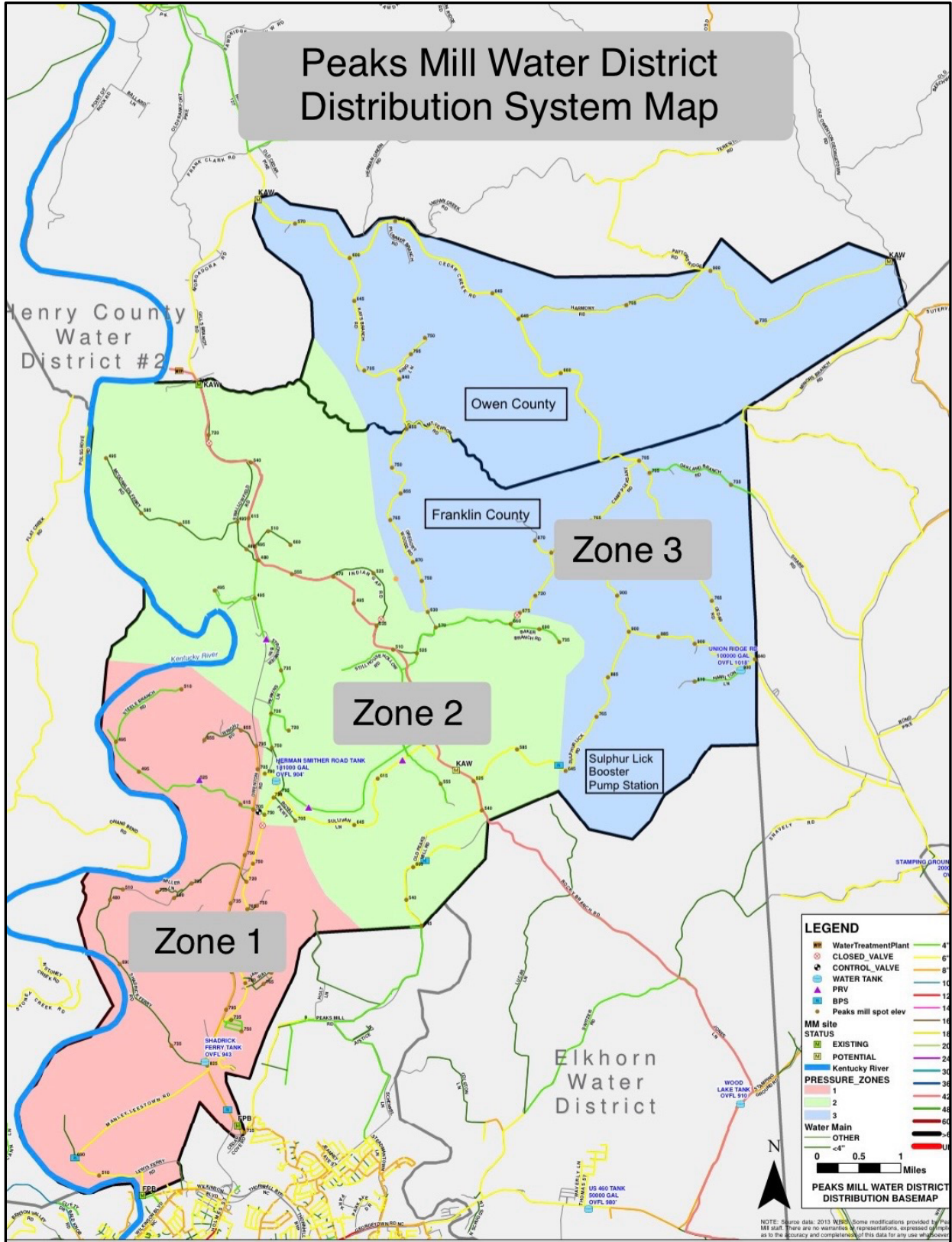


Exhibit 2.5

2.9 - System Operations: PMWD operates three primary pressure zones, and several sub-zones as follows:

Pressure Zone 1 - Shadrick Zone - shaded pink in Exhibit 2.5:

- Water supplied from FPB.
- 560 customers (varies from 550 to 570 throughout the year).
- Delivery point and master meter located on Peaks Mill Road at Cedar Cove Road, elevation 727 feet.
- Shadrick standpipe, 325,000 gallons, 110.9 feet tall, overflow 943 feet.
- Standby pump station on US 127 North, elevation 790 feet (only operated when needed to boost pressure and flow during high demand or emergency).
- Hydraulic grade of 910 to 950 feet, typical pressure range 35 psi to 170 psi.
- Sub-Zone 1A provided by 3-inch master meter at Buffalo Trace to supply Lewis Ferry and Manley-Leestown Road area, serving approximately 10-12 customers. Standby pump station on Lewis Ferry Rd.
- Sub-Zone 1B supplied by Wright Road Booster Pump Station (153 Wright Rd) – 35 GPM VFD pumps, serving approximately 16 customers on Wright Road, pressure 50 to 100 psi.
- Lower elevations in Zone 1 are served by pressure reducing valves (PRVs) for areas exceeding 150 psi.
 - Shadrick Ferry Road PRV (on 3” PVC water main, near 2293 Shadrick Ferry Road)

Pressure Zone 2 - Herman Smithers/Wright Rd Zone - shaded green in Exhibit 2.5:

- Water supplied from FPB and/or KAWC.
- 474 customers (varies from 465 to 485)
- FPB water supplied to Pressure Zone 1 through Flow Control Valve.
- Flow Control Valve located at Owenton Road (US 127 at BP Station).
- Herman Smithers standpipe, 184,000 gallons, 110.9 feet tall, overflow 904 feet.
- Hydraulic grade 870-910 feet, typical pressure range 35 psi to 100 psi.
- Beginning March 3, 2020, a portion of Pressure Zone 2 has been supplied by KAWC to provide higher chlorine residuals during the summer periods when FPB supply has lower chlorine residuals.
- Sub-zone 2A includes approximately 12 customers supplied by KAWC by a 2-inch meter at the Franklin/Owen County line.
- Sub-zone 2B supplied by Shrader Hill Booster Pump Station (5909 Peaks Mill Rd) – Two-35 GPM VFD pumps, serving approximately 6 customers on Peaks mill Road (east of Old Peaks Mill Road), pressure 50 to 100 psi.
- Lower elevations in Zone 2 are served by pressure reducing valves (PRVs) for areas exceeding 150 psi. Zone 2 PRVs:
 - Sullivan lane PRV (on 4” AC water main, near 475 Sullivan Lane)
 - Sullivan lane PRV (on 6” PVC water main, near 1685 Sullivan Lane)
 - Steele Branch PRV (on 4” PVC water main, between 667 and 676 Steele Branch)

- Strohmeier By-Pass PRV (on 4” AC water main, off US 127)
- Indian Gap PRV (on 3” PVC water main, near Peaks Mill Road)
- KAWC Zone 2/3 master meter supply line (on 8” water main from KAWC 42” water main, 7000 Peaks Mill Road, south of old elementary school building in field)

Pressure Zone 3 - Union Ridge Zone - shaded blue in Exhibit 2.5:

- Water typically supplied from KAWC (backup from FPB).
- 185 customers (varies from 180 to 190).
- Water supplied from Pressure Zone 2 through Sulphur Lick booster pump station (two 150 GPM variable speed pumps).
- Booster pump station located on Sulphur Lick Road.
- Union Ridge standpipe, 112,000 gallons, 97.8 feet tall, overflow 1,018 feet.
- Hydraulic grade 990 to 1,020 feet, typical pressure range 35 psi to 180 psi.
- Lower elevations served by pressure regulation valves (PRVs) for areas exceeding 150 psi.
- Beginning March 3, 2020, Pressure Zone 3 was supplied by KAWC to provide higher chlorine residuals that provided by FPB.

END OF SECTION 2.0.

3.0 SYSTEM WATER USE

3.1 - Water Purchases: PMWD purchases water from both the Frankfort Plant Board (FPB) and Kentucky American Water Company (KAWC). In 2024 approximately 71.5 percent of water was purchased from FPB and 28.5 percent from KAWC as show in Exhibit 3.1. Prior to 2020, PMWD purchased over 98 percent of its water from FPB.

