



Asset Management Overview for Small Community PWSs

Ohio EPA
Division of Drinking and Ground Waters
District Visits
December 2019



Agenda

- **How did we get here?**
- **What is asset management?**
- **Benefits of asset management**
- **Small Community Template**
- **Metrics requirements**
- **Where does my community start?**
- **Resources**



Image courtesy of the Capitol Square
Review and Advisory Board



How did we get here?

- **U.S. EPA has been discussing the concept of asset management for ~20 years**
- **In Ohio, there was a series of catastrophic events where recovery was slow and/or complicated**
- **Senate Bill 2 required all public water systems (PWSs) to have an asset management program. The subsequent AMP rules are located in Ohio Administrative Code (OAC) Chapter 3745-87**
- **Developing and implementing an asset management program (AMP) will help water systems to respond quicker and be better prepared for the future**

What is Asset Management?

“...maintaining a desired level of service for what you want your assets to provide at the lowest life-cycle cost.”¹

¹“Asset Management: A Best Practices Guide.” U.S. Environmental Protection Agency. 1 Apr. 2008. web. 20 Jan. 2016.





Benefits of Asset Management

- **Saves money**
 - **Water systems can coordinate projects to minimize detail plan submission costs and align funding sources**
 - **Well maintained assets last longer**
 - **Fewer emergency repairs**
- **Assists in rehabilitate/repair/replacement decisions through efficient and focused operations and maintenance**
- **Increases compliance (fewer significant deficiencies, violations)**

Benefits of Asset Management

- **Improves response to emergencies**
- **Improves security and safety of assets**
- **Assists with messaging regarding funding and needed projects in a comprehensive way**
 - **Can more easily present water system needs to council, management, and consumers**
- **Revitalizes infrastructure for the future**
 - **Keep community functioning and ready for future needs**

Benefits of Asset Management

- **More reliable service for consumers (e.g., fewer waterline breaks due to implementing a planned waterline replacement program)**
- **Meeting consumer demands with a focus on system sustainability**
- **Setting water rates based on sound operational and financial planning**



Asset Management Program (OAC Rule 3745-87-02)

- **All PWSs must demonstrate**
 - **Managerial capability**
 - **Technical capability**
 - **Financial capability**
- **Written description of asset management program**



Small Community Asset Management Program Template



Managerial capability (OAC 3745-87-03)

- **The AMP must be reviewed and updated, if necessary, at least annually**
- **Contact Information and Table of Organization (Operating Plan)**
 - **Include contact information for PWS contacts**
 - **High level table of organization for all water system contacts (e.g., administration, financial, operators, samplers)**
 - **Clearly defines who is responsible for operations, maintenance, treatment, and distribution**
 - **Specify property owner vs. business owner/lessee, if applicable**



Managerial capability (OAC 3745-87-03)

- **Succession planning for critical personnel**
 - **Must have a plan in place for replacing critical PWS personnel**
 - **Describe what would be done to replace each person**
- **If significant deficiencies are cited, then training may be required**



Managerial capability (OAC 3745-87-03)

- **Non-technical description of the PWS**
 - Type and number of service connections (e.g., residential, industrial, commercial)
 - Source type (GW, SW, hauled water)
 - List of interconnections with other PWSs
 - System capacity
 - » If not set by Ohio EPA plan approval, need to calculate it
 - » Calculation worksheet is available online:
<https://epa.ohio.gov/portals/28/documents/engineering/ProductionProjections.xlsx>



Managerial capability (OAC 3745-87-03)

- **Non-technical description of the PWS**
 - **Limiting factor for system capacity (contact Ohio EPA if unknown).**
 - **Water system usage – do you expect it to increase, decrease, or stay the same?**
 - » **For example, are businesses planning to move in or out? Are expansions planned?**
 - » **If changes are needed to meet demand (e.g., adding/removing equipment/wells/storage tanks), contact Ohio EPA to determine if detail plans are required to be submitted.**

Asset Information (Schematic, Map, Inventory)

- **What is the current state of our assets?**
 - **What do we own?**
 - **Where is it at?**
 - **What condition is it in?**
 - **What is the remaining useful life?**
 - **What is its remaining economic value?**



"Asset Management: A Best Practices Guide." U.S. Environmental Protection Agency. 1 Apr. 2008. web. 20 Jan. 2016.



Technical capability (OAC Rule 3745-87-03)

- **A schematic of water sources, treatment, storage, and distribution**
 - Some examples are provided in the template
 - Can also draw your own
- **Asset map**
 - Each asset in the asset inventory must be included in the asset map



Technical capability (OAC Rule 3745-87-03)

- **Asset Inventory and evaluation of assets**
 - **Asset name** (specific name for each asset, such as softener 1, softener 2)
 - **Location of asset** (include in the asset map)
 - **Purchase date/installation date** (estimate if unknown)
 - **Life expectancy, in years**
 - Can use the “Estimated Life Expectancy of Assets” table provided
 - **Estimated age, in years** (How old is the asset? May have purchased it used, so could be older than purchase date)

Technical capability (OAC Rule 3745-87-03)

- **Asset Inventory and evaluation of assets**
 - **Remaining useful life, in years = life expectancy – estimated age**
 - **Can adjust based on condition/performance**
 - **For example, an asset that is well maintained, in good condition, and still performing well can last much longer than the “remaining useful life”**

Remaining Useful Life of Asset

- All assets eventually reach the end of their useful life
- Some reach it sooner than others
 - Used more frequently
 - Environmental conditions





Technical capability (OAC Rule 3745-87-03)

- **Asset inventory and evaluation of assets**
 - **Status of asset, either:**
 - **In use = being used by the PWS**
 - **Available = on stand-by, but not in use**
 - **To be repaired = needs to be repaired**



Technical capability (OAC Rule 3745-87-03)

- **Asset inventory and evaluation of assets**
 - **Condition, either:**
 - **Excellent = in relatively new or new condition. Asset requires little/no maintenance.**
 - **Good = Acceptable condition. Still functions and requires minor maintenance.**
 - **Fair = Deterioration of asset is visible. Need frequent maintenance to be able to perform.**
 - **Poor = Failure of asset is likely and will need to be replaced in the next few years.**
 - **Very Poor = Failure has occurred or is imminent. Major maintenance required or replacement is necessary.**



Technical capability (OAC Rule 3745-87-03)

- **Criticality:**
 - Rank each asset on a scale from 1 to 5, with 5 as the most critical (e.g., PWS cannot function without it)
 - Can have multiple assets assigned to each number
 - For example, if a PWS has a well, pressure tank, and water softener to treat for hardness, the criticality of these assets could be:
 - Well = 5
 - Well pump = 5
 - Pressure tank = 5
 - Water softener = 3

Critical Assets

PWS can use a systematic approach with pre-defined scoring criteria

Consequence of Failure	
Criteria	Score
Process Importance	
Minimal	1
Low	2
Intermediate	3
High	4
Critical	5
Equipment Size (Cost)	
Minimal	1
Low	2
Intermediate	3
Large	4
Max	5
Redundancy	
Full	1
Partial	2
Intermediate	3
Low	4
None	5

Probability of Failure	
Criteria	Score
Age based on % of Useful life	
0% to 10% of useful life	0.5
10% to 20% of useful life	1
20% to 40% of useful life	1.5
40% to 60% of useful life	2
60% to 80% of useful life	2.5
80% to 100% of useful life	3
100% to 125% of useful life	3.5
125% to 150% of useful life	4
150% to 175% of useful life	4.5
175% to 200% of useful life	5
Performance	
Excellent	1
High	2
Intermediate	3
Low	4
Poor	5

Which assets are critical to sustained performance?



