



VIA E-FILING

Utility Code: 210104

April 30, 2026

Matthew L. Homsher, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

**RE: Aqua Pennsylvania, Inc.
2025 Water Audit Summary
Docket No. M-2026-3059580**

Dear Secretary Homsher:

Enclosed for filing are Aqua Pennsylvania, Inc.'s 2025 Annual Water Audit Summaries for the following divisions: (1) Honesdale, (2) Roaring Creek, (3) Southeast Pennsylvania, (4) Shenango, (5) Susquehanna, and (6) Whitehaven. The electronic files of the water audit summaries in Excel format are being sent separately on a Compact Disc via overnight delivery to the Secretary's Bureau.

If you have any questions regarding this filing, please contact me at 610-645-1130 or by email at astahl@aquaaamerica.com.

Sincerely,


Alexander R. Stahl
Regulatory Counsel

cc: James Kennedy, Bureau of Technical Utility Services (via email, jameskenne@pa.gov)

Enclosures



AWWA Free Water Audit Software: Worksheet

FWAS v6.0
American Water Works Association.
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Water Audit Report for: **Aqua Pennsylvania - Honesdale Division**

Audit Year: **2025** **Jan 01 2025 - Dec 31 2025** **2025**

To access definitions, click the [input name](#)

Click 'n' to add notes

Click 'g' to determine data validity grade

To edit water system info: [go to start page](#)

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

[Water Supplied Error Adjustments](#)

choose entry option:

WATER SUPPLIED

VOS	Volume from Own Sources:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="6"/>	<input type="text" value="770.959"/> MG/Yr	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="4"/>	<input type="text" value="2.00%"/> <input type="text" value="percent"/>	<input type="text" value="under-registration"/>	VOSEA
WI	Water Imported:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="6"/>	<input type="text" value="77.992"/> MG/Yr	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="4"/>	<input type="text" value="2.00%"/> <input type="text" value="percent"/>	<input type="text" value="under-registration"/>	WIEA
WE	Water Exported:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="6"/>	<input type="text" value="78.334"/> MG/Yr	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="4"/>	<input type="text" value="2.00%"/> <input type="text" value="percent"/>	<input type="text" value="under-registration"/>	WEEA

WATER SUPPLIED: MG/Yr

AUTHORIZED CONSUMPTION

BMAC	Billed Metered:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="8"/>	<input type="text" value="509.510"/> MG/Yr			
BUAC	Billed Unmetered:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="n/a"/>	<input type="text" value="0.000"/> MG/Yr			
UMAC	Unbilled Metered:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="4"/>	<input type="text" value="25.230"/> MG/Yr			
UUAC	Unbilled Unmetered:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="5"/>	<input type="text" value="0.751"/> MG/Yr			

choose entry option:

MG/Yr

AUTHORIZED CONSUMPTION: MG/Yr

WATER LOSSES

MG/Yr

Apparent Losses

Default option selected for Systematic Data Handling Errors, with automatic data grading of 3

choose entry option:

SDHE	Systematic Data Handling Errors:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="3"/>	<input type="text" value="1.274"/> MG/Yr	<input type="text" value="0.25%"/> <input type="text" value="default"/>	
CMI	Customer Metering Inaccuracies:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="6"/>	<input type="text" value="10.913"/> MG/Yr	<input type="text" value="2.00%"/> <input type="text" value="percent"/>	<input type="text" value="under-registration"/>
UC	Unauthorized Consumption:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="3"/>	<input type="text" value="1.274"/> MG/Yr	<input type="text" value="0.25%"/> <input type="text" value="default"/>	

Default option selected for Unauthorized Consumption, with automatic data grading of 3

Apparent Losses: MG/Yr

Real Losses

Real Losses: MG/Yr

WATER LOSSES: MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: MG/Yr

SYSTEM DATA

Lm	Length of mains:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="7"/>	<input type="text" value="258.0"/> miles	(including fire hydrant lead lengths)
Nc	Number of service connections:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="5"/>	<input type="text" value="8,348"/>	(active and inactive)
	Service connection density:		<input type="text" value="32"/> conn./mile main	
	Are customer meters typically located at the curbstop/property line?		<input type="text" value="No"/>	
Lp	Average length of (private) customer service line:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="1"/>	<input type="text" value="16.0"/> ft	(average distance between property line and meter)
AOP	Average Operating Pressure:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="7"/>	<input type="text" value="60.0"/> psi	

COST DATA

CRUC	Customer Retail Unit Charge:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="5"/>	<input type="text" value="\$16.25"/> \$/1000 gallons (US)	Total Annual Operating Cost
VPC	Variable Production Cost:	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="9"/>	<input type="text" value="\$611.00"/> \$/Million gallons	

WATER AUDIT DATA VALIDITY TIER:

***** The Water Audit Data Validity Score is in Tier III (51-70). See Dashboard tab for additional outputs. *****

[go to dashboard](#)

A weighted scale for the components of supply, consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION TO IMPROVE DATA VALIDITY:

Based on the information provided, audit reliability can be most improved by addressing the following components:

- 1: Volume from Own Sources (VOS)
- 2: Billed Metered (BMAC)
- 3: Number of Service Connections (Nc)

KEY PERFORMANCE INDICATOR TARGETS:

OPTIONAL: If targets exist for the operational performance indicators, they can be input below:

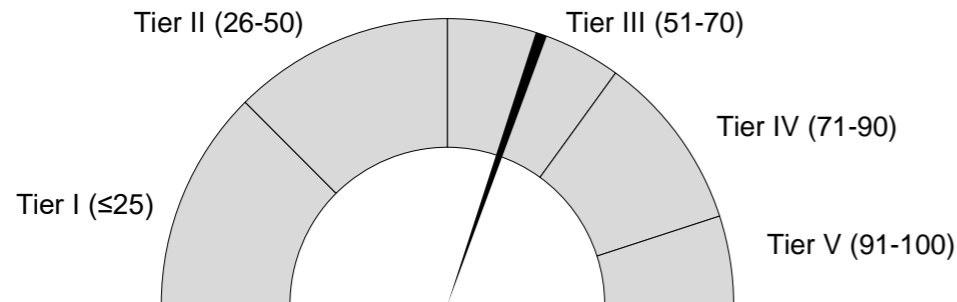
Unit Total Losses:	<input type="text"/>	gal/conn/day
Unit Apparent Losses:	<input type="text"/>	gal/conn/day
Unit Real Losses ^A :	<input type="text"/>	gal/conn/day
Unit Real Losses ^B :	<input type="text"/>	gal/mile/day

If entered above by user, targets will display on KPI gauges (see Dashboard)

Data Validity

Data Validity Score: 60 **Data Validity Tier: Tier III (51-70)**

See [Loss Control Planning](#) for Tier Details

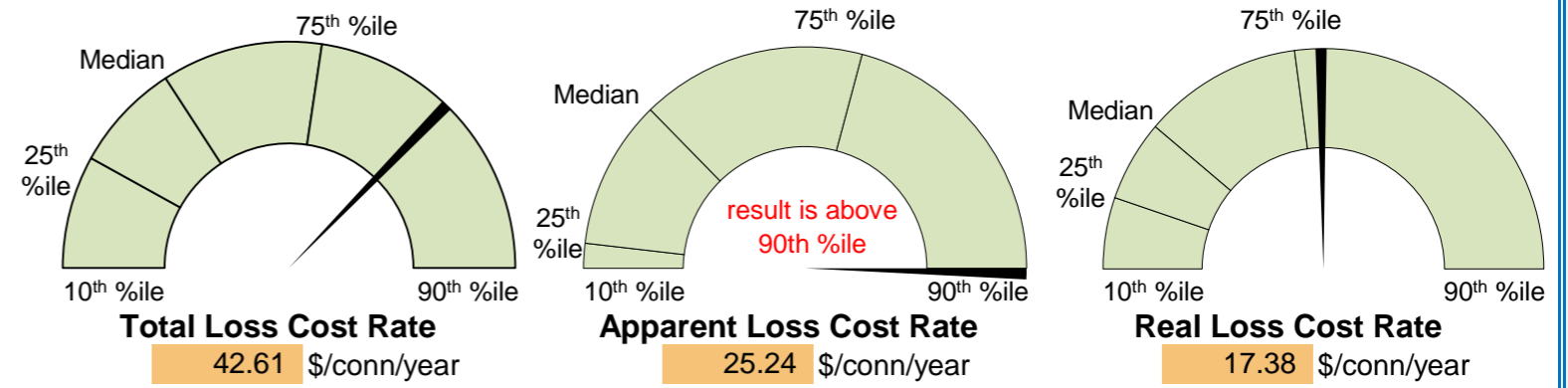


Actual KPI result

Key Performance Indicators

Target (see Worksheet)

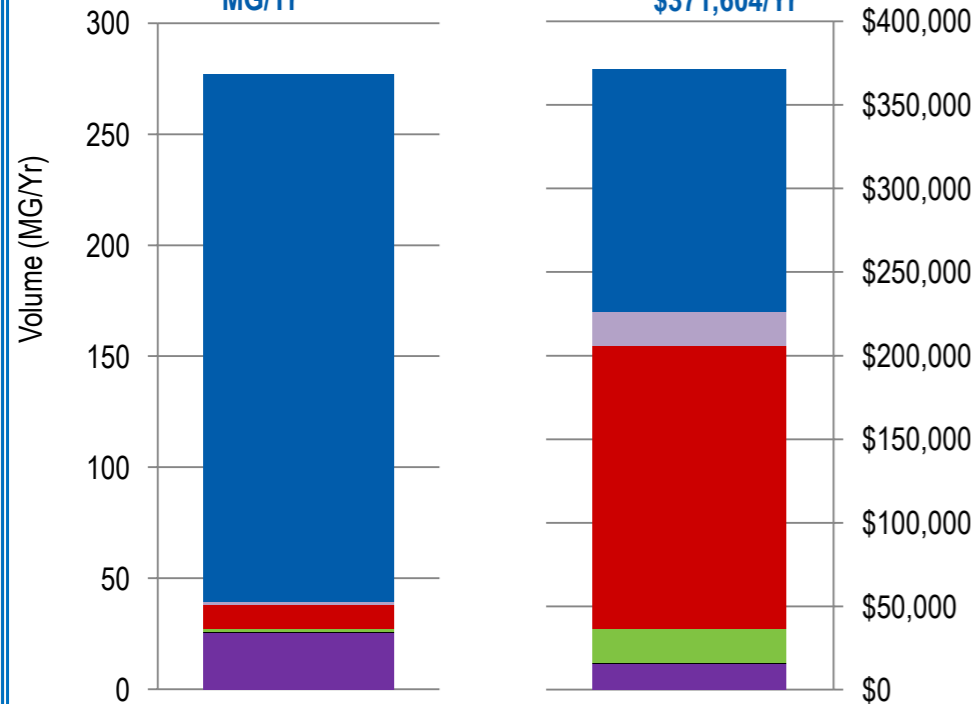
gauge %iles per validated industry ranges²