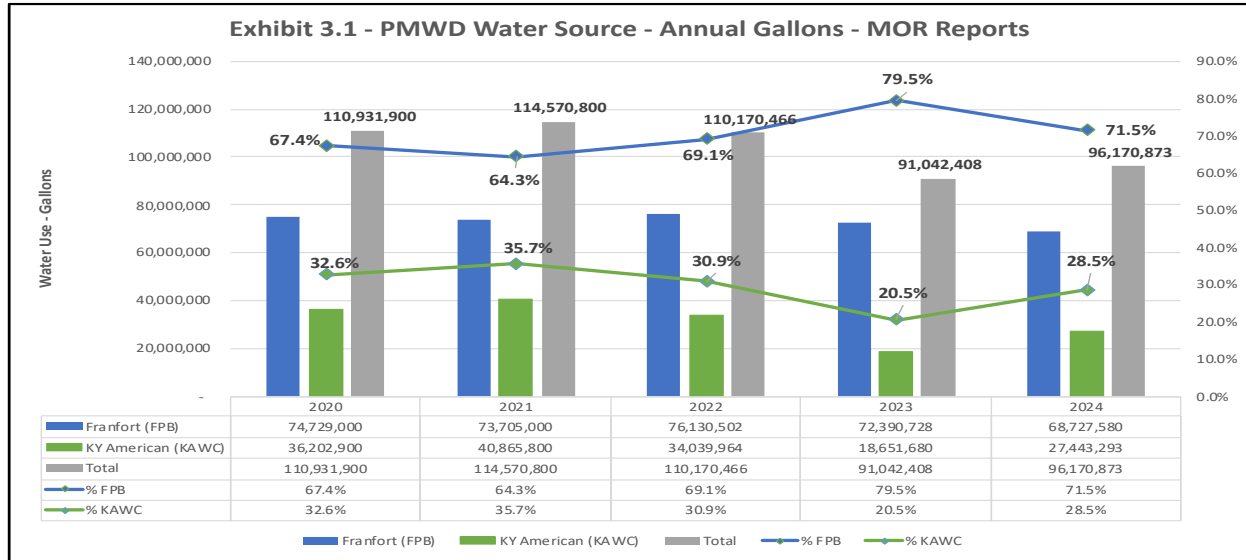
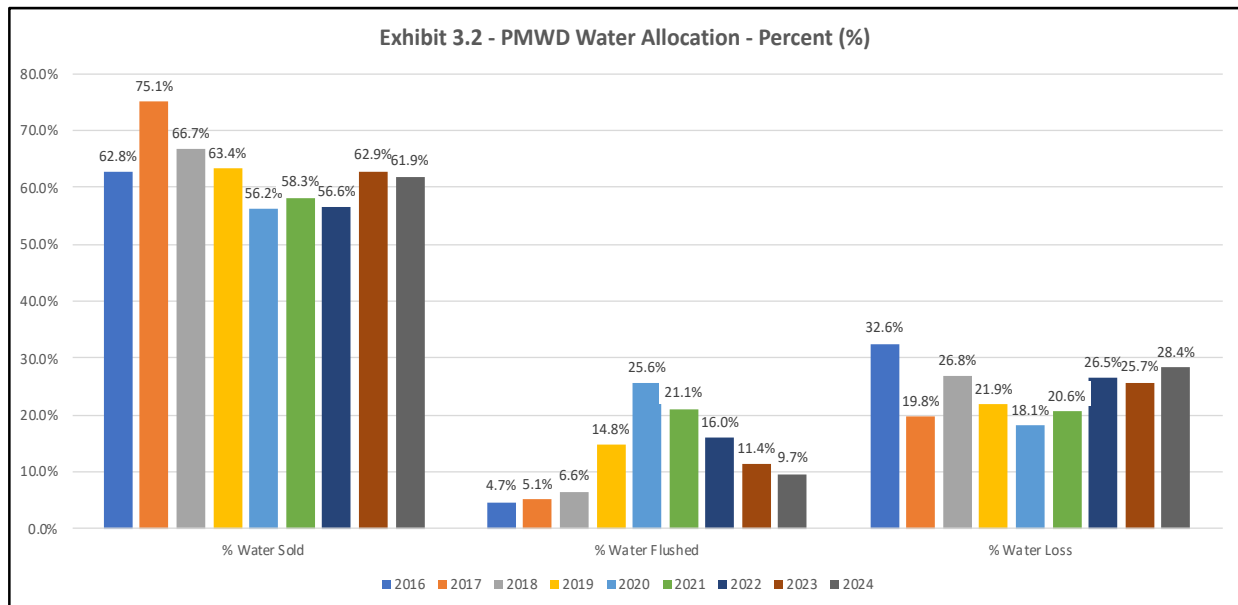
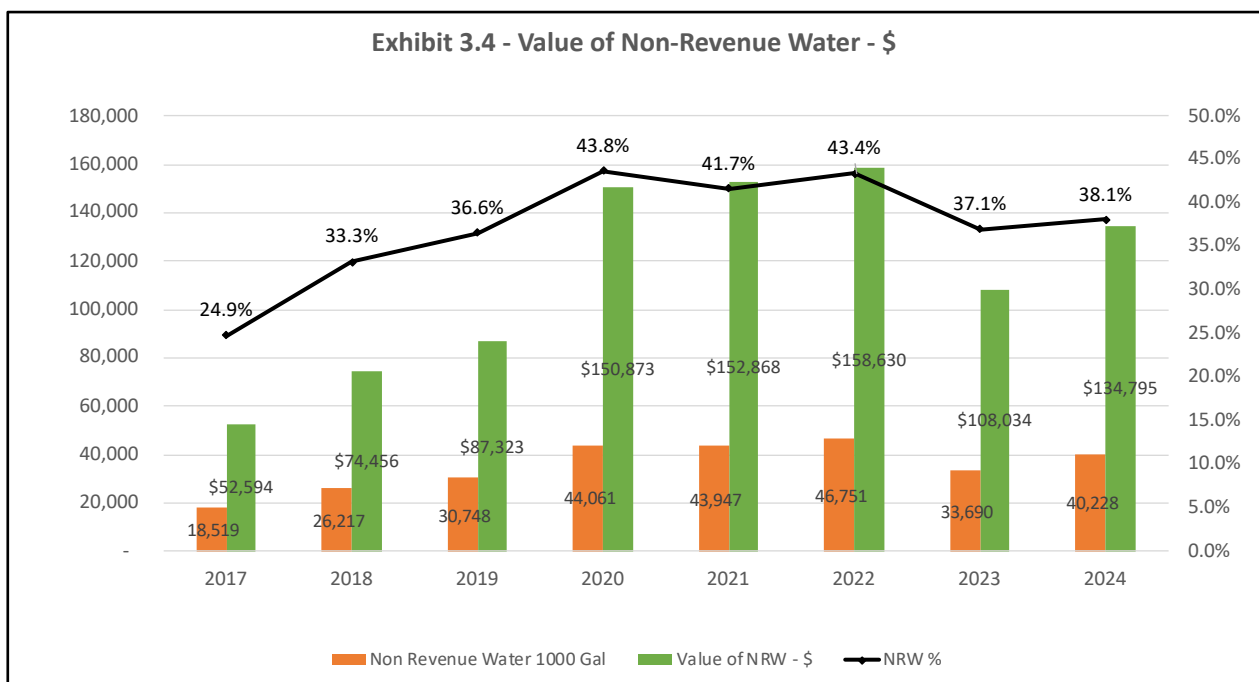
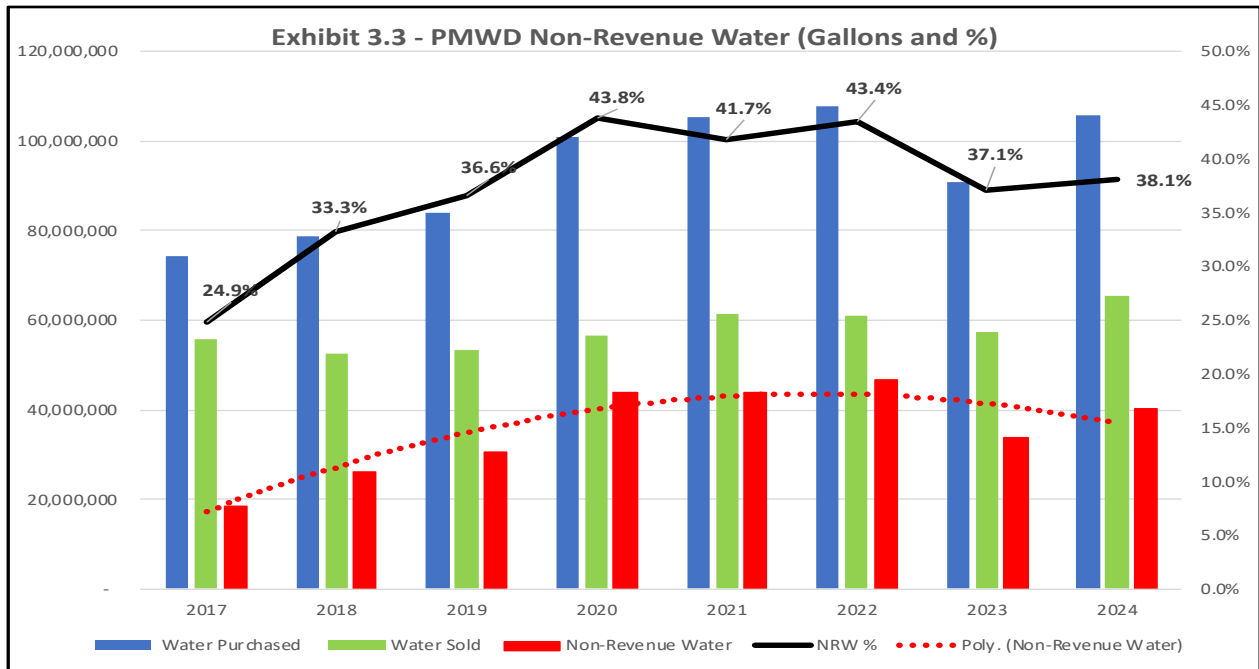


Exhibit 3.2 shows the water use trends by category since 2016. Beginning in 2019, Peaks Mill initiated an extensive flushing program to maintain chlorine residuals in the distribution system, as part of an Agreed Order with the Kentucky Division of Water. Flushing and water loss represent approximately 38.1 percent of water use in 2024 (Water Sold = 61.9 percent, Flushing = 9.7 percent, Water Loss = 28.4 percent).