- How can assets fail?
- How do assets fail?
- What are the consequences of asset failure?
- What does it cost to repair the asset?
- What are the other costs (social, environmental, etc.) associated with asset failure?

"Asset Management: A Best Practices Guide." U.S. Environmental Protection Agency. 1 Apr. 2008. web. 20 Jan. 2016.



Technical capability (OAC Rule 3745-87-03)

- **Order of Priority:**
 - Rank each asset in order of priority for repairs/replacement to occur based on the:
 - Condition
 - Criticality
 - Start with 1 being the highest priority and continue onward (e.g., 2 is next highest priority)
 - Assets in poor/very poor condition and that have a high criticality value should be a high priority

Technical capability (OAC Rule 3745-87-03)

- **Order of Priority, example:**
 - A PWS has a well, pressure tank, and a water softener to treat for hardness
 - The well and water softener are in good condition, but the pressure tank is severely corroded
 - This could be summarized in the following table



Asset Name	Status of Asset	Condition	Criticality (Scale of 1-5) 5 is most critical	Order of Priority (1 = highest priority, 2 = next highest, etc.)
Well 1	<input checked="" type="checkbox"/> In use <input type="checkbox"/> Available <input type="checkbox"/> To be repaired	<input type="checkbox"/> Excellent <input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Very Poor	5	2
Pressure Tank 1	<input checked="" type="checkbox"/> In use <input type="checkbox"/> Available <input type="checkbox"/> To be repaired	<input type="checkbox"/> Excellent <input type="checkbox"/> Good <input type="checkbox"/> Fair <input checked="" type="checkbox"/> Poor <input type="checkbox"/> Very Poor	5	1
Softener 1	<input checked="" type="checkbox"/> In use <input type="checkbox"/> Available <input type="checkbox"/> To be repaired	<input type="checkbox"/> Excellent <input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Very Poor	3	3

Example of a Completed Asset Inventory

Score	Equipment	No.	Manufacturer	Model Number	Size	Type	Year of Installation	Age	Expected Useful Life	% of EUL	Age Score	Performance	Importance	Importance Score	Size and Cost	Redundancy	Total Score
4	Clearwell	1			947,833 gallons	Basin	2011	8	50	16	1	Excellent	High	4	Large	Low	4
4	PAC Slurry Tank	1			29,620 gallons	Basin	2011	8	50	16	1	Excellent	High	4	Large	Low	4
3.25	Settling Basin	1			51,125 gallons	Basin	2011	8	50	16	1	Excellent	High	4	Large	Full	3.25
3.25	Settling Basin	2			51,125 gallons	Basin	2011	8	50	16	1	Excellent	High	4	Large	Full	3.25
3.25	Flocculation Basin	1			17,881 gallons	Basin	2011	8	50	16	1	Excellent	High	4	Large	Full	3.25
3.25	Flocculation Basin	2			17,881 gallons	Basin	2011	8	50	16	1	Excellent	High	4	Large	Full	3.25
2.75	Reaction Tank (NOM Oxidation)	1			14,000 gallons	Basin	2011	8	50	16	1	Excellent	Intermediate	3	Large	Full	2.75
2.75	Reaction Tank (NOM Oxidation)	2			14,000 gallons	Basin	2011	8	50	16	1	Excellent	Intermediate	3	Large	Full	2.75
2.75	Reaction Tank (PAC Adsorption)	1			26,364 gallons	Basin	2011	8	50	16	1	Excellent	Intermediate	3	Large	Full	2.75
2.75	Reaction Tank (PAC Adsorption)	2			26,364 gallons	Basin	2011	8	50	16	1	Excellent	Intermediate	3	Large	Full	2.75
2.8125	Caustic Soda bulk Tank	1			2,500 gallons	Bulk Tank	2011	8	25	32	1.5	Excellent	Low	2	Low	Intermediate	2.8125
2.8125	Hypochlorite bulk tank	1			1,550 gallons	Bulk Tank	2011	8	25	32	1.5	Excellent	Low	2	Low	Intermediate	2.8125
2.8125	Phosphate Bulk tank	1			55 gallon drum	Bulk Tank	2011	8	25	32	1.5	Excellent	Low	2	Low	Intermediate	2.8125
2.8125	Sulfuric Acid Bulk Tank	1			550 gallons	Bulk Tank	2011	8	25	32	1.5	Excellent	Low	2	Low	Intermediate	2.8125
2.5	Ferric Chloride bulk tank	1			1,400 gallons	Bulk Tank	2011	8	25	32	1.5	Excellent	Low	2	Low	Partial	2.5
2.5	Ferric Chloride bulk tank	2			1,400 gallons	Bulk Tank	2011	8	25	32	1.5	Excellent	Low	2	Low	Partial	2.5
3.125	Rotary Screw Compressor	1	Sullair	1809EV AC	25 PSI/99.8 CFM	Compressor	2016	3	10	30	1.5	Excellent	Intermediate	3	Low	Partial	3.125
2.5	Rotary Screw Compressor	2	Sullair	1809EV AC	25 PSI/99.8 CFM	Compressor	2018	1	10	10	1	Excellent	Intermediate	3	Low	Partial	2.5
2.5	PAC Day Tank	1			400 gallons	Day Tank	2011	8	25	32	1.5	Excellent	Low	2	Low	Partial	2.5
2.5	Ferric Chloride day tank	1			275 gallons	Day Tank	2011	8	25	32	1.5	Excellent	Low	2	Low	Partial	2.5
2.1875	Caustic Soda Day Tank	1			55 gallons	Day Tank	2011	8	25	32	1.5	Excellent	Low	2	Minimal	Partial	2.1875
2.1875	Hypochlorite day tank	1			55 gallons	Day Tank	2011	8	25	32	1.5	Excellent	Low	2	Minimal	Partial	2.1875



Technical capability (OAC Rule 3745-87-03)

