

3/12/2025



Newtown Artesian Water Company 2025 Water Audit

Attached with this letter is the completed 2025 Water Audit for Newtown Artesian Water Company, docket number M-2026-3059580.

Please contact me with any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Pierone", with a long horizontal flourish extending to the right.

Richard Pierone
Director of Operations
201 N. Lincoln Avenue
Newtown, PA 18940
Richard.Pierone@Newtownwater.com
215.968.6781



AWWA Free Water Audit Software v6.1

FWAS v6.1

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This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format and is not meant to take the place of a full-scale, comprehensive water audit format. Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targeting loss reduction levels. This tool contains several separate worksheets. Sheets can be accessed using the tabs at the bottom of the screen, or by clicking the TOC links below.

Table of Contents (TOC)

- Start Page** The current sheet. Enter contact information and basic audit details.
- Worksheet** Enter the required data on this worksheet to calculate the water balance and data grading.
- Interactive Data Grading** Answer questions about operational practices for each audit input, and the data validity grades will automatically populate.
- Dashboard** Review NRW components, performance indicators and graphical outputs to evaluate the results of the audit.
- Notes** Enter notes to explain how values were calculated, document data sources, and related information about data management practices.
- Blank Sheet** By popular demand! A blank sheet. The world is your canvas.
- Water Balance** The values entered in the Worksheet automatically populate the Water Balance.
- Carbon Calculations** An **optional** component to enter information on the utility's carbon intensity and calculation of carbon reduction through leakage reduction
- Carbon Balance** The values entered in the Worksheet and optional Carbon Calculations automatically populate the Carbon Balance.
- Loss Control Planning** Use this sheet to interpret the results of the audit validity score and performance indicators.
- Definitions** Use this sheet to understand the terms used in the audit process.
- Service Connection Diagram** Diagrams depicting possible customer service connection line configurations.
- Acknowledgements** Acknowledgements for development of the AWWA Free Water Audit Software v6.1.

AWWA Web Resources for Water Loss Control

<https://www.awwa.org/resource/water-loss-control/>

Items referenced in the Free Water Audit Software v6.0 on the web:

- Data Grading Matrix v6.0
- Example Water Audit v6.0
- Water Audit Compiler v6.0
- AWWA Reports on Performance Indicators
- M36 Manual
- Leakage Emissions Initiative - Water Loss Control Committee Report¹⁰

If you have questions or comments regarding this software please contact us at: wl@awwa.org

Enter Basic Information

Name of Utility:	Newtown Artesian Water Company
Name of Contact Person:	Richard Pierone
Email:	Richard.Pierone@Newtownwater.com
Telephone Ext.:	215-968-6781
City/Town/Municipality:	Newtown
State / Province:	Pennsylvania (PA)
Country:	United States of America
Audit Preparation Date:	Feb 18 2026
Audit Year:	2025
Audit Year Label:	Calendar (Fiscal, Calendar, etc)
Audit Period Start Date:	Jan 01 2025
Audit Period End Date:	Dec 31 2025
Volume Reporting Units:	Million gallons (US)
Water System Structure:	Retail
Water Type:	Potable Water
System ID Number:	1090043
Validator Name/ID:	
Validator Email:	
Estimated Total Population Served by Water Utility:	38,000

Key of Input Acronyms *In order of appearance in the Worksheet*

- VOS** Volume from Own Sources
- VOSEA** VOS Error Adjustment
- WI** Water Imported
- WIEA** WI Error Adjustment
- WE** Water Exported
- WEEA** WE Error Adjustment
- BMAC** Billed Metered Authorized Consumption
- BUAC** Billed Unmetered Authorized Consumption
- UMAC** Unbilled Metered Authorized Consumption
- UUAC** Unbilled Unmetered Authorized Consumption
- SDHE** Systematic Data Handling Errors
- CMI** Customer Metering Inaccuracies
- UC** Unauthorized Consumption
- Lm** Length of mains
- Nc** Number of service connections
- Lp** Average length of (private) customer service line
- AOP** Average Operating Pressure
- CRUC** Customer Retail Unit Charge
- VPC** Variable Production Cost

Color Key

User input Calculated Optional default

Guidance for the Worksheet

Choosing to enter unit of **percent** or **volume** (applies to VOSEA, WIEA, WEEA, CMI)

choose entry option:

1.00%	percent	or	25.000
	volume		

Choosing to enter **default** or **custom input** (applies to UUAC, SDHE, UC)

choose entry option:

0.25%	default	or	75.000
	custom		

Guidance for the Interactive Data Grading

Use acronym buttons in IDG header to navigate among inputs. Acronym Key above. White = needs answers, orange = complete, clear = not required. Example below.