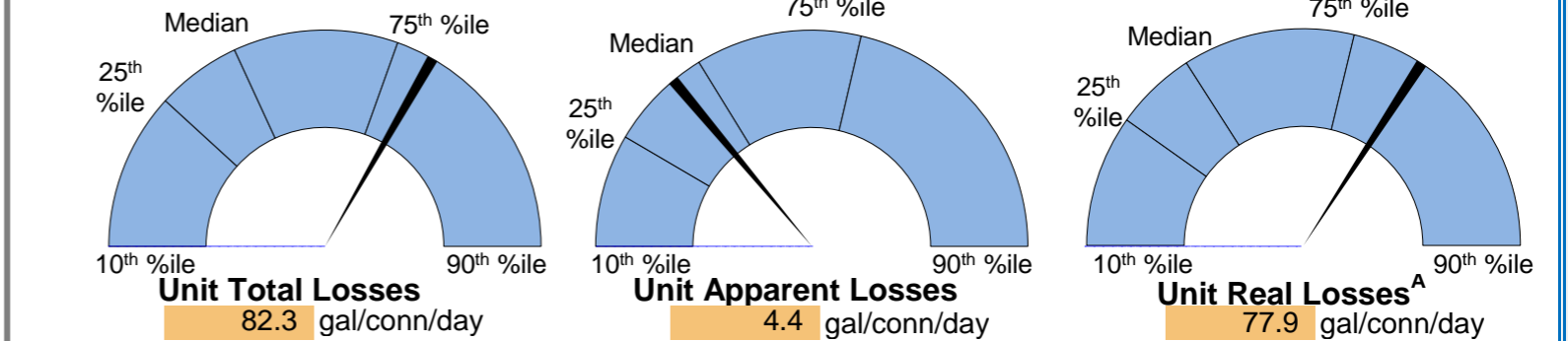
NRW Components Summary

Total Volume of NRW = 276 MG/Yr

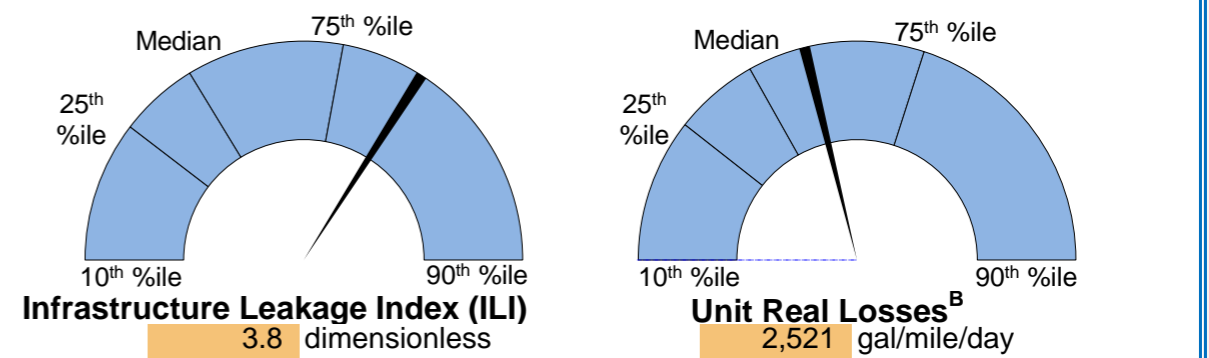
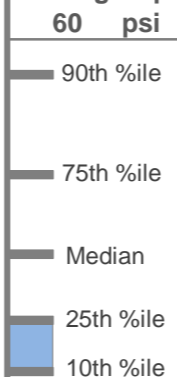
Total Cost of NRW = \$371,604/Yr



	Volume MG/Yr	Value \$/Yr	Basis of Valuation
Apparent Losses	13.5	\$210,682	CRUC
Real Losses	237.4	\$145,047	VPC
Unbilled Authorized Cons	26.0	\$15,874	VPC
Non-Revenue Water	276.8	\$371,604	Blended



Average Operating Pressure



See UARL definition for additional guidance on the ILI

(UARL) Unavoidable Annual Real Losses **62.1** MG/Yr **20.4** gal/conn/day

Guidance Information for Key Performance

- The eight indicators shown are the recommended suite per the AWWA Water Loss Control Committee 2020 Position on KPIs¹.
- A suite of KPIs is necessary, as no single KPI can holistically communicate water loss performance for a given water system.
- See Table 1 below for Uses and Limitations for each KPI, excerpted from the AWWA Water Loss Control Committee Report (2020)¹, with naming conventions updated.
- Percentiles (%iles) shown on KPI gauges come from Level 1 validated data in the AWWA WLCC Reference Water Audit Dataset (2020)².
- KPI %iles shown above are not segregated by cohorts. Limited KPI data by cohorts may be found in WRF 4695 Guidance Manual, Appendix B (2019)⁵.
- Actual KPI results that fall below 10th %ile or above 90th %ile do not necessarily imply error, but should be viewed with scrutiny.
- Percentiles not intended to imply targets. Targets may be input by user for operational KPIs, if desired, on Worksheet.
- See UARL and ILI in Definitions tab for discussion of size and pressure limitations.
- Systems that fall on the extreme ends of size or connection density should use caution when interpreting Unit Losses KPIs.



AWWA Free Water Audit Software: Worksheet

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American Water Works Association.
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Water Audit Report for: **Aqua Pennsylvania - Roaring Creek Division**

Audit Year: **2025** **Jan 01 2025 - Dec 31 2025** **2025**

To access definitions, click the [input name](#)

Click 'n' to add notes
Click 'g' to determine data validity grade

To edit water system info: [go to start page](#)

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

Water Supplied Error Adjustments

choose entry option:

VOS WI WE	Volume from Own Sources:	n g 6	2,099.403	MG/Yr	n g 4	2.00%	percent	under-registration	VOSEA WIEA WEEA
	Water Imported:	n g n/a	0.000	MG/Yr					
	Water Exported:	n g n/a	0.000	MG/Yr					
WATER SUPPLIED:			2,142.248	MG/Yr					

AUTHORIZED CONSUMPTION

choose entry option:

BMAC BUAC UMAC UUAC	Billed Metered:	n g 8	1,035.125	MG/Yr					
	Billed Unmetered:	n g n/a	0.000	MG/Yr					
	Unbilled Metered:	n g 4	126.978	MG/Yr					
	Unbilled Unmetered:	n g 3	2.588	MG/Yr	0.25%	default			
Default option selected for Unbilled Unmetered, with automatic data grading of 3									
AUTHORIZED CONSUMPTION:			1,164.691	MG/Yr					

WATER LOSSES

977.557 MG/Yr

Apparent Losses

Default option selected for Systematic Data Handling Errors, with automatic data grading of 3

choose entry option:

SDHE CMI UC	Systematic Data Handling Errors:	n g 3	2.588	MG/Yr	0.25%	default			
	Customer Metering Inaccuracies:	n g 6	23.716	MG/Yr	2.00%	percent	under-registration		
	Unauthorized Consumption:	n g 3	2.588	MG/Yr	0.25%	default			
Default option selected for Unauthorized Consumption, with automatic data grading of 3									
Apparent Losses:			28.892	MG/Yr					

Real Losses

Real Losses: 948.665 MG/Yr

WATER LOSSES: 977.557 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 1,107.123 MG/Yr

SYSTEM DATA

Lm Nc	Length of mains:	n g 7	349.0	miles	(including fire hydrant lead lengths)				
	Number of service connections:	n g 5	25,662		(active and inactive)				
	Service connection density:		74	conn./mile main					
Are customer meters typically located at the curbstop/property line?			No						
Lp	Average length of (private) customer service line:	n g 1	65.0	ft	(average distance between property line and meter)				
AOP	Average Operating Pressure:	n g 7	79.0	psi					

COST DATA

CRUC VPC	Customer Retail Unit Charge:	n g 5	\$16.25	\$/1000 gallons (US)	Total Annual Operating Cost				
	Variable Production Cost:	n g 9	\$611.00	\$/Million gallons	\$1,952,445 \$/yr (optional input)				

WATER AUDIT DATA VALIDITY TIER:

***** The Water Audit Data Validity Score is in Tier III (51-70). See Dashboard tab for additional outputs. *****

[go to dashboard](#)

A weighted scale for the components of supply, consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION TO IMPROVE DATA VALIDITY:

Based on the information provided, audit reliability can be most improved by addressing the following components:

- | |
|---------------------------------------|
| 1: Volume from Own Sources (VOS) |
| 2: Number of Service Connections (Nc) |
| 3: Customer Retail Unit Charge (CRUC) |

KEY PERFORMANCE INDICATOR TARGETS:

OPTIONAL: If targets exist for the operational performance indicators, they can be input below:

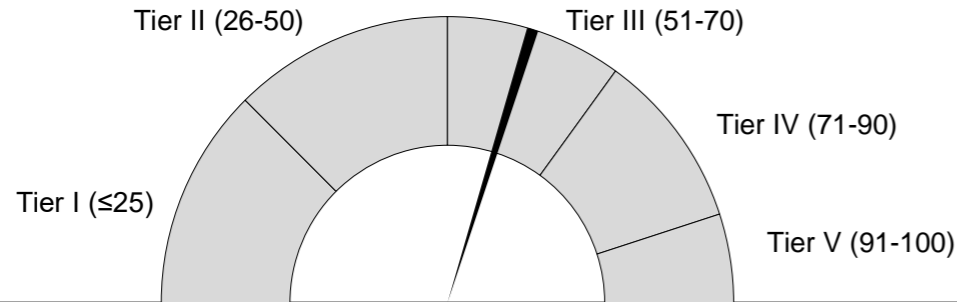
Unit Total Losses:	[input]	gal/conn/day
Unit Apparent Losses:	[input]	gal/conn/day
Unit Real Losses ^A :	[input]	gal/conn/day
Unit Real Losses ^B :	[input]	gal/mile/day

If entered above by user, targets will display on KPI gauges (see Dashboard)

Data Validity

Data Validity Score: **59** Data Validity Tier: **Tier III (51-70)**

See [Loss Control Planning](#) for Tier Details

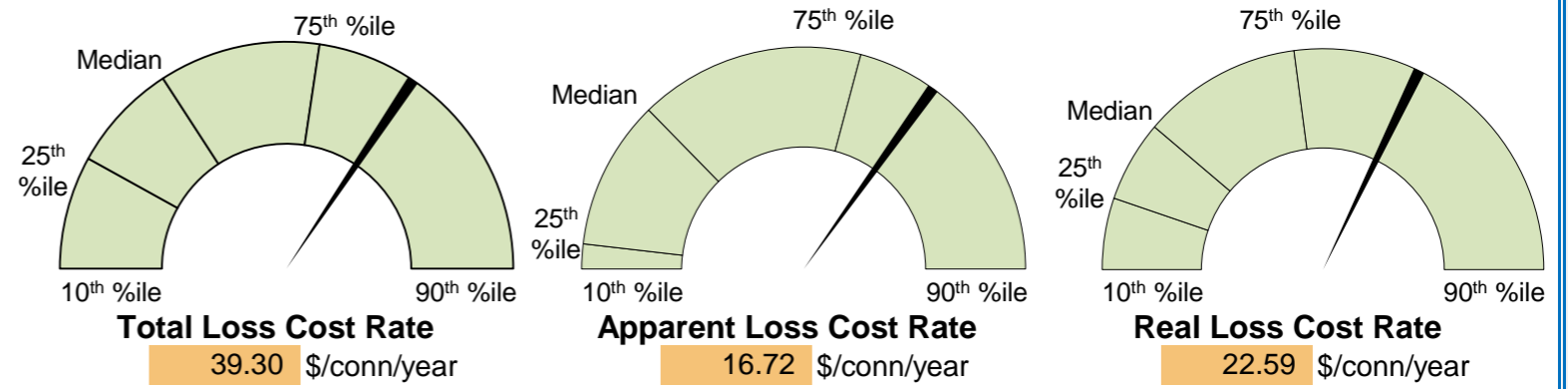


Actual KPI result

Key Performance Indicators

Target (see Worksheet)