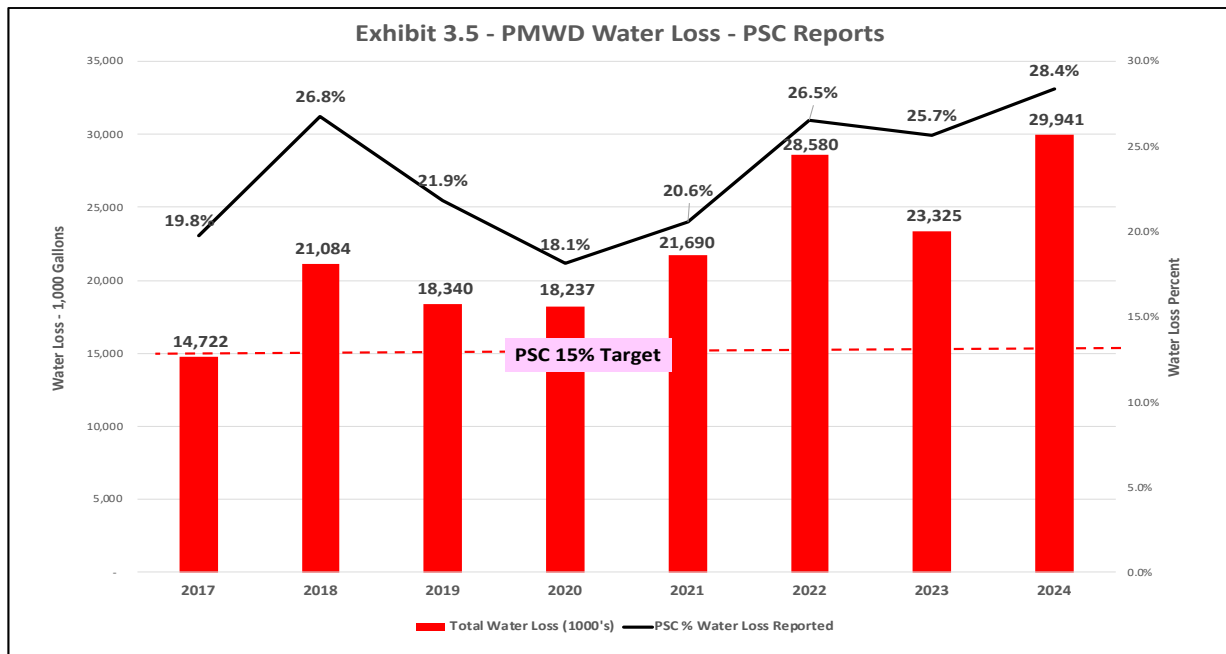


3.2 - Non-Revenue Water: One of the major challenges for PMWD is managing and reducing non-revenue water. In 2024, 38.1 percent of water was identified as non-revenue, with 61.9 percent billed to customers. Non-revenue water includes water used for flushing, breaks, leaks, tank overflows, fire department use and theft. Exhibit 3.3 shows the non-revenue water trends since 2016. The value of non-revenue water in 2024 was estimated at \$134,795, an increase over 2023 due to the increase in both water volume purchased and the rate increase by KAWC. Exhibit 3.4 shows the approximate value of non-revenue water (using an average cost of water purchased from FPB and KAWC).



3.3 - Water Loss: The water system has challenges with high water loss (averaging 28.4 percent in 2024) as shown in Exhibit 3.5. The Kentucky PSC defines water loss as water volumes for tank overflows, breaks, leaks, excavation damage, and theft. The volumes and percentages shown in Exhibit 3.5 are derived from water loss data reported to the KY PSC. Operating efforts are underway to evaluate water loss by zone and sub-zone to locate and repair water leaks.

A water meter testing and replacement program was initiated in December 2022 to identify inaccurate and underperforming meters. The water metering system was upgraded in 2009-10 with Automated Meter Reading (AMR) technology. Many meters were replaced and some retrofitted with AMR technology. Some Automated Meter Reading (AMR) lithium batteries are beginning to fail due to age and adverse field conditions. PMWD’s Capital Improvement Plan includes replacement of the existing water meter system with a new Advanced Metering Infrastructure (AMI) system (see Section 4.0 Capital Improvement Plan for the proposed schedule).



3.4 - Water Loss by Zone: The District is divided into three primary zones (or DMAs - District Metered Areas) for managing water use and tracking water loss. Water volume is measured into each zone by using the purchased water meter flows (FPB and KAWC master meters) and meters that measure water between Zone 1 and Zone 2 (meter at BP Station on US 127) and between Zone 2 and Zone 3 (Sulphur Lick Road) as shown in Exhibit 3.6.

