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**Group of Companies**  
Community Utilities of Pennsylvania

March 25, 2022

RE: Docket No. M-2022-3030282

Please see the attached filing for Community Utilities of Pennsylvania for the 2021 AWWA Water Audit Reports.

Thanks,



Alice Benton

Community Utilities of Pennsylvania

410-286-5533

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Community Utilities of Pennsylvania, Inc.

P.O. Box 379 • Dunkirk, MD 20754 • P: 800-638-0262 • F: 410-286-5532 • [www.uiwater.com](http://www.uiwater.com)



# AWWA Free Water Audit Software v6.0

FWAS v6.0

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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.
- 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 v6.0.

### AWWA Web Resources for Water Loss Control

<https://www.awwa.org/Resources-Tools/Resource-Topics/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

If you have questions or comments regarding this software please contact us at: [wlc@awwa.org](mailto:wlc@awwa.org)

## Enter Basic Information

|   |                                      |
|---|--------------------------------------|
| Name of Utility:                                    | Community Utilities of PA - Westgate |
| Name of Contact Person:                             | Felix Cardona III                    |
| Email:  | Felix.Cardona@uiwater.com            |
| Telephone   Ext.:                                   | 610-317-6145                         |
| City/Town/Municipality:                             | Bethlehem                            |
| State / Province:                                   | Pennsylvania (PA)                    |
| Country:  | USA                                  |
| Audit Preparation Date:                             | Mar 22 2022                          |
| Audit Year:   | 2021                                 |
| Audit Year Label:                                   | Calendar (Fiscal, Calendar, etc)     |
| Audit Period Start Date:                            | Jan 01 2021                          |
| Audit Period End Date:                              | Dec 01 2021                          |
| Volume Reporting Units:                             | Million gallons (US)                 |
| Water System Structure:                             | Retail                               |
| Water Type:   | Potable Water                        |
| System ID Number:                                   | 3480024                              |
| Validator Name/ID:                                  | n/a                                  |
| Validator Email:                                    |                                      |
| Estimated Total Population Served by Water Utility: | 2,465                                |

## 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     |
|       | volume  | 25.000 |

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

choose entry option:

|       |         |        |
|-------|---------|--------|
| 0.25% | default | or     |
|       | custom  | 75.000 |

## 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

7

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 v6.0

FWAS v6.0

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<https://www.awwa.org/Resources-Tools/Resource-Topics/Water-Loss-Control>  
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 Water Audit Compiler v6.0  
 AWWA Reports on Performance Indicators  
 M36 Manual

If you have questions or comments regarding this software please contact us at: [wlc@awwa.org](mailto:wlc@awwa.org)

## Enter Basic Information

|   |                                    |
|---|------------------------------------|
| Name of Utility:                                    | Community Utilities of PA Tamiment |
| Name of Contact Person:                             | Emily Long                         |
| Email:  | emily.long@uiwater.com             |
| Telephone   Ext.:                                   | 570.213.1447                       |
| City/Town/Municipality:                             | Tamiment                           |
| State / Province:                                   | Pennsylvania (PA)                  |
| Country:  | USA                                |
| Audit Preparation Date:                             | 2.11.22                            |
| Audit Year:   | 2021                               |
| Audit Year Label:                                   | 2021 (Fiscal, Calendar, etc)       |
| Audit Period Start Date:                            | Jan 01 2021                        |
| Audit Period End Date:                              | Dec 31 2021                        |
| Volume Reporting Units:                             | Million gallons (US)               |
| Water System Structure:                             | Retail                             |
| Water Type:   | Potable Water                      |
| System ID Number:                                   | 2520070                            |
| Validator Name/ID:                                  | n/a                                |
| Validator Email:                                    | n/a                                |
| Estimated Total Population Served by Water Utility: | 1,278                              |

## 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
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- 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     |
|       | volume  | 25.000 |

Choosing to enter **default** or **custom input** (applies to UUAC, SDHE, UC)  
 choose entry option:  

|       |         |        |
|-------|---------|--------|
| 0.25% | default | or     |
|       | custom  | 75.000 |

## 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)

|          |
|----------|
|          |
| 7        |
| Limiting |



# AWWA Free Water Audit Software: Worksheet

FWAS v6.0

American Water Works Association

Water Audit Report for: **Community Utilities of PA Tamiment**  
 Audit Year: **2021** | **Jan 01 2021 - Dec 31 2021** | **2021**

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

Water Supplied Error Adjustments

choose entry option:

|     |                          |  |                                     |       |
|-----|--------------------------|--|-------------------------------------|-------|
| VOS | Volume from Own Sources: | <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="1"/> | <input type="text" value="43.021"/> | MG/Yr |
| WI  | Water Imported:          | <input type="text" value="n"/> <input type="text" value="g"/> n/a                            | <input type="text" value="0.000"/>  | MG/Yr |
| WE  | Water Exported:          | <input type="text" value="n"/> <input type="text" value="g"/> 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="percent"/> |
|--|--------------------------------------|