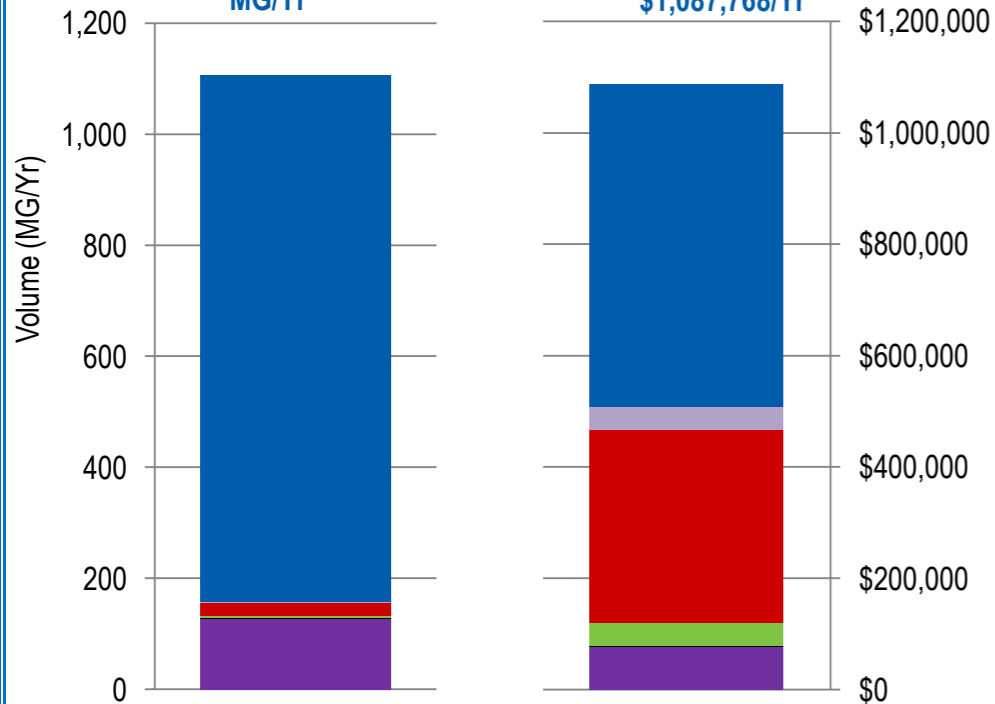
gauge %iles per validated industry ranges²



NRW Components Summary

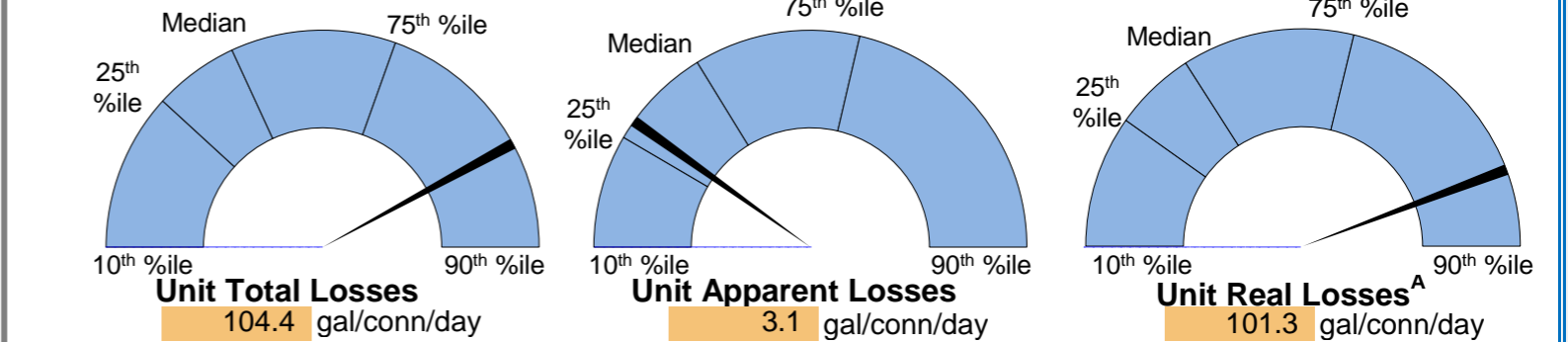
Total Volume of NRW = 1,105 MG/Yr

Total Cost of NRW = \$1,087,768/Yr

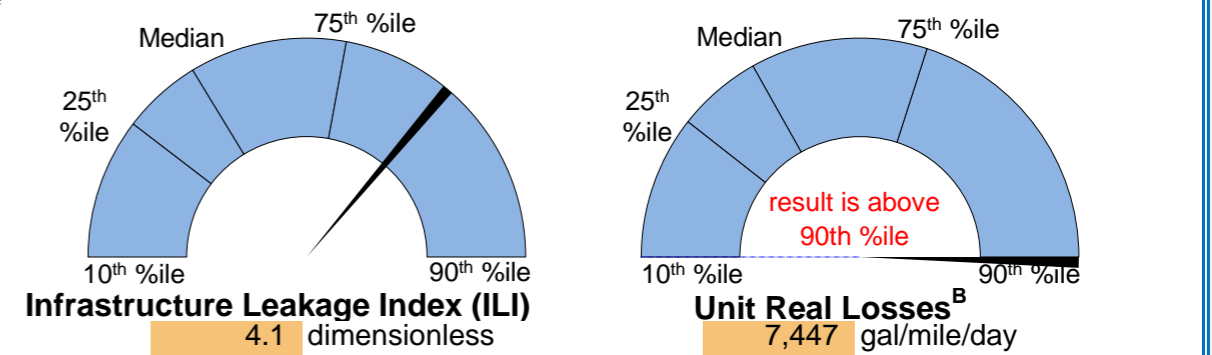
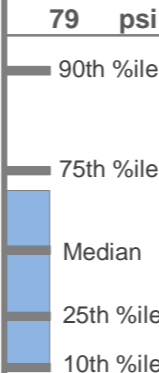


Component	Volume (MG/Yr)	Value (\$/Yr)	Basis of Valuation
Real Losses	948.7	\$579,634	VPC
Systematic Data Handling Errors	28.9	\$428,968	CRUC
Customer Metering Inaccuracies	129.6	\$79,165	VPC
Unauthorized Consumption	1,107.1	\$1,087,768	Blended
Unbilled Unmetered Auth Cons			
Unbilled Metered Authorized Cons			

Component	Volume (MG/Yr)	Value (\$/Yr)	Basis of Valuation
Apparent Losses	28.9	\$428,968	CRUC
Real Losses	948.7	\$579,634	VPC
Unbilled Authorized Cons	129.6	\$79,165	VPC
Non-Revenue Water	1,107.1	\$1,087,768	Blended



Average Operating Pressure



See UARL definition for additional guidance on the ILI

(UARL) Unavoidable Annual Real Losses **233.8** MG/Yr **25.0** gal/conn/day

Guidance Information for Key Performance

- The eight indicators shown are the recommended suite per the AWWA Water Loss Control Committee 2020 Position on KPIs¹.
- A suite of KPIs is necessary, as no single KPI can holistically communicate water loss performance for a given water system.
- See Table 1 below for Uses and Limitations for each KPI, excerpted from the AWWA Water Loss Control Committee Report (2020)¹, with naming conventions updated.
- Percentiles (%iles) shown on KPI gauges come from Level 1 validated data in the AWWA WLCC Reference Water Audit Dataset (2020)².
- KPI %iles shown above are not segregated by cohorts. Limited
- KPI data by cohorts may be found in WRF 4695 Guidance Manual, Appendix B (2019)⁵.
- Actual KPI results that fall below 10th %ile or above 90th %ile do not necessarily imply error, but should be viewed with scrutiny.
- Percentiles not intended to imply targets. Targets may be input by user for operational KPIs, if desired, on Worksheet.
- See UARL and ILI in Definitions tab for discussion of size and pressure limitations.
- Systems that fall on the extreme ends of size or connection density should use caution when interpreting Unit Losses KPIs.



AWWA Free Water Audit Software: Worksheet

FWAS v6.0
American Water Works Association.
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Water Audit Report for: **Aqua Pennsylvania - Shenango Division**

Audit Year: **2025** **Jan 01 2025 - Dec 31 2025** **2025**

To access definitions, click the [input name](#)

Click 'n' to add notes
Click 'g' to determine data validity grade

To edit water system info: [go to start page](#)

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

Water Supplied Error Adjustments

choose entry option:

WATER SUPPLIED													
VOS	Volume from Own Sources:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="6"/>	<input type="text" value="3,767.077"/>	MG/Yr	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="4"/>	<input type="text" value="2.00%"/>	percent	<input type="text" value="under-registration"/>	VOSEA
WI	Water Imported:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="6"/>	<input type="text" value="68.324"/>	MG/Yr	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="4"/>	<input type="text" value="2.00%"/>	percent	<input type="text" value="under-registration"/>	WIEA
WE	Water Exported:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="6"/>	<input type="text" value="101.490"/>	MG/Yr	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="4"/>	<input type="text" value="2.00%"/>	percent	<input type="text" value="under-registration"/>	WEEA
WATER SUPPLIED:					3,810.113	MG/Yr							

AUTHORIZED CONSUMPTION

BMAC	Billed Metered:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="8"/>	<input type="text" value="2,914.576"/>	MG/Yr							
BUAC	Billed Unmetered:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="n/a"/>	<input type="text" value="0.000"/>	MG/Yr							
UMAC	Unbilled Metered:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="4"/>	<input type="text" value="0.000"/>	MG/Yr							
UUAC	Unbilled Unmetered:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="3"/>	<input type="text" value="7.286"/>	MG/Yr							
Default option selected for Unbilled Unmetered, with automatic data grading of 3													
AUTHORIZED CONSUMPTION:					2,921.862	MG/Yr							

choose entry option:

WATER LOSSES

888.251 MG/Yr

Apparent Losses

Default option selected for Systematic Data Handling Errors, with automatic data grading of 3

SDHE	Systematic Data Handling Errors:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="3"/>	<input type="text" value="7.286"/>	MG/Yr							
CMI	Customer Metering Inaccuracies:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="6"/>	<input type="text" value="59.481"/>	MG/Yr							
UC	Unauthorized Consumption:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="3"/>	<input type="text" value="7.286"/>	MG/Yr							
Default option selected for Unauthorized Consumption, with automatic data grading of 3													
Apparent Losses:					74.054	MG/Yr							

choose entry option:

Real Losses

Real Losses: **814.197** MG/Yr

WATER LOSSES: **888.251** MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: **895.537** MG/Yr

SYSTEM DATA

Lm	Length of mains:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="7"/>	<input type="text" value="534.0"/>	miles	(including fire hydrant lead lengths)					
Nc	Number of service connections:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="5"/>	<input type="text" value="27,421"/>		(active and inactive)					
Service connection density:					51	conn./mile main						
Are customer meters typically located at the curbstop/property line?					<input type="text" value="No"/>							
Lp	Average length of (private) customer service line:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="1"/>	<input type="text" value="17.0"/>	ft	(average distance between property line and meter)					
AOP	Average Operating Pressure:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="7"/>	<input type="text" value="65.0"/>	psi						

COST DATA

CRUC	Customer Retail Unit Charge:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="5"/>	<input type="text" value="\$16.25"/>	\$/1000 gallons (US)	Total Annual Operating Cost					
VPC	Variable Production Cost:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="9"/>	<input type="text" value="\$611.00"/>	\$/Million gallons	<input type="text" value="\$3,503,382"/> \$/yr (optional input)					