- **Criteria for repair, rehabilitation, and replacement:**
 - **Select or identify criteria that will be used to determine when an asset should be repaired, rehabilitated, or replaced:**
 - **Poor or very poor condition (e.g., severely corroded, leaking)**
 - **High criticality value (from asset inventory)**
 - **Does not function as intended**
 - **Others**
 - **Can have multiple criteria**



Technical capability (OAC Rule 3745-87-03)

- Use this criteria to complete the “Timeline for Repair, Rehabilitation, Replacement, and Expansion” and the “Capital Improvement Plans” (3-5 year, 5-20 year)
- Assets in poor or very poor condition must be put on a schedule for repair, rehab, or replacement



Technical capability (OAC Rule 3745-87-03)

- **Timeline for Repair, Rehabilitation, Replacement and Expansion must include:**
 - **Project description = must be in the order of priority based on the asset inventory (e.g., highest priority should be listed first)**
 - **Scheduled completion date**
 - **Funding sources = list any funding sources that will be used to pay for the project**



Technical capability (OAC Rule 3745-87-03)

- **Capital Improvement Plans (CIP)**
 - Annual projections for a 3 to 5-year planning period
 - List projects by year they are planned
 - Detail of each project
 - Need for and benefits of each project
 - Estimated cost of each project (including design and construction)
 - Funding source for each project
 - Significant projects projected for 5 to 20 years
 - Description and estimated cost of each project



Financial capability (OAC Rule 3745-87-03)

- **PWSs must demonstrate adequate financial capability**
- **PWSs must include a long-term funding strategy to support AMP implementation**
 - **Must include sources of funding**
 - **Must include amount of funds needed for repairs, rehabilitation, replacement or expansion including debt service**



Financial capability (OAC Rule 3745-87-03)

- **Copy of latest water rate ordinance/schedule, if applicable**
- **Documentation of triennial water rate evaluation, if applicable (rates evaluated in past 3 years)**
- **Documentation of all customers being billed for water usage, if applicable**



Financial capability (OAC Rule 3745-87-03)

- **5-year pro forma statement for the next 5 years including:**
 - **Income statement, balance sheet, statement of cash flow of water operating funds**
 - **Amortization schedule of all water debt including all outstanding debt**
 - **Long-term debt anticipated for next 5 years of operation**
 - **Existing information on bond or credit rating**



Financial capability (OAC Rule 3745-87-03)

- One of the following from the past 5 years:
 - Publicly owned PWSs = Comprehensive Annual Financial Reports (CAFRs) or equivalent documents, OR
 - Non-publicly owned PWSs = Annual financial statements, including assets, liabilities, income, expenditures, balances, and equity of the water system

What is my best long-term funding strategy?

- When it comes to long-term planning, PWSs should be asking:
 - Do we have enough funding to cover the costs associated with our asset management program?
 - Do we have enough funding to maintain our assets for our required level of service?
 - Is our rate structure sustainable for our system's long-term needs?



Funding

- Sources of funding include:
 - System revenues
 - System reserve funds
 - System generated replacement funds
 - Non-system revenues





Written Policies (OAC Rule 3745-87-03)

- **Attach or describe written procedures for:**
 - Security
 - Use of water system equipment
 - Billing practices and revenue collection
 - Purchasing procedure for routine and emergency repairs/replacements
 - Contracting procedure for routine and emergency repairs/replacements

Technical capability (OAC Rule 3745-87-03)

- **Operation and Maintenance (O&M) Program must include:**
 - **Standard operating procedures (SOPs) for daily operation of the PWS**
 - For example, describe the system checks and other work that is done daily
 - **An adequate maintenance log for each asset (e.g., describe work performed and when it took place)**

Technical capability (OAC Rule 3745-87-03)

- **Operation and Maintenance (O&M) Program must include:**
 - **An acceptable maintenance schedule for each asset, including:**
 - **Wells, all raw water reservoirs, and intakes**
 - **Pump stations**
 - **Electrical equipment and controls**
 - **Water treatment facilities**
 - **Water storage tanks and/or hydropneumatic tanks (pressure tanks)**
 - **Distribution system components, including hydrants and valves**
 - **Auxiliary power (e.g., generator)**

What is the minimum life cycle cost to run each asset?

- What alternative strategies exist for managing O&M, personnel, and capital budget accounts?
- What strategies are the most feasible for my water system?
- What is the cost of rehabilitation, repair, and replacement for critical assets?





Operational & Maintenance Activities

- **Standard operating procedures**
- **Alternate operating procedures**
- **Emergency operating procedures**
- **Routine maintenance**
- **Preventive maintenance**
- **Emergency/reactive maintenance**
- **Deferred maintenance**

"Asset Management: A Best Practices Guide." Environmental Protection Agency.
1 Apr. 2008. web. 20 Jan. 2016.



Operational & Maintenance Activities

- **Valve exercising program must include:**
 - **A maintenance schedule (e.g., exercise all valves every 5 years)**
 - **Adequate maintenance log (e.g., log when each valve is exercised)**
 - **An up-to-date map showing the location of each valve**