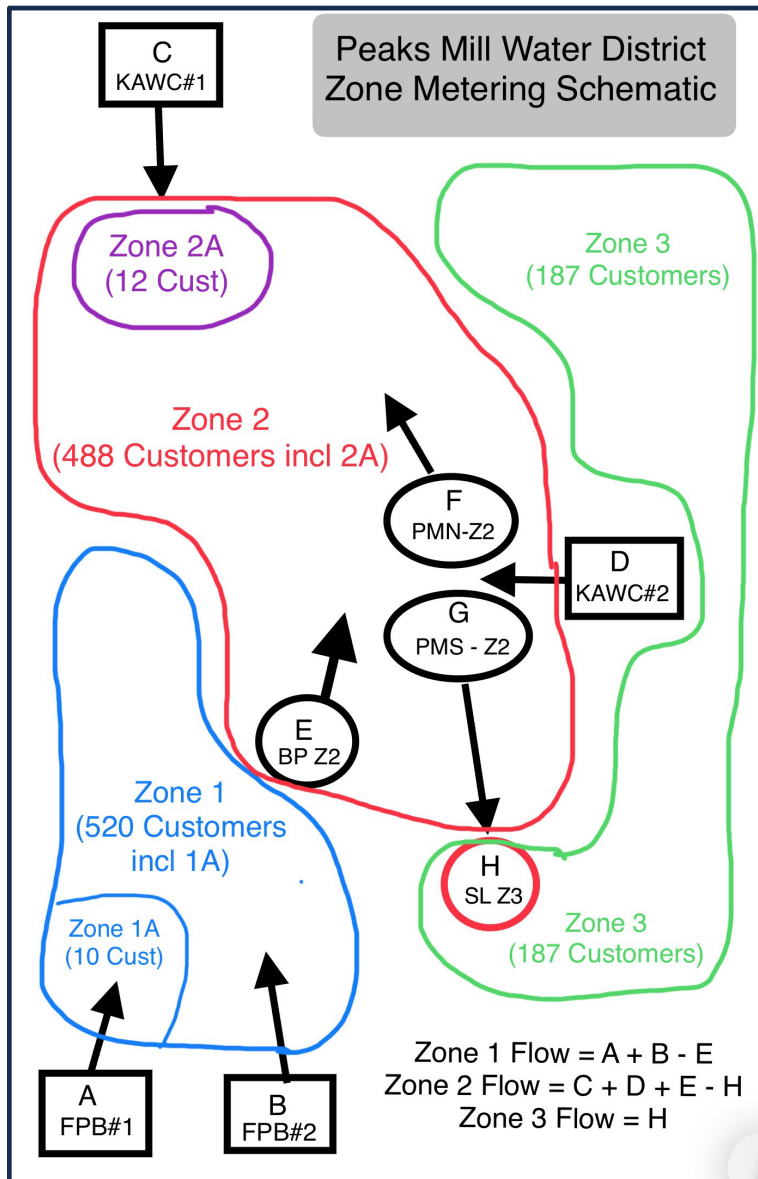
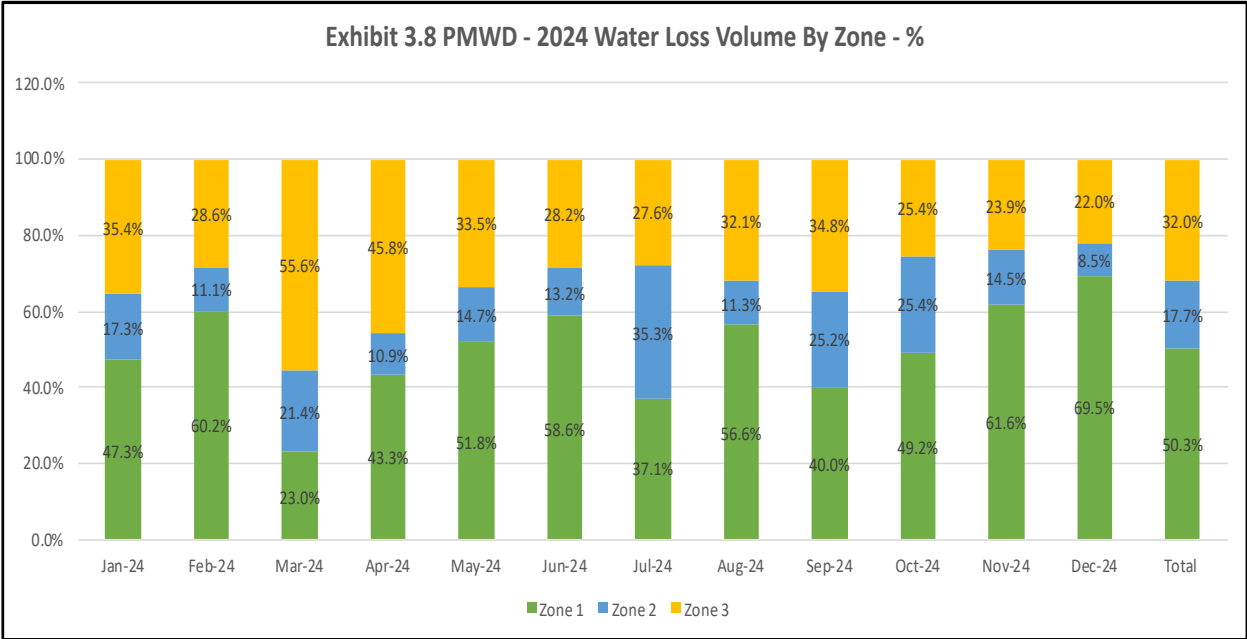
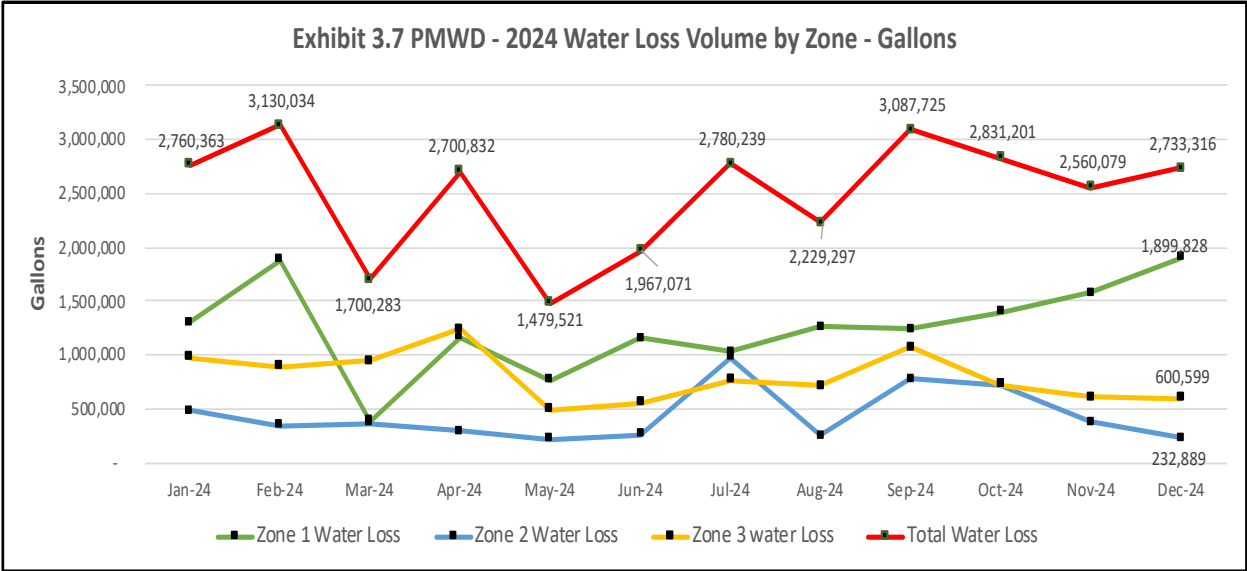


Exhibit 3.6

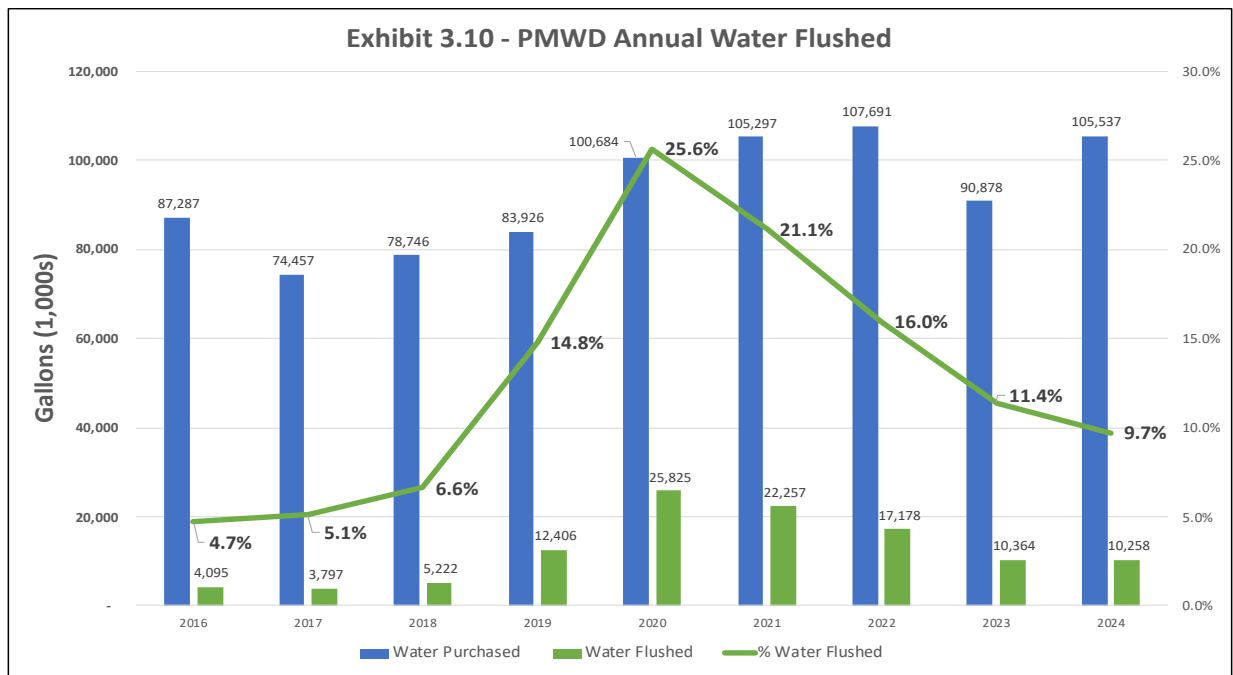
From a review of the water loss by zone analysis (Exhibits 3.7 and 3.8), the highest percentage and volume of water loss has been recorded in Zone 1 at 50 percent. Zone 1 includes the original system installed in the 1970s and has some small diameter water mains of non-standard material and in some cases water mains are located behind homes (i.e. Stonewall Subdivision). PMWD staff monitors tank levels and system pressures to identify areas of water loss. In addition, field inspections are conducted in periods of dry weather to identify locations of potential leaks. From review of the data, it appears the Zone 2 and Zone 3 meters may not be accurately measuring water flow and need to be checked in the field for accuracy. This may account for the lower water loss measured in Zone 2, as the Zone 2 meter appears to be registering slow, and the Zone 3 meter may be registering high. The WLRP includes purchasing a portable ultrasonic meter to test the accuracy of the Zone 2 and Zone 3 meters.