WATER AUDIT DATA VALIDITY TIER:

***** The Water Audit Data Validity Score is in Tier III (51-70). See Dashboard tab for additional outputs. *****

[go to dashboard](#)

A weighted scale for the components of supply, consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION TO IMPROVE DATA VALIDITY:

Based on the information provided, audit reliability can be most improved by addressing the following components:

- | |
|--|
| 1: Volume from Own Sources (VOS) |
| 2: Billed Metered (BMAC) |
| 3: Number of Service Connections (Nc) |

KEY PERFORMANCE INDICATOR TARGETS:

OPTIONAL: If targets exist for the operational performance indicators, they can be input below:

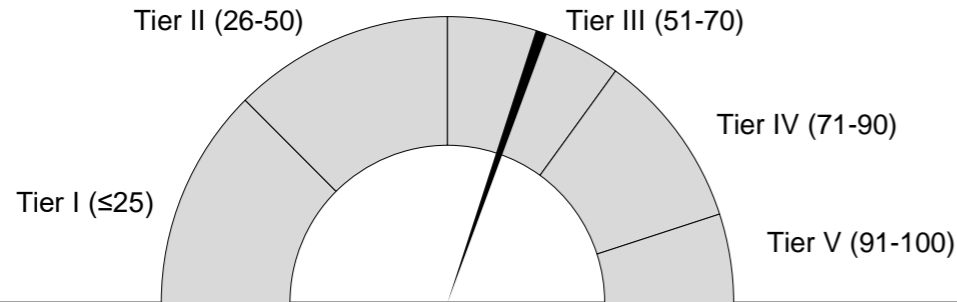
Unit Total Losses:	<input type="text"/>	gal/conn/day
Unit Apparent Losses:	<input type="text"/>	gal/conn/day
Unit Real Losses ^A :	<input type="text"/>	gal/conn/day
Unit Real Losses ^B :	<input type="text"/>	gal/mile/day

If entered above by user, targets will display on KPI gauges (see Dashboard)

Data Validity

Data Validity Score: **60** Data Validity Tier: **Tier III (51-70)**

See [Loss Control Planning](#) for Tier Details

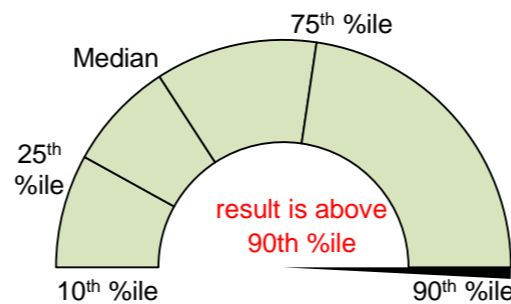


Actual KPI result

Key Performance Indicators

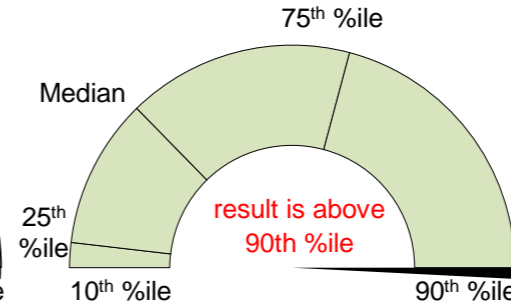
Target (see Worksheet)

gauge %iles per validated industry ranges²



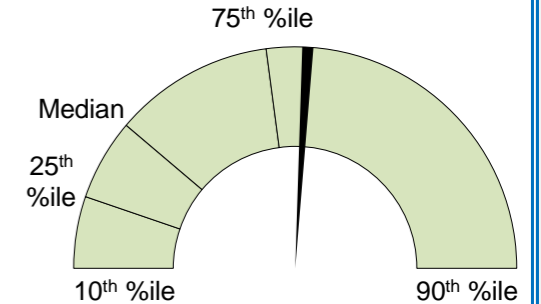
Total Loss Cost Rate

62.03 \$/conn/year



Apparent Loss Cost Rate

43.89 \$/conn/year



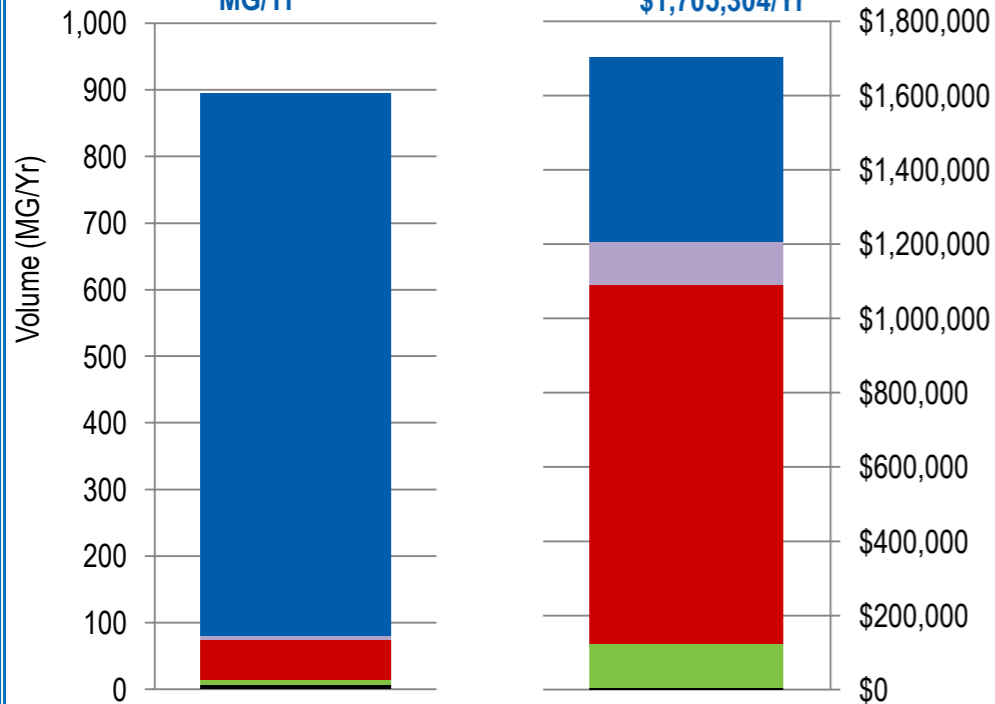
Real Loss Cost Rate

18.14 \$/conn/year

NRW Components Summary

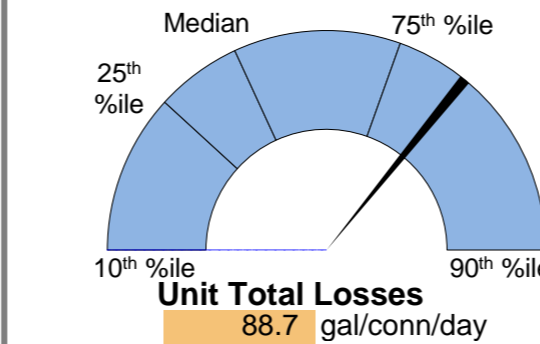
Total Volume of NRW = **896** MG/Yr

Total Cost of NRW = **\$1,705,304**/Yr



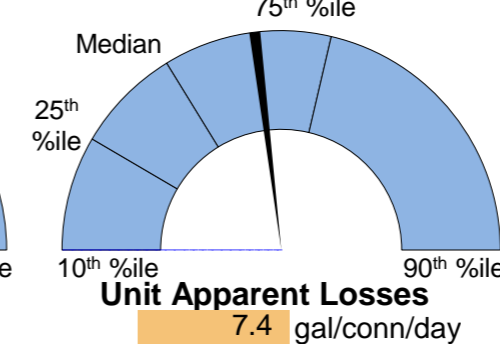
Real Losses	Unauthorized Consumption
Systematic Data Handling Errors	Unbilled Unmetered Auth Cons
Customer Metering Inaccuracies	Unbilled Metered Authorized Cons

	Volume MG/Yr	Value \$/Yr	Basis of Valuation
Apparent Losses	74.1	\$1,203,378	CRUC
Real Losses	814.2	\$497,474	VPC
Unbilled Authorized Cons	7.3	\$4,452	VPC
Non-Revenue Water	895.5	\$1,705,304	Blended



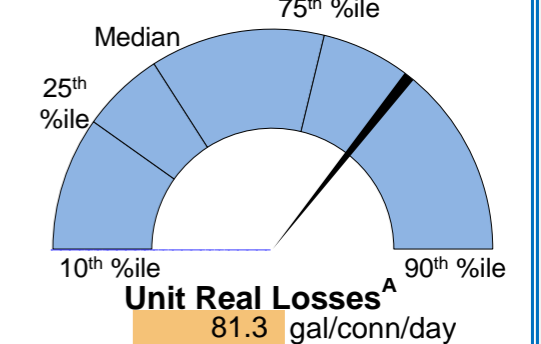
Unit Total Losses

88.7 gal/conn/day



Unit Apparent Losses

7.4 gal/conn/day

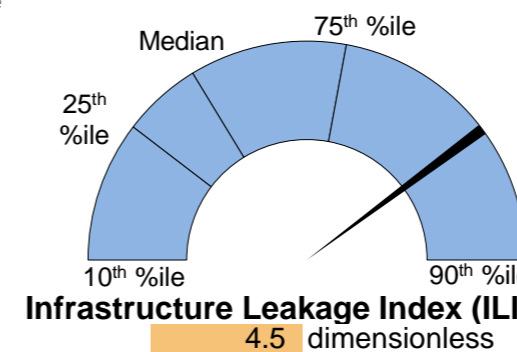
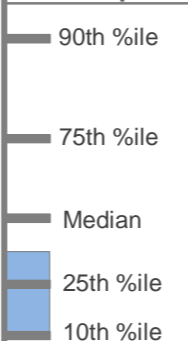


Unit Real Losses^A

81.3 gal/conn/day

Average Operating Pressure

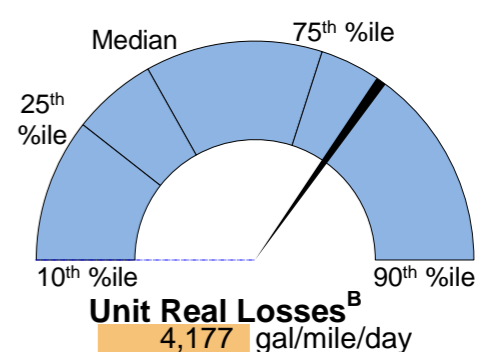
65 psi



Infrastructure Leakage Index (ILI)

4.5 dimensionless

See UARL definition for additional guidance on the ILI



Unit Real Losses^B

4,177 gal/mile/day

(UARL) Unavoidable Annual Real Losses **181.8** MG/Yr **18.2** gal/conn/day

Guidance Information for Key Performance

- The eight indicators shown are the recommended suite per the AWWA Water Loss Control Committee 2020 Position on KPIs¹.
- A suite of KPIs is necessary, as no single KPI can holistically communicate water loss performance for a given water system.
- See Table 1 below for Uses and Limitations for each KPI, excerpted from the AWWA Water Loss Control Committee Report (2020)¹, with naming conventions updated.
- Percentiles (%iles) shown on KPI gauges come from Level 1 validated data in the AWWA WLCC Reference Water Audit Dataset (2020)².
- KPI %iles shown above are not segregated by cohorts. Limited KPI data by cohorts may be found in WRF 4695 Guidance Manual, Appendix B (2019)⁵.
- Actual KPI results that fall below 10th %ile or above 90th %ile do not necessarily imply error, but should be viewed with scrutiny.
- Percentiles not intended to imply targets. Targets may be input by user for operational KPIs, if desired, on Worksheet.
- See UARL and ILI in Definitions tab for discussion of size and pressure limitations.
- Systems that fall on the extreme ends of size or connection density should use caution when interpreting Unit Losses KPIs.