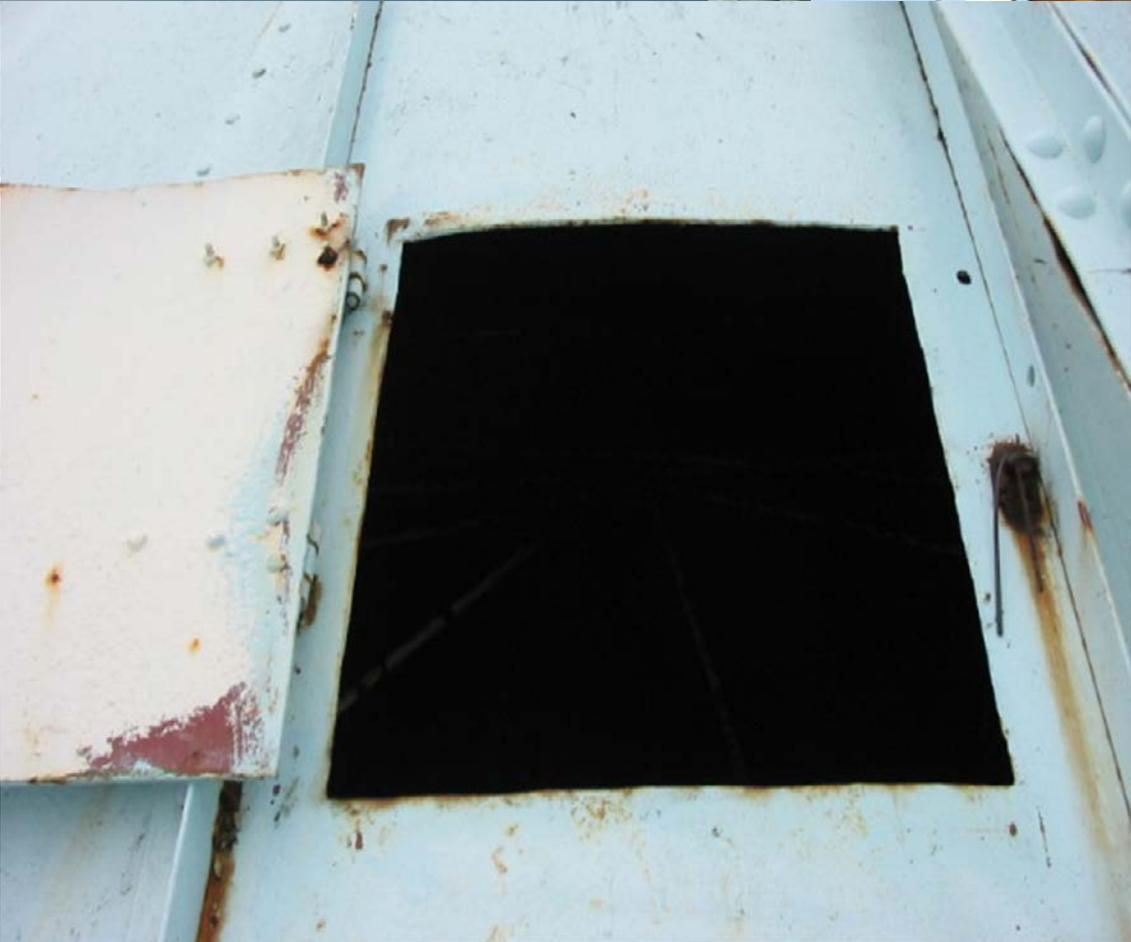
Operational & Maintenance Activities

- Distribution storage tanks





Operational & Maintenance Activities





Operational & Maintenance Activities

- **Distribution storage tanks – Need to be regularly inspected!**
 - **AWWA = every 3-5 years**
 - **Ohio EPA will be reviewing the most recent tank inspection during your next sanitary survey**
 - **If one is not available, it will be a violation**
 - **PWSs need to have maintenance records for assets, including tank inspections**



Metrics

- **Metrics can be used to track PWS performance over time and measure the success of the PWS's AMP**
- **PWSs can set measurable internal goals for their metrics**
- **Metrics can help:**
 - **Meet customer expectations**
 - **Meet regulatory requirements**
 - **Determine amount of funding and time required to maintain, renew and upgrade**
- **It is recommended to convey your metrics in your CCR**

Metrics

- **What level of performance do my stakeholders and customers demand?**
- **What do the regulators require?**
- **What is our actual performance?**
- **What are the physical capabilities of our assets?**



“Asset Management: A Best Practices Guide.”
Environmental Protection Agency.
1 Apr. 2008. web. 20 Jan. 2016.



Metrics

- **OAC Rule 3745-87-05 requires all PWSs to annually document metrics**
- **The metrics are summarized in two fact sheets:**
 - **Community Asset Management Metrics**
 - **Noncommunity Asset Management Metrics**
- **PWSs must develop a tracking system to document the metrics data (use the AMP template, develop a spreadsheet, etc.)**



Metrics

- **Community PWSs must document six metrics:**
 - **Five pre-defined in rule:**
 - **Operating ratio**
 - **Operating cost to produce water per service connection**
 - **Breaks per ten miles of distribution pipe**
 - **Non-revenue water**
 - **Maintenance tasks per year on vertical assets**
 - **One PWS choice = customer service metric (many examples in fact sheet)**



Metrics

- **The five pre-defined metrics are all based on calculations**
- **In order to increase consistency among the calculations, PWSs must report the raw metrics data to Ohio EPA and the calculation will be done automatically**



Metrics

- **Community PWS raw metrics data:**
 - PWS expenses
 - PWS revenue
 - # of distribution system line breaks
 - Billed water exported (e.g., interconnections)
 - Billed, metered consumption (e.g., billed through service connections or sold through bulk stations)
 - Billed, unmetered consumption (e.g., flat fee structure accounts)
- **Note: Community PWSs without meters must estimate the water consumption (e.g., Greenbook, using meter at sewer plant)**



Metrics

- **Community PWS raw metrics data: (continued)**
 - # of planned maintenance tasks completed on vertical assets
 - # of unplanned maintenance tasks completed on vertical assets
 - One additional customer service metric (PWS choice)
 - Total number of service connections
 - Total miles or feet of distribution pipe
- **Vertical asset = Asset within a building or facility, also known as an above-ground asset (assets in treatment plants, pump stations, storage facilities, etc.)**



Metrics

- **One additional customer service metric:**
 - **Must be chosen by the PWS**
 - **Examples:**
 - **Disruption of service**
 - **Number of complaints**
 - **Call center indicators**
 - **Customer service cost per account**
 - **Billing accuracy**
 - **Residential service charges**
 - **Service affordability**
 - **Delinquency rate (%)**
 - **Low income billing assistance rate**



Metrics

- **Noncommunities must track four metrics:**
 - Document instances when pressure <20 psi
 - Number of days unable to serve water
 - Repair, rehabilitation, or replacement tasks per year
 - Emergency
 - Planned
 - Reserve funds
- **No calculations necessary, simply tally or report**



Metrics

- **The metrics data must be reported annually online using the LTO Inventory and Pre-Application**
- **It must include the past 12 months of data**
- **Again, PWSs must develop a tracking system to document the metrics data, and start recording it now**



Metrics

- **For example, the first set of metrics data must be reported with the LTO Inventory and Pre-Application in November 2020**
- **It should include metrics data from past 12 months, which would be November 2019 to October 2020**
- **Additional instructions for how to report the data online will be available in the near future**



Technical capability (OAC Rule 3745-87-03)

- **Emergency preparedness and contingency planning**
 - **Community PWSs must have a written contingency plan, in accordance with OAC Chapter 3745-85**
 - **The plan must include the completed list of 24-hour contact information**



Technical capability (OAC Rule 3745-87-03)

- **Source Water Protection Plan (SWAP)**
 - **PWSs must review their source water assessment annually**
 - This is an assessment completed by Ohio EPA for each PWS
 - Includes map of potential sources of contamination
 - Evaluate the map to determine if there have been any changes (e.g., fuel tank removed/installed, septic system removed/installed, chemical storage shed removed/installed)
 - Evaluate the rest of the report to see if any changes are necessary
 - Report any necessary revisions to Ohio EPA
 - **Every five years evaluate assessment and checklist**



Technical capability (OAC Rule 3745-87-03)

- **Source Water Protection Plan (SWAP)**
 - **For municipal PWSs**: If a source water protection plan has been completed and endorsed by Ohio EPA:
 - Review it at least once every three years or as specified in the plan
 - **For non-municipal PWSs**: If a “Source Water Protective Strategies Checklist” has been completed and accepted by Ohio EPA:
 - Review it at least once every five years
 - If any changes are necessary based on the review, submit a revised copy to Ohio EPA within 60 days