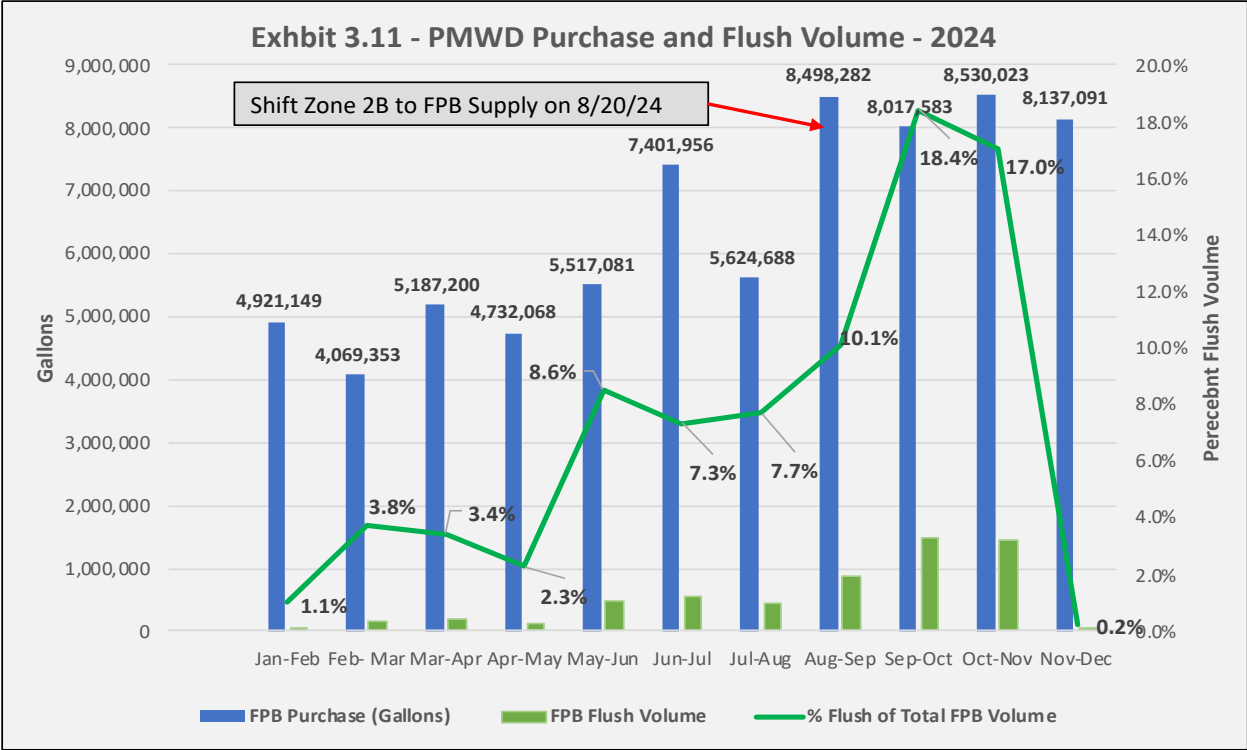


3.5 - Meter Testing: PMWD did not test meters during the COVID period of 2020 to 2021. Beginning in December 2022, PMWD began testing meters again, and the results of 77 meters tested are shown in Exhibit 3.9. Overall, 87% of the meters tested have failed one or more of the AWWA testing levels (Low, Medium, High Flow). While the low flow testing of ¼ gallon per minute (gpm) is not significant, the failure of 35 percent of the meters on the medium flow rate of 2 gpm and 21 percent of the meters on the high flow rate of 15 gpm is significant. The meters tested come from across the system and vary in age from 2 to 35 years in age (manufacture years of 1990 to 2023). The average age of the 77 meters tested is 18.3 years. This high failure rate indicates a significant portion of the water loss (estimated at 5 to 7%) may be from inaccurate meters. Once cash flow improves in 2025, following the October 2024 rate increase, PMWD will begin replacing up to 120 meters per year (approximately 10% of total meters).

Exhibit 3.9 PMWD Meter Testing 2022-2024											
1/4 GPM for 10 Gallons			2 GPM for 10 Gallons			15 GPM for 100 Gallons			Overall Test Summary		
95.0 to 101.0% = Accuracy Range			98.5 to 101.5% = Accuracy Range			98.5 to 101.5% = Accuracy Range					
Not Counting Duplicate Tests			Not Counting Duplicate Tests			Not Counting Duplicate Tests			Not Counting Duplicate Tests		
Failure Rate LOW Flow	62	80.5%	Failure Rate MID Flow	27	35.1%	Failure Rate HIGH Flow	16	20.8%	Overall Failure Rate	67	87.0%
Pass Rate LOW Flow	15	19.5%	Pass Rate MED Flow	50	64.9%	Pass Rate HIGH Flow	61	79.2%	Overall Pass Rate	10	13.0%
#Tests	77	100.0%	Total Tests	77	100.0%	Total Tests	77	100.0%	Total Tests	77	100.0%

3.6 - System Flushing: PMWD has numerous dead-end water mains with low customer density. This system configuration creates challenges with maintaining chlorine residuals above 0.5 ppm and requires extensive flushing. Water used for flushing represented 9.7 percent of water purchased in 2024. The multi-year trend of water volume flushed is shown in Exhibit 3.10. Flushing increased dramatically to 25.6 percent in 2020 as a result of the Agreed Order to comply with the regulation to maintain distribution chlorine residuals above 0.5 ppm (chloramines). Efforts have been made to reduce the volume of water flushed by installing auto-flushers in 2023-24 using Cleaner Water Program (CWP) grant funds. Beginning January 2024 all water flushed was metered. Prior to 2024, flushed volumes were estimated and may have impacted the amount of water loss reported. In addition, FPB began offering a \$1.64 per 1,000-gallon credit for flushed water volume used to maintain water quality. The total credit for 2024 was \$9,427. Exhibit 3.11 illustrates the FPB purchased and flushed water volume by month for 2024.





END OF SECTION 3.0.

4.0 CAPITAL IMPROVEMENT PLAN

In 2022, PMWD developed a 10-year Capital Improvement Plan (CIP) to identify water system infrastructure needs. The CIP is reviewed, updated and approved annually by the PMWD Board and serves as a plan for capital investment over a ten-year period. Exhibit 4.1 includes the draft 2025 10-year CIP that will be presented to the PMWD board for approval at its January 2025 meeting.

The CIP projects are identified in three priority areas:

Priority A – Immediate needs in the 1 to 5-year planning period.

Priority B – Intermediate needs for the 3 to 7-year planning period.

Priority C – Long range needs for the 7 to 10-year planning period.

PMWD has submitted project profiles (approved and pending) for the Priority A and B projects to the Kentucky Infrastructure Authority for identification in the Water Resource Information Systems (WRIS). These projects will be considered for state/federal grants or low interest loan funding.

In addition, PMWD will retire two Rural Development loans (91-03 and 91-05) in 2035 (current principal balance of \$313,000 as of 12/31/24). PMWD will retire a KIA loan (C05-01) in 2029 (current principal balance of \$292,258 as of 12/31/24). A multi-year pro-forma cash flow will be developed to evaluate the feasibility of paying off the remaining principal balance (\$528,056 on 12/31/25, \$448,781 on 12/31/26). The existing annual principal and interest included the rate base of \$8,384 per month will fund an approximate \$2.1 million loan at 2.5 percent interest rate that can be used to fund capital projects identified in the CIP. PMWD has also applied for state and federal grants to fund capital projects.