AWWA Free Water Audit Software: Worksheet

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Water Audit Report for: **Aqua Pennsylvania - SEPA Division**
Audit Year: **2025** **Jan 01 2025 - Dec 31 2025** **2025**

To access definitions, click the [input name](#)
Click 'n' to add notes
Click 'g' to determine data validity grade
To edit water system info: [go to start page](#)
All volumes to be entered as: MILLION GALLONS (US) PER YEAR

Water Supplied Error Adjustments

WATER SUPPLIED

choose entry option:

VOS	Volume from Own Sources:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="6"/>	<input type="text" value="35,222.190"/>	MG/Yr	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="4"/>	<input type="text" value="2.00%"/>	<input type="text" value="percent"/>	<input type="text" value="under-registration"/>	VOSEA
WI	Water Imported:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="6"/>	<input type="text" value="1,242.148"/>	MG/Yr	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="4"/>	<input type="text" value="2.00%"/>	<input type="text" value="percent"/>	<input type="text" value="under-registration"/>	WIEA
WE	Water Exported:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="6"/>	<input type="text" value=""/>	MG/Yr							WEEA

WATER SUPPLIED: MG/Yr

AUTHORIZED CONSUMPTION

choose entry option:

BMAC	Billed Metered:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="8"/>	<input type="text" value="28,828.869"/>	MG/Yr							
BUAC	Billed Unmetered:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="n/a"/>	<input type="text" value="0.000"/>	MG/Yr							
UMAC	Unbilled Metered:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="n/a"/>	<input type="text" value="0.000"/>	MG/Yr							
UUAC	Unbilled Unmetered:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="3"/>	<input type="text" value="72.072"/>	MG/Yr				<input type="text" value="0.25%"/>	<input type="text" value="default"/>		

Default option selected for Unbilled Unmetered, with automatic data grading of 3

AUTHORIZED CONSUMPTION: MG/Yr

WATER LOSSES

MG/Yr

Apparent Losses

Default option selected for Systematic Data Handling Errors, with automatic data grading of 3

choose entry option:

SDHE	Systematic Data Handling Errors:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="3"/>	<input type="text" value="72.072"/>	MG/Yr	<input type="text" value="0.25%"/>	<input type="text" value="default"/>					
CMI	Customer Metering Inaccuracies:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="6"/>	<input type="text" value="588.344"/>	MG/Yr	<input type="text" value="2.00%"/>	<input type="text" value="percent"/>				<input type="text" value="under-registration"/>	
UC	Unauthorized Consumption:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="3"/>	<input type="text" value="72.072"/>	MG/Yr	<input type="text" value="0.25%"/>	<input type="text" value="default"/>					

Default option selected for Unauthorized Consumption, with automatic data grading of 3

Apparent Losses: MG/Yr

Real Losses

Real Losses: MG/Yr

WATER LOSSES: MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: MG/Yr

SYSTEM DATA

Lm	Length of mains:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="7"/>	<input type="text" value="5,866.0"/>	miles							(including fire hydrant lead lengths)
Nc	Number of service connections:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="5"/>	<input type="text" value="385,000"/>								(active and inactive)
	Service connection density:				<input type="text" value="66"/>	conn./mile main							
Lp	Are customer meters typically located at the curbstop/property line?				<input type="text" value="No"/>								
	Average length of (private) customer service line:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="1"/>	<input type="text" value="35.0"/>	ft							(average distance between property line and meter)
AOP	Average Operating Pressure:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="7"/>	<input type="text" value="60.0"/>	psi							

COST DATA

CRUC	Customer Retail Unit Charge:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="5"/>	<input type="text" value="\$16.25"/>	\$/1000 gallons (US)				Total Annual Operating Cost			
VPC	Variable Production Cost:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="9"/>	<input type="text" value="\$611.00"/>	\$/Million gallons				<input type="text" value="\$32,756,637"/>	\$/yr (optional input)		

WATER AUDIT DATA VALIDITY TIER:

***** The Water Audit Data Validity Score is in Tier III (51-70). See Dashboard tab for additional outputs. *****

[go to dashboard](#)

A weighted scale for the components of supply, consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION TO IMPROVE DATA VALIDITY:

Based on the information provided, audit reliability can be most improved by addressing the following components:

- 1: Volume from Own Sources (VOS)
- 2: Billed Metered (BMAC)
- 3: Number of Service Connections (Nc)

KEY PERFORMANCE INDICATOR TARGETS:

OPTIONAL: If targets exist for the operational performance indicators, they can be input below:

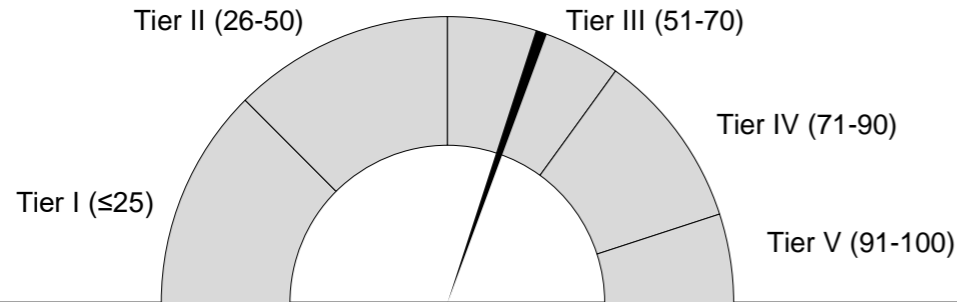
Unit Total Losses:	<input type="text" value=""/>	gal/conn/day
Unit Apparent Losses:	<input type="text" value=""/>	gal/conn/day
Unit Real Losses ^A :	<input type="text" value=""/>	gal/conn/day
Unit Real Losses ^B :	<input type="text" value=""/>	gal/mile/day

If entered above by user, targets will display on KPI gauges (see Dashboard)

Data Validity

Data Validity Score: **60** Data Validity Tier: **Tier III (51-70)**

See [Loss Control Planning](#) for Tier Details

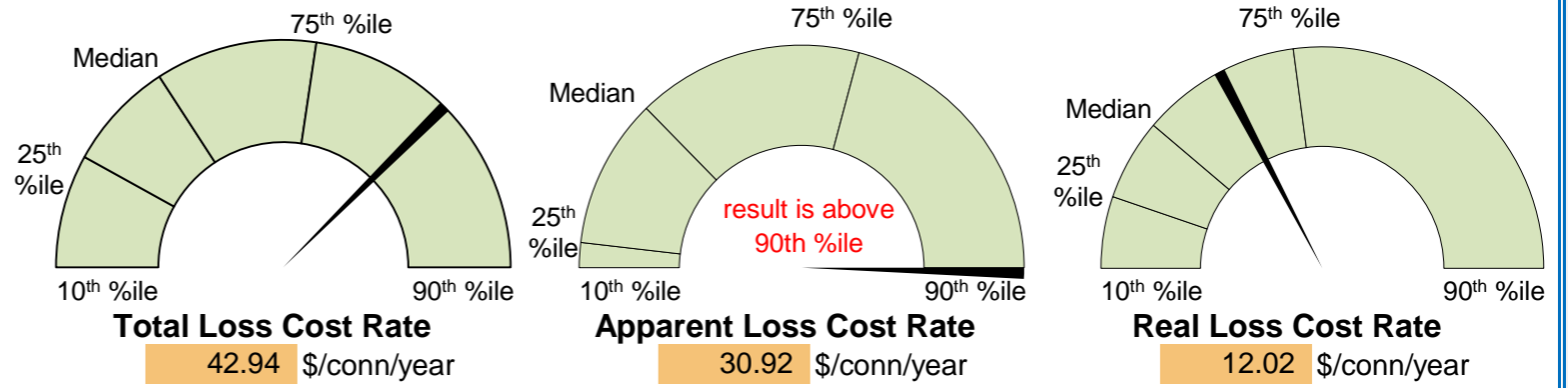


Actual KPI result

Key Performance Indicators

Target (see Worksheet)

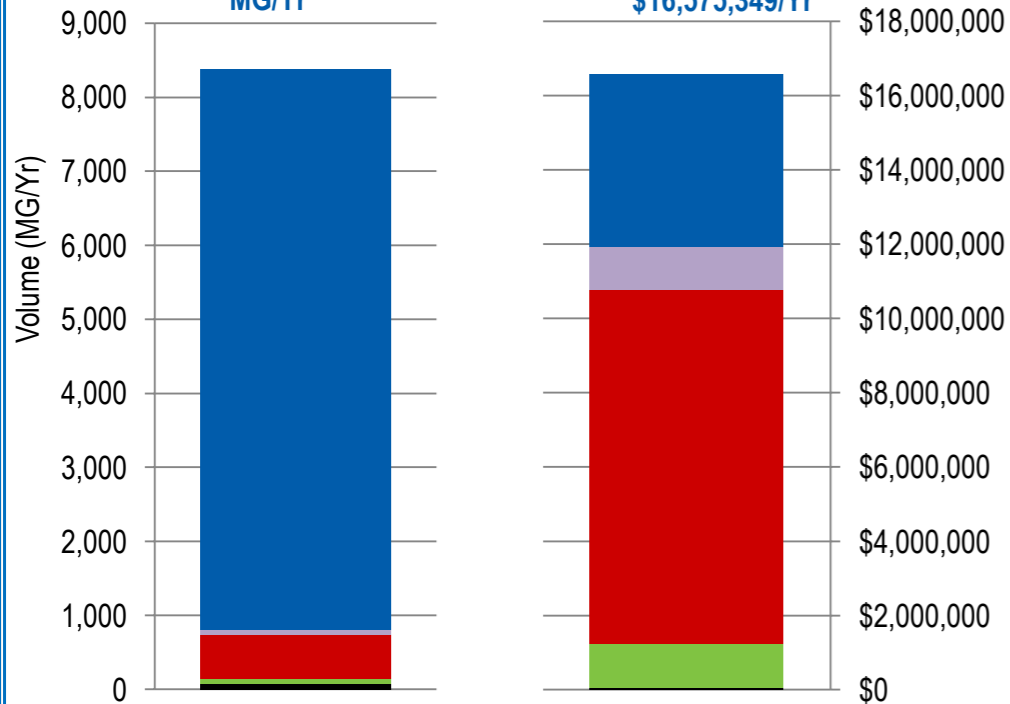
gauge %iles per validated industry ranges²



