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# Ohio RCAP Community Water System Asset Management Plan

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**Prepared for:**

OHIO RCAP COMMUNITY WATER SYSTEM  
POEDUNK, OHIO

**Prepared by:**

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# Contents

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<b>Executive Summary .....</b>	<b>4</b>
Table E-1. Levels of Service .....	4
Table E-2. Action Plan .....	5
<b>1 Introduction.....</b>	<b>8</b>
1.1 Mission Statement.....	8
1.2 Asset Management Team .....	8
Figure 1-1. Ohio RCAP Community Water System Organization Chart.....	9
Table 1-1. Ohio RCAP Community Water System Asset Management Team .....	9
<b>2 Utility Overview.....</b>	<b>10</b>
Table 2-1. Ohio RCAP Community Water System Utility Overview .....	10
Figure 2-1. Ohio RCAP Community Water System Age Profile .....	11
Figure 2-2. Ohio RCAP Community Water System Schematic .....	12
<b>3 Level of Service Agreement .....</b>	<b>13</b>
Table 3-1. Level of Service Goals - for example table, see Appendix E.....	13
<b>4 Critical Assets.....</b>	<b>15</b>
Table 4-1. Ohio RCAP Community Water System Critical Asset Inventory .....	15
<b>5 Operation and Maintenance (O&amp;M) Strategy .....</b>	<b>18</b>
5.1 Preventive Maintenance.....	18
Table 5-1. Ohio RCAP Community Water System Preventive Maintenance Schedule for 2010 .....	19
5.2 Emergency/Reactive Maintenance .....	21
Table 5-2. Ohio RCAP Community Water System Emergency/Reactive Maintenance Expenses for 2009 .....	21
5.3 Deferred Maintenance.....	22
<b>6 Water Quality .....</b>	<b>23</b>
Source Water Assessments and Protection .....	23
Total Maximum Daily Loads (TMDLs).....	23
6.1 Implementation Strategy to Protect Watersheds .....	23
Water Quality Monitoring Strategy .....	23
Water and Energy Efficiency .....	24
Best Management Practices (BMPs) .....	24
<b>7 Capital Improvement Program (CIP).....</b>	<b>25</b>
Table 7-1. Ohio RCAP Community Water System Capital Improvement Projects .....	26

Table 7-2. Ohio RCAP Community Water System Capital Improvement Projects .....27

**8 Financial Management Strategy** .....**30**

8.1 Financial Forecast ..... 30

8.2 Total Expenditure ..... 30

Table 8-1. Ohio RCAP Community Water System Total Expenditure Summary - Actual/Forecast .....31

**9 Action Plan** .....**36**

Table 9-1 Action Plan Table .....36

9.1 Review Schedule ..... 39

**10 Appendices** .....**40**

Appendix C. Financial History ..... 40

Expenses for Ohio RCAP Community Water System ..... 40

Revenue for Ohio RCAP Community Water System ..... 42

Appendix F. Glossary ..... 43

## Executive Summary

This Asset Management Plan is for the Ohio RCAP Community Water System and describes how the utility will manage its infrastructure assets. The Ohio RCAP Community Water System has a staff of 2 full-time equivalents (FTEs) who perform day-to-day functions to keep the utility functioning properly. The utility delivers 135,000 gallons per day of water to 825 of connections. Maps of the utility are maintained by the utility at the Water Department Office which is located at the Water Treatment Plant.

The Ohio RCAP Community Water System has considered a range of service levels the utility could establish. These include the following:

**Table E-1. Levels of Service**

Service Area	Levels of Service		Achieved
	Goal	Performance Targets	
Health, Safety and Security	Reduce the number, frequency and duration of boil advisories.	Reduce the number of water leaks by 20%. Reduce the average length of utility outage to less than a day.	Major performance deficiencies
Asset Preservation and Condition	Improve Preventative Maintenance	Complete all scheduled preventative maintenance tasks within 10 days.	Considerable performance deficiencies
Asset Preservation and Condition	Establish a Predictive Maintenance program	Complete all scheduled monitoring tasks within 10 days.  Escrow \$1,445 monthly for predictive maintenance expenses.	Major performance deficiencies
Asset Preservation and Condition	Development an Asset Replacement Strategy	Escrow \$25,500 annually for Asset Replacement.	Major performance deficiencies
Service Quality and Cost	Increase utility rate to improve sustainability and absorb the up-front cost of asset management planning.	Utility Rate Adjustment Pending	Major performance deficiencies
Service Quality and Cost	Enact automatic inflationary rate adjustments	Utility Rate Adjustment Pending	Major performance deficiencies
Service Quality and Cost	Minimize life-of-asset ownership cost	Begin monitoring the cost of unplanned (emergency) repairs relative to scheduled preventative maintenance.	Meets no performance objectives
Conservation, Compliance and Enhancement	Improve reliability of water distribution through the distribution system	Hire engineer to perform preliminary engineering report and begin project design. Prepare project funding applications for construction start in fall of 2011.	Major performance deficiencies

To support the above Level of Service goals the utility has identified the following costs to help improve overall service to the community:

The O&M Preventative Maintenance program will require an additional \$31,624 annually. Improved preventative maintenance cost is divided between labor and materials. The community will need to hire .8 FTE at a cost of approximately \$20,000 annually. A detailed summary of deferred O&M cost is presented in Table 5.1.

O&M Predictive Maintenance includes items such as painting, roofing, HVAC, etc. These expenditures occur in a predictive manner several times over the useful life of the parent assets. Predictive maintenance costs are shown in Table 7.1. The community needs to save \$17,330 each year to pay for O&M predictive maintenance.

The water system replacement cost is estimated at \$11,570,250. The depreciated replacement value is \$5,906,874. Total asset replacement from savings would require annual escrow deposits of \$169,944. Self funding 100% of capital replacement cost is not a realistic goal for Poedunk. Instead the community has chosen to target 15% of projected replacement cost or \$25,492 each year to pay for the pre-construction soft cost associated with total asset replacement.

It is estimated that the utility will spend a total of \$989,250 on various water system improvement projects over the next 10 years. A detailed financial summary is presented in Table 8-1. External financing for capital expenses will be financed using various loan and grant programs including but not limited to ARC, OPWC, OWDA, Ohio EPA WSRLA and USDA / RD.

The community will endeavor to maintain water rate at or below 1.6% MHI as documented by the 2000 Census or \$48 per month for typical residential user of 4,500 gallons. Water rates of 1.5% MHI are necessary to achieve low interest rate loans and grant eligibility from all state and federal funding sources.

The utility's action plan for improving the overall management of this utility and supporting the above Level of Service goals (including addressing the financial management, environmental management and specific issues) is shown in Table E-2.



**Table E-2. Action Plan**

Urgency	Service (All, W, WW)	Issue	Corrective Action Plan	Target Date for Completion
High	W	Reduce the number of water leaks by 20%. Reduce the average length of utility outage to less than a day. Reduce the number, frequency and duration of boil advisories.	An aggressive monitoring program will be undertaken to locate and replace the worst sections of pipe in the old distribution system.  Pipe replacement projects will be developed based upon frequency of pipeline breaks and number of customers impacted. Pipelines located under village streets will be replaced in advance of scheduled street resurfacing projects.	6/1/2010