VOSEA  
WIEA  
WEEA

WATER SUPPLIED:  MG/Yr

### AUTHORIZED CONSUMPTION

|      |                     |  |                                     |       |
|------|---------------------|--|-------------------------------------|-------|
| BMAC | Billed Metered:     | <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="5"/> | <input type="text" value="17.716"/> | MG/Yr |
| BUAC | Billed Unmetered:   | <input type="text" value="n"/> <input type="text" value="g"/> 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="0.046"/>  | MG/Yr |
| UUAC | Unbilled Unmetered: | <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="5"/> | <input type="text" value="0.256"/>  | MG/Yr |

choose entry option:

|                                     |                                    |       |
|-------------------------------------|------------------------------------|-------|
| <input type="text" value="custom"/> | <input type="text" value="0.256"/> | 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

|      |                                  |  |                                    |       |
|------|----------------------------------|--|------------------------------------|-------|
| SDHE | Systematic Data Handling Errors: | <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="3"/> | <input type="text" value="0.044"/> | MG/Yr |
| CMi  | Customer Metering Inaccuracies:  | <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="2"/> | <input type="text" value="0.000"/> | MG/Yr |
| UC   | Unauthorized Consumption:        | <input type="text" value="n"/> <input type="text" value="g"/> <input type="text" value="3"/> | <input type="text" value="0.044"/> | MG/Yr |

choose entry option:

|                                    |                                      |
|------------------------------------|--------------------------------------|
| <input type="text" value="0.25%"/> | <input type="text" value="default"/> |
| <input type="text" value="0.25%"/> | <input type="text" value="percent"/> |
| <input type="text" value="0.25%"/> | <input type="text" value="default"/> |

under-registration

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="10"/> | <input type="text" value="16.0"/> | 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="511"/>  |                 | (active and inactive)                              |
|     | Service connection density:  | <input type="text" value="32"/>   |                                   | 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="75.0"/> | 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="5"/>  | <input type="text" value="47.0"/> | 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="\$9.28"/>   | \$/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="3"/> | <input type="text" value="\$783.35"/> | \$/Million gallons   |   |
|      |                              |  |                                       |                      | <input type="text" value="\$404,191"/> \$/yr (optional input) |

### WATER AUDIT DATA VALIDITY TIER:

\*\*\* The Water Audit Data Validity Score is in Tier II (26-50). 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: Customer Metering Inaccuracies (CMi)

#### 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 <sup>A</sup> : | <input type="text"/> | gal/conn/day |
| Unit Real Losses <sup>B</sup> : | <input type="text"/> | gal/mile/day |

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



# AWWA Free Water Audit Software v6.0

FWAS v6.0

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 M36 Manual

If you have questions or comments regarding this software please contact us at: [wlc@awwa.org](mailto:wlc@awwa.org)

## Enter Basic Information

|   |   |
|---|---|
| Name of Utility:                                    | Community Utilities of PA at Penn Estates |
| Name of Contact Person:                             | Vincent Varuolo                           |
| Email:  | vincent.varuolo@uiwater.com               |
| Telephone   Ext.:                                   | 570-517-9884                              |
| City/Town/Municipality:                             | East Stroudsburg                          |
| State / Province:                                   | Pennsylvania (PA)                         |
| Country:  | United States                             |
| Audit Preparation Date:                             | Jan 28 2022                               |
| Audit Year:   | 2021                                      |
| Audit Year Label:                                   | 2021 (Fiscal, Calendar, etc)              |
| Audit Period Start Date:                            | Jan 01 2021                               |
| Audit Period End Date:                              | Dec 31 2021                               |
| Volume Reporting Units:                             | Million gallons (US)                      |
| Water System Structure:                             | Retail                                    |
| Water Type:   | Potable Water                             |
| System ID Number:                                   | 2450065                                   |
| Validator Name/ID:                                  | n/a                                       |
| Validator Email:                                    | n/a                                       |
| Estimated Total Population Served by Water Utility: | 4,330                                     |

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

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- WI** Water Imported
- WIEA** WI Error Adjustment
- WE** Water Exported
- WEEA** WE Error Adjustment
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- BUAC** Billed Unmetered Authorized Consumption
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- 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     |
|       | volume  | 25.000 |

Choosing to enter **default** or **custom input** (applies to UUAC, SDHE, UC)  
 choose entry option:  

|       |         |        |
|-------|---------|--------|
| 0.25% | default | or     |
|       | custom  | 75.000 |

## 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

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|                      |
|----------------------|
| <input type="text"/> |
| 7                    |
| Limiting             |



# AWWA Free Water Audit Software: Worksheet

FWAS v6.0

American Water Works Association

Water Audit Report for: **Community Utilities of PA at Penn Estates**  
 Audit Year: **2021** Jan 01 2021 - Dec 31 2021 **2021**

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

Water Supplied Error Adjustments

choose entry option:

VOS: Volume from Own Sources:     MG/Yr  
 WI: Water Imported:    MG/Yr  
 WE: Water Exported:    MG/Yr

VOSEA  
WIEA  
WEEA

WATER SUPPLIED:  MG/Yr

### AUTHORIZED CONSUMPTION

choose entry option:

BMAC: Billed Metered:     MG/Yr  
 BUAC: Billed Unmetered:    MG/Yr  
 UMAC: Unbilled Metered:     MG/Yr  
 UUAC: Unbilled Unmetered:     MG/Yr

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:     MG/Yr  
 CMI: Customer Metering Inaccuracies:     MG/Yr  
 UC: Unauthorized Consumption:     MG/Yr

[under-registration](#)

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:     miles (including fire hydrant lead lengths)  
 Nc: Number of service connections:     (active and inactive)  
 Service connection density:  conn./mile main  
 Lp: Are customer meters typically located at the curbstop/property line?   
 Average length of (private) customer service line:     ft (average distance between property line and meter)  
 AOP: Average Operating Pressure:     psi

### COST DATA

CRUC: Customer Retail Unit Charge:     \$/1000 gallons (US)  
 VPC: Variable Production Cost:     \$/Million gallons  
 Total Annual Operating Cost:  \$/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: Customer Metering Inaccuracies (CMI)
- 3: Billed Metered (BMAC)

#### KEY PERFORMANCE INDICATOR TARGETS:

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

Unit Total Losses:  gal/conn/day  
 Unit Apparent Losses:  gal/conn/day  
 Unit Real Losses<sup>A</sup>:  gal/conn/day  
 Unit Real Losses<sup>B</sup>:  gal/mile/day

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