NRW Components Summary

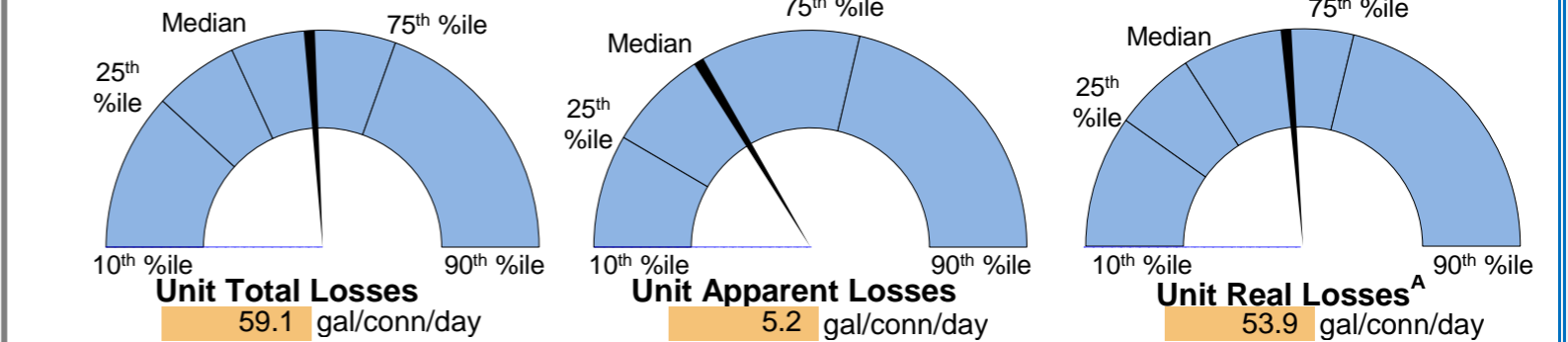
Total Volume of NRW = 8,380 MG/Yr

Total Cost of NRW = \$16,575,349/Yr

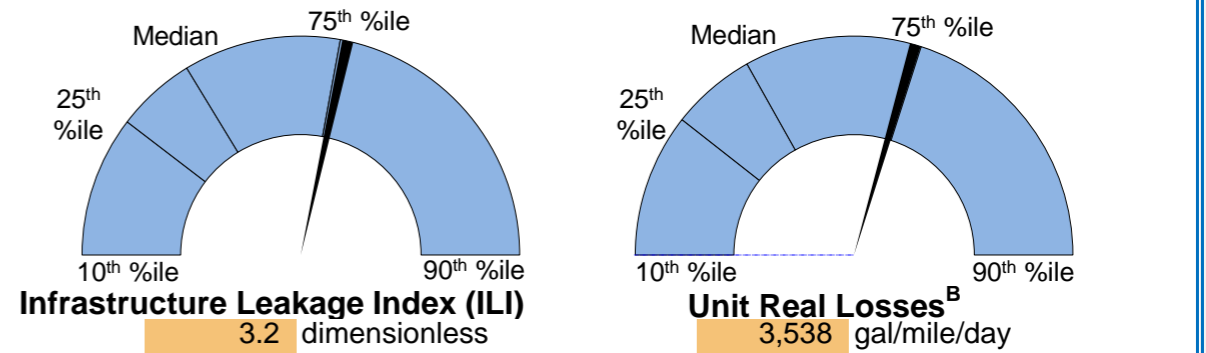
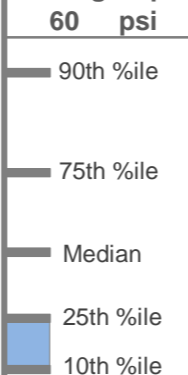


Real Losses	Systematic Data Handling Errors	Customer Metering Inaccuracies	Unauthorized Consumption	Unbilled Unmetered Auth Cons	Unbilled Metered Authorized Cons
-------------	---------------------------------	--------------------------------	--------------------------	------------------------------	----------------------------------

	Volume MG/Yr	Value \$/Yr	Basis of Valuation
Apparent Losses	732.5	\$11,902,940	CRUC
Real Losses	7,575.1	\$4,628,373	VPC
Unbilled Authorized Cons	72.1	\$44,036	VPC
Non-Revenue Water	8,379.6	\$16,575,349	Blended



Average Operating Pressure



See UARL definition for additional guidance on the ILI

(UARL) Unavoidable Annual Real Losses **2,378.9** MG/Yr **16.9** gal/conn/day

Guidance Information for Key Performance

- The eight indicators shown are the recommended suite per the AWWA Water Loss Control Committee 2020 Position on KPIs¹.
- A suite of KPIs is necessary, as no single KPI can holistically communicate water loss performance for a given water system.
- See Table 1 below for Uses and Limitations for each KPI, excerpted from the AWWA Water Loss Control Committee Report (2020)¹, with naming conventions updated.
- Percentiles (%iles) shown on KPI gauges come from Level 1 validated data in the AWWA WLCC Reference Water Audit Dataset (2020)².
- KPI %iles shown above are not segregated by cohorts. Limited KPI data by cohorts may be found in WRF 4695 Guidance Manual, Appendix B (2019)⁵.
- Actual KPI results that fall below 10th %ile or above 90th %ile do not necessarily imply error, but should be viewed with scrutiny.
- Percentiles not intended to imply targets. Targets may be input by user for operational KPIs, if desired, on Worksheet.
- See UARL and ILI in Definitions tab for discussion of size and pressure limitations.
- Systems that fall on the extreme ends of size or connection density should use caution when interpreting Unit Losses KPIs.



AWWA Free Water Audit Software: Worksheet

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Water Audit Report for: **Aqua Pennsylvania - Susquehanna Division**
 Audit Year: **2025** **Jan 01 2025 - Dec 31 2025** **2025**

To access definitions, click the [input name](#) Click 'n' to add notes Click 'g' to determine data validity grade To edit water system info: [go to start page](#)

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

Water Supplied Error Adjustments

WATER SUPPLIED

choose entry option:

VOS	Volume from Own Sources:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="6"/>	<input type="text" value="421.538"/>	MG/Yr	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="4"/>	<input type="text" value="2.00%"/>	<input type="text" value="percent"/>	<input type="text" value="under-registration"/>	
WI	Water Imported:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="n/a"/>	<input type="text" value="0.000"/>	MG/Yr							VOSEA
WE	Water Exported:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="n/a"/>	<input type="text" value="0.000"/>	MG/Yr							WIEA WEEA

WATER SUPPLIED: MG/Yr

AUTHORIZED CONSUMPTION

choose entry option:

BMAC	Billed Metered:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="8"/>	<input type="text" value="305.794"/>	MG/Yr						
BUAC	Billed Unmetered:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="n/a"/>	<input type="text" value="0.000"/>	MG/Yr						
UMAC	Unbilled Metered:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="4"/>	<input type="text" value="1.116"/>	MG/Yr						
UUAC	Unbilled Unmetered:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="3"/>	<input type="text" value="0.764"/>	MG/Yr						

Default option selected for Unbilled Unmetered, with automatic data grading of 3

AUTHORIZED CONSUMPTION: MG/Yr

WATER LOSSES

MG/Yr

Apparent Losses

Default option selected for Systematic Data Handling Errors, with automatic data grading of 3

choose entry option:

SDHE	Systematic Data Handling Errors:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="3"/>	<input type="text" value="0.764"/>	MG/Yr	<input type="text" value="0.25%"/>	<input type="text" value="default"/>					
CMI	Customer Metering Inaccuracies:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="6"/>	<input type="text" value="6.263"/>	MG/Yr	<input type="text" value="2.00%"/>	<input type="text" value="percent"/>					
UC	Unauthorized Consumption:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="3"/>	<input type="text" value="0.764"/>	MG/Yr	<input type="text" value="0.25%"/>	<input type="text" value="default"/>					

Default option selected for Unauthorized Consumption, with automatic data grading of 3

Apparent Losses: MG/Yr

Real Losses

Real Losses: MG/Yr

WATER LOSSES: MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: MG/Yr

SYSTEM DATA

Lm	Length of mains:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="7"/>	<input type="text" value="83.0"/>	miles	(including fire hydrant lead lengths)						
Nc	Number of service connections:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="5"/>	<input type="text" value="4,896"/>		(active and inactive)						
	Service connection density:					<input type="text" value="59"/>	conn./mile main						
Lp	Are customer meters typically located at the curbstop/property line?					<input type="text" value="No"/>							
	Average length of (private) customer service line:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="1"/>	<input type="text" value="20.0"/>	ft	(average distance between property line and meter)						
AOP	Average Operating Pressure:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="7"/>	<input type="text" value="85.0"/>	psi							

COST DATA

CRUC	Customer Retail Unit Charge:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="5"/>	<input type="text" value="\$16.25"/>	\$/1000 gallons (US)	Total Annual Operating Cost					
VPC	Variable Production Cost:	<input type="text" value="n"/>	<input type="text" value="g"/>	<input type="text" value="9"/>	<input type="text" value="\$611.00"/>	\$/Million gallons	<input type="text" value="\$392,030"/> \$/yr (optional input)					

WATER AUDIT DATA VALIDITY TIER:

***** The Water Audit Data Validity Score is in Tier III (51-70). See Dashboard tab for additional outputs. *****

[go to dashboard](#)

A weighted scale for the components of supply, consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION TO IMPROVE DATA VALIDITY:

Based on the information provided, audit reliability can be most improved by addressing the following components:

- | |
|---------------------------------------|
| 1: Volume from Own Sources (VOS) |
| 2: Billed Metered (BMAC) |
| 3: Number of Service Connections (Nc) |

KEY PERFORMANCE INDICATOR TARGETS:

OPTIONAL: If targets exist for the operational performance indicators, they can be input below:

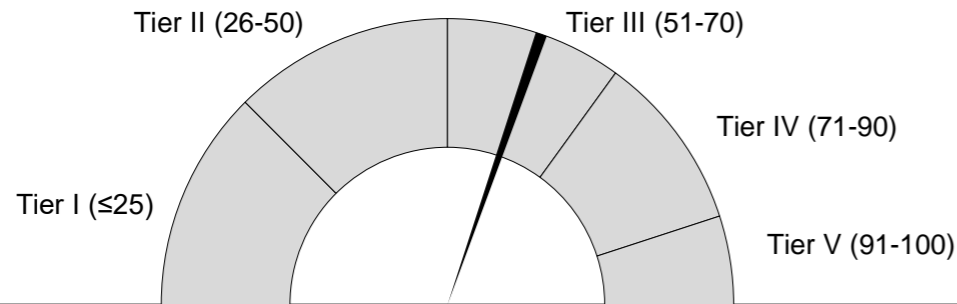
Unit Total Losses:	<input type="text"/>	gal/conn/day
Unit Apparent Losses:	<input type="text"/>	gal/conn/day
Unit Real Losses ^A :	<input type="text"/>	gal/conn/day
Unit Real Losses ^B :	<input type="text"/>	gal/mile/day

If entered above by user, targets will display on KPI gauges (see Dashboard)

Data Validity

Data Validity Score: **60** Data Validity Tier: **Tier III (51-70)**

See [Loss Control Planning](#) for Tier Details

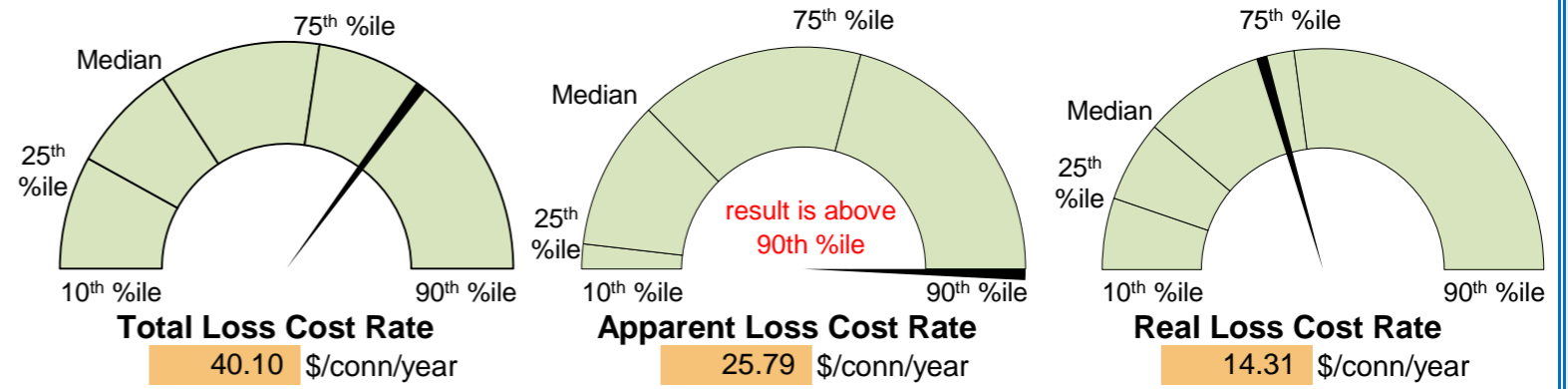


Actual KPI result

Key Performance Indicators

Target (see Worksheet)