Asset Management Program Review

- **The AMP will be discussed during sanitary surveys**
- **The AMP will be reviewed in-depth as part of certain site visits, loan applications, the enforcement process, and as otherwise requested by Ohio EPA**
- **Water systems will need to do an annual review and make any necessary revisions to their AMP**



WSRLA Loan Process

- All PWSs must have an acceptable AMP or be on an acceptable schedule for completing their AMP prior to receiving a loan
- Ohio EPA will still be conducting an asset management screening, unless one was conducted in the past three years
- If a screening was conducted in the past three years:
 - Provide Ohio EPA with any requested information regarding the last screening
 - Submit updated financial information the Division of Environmental and Financial Assistance Central Office (DEFA-CO)
 - The list of what to submit is on Ohio EPA's new asset management webpage:
<https://epa.ohio.gov/ddagw/pws/assetmanagement>



WSRLA Loan Process

- **Ohio EPA will contact you if a new AM screening is necessary**
- **The screening will include an in-depth review of your AMP**
- **A list of suggested attendees will be sent to the PWS** (resident of the Board of Public Affairs, Mayor, Village Administrator, Fiscal Office, ORCs, maintenance personnel, etc.)
- **Any deficiencies found during the screening must be addressed according to an acceptable schedule provided by the PWS**

Where does my community start?





Need to have a paradigm shift!





Team Effort





Who makes up the asset management team?

- **Decision making body (board members)**
- **Fiscal officer**
- **Operators**
- **Maintenance personnel**
- **Samplers**
- **Engineers**
- **Planners**
- **etc.**



Where should we go from here?

- **Everyone on the asset management team has a role to play in developing and implementing the program**
- **Work together to make sure your PWS's AMP includes the required information**
- **Seek assistance as necessary to help complete/improve your AMP**



Resources

- **U.S. EPA: Reference Guide for Asset Management Tools, May 2014**
- **U.S. EPA: Taking Stock of Your Water System: A Simple Asset Inventory for Very Small Drinking Water Systems, Oct. 2004**
- **The Water Research Foundation www.waterrf.org**
- **Ohio Rural Water Association (ORWA) offers free onsite technical assistance to members**
- **Asset Management: A Guide for Water and Wastewater Systems, 2006**

Resources

- Ohio EPA's new AMP webpage:
<https://epa.ohio.gov/ddagw/pws/assetmanagement>
 - Lots of resources available
 - PWSs can register for external training on [AMP workshop webpage](#)
- Auditor of State's Office
 - Fiscal officer training
 - Fiscal distress assistance ([fiscal caution, fiscal watch, fiscal emergency](#))
 - [2019 Local Gov't Conference](#)



Resources

- **Rural community assistance partnership (RCAP)**
- **ISO 55000 - Asset Management**
- **Water Environment Research Foundation (WERF)**
- **PIPEid**
- **Waterid**
- **Virginia Tech**
- **American Water Works Association**



Resources

- **Ohio EPA DDAGW-Central Office - (614) 644-2752**
- **District Offices:**
 - Northwest: (419) 352-8461** **Northeast: (330) 963-1200**
 - Central: (614) 728-3778**
 - Southwest: (937) 285-6357** **Southeast: (740) 385-8501**

<https://epa.ohio.gov/ddagw/pws/assetmanagement>

Small Community AMP Template



Small Community Asset Management Program

This template is intended for community public water systems (serving a population less than or equal to 3,300). It incorporates the Asset Management Plan requirements in Ohio Administrative Code Rules 3745-87-03 and 3745-87-05.
(Revised Date: 11/12/2019)

Public Water System Name: _____ PWS ID: _____ Date: _____

Section 1. Asset Management Program Review and Locations

Asset management programs are required to be reviewed at least annually and updated if necessary (OAC Rule 3745-87-05(A)). Please use the following table to track when your asset management program was last reviewed/updated.

Date of Asset Management Program Review/Update (min. annually)

Section 2. Contact Information and Table of Organization

Insert contact information for all water system contacts (e.g., administration, financial contact, water system operators, samplers). Clearly describe who is responsible for water system operations, maintenance, treatment, and distribution work. Additional contact information tables are available in Appendix A.

Contact Name	Job Title/Contact Type: (check all that apply)	
Address	<input type="checkbox"/> Manager	<input type="checkbox"/> Mayor
Phone	<input type="checkbox"/> Maintenance Staff	<input type="checkbox"/> Village Administrator
Email	<input type="checkbox"/> Business Owner	<input type="checkbox"/> Financial Contact
To whom does this person report?	<input type="checkbox"/> Operator	
Credentials	<input type="checkbox"/> Sample Collector	
Water system job duties/responsibilities (required)	<input type="checkbox"/> Other: _____	
	<input type="checkbox"/> Operations <input type="checkbox"/> Maintenance <input type="checkbox"/> Treatment <input type="checkbox"/> Distribution	
	<input type="checkbox"/> Other: _____	
	<input type="checkbox"/> Other: _____	

Small Community Asset Management Program

Contact Name		Job Title/Contact Type: (check all that apply)
Address		<input type="checkbox"/> Manager <input type="checkbox"/> Mayor
Phone		<input type="checkbox"/> Maintenance Staff <input type="checkbox"/> Village Administrator
Email		<input type="checkbox"/> Business Owner <input type="checkbox"/> Financial Contact
To whom does this person report?		<input type="checkbox"/> Operator
Credentials		<input type="checkbox"/> Sample Collector
Water system job duties/responsibilities (required)	<input type="checkbox"/> Operations <input type="checkbox"/> Maintenance <input type="checkbox"/> Treatment <input type="checkbox"/> Distribution	<input type="checkbox"/> Other: _____
	<input type="checkbox"/> Other: _____	<input type="checkbox"/> Other: _____

Contact Name		Job Title/Contact Type: (check all that apply)
Address		<input type="checkbox"/> Manager <input type="checkbox"/> Mayor
Phone		<input type="checkbox"/> Maintenance Staff <input type="checkbox"/> Village Administrator
Email		<input type="checkbox"/> Business Owner <input type="checkbox"/> Financial Contact
To whom does this person report?		<input type="checkbox"/> Operator
Credentials		<input type="checkbox"/> Sample Collector
Water system job duties/responsibilities (required)	<input type="checkbox"/> Operations <input type="checkbox"/> Maintenance <input type="checkbox"/> Treatment <input type="checkbox"/> Distribution	<input type="checkbox"/> Other: _____
	<input type="checkbox"/> Other: _____	<input type="checkbox"/> Other: _____

Section 3. Succession Plan

Describe your plan for replacing/rehiring each critical person associated with the water system (administration, financial contact, water system operators, samplers, etc.). For example, how will the water system meet minimum staffing requirements if the operator(s) leave?