VOS	VOSEA	WI	WIEA	WE	WEEA	BMAC	BUAC	UMAC	UUAC
SDHE	CMI	UC	Lm	Nc	Lp	AOP	CRUC	VPC	

After clicking an acronym button, answer all visible questions in the order they're presented, choosing best-fit answer

Grade will populate when all visible questions are complete for an input

The limiting criteria will be labeled along the right. If only 1 limiting criterion is shown, improving on that criterion will achieve a higher data grade. If multiple limiting criteria are shown, improving on *each* limiting criterion is necessary to achieve a higher data grade. A complete inventory of data grading criteria is available in the Data Grading Matrix v6.0 (see web resources)

Limiting



AWWA Free Water Audit Software: Worksheet

FWAS v6.1
American Water Works Association.
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Water Audit Report for: **Newtown Artesian Water Company**
 Audit Year: **2025** | **Jan 01 2025 - Dec 31 2025** | **Calendar**

Click 'n' to add notes | Click 'g' to determine data validity grade | To edit water system info: [go to start page](#)

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

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

Water Supplied Error Adjustments

choose entry option:

WATER SUPPLIED	Volume from Own Sources: <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="7"/> <input type="text" value="227.551"/> MG/Yr Water Imported: <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="7"/> <input type="text" value="506.709"/> MG/Yr 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	<input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="8"/> <input type="text" value="3.92%"/> percent <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="9"/> <input type="text" value="0.15%"/> percent	<input type="text" value="under-registration"/> VOSEA <input type="text" value="over-registration"/> WIEA <input type="text" value=""/> WEEA
WATER SUPPLIED: 742.785 MG/Yr			

AUTHORIZED CONSUMPTION

AUTHORIZED CONSUMPTION	Billed Metered: <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="7"/> <input type="text" value="706.482"/> MG/Yr 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 Unbilled Metered: <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="10"/> <input type="text" value="4.098"/> MG/Yr Unbilled Unmetered: <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="10"/> <input type="text" value="6.803"/> MG/Yr	choose entry option: <input type="text" value="custom"/> <input type="text" value="6.803"/> MG/Yr	
AUTHORIZED CONSUMPTION: 717.383 MG/Yr			

WATER LOSSES

Apparent Losses

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

Apparent Losses	Systematic Data Handling Errors: <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="3"/> <input type="text" value="1.766"/> MG/Yr Customer Metering Inaccuracies: <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="9"/> <input type="text" value="7.540"/> MG/Yr Unauthorized Consumption: <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="3"/> <input type="text" value="1.766"/> MG/Yr	choose entry option: <input type="text" value="0.25%"/> default <input type="text" value="1.05%"/> percent <input type="text" value="0.25%"/> default	<input type="text" value="under-registration"/>
Apparent Losses: 11.073 MG/Yr			

Real Losses

Real Losses: MG/Yr

WATER LOSSES: 25.402 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 36.303 MG/Yr

SYSTEM DATA

Lm	Length of mains: <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="10"/> <input type="text" value="137.8"/> 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="8"/> <input type="text" value="10,750"/>		(active and inactive)
	Service connection density: <input type="text" value="78"/> 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="10"/> <input type="text" value="68.8"/> 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="76.0"/> psi		

COST DATA

CRUC	Customer Retail Unit Charge: <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="9"/> <input type="text" value="\$7.68"/> \$/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="8"/> <input type="text" value="\$2,959.81"/> \$/Million gallons		<input type="text" value=""/> \$/yr (optional input)

Click here to calculate carbon emissions ---> [carbon](#)

WATER AUDIT DATA VALIDITY TIER:

***** The Water Audit Data Validity Score is in Tier IV (71-90). 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: Water Imported (WI)
- 2: Billed Metered (BMAC)
- 3: Volume from Own Sources (VOS)

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 ¹ :	<input type="text" value=""/>	gal/conn/day
Unit Real Losses ² :	<input type="text" value=""/>	gal/mile/day