Exhibit 4.1 - Peaks Mill Water District - 10 Year Capital Improvement Program 2025-2034							
Revised 9/27/22 GH, 11/10/22 GH, 1/23/23 GH, 12/31/24							
#	Priority	Type	WX #	Project Title	Scope/Description	Years	Budget
1	A1	Renewal, Reliability, Hydraulics	WX 21073024	Sulfur Lick Booster Pump Station	Rehabilitate Sulphur Lick pump station, including pumps, motors, controls, SCADA telemetry; install 500 feet of 6-inch water main in Cedar Road for emergency supply connection from Georgetown. Project scope reduced to match grant fund availability from Franklin and Owen Counties.	2022-25	\$250,000
2	A2	Water Quality, Water Loss, Operating Equipment	WX 21073035	Distribution System Improvements for Water Quality and Water Loss	Install water circulation in the Shadrick Ferry and Herman Smithers tanks to improve water quality. Install automatic flushing connections on dead end water mains to maintain chlorine residuals. Install on-line chlorine monitoring at PM Office. Install continuous water pressure monitoring as required by KY PSC. Purchase equipment for leak detection, line location, and flow measurement. \$113,000 funded from CWP Grant, balance from PMWD.	2022-25	\$150,000
3	A3	Regulatory	WX 21073034	Service Line Inventory	Build a Service Line Inventory database required by the Revised Lead and Copper Rule. Complete Inventory of 1250 services by Oct 2024. Scope of work includes vacuum excavation, property/house research age, and field inspection.	2025-27	\$65,000
4	A4	Renewal, Reliability	WX 21073039	PMWD - Annual Hydrant, Valve, Meter, Tool/Equipment Replacement Program	Annually replace hydrants and valves: 1 fire hydrants = \$5,000, 3 flush hydrants = \$9,000, 5 valves = \$15,000, and 120 meters = \$36,000, miscellaneous tools/equipment = \$75,000 annually using depreciation funds.	Annually	\$75,000
5	B1	Operations	WX 21073040	PMWD - Feasibility Study for Shared Water Services	Franklin County is served by six water utilities: Elkhorn Water District, Farmdale Water District, Frankfort Plant Board, North Shelby Water District, Peaks Mill Water District and US 60 Water District. Three of the water districts (Elkhorn, Farmdale, and Peaks Mill Water District) propose to explore a shared services partnership for the benefit of their customers.	2025-26	\$35,000
6	B2	System Reliability	WX # Not yet Assigned	Backup Power Supply/ Mobile Generator	Purchase backup generator, trailer, and three transfer switch's. Provides backup power for Sulphur Lick, Wright Road, and Snawder Hill Booster Pump Stations.	2025-26	\$127,500
7	B3	Customer Service	WX 21073036	AMR Replacement	Existing AMR system installed in 2009 and reaching end of useful life in 2024. Replace existing 1250 AMR meters with new AMR/AMI system. Scope includes meters, encoders, transponders, radios, communication software, field computers, leak sounding equipment. Phase project over 3-5 years.	2025-29	\$745,000
8	B4	Regulatory, Customer Service	WX 21073027	Stonewall Subdivision Main Replacement	Replace 4,000 feet of 2-inch water mains with 5,000 feet of 6-inch and 4-inch water mains. Relocate 50 meter/services to front of house, install hydrants and line valves. Existing 3-inch water. Main is undersized and experiences high water loss. (Need to validate high water loss in Stonewall subdivision)	2027-29	\$582,950
9	B5	Renewal, Reliability	WX 21073026	US 127 8-inch Main Extension	Install 5,000 feet of 8-inch water main in Owenton Rd/US 127 from Quarles Road/Wright Rd/Perkins Lane to Strohmeier Bypass to replace existing 3" water main and provide backbone water supply for pressure zone 2. (Replaces vulnerable vertical 3-inch cast iron pipe near Strohmeier Bypass)	After 2028	\$566,250
10	B6	Renewal, Reliability	WX 21073038	PMWD - Harmony Lane Finished Water Interconnection	Install 1,200 feet of 6-inch water main in Harmony Road from existing dead end line to Georgetown Road (Hwy 227) to connect to Kentucky American Water Supply. Includes installation of master meter for backup/emergency supply from Kentucky American water main in Georgetown Road. Alternate scope to install interconnect in Cedar Road to US 127. Selected route will be based on evaluation of pressure, flow and water quality from Kentucky American at both locations.	2030-32	\$120,000
11	C2	Maintenance	TBD	Shadrick Ferry Tank Painting	Storage tank installed in 2005, plan to repaint exterior in 2027-31	2030-35	\$153,000
12	C3	Maintenance	TBD	Herman Smithers Tank Painting	Storage tank installed in 1986, plan to repaint exterior in 2027-31	2030-35	\$153,000
13	C4	Maintenance	TBD	Union Ridge Tank Painting	Storage tank installed in 2005, plan to repaint exterior 2027-31	2030-35	\$153,000
14	C5	Renewal, Reliability, Hydraulics	TBD	New Storage Tank	Replace Shadrick and Herman Smithers with 250,000 gallon elevated tank to improve hydraulics and water quality. May require upgrade of existing PRV stations.. (would eliminate need to paint Shadrick and Herman Smithers tank). Average Day demand for Zone 1 & 2 = 245,000 GPD. Estimated cost for 250,000 gallon tank is \$739,250, Net budget is \$433,250 when removing Shadrick and Herman Smithers tank painting. Need hydraulic analysis to verify tank capacity and tank OF elevation.	2030-35	\$433,250
Total CIP 2025 to 2034							\$3,608,950

END OF SECTION 4.0.

5.0 WATER LOSS REDUCTION PLAN

From review of the water loss data collected of the past five years, PMWD has concluded its high-water loss is attributed to a combination of factors, including: leakage from aging water distribution infrastructure, non-standard materials and inaccurate meters. The revenue from the Water Loss Surcharge of approximately \$45,000 per year, is not sufficient to replace water infrastructure, therefore the funds are proposed for the following investments:

1. Purchasing tools, equipment, software to monitor the water system and identify areas of water loss.
2. Pressure Zone One investment in valves, zone meters, leak repairs and a smart meter pilot.
3. Pressure Zone Two investment in valves, zone meters, leak repairs.
4. Pressure Zone Three investment in valves, zone meters, leak repairs.
5. Updated GIS mapping of the distribution system.
6. Monitoring a reporting of water use for improved operations and decision making for future capital investment to reduce water loss.

Each of these areas are outlined in detail, including estimated costs and schedule of investment. A summary of proposed investment is summarized in Exhibit 5.1.

5.1 - Tools, Equipment, Software: PMWD used a grant from the Kentucky Cleaner Water Program (CWP) to fund purchase of basic tools and equipment for operating the distribution system, including: pressure gauges, pipe locators, a digital leak detector, and GPS locating equipment. This investment has allowed staff to improve operations and locate leaks for repairs. In addition, PMWD used the CWP grant to install metered auto flushers. Beginning in February 2024, PMWD was able to accurately meter water used in flushing and as a result, determine a more accurate measure of water loss reported to the PSC. Prior to this, flushing volumes were estimated, and any high estimates would result in lower water loss volumes reported.

The following tools, equipment and software are proposed for an estimated \$20,900. These items will enhance operation and measurement if water loss by zone in sub-zone a pinpoint es of highest water loss:

- 5.1.1 - Pressure data loggers -\$1,200.
- 5.1.2 - Portable ultrasonic meter and data logger (Dynasonics DXN or equal) - \$7,500.
- 5.1.3 - Retrofit existing by-pass meters in Zones 1,2,3 with smart meter technology, includes software and equipment for six existing by-pass meters - \$5,000.
- 5.1.4 - 3/4" and 1" smart flow meters for zone metering and leak detection - \$3,600.
- 5.1.5 - 2" smart flow meters for zone metering and leak detection - \$3,600.

5.2 - Zone 1 Improvements: The Zone 1 improvements include installation of valves, by-pass meters, system telemetry for pressure and flow, an AMI meter pilot, and repair of system leaks at an estimated cost of \$49,000 as follows:

- 5.2.1 - Install valves in Zone 1 for sub-zone analysis. Includes materials and contract labor - \$6,000.
- 5.2.2 - Install 3/4" or 1" by-pass meter installations (Manley/Black Oak, Ridgewood, Tracy, Shadrick North). Includes materials and contract labor - \$8,000.
- 5.2.3 - Install pressure/flow telemetry at Zone 1 FPB supply/Shadrick valve. Includes materials and contract labor - \$2,000.
- 5.2.4 - Install ultrasonic AMI meter pilot in Stonewall/Ridgewood. Includes materials and contract labor - \$28,000.
- 5.2.5 - Repair leaks once identified by zone and by-pass meters (assume 4), includes materials and contract labor - \$6,000.

5.3 - Zone 2 Improvements: The Zone 2 improvements include installation of valves, by-pass meters, system telemetry for pressure and flow, installation of a portable ultrasonic meter to test the accuracy of the Zone 2 meter, and repair of system leaks at an estimated cost of \$49,000 as follows:

- 5.3.1 - Install valves in Zone 2 for sub-zone analysis - \$5,000.
- 5.3.2 - Install 3/4" or 1" by-pass meter installations (Steele Branch, Wright, Sullivan 4", Strohmeier Campground, McDonald Ferry, Indian Gap/Bates, Indian Gap/Camp Pleasant). Includes materials and contract labor - \$14,000.
- 5.3.3 - Install Pressure/Flow Telemetry at Zone 2 Control Valve. Includes materials and contract labor - \$2,500.
- 5.3.4 - Install Pressure/Flow Telemetry at Zone 2 Control Valve. Includes materials and contract labor - \$5,000.
- 5.3.5 - Repair leaks once identified by zone and by-pass meters (assume 4), includes materials and contract labor - \$6,000.

5.4 - Zone 3 Improvements: The Zone 3 improvements include installation of valves, by-pass meters, upgrade of Zone 2 and Zone 3 meters with AMI connectivity, and repair of system leaks at an estimated cost of \$49,000 as follows:

- 5.4.1 - Install valves in Zone 2 for sub-zone analysis - \$7,500

- 5.4.2 - Upgrade KAWC/Old School Zone 2 and Zone 3 meters with AMI cellular connectivity and ultrasonic meters. Includes materials and contract labor - \$7,500
- 5.4.3 - Install 3/4" or 1" by-pass meter installations (Union Ridge, Hamilton, Sharp, Harmony, Kays Branch). Includes materials and contract labor - \$10,000.
- 5.4.4 - Repair leaks once identified by zone and by-pass meters (assume 4), includes materials and contract labor - \$6,000.