Urgency	Service (All, W, WW)	Issue	Corrective Action Plan	Target Date for Completion
High	W	Complete all scheduled preventative maintenance tasks within 10 days. Improve Preventative Maintenance	Establish CUPSS preventative maintenance work orders on all inventoried assets to schedule maintenance in per equipment manufacturer recommendations and industry recognized best management practices.  Existing utility department revenues are inadequate to support an effective preventative maintenance program. <b>An additional \$31,624 must be appropriated into the annual O&amp;M budget. A utility rate increase will be necessary to sustain the improved preventative maintenance program</b>	6/1/2010
High	W	Complete all scheduled monitoring tasks within 10 days.  Escrow \$1,445 monthly for predictive maintenance expenses.	Develop equipment condition monitoring techniques using CUPSS work orders. Monitoring information will be used to schedule equipment overhauls. Monitoring information will also be used to predict and hopefully mitigate future equipment failures.  A Rehabilitation & Replacement Escrow account needs to be established with minimum annual deposits adequate to finance all anticipated equipment rehabilitation from savings within 10 years.  <b>The predictive maintenance program dedicates the minimum recommended amount of capital reserves. An annual escrow deposit of \$17,330 is required. Escrowed funds must be housed in dedicated bank account.</b>	6/1/2010
Medium	W	Escrow \$25,500 annually for Asset Replacement.	Annual Rehabilitation & Replacement Escrow account deposits need to include money for the eventual replacement of inventoried assets.  <b>We recommend funding 15% of projected asset replacement cost or \$25,492 annually. Escrowed funds must be housed in dedicated bank account.</b>	12/31/2011
High	W	Utility Rate Adjustment Pending	A utility rate increase must be implemented to fulfill the goals of this Asset Management Plan. Utility rates have remained unchanged of three years. Furthermore it appears that prior rate adjustments failed to keep pace with inflation. Maintenance had to be deferred because revenues were inadequate to sustain the business.  <b>The initial rate adjustment will need to both correct for ongoing revenue deficiencies and provide for future asset management. Goals of this asset management plan can not be achieved without a rate increase.</b>	3/31/2010

Urgency	Service (All, W, WW)	Issue	Corrective Action Plan	Target Date for Completion
Medium	W	Utility Rate Adjustment Pending	An automatic 3.0% rate increase is recommended. Implementation of automatic annual rate adjustments will both stabilize revenue to the utility system and reduce rate burden to the customers.	3/31/2010
Low	W	Begin monitoring the cost of unplanned (emergency) repairs relative to scheduled preventative maintenance.	<p>Reduce the number and cost of emergency maintenance relative to scheduled maintenance task. A reduction in number and cost of emergency repairs is an indicator of the effectiveness of your asset management program.</p> <p><b>While changes in cost structure occur very slowly, a 20 to 30% life cycle cost reduction is achievable based upon a review of Australia's advanced asset management program.</b></p>	12/31/2010
Medium	W	Hire engineer to perform preliminary engineering report and begin project design. Prepare project funding applications for construction start in fall of 2011.	<p>Segments of the old downtown distribution system are over 75+ years old including the primary transmission main. This transmission main is critical to water distribution throughout the entire system. Replacement of this water transmission main will require \$75,000.</p> <p>However, the community would like to upgrade the line from 8 inch to 12 inch to facilitate future development. The requested upgrade will increase the cost of water line replacement from \$75,000 to \$175,000.</p>	9/1/2011

# 1 Introduction

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This Asset Management Plan is for the Ohio RCAP Community Water System and describes how the utility will manage the infrastructure assets. Customer service demands and regulations require utilities to actively manage drinking water and wastewater assets through careful maintenance, repair and replacement decisions. This plan is an effective tool for combining technical, management and financial practices to ensure that the level of service required by the community is provided at the appropriate cost.

The plan has the following purposes:

1. To demonstrate responsible management of the drinking water and wastewater assets
2. To communicate and justify funding requirements indicated by the plan
3. To provide a management roadmap for the utility
4. To serve as a link between the Ohio RCAP Community Water System and its customers

The Asset Management Plan contains an overview of the utility, mission statement, level of service agreement, critical asset list, operation and maintenance strategy, capital investment program, and financial strategies.

## 1.1 Mission Statement

The mission statement defines the goals of the Ohio RCAP Community Water System and is the guide for level of service agreements discussed in section 3. The Ohio RCAP Community Water System mission statement is as follows:

We commit to improving and maintaining the public health protection and performance of our drinking water/wastewater plant and distribution/collection utility assets, while minimizing the long-term cost of operating those assets. We strive to make the most cost-effective renewal and replacement investments and provide the highest-quality customer service possible.