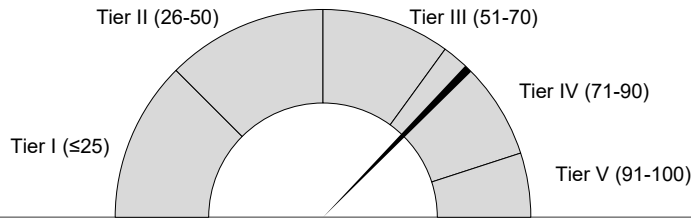
If entered above by user, targets will display on KPI gauges (see Dashboard)



Data Validity

Data Validity Score: **74** Data Validity Tier: **Tier IV (71-90)**

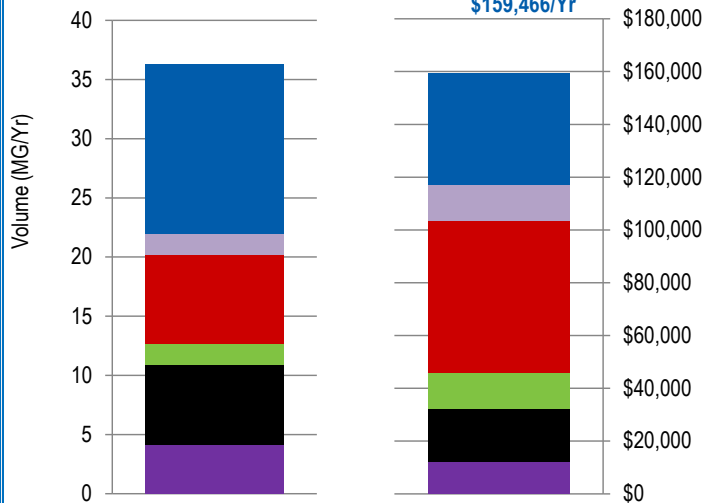
See [Loss Control Planning](#) for Tier Details



NRW Components Summary

Total Volume of NRW = 36 MG/Yr

Total Cost of NRW = \$159,466/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	Carbon Emissions mt/Yr
Apparent Losses	11.1	\$84,789	0
Real Losses	14.3	\$42,412	0
Unbilled Authorized Cons	10.9	\$32,265	0
Non-Revenue Water	36.3	\$159,466	0

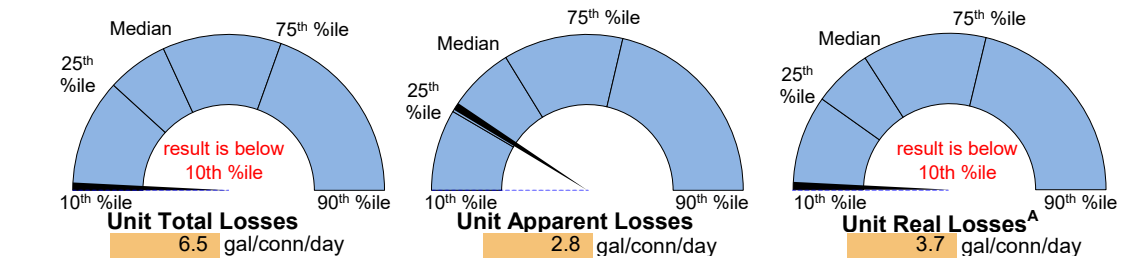
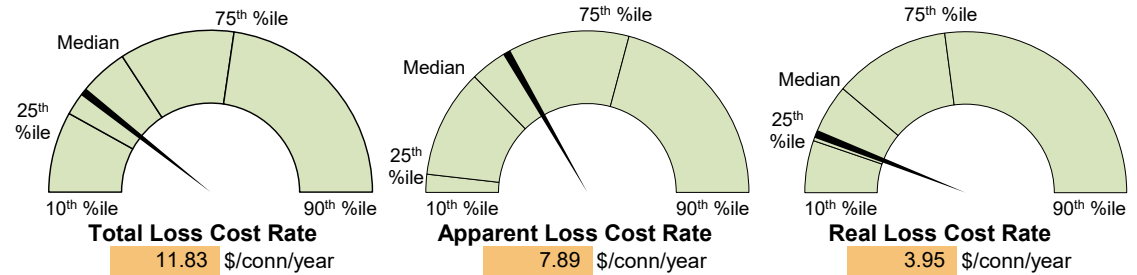
mt = metric tons