The sub-total budget cost for equipment, materials and labor is estimated at \$133,400. The budget proposes a 10 percent contingency of \$13,340 bringing the total cost for equipment, materials and labor to \$146,740, as shown in Exhibit 5.1.

5.5 – Project Management and Engineering – The Water Loss Reduction Plan includes proposed budget for project management, updating the ARC GIS mapping system with GPS field collection of system components, analyzing monthly water loss data, monthly reporting and conducting a water loss audit for an estimated cost of \$33,000 as follows:

- 5.5.1 - Project management and reporting – 10 percent of Project Budget - \$18,000.
- 5.5.2 - Updating ARC GIS mapping system with pipes, valves, hydrants, zone and by-pass meters using Trimble GPS locator - \$7,500.
- 5.5.3 - Analysis of monthly water loss data to identify leaks, preparing monthly water loss reporting and conducting a water loss audit - \$7,500.

5.6 – Total Budget for Water Loss Plan: The total budget for the Water Loss Plan is \$179,740, slightly less than the projected Water Loss Surcharge revenue of \$179,908 projected over four years. The proposed budget details are shown in Exhibit 5.1 and summarized below. Exhibit 5.1 also includes a proposed schedule of investment over the four-year period. PMWD will cash flow the project and request approval from the PSC for reimbursement from the Water Loss Surcharge reserve account. Exhibit 5.2 shows the proposed locations of zone meter upgrades and by-pass meter installations.

Equipment, Meters and Technology Software	\$20,900
Pressure Zone 1 Leak Monitoring and Meters	\$49,000
Pressure Zone 2 Leak Monitoring	\$32,500
Pressure Zone 3 Leak Monitoring	\$31,000
Subtotal Equipment, Materials, and Labor	\$133,400
Contingency 10%	\$13,340
Total Equipment, Materials, Labor	\$146,740
Project Management, Mapping, Reporting	\$33,000
Total Project Budget	\$179,740
PSC Surcharge Approval Amount = \$44,977/year for 4 years	\$179,908
Remaining Budget	\$168

Exhibit 5.1								
Peaks Mill Water District								
Proposed Water Loss Reduction Plan - 1-2-25								
Item #	Description	Quantity	Unit Cost	Total	Year	Year	Year	Year
			Estimate	Estimate	2025	2026	2027	2028
	Equipment, Meters and Technology Software							
5.1.1	Pressure data loggers	2	\$600	\$1,200	\$1,200			
5.1.2	Portable ultrasonic meter and data logger (Dynasonic DXN or equal)	1	\$7,500	\$7,500	\$7,500			
5.1.3	Retrofit existing by- meters in Zone 1,2,3 with smart meter technology, includes software and equipment for six existing by-pass meters.	1	\$5,000	\$5,000	\$5,000			
5.1.4	3/4" and 1" smart flow meters for zone metering and leak detection	6	\$600	\$3,600	\$3,600			
5.1.5	2" smart flow meters for zone metering and leak detection	2	\$1,800	\$3,600	\$3,600			
			Subtotal	\$20,900	\$20,900	\$0	\$0	\$0
	Pressure Zone 1 Leak Monitoring and Meters							
5.2.1	Install valves in Zone 1 for sub-zone analysis. Includes materials and contract labor.	2	\$2,500	\$5,000	\$2,500	\$2,500		
5.2.2	Install 3/4" or 1" by-pass meter installations (Manley/Black Oak, Ridgewood, Tracy, Shadrick North). Includes materials and contract labor.	4	\$2,000	\$8,000	\$4,000	\$4,000		
5.2.3	Install pressure/flow telemetry at Zone 1 FPB supply/Shadrick valve. Includes materials and contract labor.	1	\$2,000	\$2,000	\$2,000			
5.2.4	Install ultrasonic AMI meter pilot in Stonewall/Ridgewood. Includes materials and contract labor.	70	\$400	\$28,000	\$14,000	\$14,000		
5.2.5	Repair leaks once identified by Zone and By-pass meters (assume 4), includes materials and contract labor.	4	\$1,500	\$6,000	\$3,000	\$3,000		
			Subtotal	\$49,000	\$25,500	\$23,500	\$0	\$0
	Pressure Zone 2 Leak Monitoring							
5.3.1	Install valves in Zone 2 for sub-zone analysis	2	\$2,500	\$5,000		\$5,000		\$0
5.3.2	Install 3/4" or 1" by-pass meter installations (Steele Branch, Wright, Sullivan 4", Strohmeier Camp Ground, McDonald Ferry, Indian Gap/Bates, Indian Gap/Camp Pleasant). Includes materials and contract labor.	7	\$2,000	\$14,000		\$14,000		\$0
5.3.3	Install Pressure/Flow Telemetry at Zone 2 Control Valve. Includes materials and contract labor.	1	\$2,500	\$2,500		\$2,500		\$0
5.3.4	Install valves, access vault at Zone 1/2 Bermaid Control Valve/Meter on 8" PVC for use of portable ultrasonic meter to validate accuracy of Zone 2 meter. Includes materials and contract labor.	1	\$5,000	\$5,000		\$5,000		\$0
5.3.5	Repair leaks once identified by Zone and By-pass meters (assume 4), includes materials and contract labor.	4	\$1,500	\$6,000		\$6,000		\$0
			Subtotal	\$32,500	\$0	\$32,500	\$0	\$0
	Pressure Zone 3 Leak Monitoring							
5.4.1	Install valves in Zone 2 for sub-zone analysis	3	\$2,500	\$7,500			\$5,000	\$2,500
5.4.2	Upgrade KAW/Old School Zone 2 and Zone 3 meters with AMI cellular connectivity and ultrasonic meters. Includes materials and contract labor.	1	\$7,500	\$7,500	\$7,500			
5.4.3	Install 3/4" or 1" by-pass meter installations (Union Ridge, Hamilton, Sharp, Harmony, Kays Branch). Includes materials and contract labor.	5	\$2,000	\$10,000			\$5,000	\$5,000
5.4.4	Repair leaks once identified by Zone and By-pass meters (assume 4), includes materials and contract labor.	4	\$1,500	\$6,000			\$3,000	\$3,000
			Subtotal	\$31,000	\$7,500	\$0	\$13,000	\$10,500
	Subtotal Equipment, Materials, and Labor			\$133,400	\$53,900	\$56,000	\$13,000	\$10,500
			Contingency 10%	\$13,340	\$5,390	\$5,600	\$1,300	\$1,050
			Total Equipment, Materials, Labor	\$146,740	\$59,290	\$61,600	\$14,300	\$11,550
	Project Management, Mapping, Reporting							
5.5.1	Project management and reporting - 10% of Project Budget.			\$18,000	\$4,500	\$4,500	\$4,500	\$4,500
5.5.2	Updating ARC GIS mapping system with pipes, valves, hydrants, zone and by-pass meters using Trimble GPS locator.	50	\$150	\$7,500	\$1,875	\$1,875	\$1,875	\$1,875
5.5.3	Analysis of monthly water loss data to identify leaks, preparing monthly water loss reporting and conducting a water loss audit.	50	\$150	\$7,500	\$1,875	\$1,875	\$1,875	\$1,875
			Subtotal Project Management, Mapping, Reporting	\$33,000				
			Total Project Budget	\$179,740	\$67,540	\$69,850	\$22,550	\$19,800
			PSC Surcharge Approval Amount = \$44,977/year for 4 years	\$179,908				
			Remaining Budget	\$168				
	Water Loss Reduction Plan prepared by BlueWater Kentucky.							