## 1.2 Asset Management Team

The Ohio RCAP Community Water System has a staff of 2 FTEs who perform day-to-day functions to keep the utility functioning properly. Together, these individuals have volunteered as members of the "the asset management team. John Smith is the water system superintendent. Jane Doe is the village's financial officer. Jane also works as billing clerk for the water and sewer system. Ed. Jones is the community's mayor. Evelyn Dunn serves as chairperson on the board of public affairs.

These four individuals with outside assistance from Ohio RCAP represent the asset management team. The team is responsible for preparing, implementing, and updating this plan. To the extent that other individuals such as engineer and law director are involved with this or other projects, the asset management team is responsible for coordinating such involvement in the developing and implementing this plan.

More specific roles and responsibilities are listed in Table 1-1 and Table 1-2.

**Figure 1-1. Ohio RCAP Community Water System Organization Chart**




**Table 1-1. Ohio RCAP Community Water System Asset Management Team**

Name	Title	Organization	Role / Responsibility on Project
John Smith	Superintendent	Community Water System	Facility Manager
Wayne Cannon	Rural Development Supervisor	Ohio RCAP	Technical Assistance Provider
Tom Fishbaugh	Rural Development Specialist	Ohio RCAP	Technical Assistance Provider
Josh Eggleston	Rural Development Specialist	Ohio RCAP	Technical Assistance Provider
Larry Baxa	Rural Development Specialist	Ohio RCAP	Technical Assistance Provider

## 2 Utility Overview

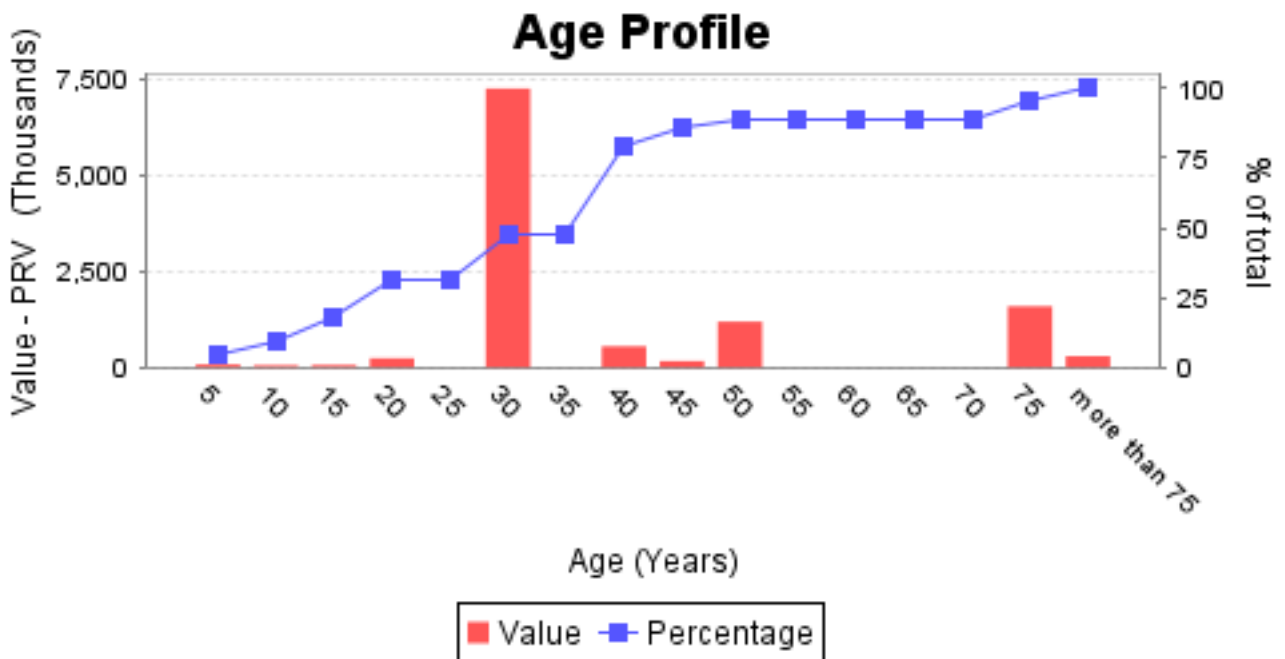
The Ohio RCAP Community Water System serves the Village of Poedunk with a population of 1955. The following table demonstrates key statistics about the utility and the population it serves. Maps of the utility are maintained at Water Department Office in the Water Treatment Plant.