Any cooperative and service contracts have been attached: Yes No Not applicable

Section 4. Training Record

List relevant water system training completed by staff or administrative personnel (e.g., fiscal, managerial, technical training).

Training Name/Description	Training Date	Personnel Who Attended

Section 5. Non-Technical Description of the Public Water System

1. Type and Number of Service Connections

Type of Service Connection	# of service connections
Residential	
Industrial	
Commercial	
Other:	
Other:	
Total Number:	

2. Source Type (check one):

Ground water (e.g., well)
 Surface water (e.g., river, pond, lake)
 Hauled water, Supplier: _____

3. Interconnections (List, if applicable): _____
Interconnections include connections between the waterlines of 2 different public water systems (for example, a connection between 2 villages that is only used in the event of an emergency).

4. System capacity in gallons/day (if unknown, contact your Ohio EPA district office representative): _____

5. **Limiting factor for system capacity** (if unknown, contact your Ohio EPA district office representative): _____

6. Water System Usage

The water usage in the next 5 years is expected to (check one):

- Increase
- Decrease
- Stay the same

7. **Will changes to the water system be necessary to meet the change in demand?** (for example, will the water system need to expand/reduce treatment equipment, add/reduce the number of wells or storage tanks, etc.)

- Yes – Include any infrastructure changes in Section 10, 11.1, or 11.2 below. Contact the Ohio EPA District Office to determine if detail plan submission is required.
- No
- Not applicable

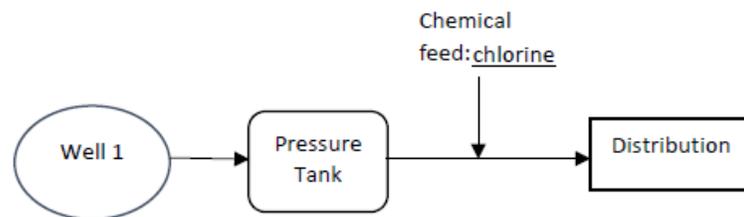
Section 6. Water System Schematic

Include a schematic of your public water system components. The schematic can be attached, hand drawn, or selected from one of the options below. The schematic must include the following, as applicable:

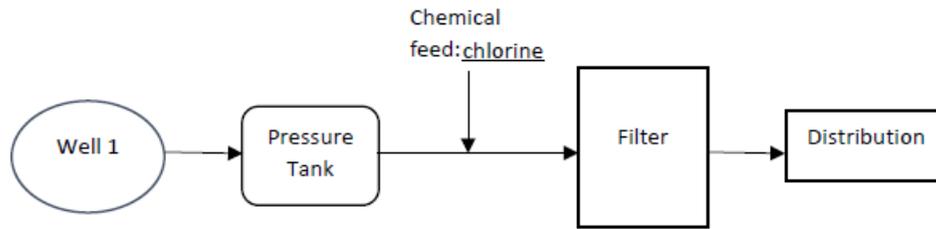
- Source (e.g., well),
- Pressure tank(s),
- Treatment equipment (e.g., water softener, chemical feeds, filters, UV, ozone)
- Storage tanks, and
- Distribution system (e.g., waterlines)

If one of the following examples applies to your public water system, please circle that schematic. If none apply, please attach a schematic or draw one in the space provided:

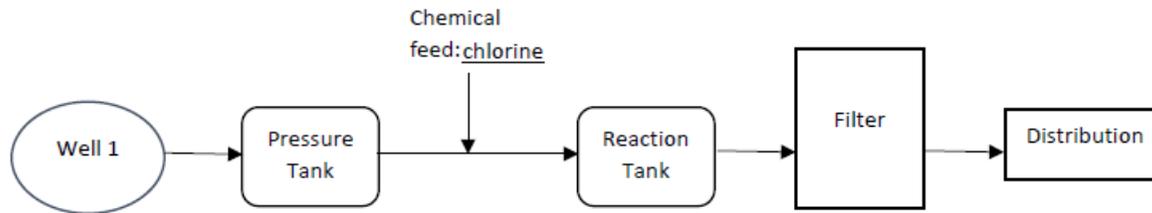
1. Well, pressure tank, chemical feed (list chemical below)



2. Well, pressure tank, chemical feed (list chemical below), filter



3. Well, pressure tank, chemical feed (list chemical below), reaction tank, filter



Draw your own schematic showing the water flow from the well to the distribution system. Include the source, any pressure tanks, any treatment equipment, and the distribution system.

Section 7. Asset Map

Attach a map showing the location of each water system asset or draw a map below. The map should show the location of each asset included in the asset inventory in Section 8 below.



Section 8. Asset Inventory

Asset Name (e.g., Well 1, Pressure tank 1, softener 1)	Location of Asset (Attach a map showing the location of each asset)	Purchase Date/Installation Date (Estimate if unknown)	Life Expectancy, in Years (See Table 1 below, if necessary)	Estimated Age, in Years (How old is the asset?)	Remaining Useful Life, in Years (life expectancy - estimated age; can adjust based on condition/performance)	Status of Asset	Condition (See Table 2 below for descriptions)	Criticality ¹ (Scale of 1-5) 5 is most critical to function of water system	Order of Priority ² (1 = highest priority, 2 = next highest, etc.) Poorer condition and higher criticality = higher priority
						<input type="checkbox"/> In use <input type="checkbox"/> Available <input type="checkbox"/> To be repaired	<input type="checkbox"/> Excellent <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Very Poor		
						<input type="checkbox"/> In use <input type="checkbox"/> Available <input type="checkbox"/> To be repaired	<input type="checkbox"/> Excellent <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Very Poor		
						<input type="checkbox"/> In use <input type="checkbox"/> Available <input type="checkbox"/> To be repaired	<input type="checkbox"/> Excellent <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Very Poor		
						<input type="checkbox"/> In use <input type="checkbox"/> Available <input type="checkbox"/> To be repaired	<input type="checkbox"/> Excellent <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Very Poor		
						<input type="checkbox"/> In use <input type="checkbox"/> Available <input type="checkbox"/> To be repaired	<input type="checkbox"/> Excellent <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Very Poor		

¹**Criticality** = The largest number will have the greatest risk to the continued operation of the water system if the asset were to fail. For example, if the well pump failed, the water system may not be able to supply water. Therefore, the well pump should have a high criticality value.