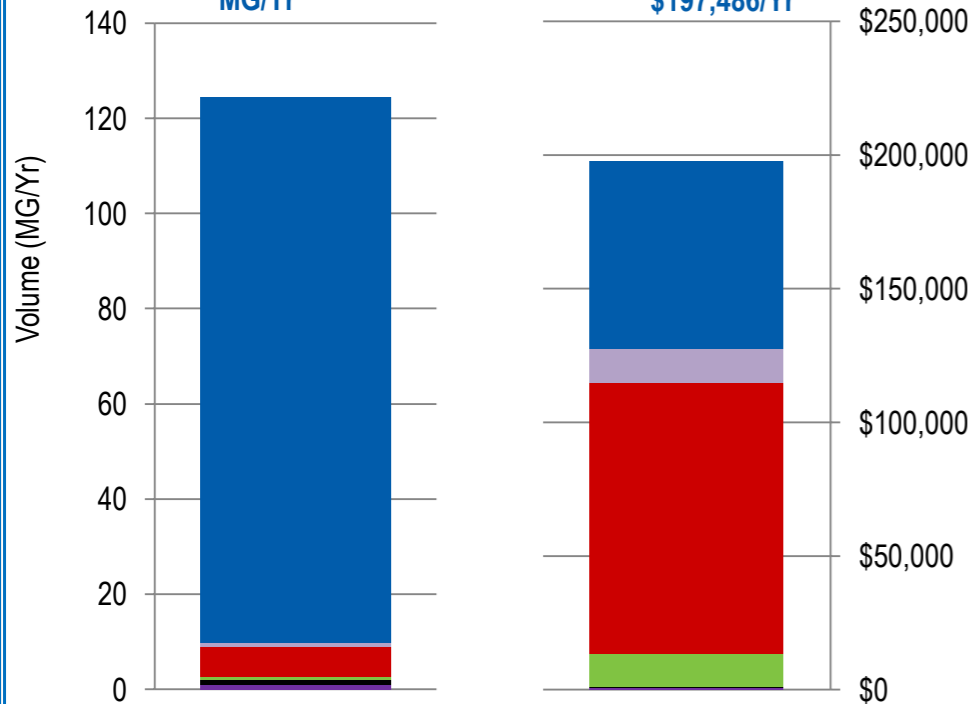
gauge %iles per validated industry ranges²



NRW Components Summary

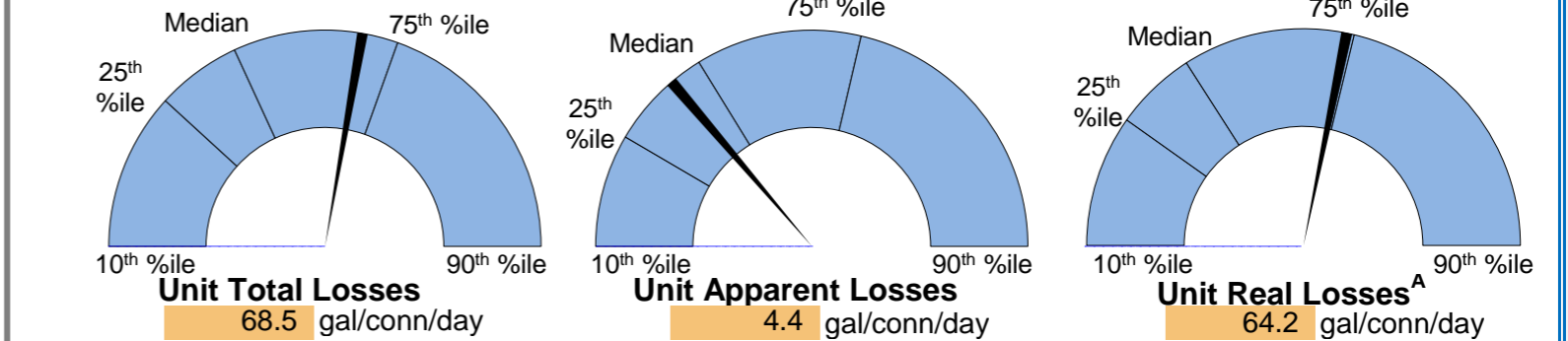
Total Volume of NRW = 124 MG/Yr

Total Cost of NRW = \$197,486/Yr

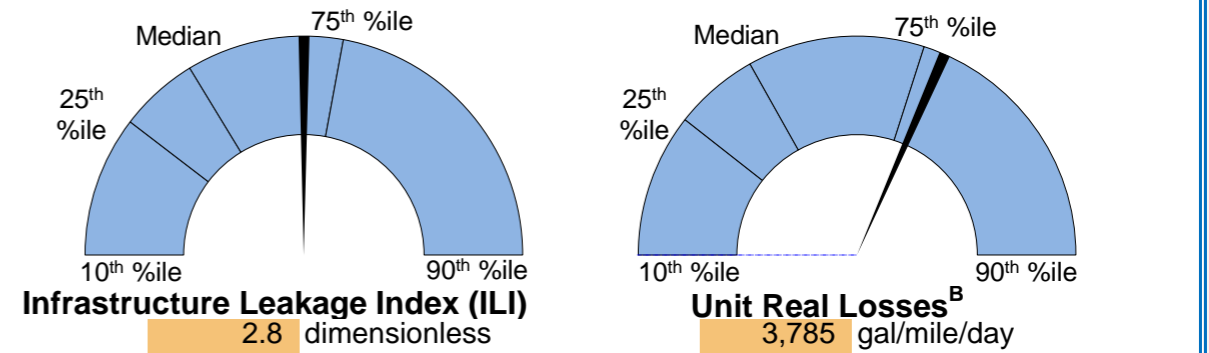
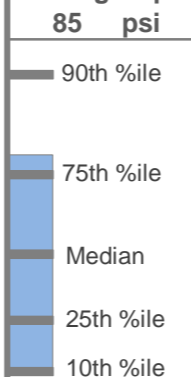


Real Losses	Unauthorized Consumption
Systematic Data Handling Errors	Unbilled Unmetered Auth Cons
Customer Metering Inaccuracies	Unbilled Metered Authorized Cons

	Volume MG/Yr	Value \$/Yr	Basis of Valuation
Apparent Losses	7.8	\$126,271	CRUC
Real Losses	114.7	\$70,066	VPC
Unbilled Authorized Cons	1.9	\$1,149	VPC
Non-Revenue Water	124.3	\$197,486	Blended



Average Operating Pressure



See UARL definition for additional guidance on the ILI

(UARL) Unavoidable Annual Real Losses **41.0** MG/Yr **23.0** gal/conn/day

Guidance Information for Key Performance

- The eight indicators shown are the recommended suite per the AWWA Water Loss Control Committee 2020 Position on KPIs¹.
- A suite of KPIs is necessary, as no single KPI can holistically communicate water loss performance for a given water system.
- See Table 1 below for Uses and Limitations for each KPI, excerpted from the AWWA Water Loss Control Committee Report (2020)¹, with naming conventions updated.
- Percentiles (%iles) shown on KPI gauges come from Level 1 validated data in the AWWA WLCC Reference Water Audit Dataset (2020)².
- KPI %iles shown above are not segregated by cohorts. Limited KPI data by cohorts may be found in WRF 4695 Guidance Manual, Appendix B (2019)⁵.
- Actual KPI results that fall below 10th %ile or above 90th %ile do not necessarily imply error, but should be viewed with scrutiny.
- Percentiles not intended to imply targets. Targets may be input by user for operational KPIs, if desired, on Worksheet.
- See UARL and ILI in Definitions tab for discussion of size and pressure limitations.
- Systems that fall on the extreme ends of size or connection density should use caution when interpreting Unit Losses KPIs.



AWWA Free Water Audit Software: Worksheet

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Water Audit Report for: **Aqua Pennsylvania - Whitehaven Division**
 Audit Year: **2025** **Jan 01 2025 - Dec 31 2025** **2025**

To access definitions, click the [input name](#) Click 'n' to add notes Click 'g' to determine data validity grade To edit water system info: [go to start page](#)

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

Water Supplied Error Adjustments

choose entry option:

VOS WI WE	Volume from Own Sources: Water Imported: Water Exported:	n g 6 n g 6 n g 6	509.360 21.540 0.109	MG/Yr MG/Yr MG/Yr	n g 4 n g 4 n g 4	2.00% 2.00% 2.00%	percent percent percent	under-registration under-registration under-registration	VOSEA WIEA WEEA
WATER SUPPLIED:					541.623 MG/Yr				

AUTHORIZED CONSUMPTION

choose entry option:

BMAC BUAC UMAC UUAC	Billed Metered: Billed Unmetered: Unbilled Metered: Unbilled Unmetered:	n g 8 n g 10 n g 4 n g 6	345.131 0.402 0.829 8.631	MG/Yr MG/Yr MG/Yr MG/Yr	custom	8.631	MG/Yr		
AUTHORIZED CONSUMPTION:					354.993 MG/Yr				

WATER LOSSES

186.630 MG/Yr

Apparent Losses

Default option selected for Systematic Data Handling Errors, with automatic data grading of 3

choose entry option:

SDHE CMI UC	Systematic Data Handling Errors: Customer Metering Inaccuracies: Unauthorized Consumption:	n g 3 n g 6 n g 3	0.864 7.060 0.864	MG/Yr MG/Yr MG/Yr	0.25% 2.00% 0.25%	default percent default	under-registration		
Apparent Losses:					8.788 MG/Yr				

Real Losses

Real Losses: 177.842 MG/Yr

WATER LOSSES: 186.630 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 196.090 MG/Yr

SYSTEM DATA

Lm Nc	Length of mains: Number of service connections: Service connection density:	n g 7 n g 5	187.0 8,085 43	miles conn./mile main	(including fire hydrant lead lengths) (active and inactive)
Lp	Are customer meters typically located at the curbstop/property line? Average length of (private) customer service line:	No n g 1	34.0	ft	(average distance between property line and meter)
AOP	Average Operating Pressure:	n g 7	69.0	psi	

COST DATA

CRUC VPC	Customer Retail Unit Charge: Variable Production Cost:	n g 5 n g 9	\$16.25 \$611.00	\$/1000 gallons (US) \$/Million gallons	Total Annual Operating Cost	\$473,705 \$/yr (optional input)
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WATER AUDIT DATA VALIDITY TIER:

***** The Water Audit Data Validity Score is in Tier III (51-70). See Dashboard tab for additional outputs. *****

[go to dashboard](#)

A weighted scale for the components of supply, consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION TO IMPROVE DATA VALIDITY:

Based on the information provided, audit reliability can be most improved by addressing the following components:

- | |
|---------------------------------------|
| 1: Volume from Own Sources (VOS) |
| 2: Billed Metered (BMAC) |
| 3: Number of Service Connections (Nc) |

KEY PERFORMANCE INDICATOR TARGETS:

OPTIONAL: If targets exist for the operational performance indicators, they can be input below:

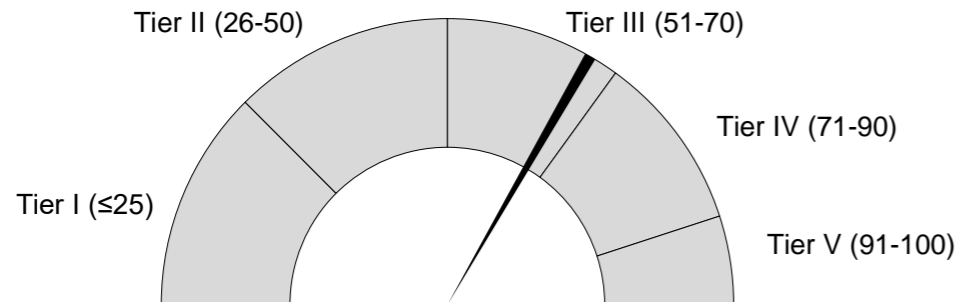
Unit Total Losses:	<input type="text"/>	gal/conn/day
Unit Apparent Losses:	<input type="text"/>	gal/conn/day
Unit Real Losses ^A :	<input type="text"/>	gal/conn/day
Unit Real Losses ^B :	<input type="text"/>	gal/mile/day

If entered above by user, targets will display on KPI gauges (see Dashboard)

Data Validity

Data Validity Score: **66** Data Validity Tier: **Tier III (51-70)**

See [Loss Control Planning](#) for Tier Details

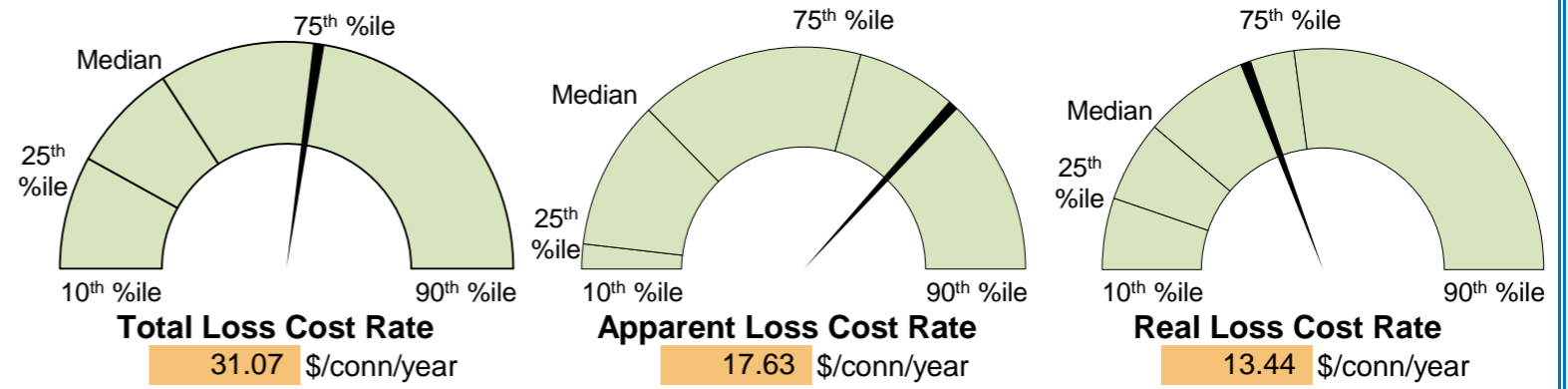


Actual KPI result

Key Performance Indicators

Target (see Worksheet)

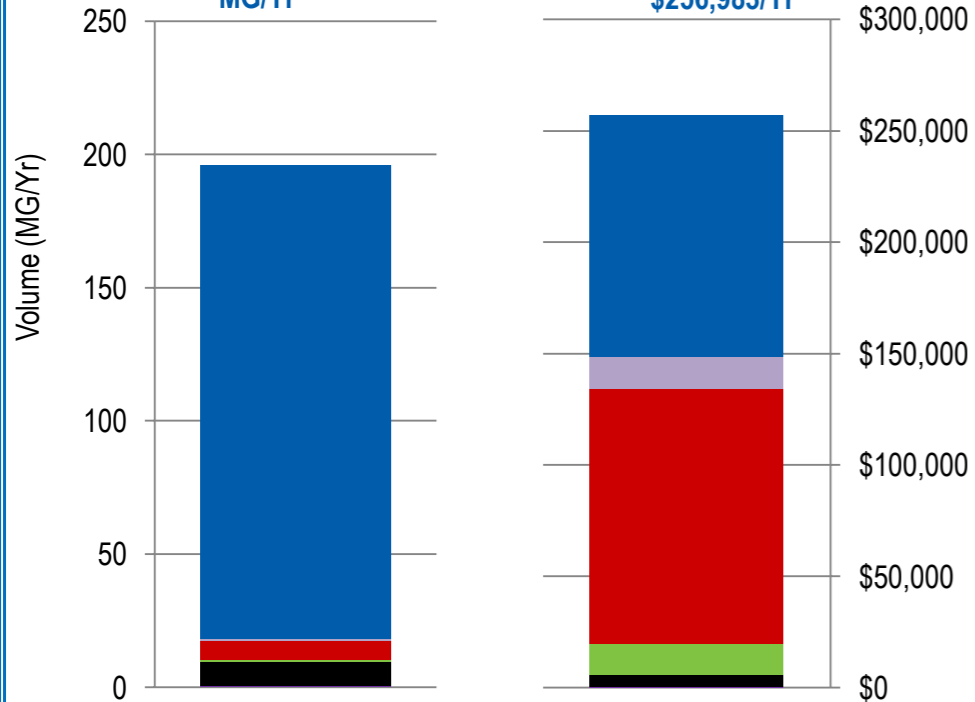
gauge %iles per validated industry ranges²



NRW Components Summary

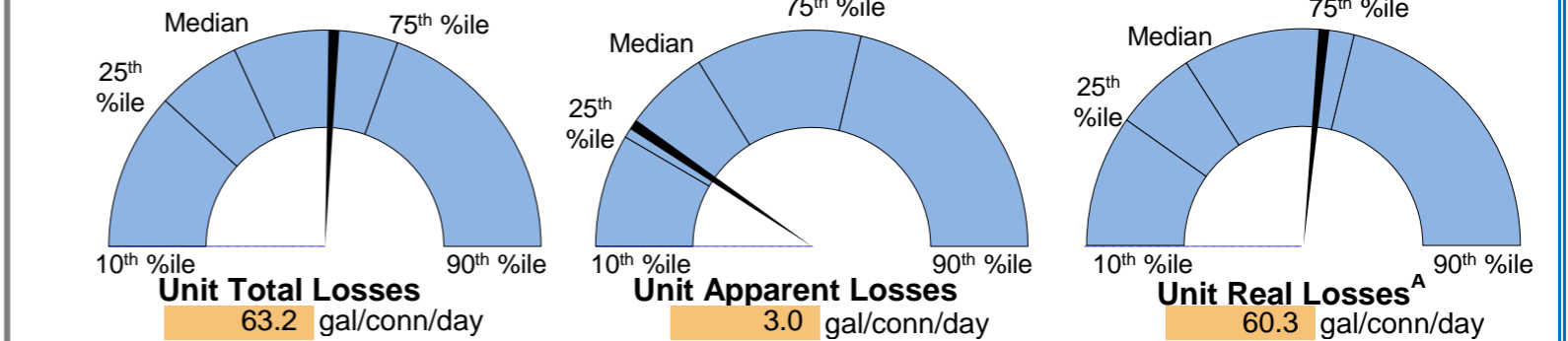
Total Volume of NRW = 196 MG/Yr

Total Cost of NRW = \$256,983/Yr

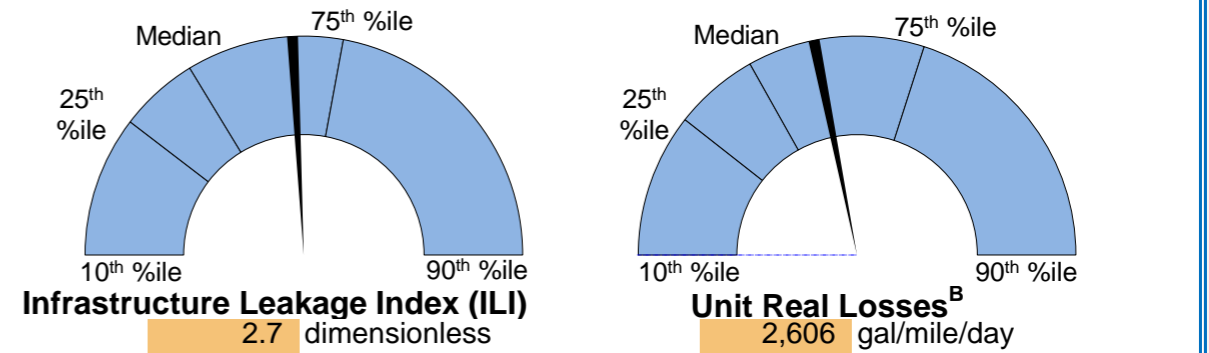
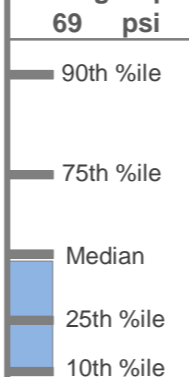


Real Losses	Unauthorized Consumption
Systematic Data Handling Errors	Unbilled Unmetered Auth Cons
Customer Metering Inaccuracies	Unbilled Metered Authorized Cons

	Volume MG/Yr	Value \$/Yr	Basis of Valuation
Apparent Losses	8.8	\$142,542	CRUC
Real Losses	177.8	\$108,662	VPC
Unbilled Authorized Cons	9.5	\$5,780	VPC
Non-Revenue Water	196.1	\$256,983	Blended



Average Operating Pressure



See UARL definition for additional guidance on the ILI

(UARL) Unavoidable Annual Real Losses **65.9** MG/Yr **22.3** gal/conn/day

Guidance Information for Key Performance

- The eight indicators shown are the recommended suite per the AWWA Water Loss Control Committee 2020 Position on KPIs¹.
- A suite of KPIs is necessary, as no single KPI can holistically communicate water loss performance for a given water system.
- See Table 1 below for Uses and Limitations for each KPI, excerpted from the AWWA Water Loss Control Committee Report (2020)¹, with naming conventions updated.
- Percentiles (%iles) shown on KPI gauges come from Level 1 validated data in the AWWA WLCC Reference Water Audit Dataset (2020)².
- KPI %iles shown above are not segregated by cohorts. Limited KPI data by cohorts may be found in WRF 4695 Guidance Manual, Appendix B (2019)⁵.
- Actual KPI results that fall below 10th %ile or above 90th %ile do not necessarily imply error, but should be viewed with scrutiny.
- Percentiles not intended to imply targets. Targets may be input by user for operational KPIs, if desired, on Worksheet.
- See UARL and ILI in Definitions tab for discussion of size and pressure limitations.
- Systems that fall on the extreme ends of size or connection density should use caution when interpreting Unit Losses KPIs.