Actual KPI result

Key Performance Indicators

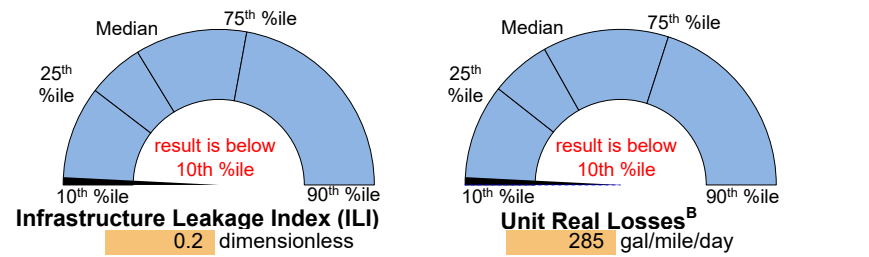
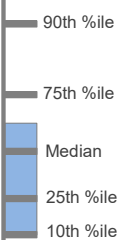
Target (see Worksheet)

gauge %iles per validated industry ranges²



Average Operating Pressure

76 psi



See UARL definition for additional guidance on the ILI

[\(UARL\)](#) Unavoidable Annual Real Losses **94.6** MG/Yr **24.1** 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)³.
- 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.

Table 1

Source: AWWA Water Loss Control Committee Report (2020)¹, with naming conventions updated

2020 AWWA Water Audit Method – Water Audit Outputs and Key Performance Indicators: Uses and Limitations

Type	Indicator	Description	Suitable Purposes					Uses and Limitations	Principal Users
			Assessment	Bench-Marking	Target-Setting	Planning	Tracking		
Attribute	Apparent Loss Volume	Calculated by Free Water Audit Software	✓				✓	Assess loss level	Utility, Regulators
	Apparent Loss Cost	Calculated by Free Water Audit Software	✓				✓	Assess cost loss level	Utility, Regulators
	Real Loss Volume	Calculated by Free Water Audit Software	✓				✓	Assess loss level	Utility, Regulators
	Real Loss Cost	Calculated by Free Water Audit Software	✓				✓	Assess loss cost level	Utility, Regulators
	Unavoidable Annual Real Loss (UARL)	Calculated by Free Water Audit Software	✓				✓	Reveal theoretical technical low level of leakage	Utility, Regulators
Volume	Unit Apparent Losses (vol/conn/day)	Strong and understandable indicator for multiple users.	✓	✓	✓	✓	✓	Used for performance tracking and target-setting	Utility, Regulators
	Unit Real Losses ^A (vol/conn/day)	Strong and understandable indicator for multiple users.	✓	✓	✓	✓	✓	Used for performance tracking and target-setting	Utility, Regulators, Policy Makers
	Unit Real Losses ^B (vol/pipeline length/day)	Strong and understandable indicator for use by utilities with low connection density.	✓	✓	✓	✓	✓	Data collection and assessment of systems with “low” connection density	Utility, Regulators, Policy Makers
	Unit Total Losses (vol/conn/day) New KPI	Strong and understandable indicator, suitable for high-level performance measurement.	✓				✓	High level indicator for trending analysis. Not appropriate for target-setting or benchmarking	Utilities, Customers
	Infrastructure Leakage Index (ILI)	Robust, specialized ratio KPI; can be influenced by pressure and connection density.	✓	✓			✓	Benchmarking after pressure management is implemented	Utilities
Value	Apparent Loss Cost Rate (value/conn/year) New KPI	Indicators with sufficient technical rigor. Provide the unit financial value of each type of loss, which is useful for planning and assessment of cost efficiency of water loss reduction and control interventions and programs.	✓			✓	✓	Data collection and assessment on AWWA indicators or contextual parameters to use in conjunction with Loss Cost Rates	Utilities, Regulators, Customers
	Real Loss Cost Rate (value/conn/year) New KPI		✓			✓	✓		Utilities, Regulators, Customers
Validity	Data Validity Tier (DVT)	Strong indicator of water loss audit data quality, if data has been validated. Tier provides guidance on priority areas of activity.	✓	✓		✓	✓	Assess caliber of data inputs of the water audit	Regulators, Utilities