PEAKS MILL WATER DISTRICT DISTRIBUTION MAP

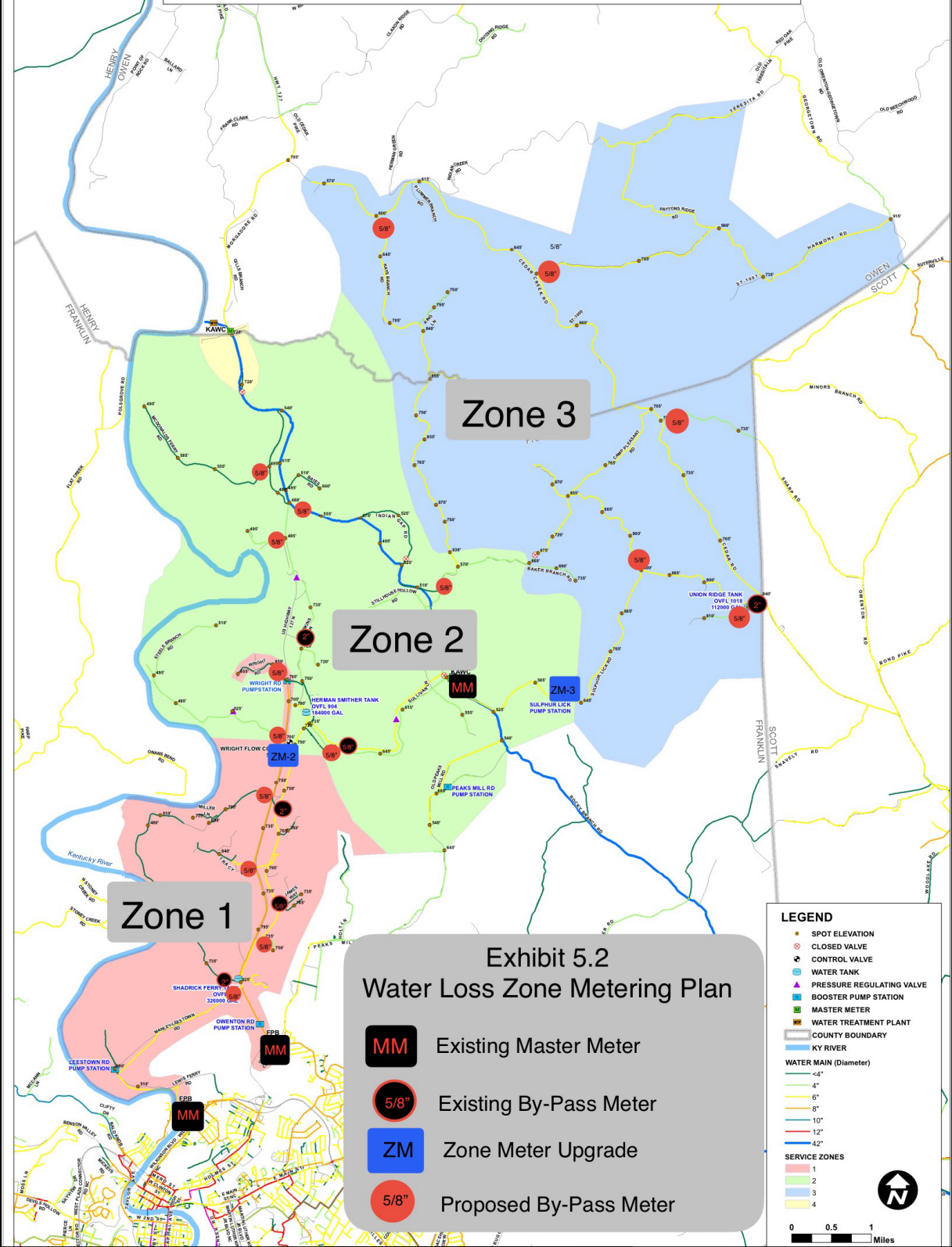


Exhibit 5.2
Water Loss Zone Metering Plan

- MM** Existing Master Meter
- 5/8"** Existing By-Pass Meter
- ZM** Zone Meter Upgrade
- 5/8"** Proposed By-Pass Meter

LEGEND

- SPOT ELEVATION
- ⊗ CLOSED VALVE
- ⊕ CONTROL VALVE
- ⊕ WATER TANK
- ⊕ PRESSURE REGULATING VALVE
- ⊕ BOOSTER PUMP STATION
- ⊕ MASTER METER
- ⊕ WATER TREATMENT PLANT
- ▭ COUNTY BOUNDARY
- ▭ KY RIVER
- ▭ WATER MAIN (Diameter)
 - <4"
 - 4"
 - 6"
 - 8"
 - 10"
 - 12"
 - 42"

SERVICE ZONES

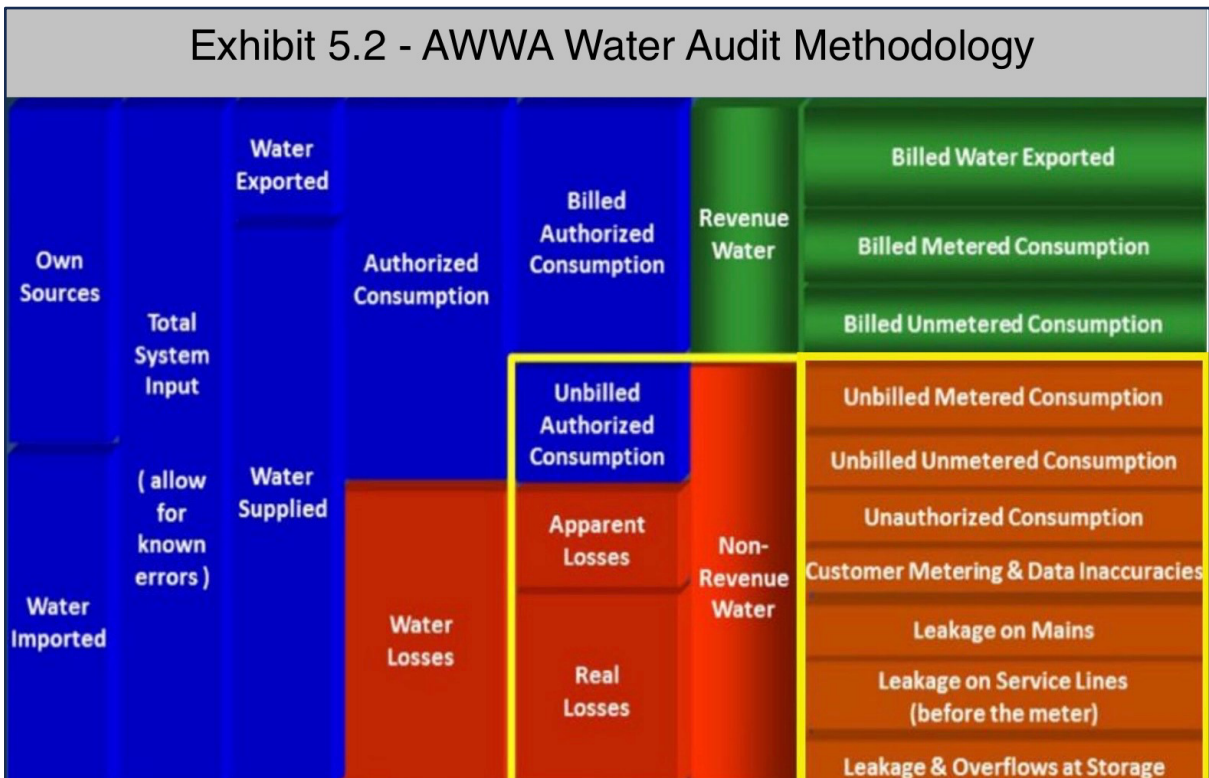
- 1
- 2
- 3
- 4

0 0.5 1 Miles

5.7 – Projection of Water Loss Reduction: PMWD will use the proposed improvements to reduce water loss from the current level of 28 percent to a goal of 15 percent or less by January 2029. The proposed WLRP is to systematically divide the distribution system into zones and sub-zones (also referred to as District Metered Areas or DMAs) to pinpoint the areas of highest water loss and then repair the leaks. The scope includes purchasing of sub-metering equipment, data logging of flow by zone, and a pilot program to evaluate smart meters with AMI technology. In addition, annual replacement of meters funded by depreciation will help reduce water loss, since meter testing indicates meters are inaccurate (up to 87%). New accurate meters will reduce water loss and increase revenue.

The final component of the WLRP will be to conduct a water audit to determine authorized consumption, apparent losses and real losses in the systems using the AWWA Water Audit methodology and shown in Exhibit 5.2. This exercise will include testing of the field collection of meter reading data to determine accuracy of the imported data into the billing software and verify customers are being billed accurately for metered consumption. The water audit will be completed by pressure zone, in order of priority from Zone 1 to Zone 3.

Following completion of this work by pressure zone, PMWD may discover the water loss is coming from areas that require replacement of water mains, and in such case, the District may request an extension of the surcharge beyond four years to fund main replacement.



END OF SECTION 5.0.

6.0 REQUEST FOR APPROVAL OF QIIP AND WLRP

Peaks Mill Water District (PMWD) respectfully requests the Kentucky Public Service Commission approve this Qualified Infrastructure Improvement Plan (QIIP) and Water Loss Reduction Plan (WLRP).

Upon PSC approval of the WLRP, PMWD will proceed with securing quotes for the items (equipment, tools, materials, and labor) identified in the PSC approved plan and submit a formal request to proceed with procurement.

PMWD will fund the WLRP improvements from cash reserves and request reimbursement from the Water Loss Surcharge reserve account.

This document was prepared by BlueWater Kentucky for the Peaks Mill District. Questions or comments on the QIIP or WLRP can be directed to Greg Heitzman, BlueWater Kentucky at 502-533-5073, or gheitzman@bluewaterky.com.

END OF SECTION 6.0.