**Table 2-1. Ohio RCAP Community Water System Utility Overview**

	Unit	Description
<b>WATER SUPPLY</b>		
<b>Water Supply Connection - Customer Breakdown</b>		
Residential Facilities connected to potable water	No.	800
Commercial Facilities connected to potable water	No.	24
Industrial Facilities connected to potable water	No.	1
<b>The Drinking Water Network</b>		
Wells and Springs	Number	2
Pumping Equipment	Number	5
Concrete & Metal Storage Tanks	Storage Capacity Days	5
Transmission Mains	Number	4
Distribution / Collection Mains	LF	165500
Valves	Number	2
Computer Equipment / Software	Number	1
Transformers / Switchgears / Wiring	Number	1
Motor Controls / Drives	Number	4
Buildings	Number	1 
Service Lines	LF	0
Hydrants	Number	2
Treatment Equipment	Number	3
Lab / Monitoring Equipment	Number	1
Tools and Shop Equipment	Number	2
Transportation Equipment	Number	2
Land	Acres	28
Meters	Number	4
Generators	Number	1
Liquid Waste Handling & Disposal	Number	1
<b>General Water Supply Information</b>		
Number of connections	No.	825
Storage Capacity	MG	1
How Sourced	Descr.	Ground Water
Interconnected or Shared with other Drinking Utilities	Descr (if yes)	None
Water loss and Inflow / Infiltration calculations	Descr.	Water loss is excessive at 35%. It is believed that the majority of water loss occurs in the old downtown area. In addition, many of the water meters are 30+ years old.
Total Volume Produced	Gallons/Day	185000
Total Volume Sold	Gallons/Day	120000
Average / Peak Daily Consumption	Gallons/Day	150000

	Unit	Description
<b>Water Supply Asset Values</b>		
Replacement Value	\$000,000	11,570,250
Depreciated Replacement Value	\$000,000	5,906,874

Poedunk does not expect any significant customer growth over the next 10 years. The village’s population actually declined during each of the three prior decades. However, the number of water taps has remained relatively constant over the past 10 years thanks to water line extension installed in 2005 which added approximately 50 out of town users. Increased service to out-of-town customers represents the only reasonable opportunity for growth.