²**Order of Priority** = Assets must be prioritized based on their condition and criticality (i.e., how important the asset is to the function of the water system). Assets in poor or very poor condition should be placed on a timeline for repair, replacement, or rehabilitation based on their criticality value. Assets with a high criticality value are important to the continued operation of the water system. **Therefore, assets in poorer condition and that have a higher criticality value should be at the top of the priority list and at the beginning of the timeline to be rehabilitated, repaired, or replaced.**

Table 1. Estimated Life Expectancy of Assets	
Asset	Life Expectancy (years)
Wells	25-35
Pressure Tank	7-10
Chlorination Equipment (e.g., chemical feed pump)	10-15
Pumps	10-15
Other Treatment Equipment	10-15
Storage Tanks	30-60
Distribution Pipes	35-40
Hydrants	40-60
Lab/Monitoring Equipment	5-7
Meters	10-15
Valves	35-40
Backflow Prevention Devices	35-40
Transportation Equipment	10
Buildings	30-60
Computers	5
Electrical Systems	7-10
Source: "Taking Stock of Your Water System: A Simple Asset Inventory for Very Small Drinking Water Systems." U.S. E.P.A., 2004.	
Note: The life expectancy of each asset may vary from the estimates listed above based on site specific conditions (e.g., poor water quality, high humidity), maintenance history (e.g., regularly maintained vs. not maintained), etc.	

Table 2. Condition Descriptions	
Condition	Description
Excellent	In relatively new or new condition. The asset has required little to no maintenance.
Good	Acceptable condition. It still functions and requires minor maintenance.
Fair	Deterioration of the asset can be seen. It needs maintenance frequently to be able to perform.
Poor	Failure of the asset is likely and will need to be replaced in the next few years.
Very Poor	Failure has occurred or is going to. Major maintenance is required, or replacement needs to occur.

Section 9. Criteria for Repair, Rehabilitation, and Replacement

Select the criteria that will be used to determine when a water system asset should be repaired, rehabilitated, or replaced (check all that apply):

- Poor or very poor condition (e.g., severely corroded, leaking)
- High criticality value (from Asset Inventory)
- Does not function as intended

- Other – Describe: _____

- Other – Describe: _____

- Other – Describe: _____

Section 10. Timeline for Repair, Rehabilitation, Replacement and Expansion

Project Description <i>Describe, in order of priority, any repair, replacement, rehabilitation or expansion projects necessary based on the asset's condition and criticality in the asset inventory (Section 8 above)</i>	Scheduled Completion Date	Funding Source(s) <i>Describe how the project will be funded</i>

Section 11. Capital Improvement Plan

Section 11.1 Three to Five Year Capital Improvement Plan

Are any additional water system projects planned for the next 3 to 5 years other than those described above in Section 10 ("Timeline for Repair, Rehabilitation, Replacement and Expansion")? Yes (If yes, complete the following table describing the 3 to 5 year capital improvement plan)
 No

Year Scheduled	Project Description <i>Describe, in order by year scheduled, any water system projects needed in the next 3 to 5 years (other than the projects outlined in Section 10 above)</i>	Describe why the project is necessary, including the benefits of the project	Year Scheduled	Estimated Cost <i>Including design & construction</i>	Funding Source(s) <i>Describe how the project will be funded</i>

Section 11.2 Five to Twenty Year Capital Improvement Plan

Are any other significant water system projects planned for the next 5 to 20 years other than those described in Sections 10 and 11.1 above?

- Yes (If yes, complete the following table describing the 5 to 20 year capital improvement plan)
- No

Project Description <i>Describe any significant water system projects anticipated in the next 5 to 20 years (other than the projects outlined above)</i>	Estimated Cost

Section 12. Funding

1. Is there a funding strategy in place to cover the costs associated with this asset management program (e.g., operation and maintenance costs, capital improvement projects, repair, replacement, rehabilitation, and expansion of existing assets) (OAC Rule 3745-87-03(C))?

- Yes
- No

2. If your water system publicly owned?

- Yes
- No – Answer the following:

Describe the type of business: _____

When did this business open (date)? _____

Financial Documentation (required)	Document Storage Location <i>Describe the location where the document is stored, or attach a copy</i>
Copy of the latest water rate ordinance / schedule, if applicable	<input type="checkbox"/> Copy attached, or <input type="checkbox"/> Describe location where document is stored: _____ <input type="checkbox"/> N/A, explain: _____
Documentation of triennial water rate evaluation, if applicable	<input type="checkbox"/> Copy attached, or <input type="checkbox"/> Describe location where document is stored: _____ <input type="checkbox"/> N/A, explain: _____
Documentation of all customers being billed for water usage, if applicable	<input type="checkbox"/> Copy attached, or <input type="checkbox"/> Describe location where document is stored: _____ <input type="checkbox"/> N/A, explain: _____
5-year pro forma statement for the next 5 years with the following:	
1. Income statement, balance sheet, and statement of cash flow for the PWS operating fund	<input type="checkbox"/> Copy attached, or <input type="checkbox"/> Describe location where document is stored: _____ <input type="checkbox"/> N/A, explain: _____
2. Amortization schedule of all PWS debt, including terms of all outstanding debt	<input type="checkbox"/> Copy attached, or <input type="checkbox"/> Describe location where document is stored: _____ <input type="checkbox"/> N/A, explain: _____
3. Capitalization of long-term debt anticipated in the next five years	<input type="checkbox"/> Copy attached, or <input type="checkbox"/> Describe location where document is stored: _____ <input type="checkbox"/> N/A, explain: _____
4. Any existing information demonstrating bond or credit rating	<input type="checkbox"/> Copy attached, or <input type="checkbox"/> Describe location where document is stored: _____ <input type="checkbox"/> N/A, explain: _____
One of the following from the past 5 years:	
<ol style="list-style-type: none"> <li>1. <u>Publicly owned water system</u>: Copies of the <u>past</u> 5 years of Comprehensive Annual Financial Reports (CAFR) or substantively equivalent documents which describe the performance of the owner and water system, <u>OR</u> <li>2. <u>Non-publicly owned water system</u>: The financial statement for each of the <u>past</u> 5 years of operation. This must include assets, liabilities, income, expenditures, balances, and equity of the water system. <p><i>Note: Either of these sources (i.e., CAFR or financial statements) must have the enterprise or proprietary funds separated (the water, sewer, and all other funds must be delineated separately).</i></p>	<input type="checkbox"/> Copy attached, or <input type="checkbox"/> Describe location where document is stored: _____ <input type="checkbox"/> N/A, explain: _____

Section 13. Written Policies

Describe below or attach the documentation and/or written procedures for the following topics.

Section 13.1 Security

1. Are water treatment and equipment rooms locked?

- Yes - Who has the keys? _____
- No
- Not applicable

2. How often is water system equipment inspected and areas patrolled: _____

3. What measures have been taken to protect water system equipment from damage/vandalism: _____

4. Other security measures taken: _____

Section 13.2 Use of Water System Equipment

1. Do you have documentation for use of water system equipment (e.g., who, what, when, why, and/or how people can use water system equipment)?

- Yes
 - Documentation is attached, or
 - Describe the location of the documentation: _____

No – Describe the process for how water system equipment can be used: _____

Not applicable – For example, we do not have any water system equipment that can be used aside from the equipment necessary to operate the water system

Section 13.3 Billing Practices and Revenue Collection

1. Do you have documentation for billing practices and revenue collection?

Yes

Documentation is attached, or

Describe the location of the documentation: _____

No – Describe the process for billing and revenue collection for the water system: _____

Not applicable (e.g., we do not bill for water usage)

	Routine Repairs/Replacements <i>Describe the procedure:</i>	Emergency Repairs/Replacements <i>Note: Community PWSs are required to have funds available and immediately accessible for emergency use.</i>
13.4 Purchasing Authority and Procedures		
a. Who is authorized to make purchases for water system repairs/replacements?		
a. Authorized amount to spend:		
b. Under what conditions can this person make the purchase? (for example, this person is authorized to spend up to \$XXX for routine purchases and \$XXX for emergency purchases)		
c. Is administrative approval required prior to making the purchase?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable
d. If yes, describe the approval process:		

13.5 Contracting	Routine Repairs/Replacements <i>Describe the procedure:</i>	Emergency Repairs/Replacements <i>Describe the procedure:</i>
a. Who is authorized to sign contracts for water system work?		
a. Authorized amount to spend:		
b. Is administrative approval required prior to signing the contract?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable
c. Describe the required steps prior to signing a contract:		

Section 15. Metrics

The following metrics data must be tracked and reported online annually to Ohio EPA. The following table can be used to assist with data tracking.

Metrics Data									
	PWS Expenses	PWS Revenue	# of distribution line breaks	Billed water exported (gal or MGD) (e.g., interconnections)	billed, metered consumption (e.g., billed to service connections or through bulk station)	billed, unmetered consumption (e.g., flat fee structure accounts)	# of planned maintenance tasks on vertical assets ¹ (e.g., routine)	# of unplanned maintenance tasks on vertical assets ¹ (e.g., emergency)	Customer service metric (describe in #1 below)
Nov.									
Dec.									
Jan.									
Feb.									
Mar.									
Apr.									
May									
June									
July									
Aug.									
Sept.									
Oct.									
Total:									

¹Vertical assets are assets within a building or facility, also known as above-ground assets (assets in treatment plants, pump stations, storage facilities, etc.).

Additional Annual Metrics Data

1. Description of 1 additional customer service metric chosen by PWS: _____
2. Total number of service connections: _____
3. Total miles or feet of distribution pipe: _____ feet miles

Section 16. Emergency and Contingency Planning

All community PWSs are required to complete and maintain a contingency plan, in accordance with OAC Chapter 3745-85. The contingency plan must be reviewed at least annually and updated as necessary.

What page of your contingency plan includes the completed external contacts list (24-hr phone numbers for Ohio EPA, police, fire, etc.)? _____

Section 17. Source Water Protection

A source water assessment has been conducted for your public water system by Ohio EPA. This document includes an assessment of the susceptibility of your water source to contamination, a map of potential sources of contamination in your area, and a checklist of strategies to protect your well/source. **Please contact the Ohio EPA district office to obtain a copy of your source water assessment if a copy is not already on site.**

Section 17.1 Source Water Assessment

The source water assessment must be reviewed annually. To do so, review the map for any potential contaminant sources that have been removed or added (e.g., fuel tank installed/removed, septic system installed/removed, chemical storage shed constructed/removed). If changes are necessary, contact Ohio EPA.

Year:	20____	20____	20____	20____	20____
Date Source Water Assessment Reviewed (Required at least annually)					

Section 17.2 Source Water Protection Plan

Have you completed the source water protective strategies checklist and submitted it to Ohio EPA?

- Yes.
- Date submitted to Ohio EPA: _____
 - Date of most recent review: _____
The checklist must be reviewed and updated at least once every 5 years. If changes are made to the checklist during the review, submit a revised copy to the Ohio EPA district office within 60 days.
- No. *It is recommended that all public water systems have a source water protection plan to protect their source (e.g., well) from potential contamination. Please contact the Ohio EPA district office if you need assistance with completing the plan.*
- Not applicable.
- Do you have an endorsed source water protection plan from Ohio EPA (e.g., your water system completed and submitted a source water protection plan and the plan was endorsed by Ohio EPA)?
 - Yes - Date of most recent review: _____
Must be reviewed at least once every 3 years, or as specified in the plan. If changes are made to the protection plan during the review, submit a revised copy to the Ohio EPA district office within 60 days.
 - No

Appendix A. Contact Information

Contact Name		Job Title/Contact Type: (check all that apply)
Address		<input type="checkbox"/> Manager <input type="checkbox"/> Mayor
Phone		<input type="checkbox"/> Maintenance Staff <input type="checkbox"/> Village Administrator
Email		<input type="checkbox"/> Business Owner <input type="checkbox"/> Financial Contact
To whom does this person report?		<input type="checkbox"/> Operator
Credentials		<input type="checkbox"/> Sample Collector
Water system job duties/responsibilities (req'd)	<input type="checkbox"/> Operations <input type="checkbox"/> Maintenance <input type="checkbox"/> Treatment <input type="checkbox"/> Distribution Other: _____	<input type="checkbox"/> Other: _____ <input type="checkbox"/> Other: _____ <input type="checkbox"/> Other: _____

Contact Name		Job Title/Contact Type: (check all that apply)
Address		<input type="checkbox"/> Manager <input type="checkbox"/> Mayor
Phone		<input type="checkbox"/> Maintenance Staff <input type="checkbox"/> Village Administrator
Email		<input type="checkbox"/> Business Owner <input type="checkbox"/> Financial Contact
To whom does this person report?		<input type="checkbox"/> Operator
Credentials		<input type="checkbox"/> Sample Collector
Water system job duties/responsibilities (req'd)	<input type="checkbox"/> Operations <input type="checkbox"/> Maintenance <input type="checkbox"/> Treatment <input type="checkbox"/> Distribution Other: _____	<input type="checkbox"/> Other: _____ <input type="checkbox"/> Other: _____ <input type="checkbox"/> Other: _____

Contact Name		Job Title/Contact Type: (check all that apply)
Address		<input type="checkbox"/> Manager <input type="checkbox"/> Mayor
Phone		<input type="checkbox"/> Maintenance Staff <input type="checkbox"/> Village Administrator
Email		<input type="checkbox"/> Business Owner <input type="checkbox"/> Financial Contact
To whom does this person report?		<input type="checkbox"/> Operator
Credentials		<input type="checkbox"/> Sample Collector
Water system job duties/responsibilities (req'd)	<input type="checkbox"/> Operations <input type="checkbox"/> Maintenance <input type="checkbox"/> Treatment <input type="checkbox"/> Distribution Other: _____	<input type="checkbox"/> Other: _____ <input type="checkbox"/> Other: _____ <input type="checkbox"/> Other: _____