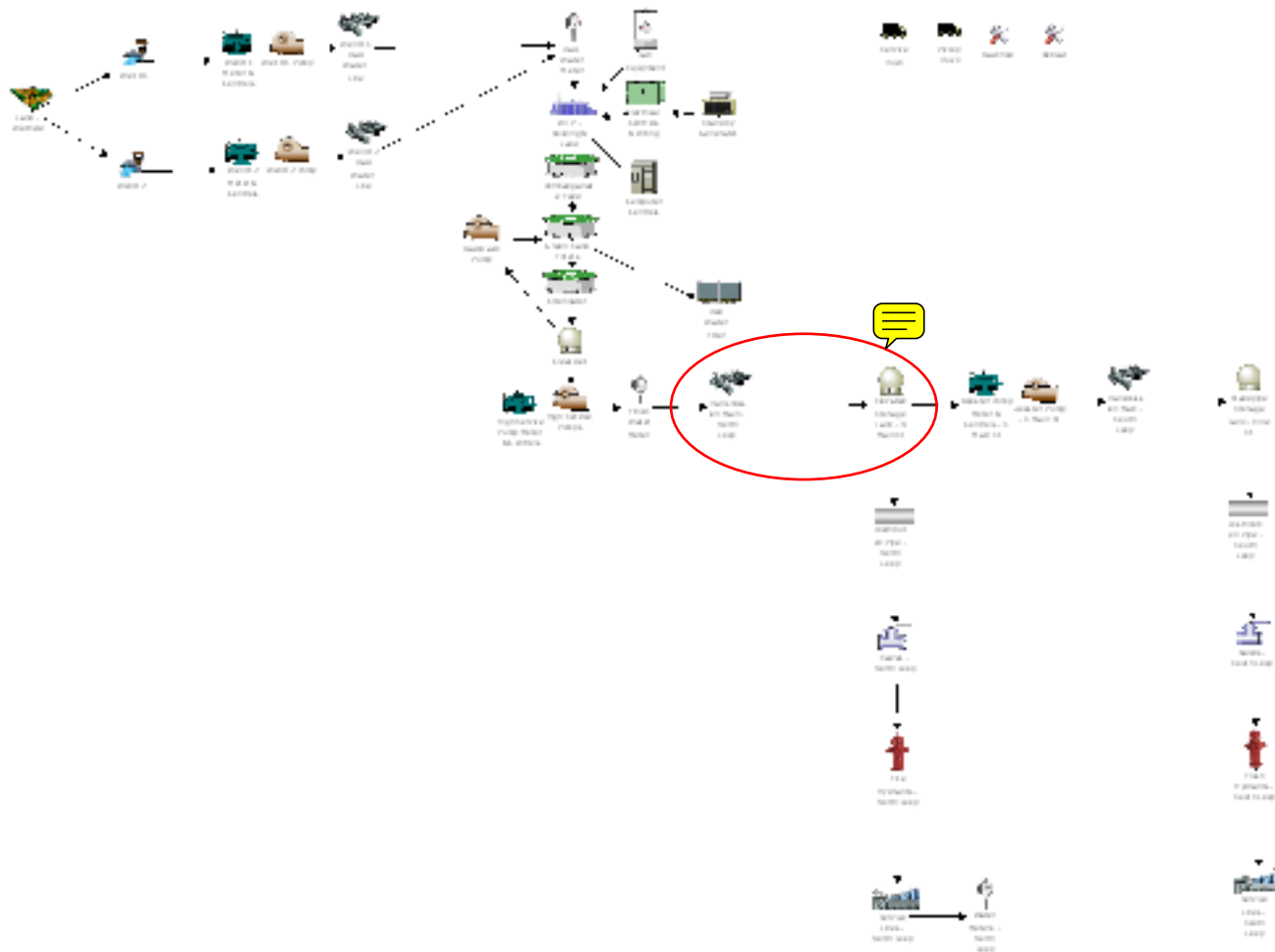


**Figure 2-1. Ohio RCAP Community Water System Age Profile**

Very little capital investment has occurred over the past 25 years. Approximately half of the utility department’s assets are 30+ years old. Core water distribution assets in the old downtown area are over 75 years old. Core infrastructure assets are approaching the end of their useful life.

The south distribution loop was installed 30 years ago. The south distribution loop and associated upgrades at the well field and treatment plant account for the large spike in value during this time period.

Subsequent water system investments are best classified as reactive asset replacement. The majority of the capital improvement projects constructed during the past three decades were driven by the failure of existing assets.



**Figure 2-2. Ohio RCAP Community Water System Schematic**

Arrows show the flow of water from the well field through the distribution system. All finished water flows through the old downtown distribution system and storage tank. This is both the oldest and most critical portion of the distribution system. The primary water transmission main is 75+ years old. This particular asset is in very poor condition with history of significant maintenance problems.

### 3 Level of Service Agreement

The goal of the Ohio RCAP Community Water System is to deliver safe water by providing services that meet or exceed customer expectations and comply with federal regulations. This section describes the utility's Level of Service goals and the key performance targets for each of the level of service goal for present and future performance. The level of service describes the characteristics of utility's performance such as "how much", "of what nature", and "how frequently" about the service and the performance target define how each level of service will be measured. The utility's progress toward meeting those goals will be reported annually.

The levels of service determine the amount of funding that is required to maintain, renew and upgrade the water infrastructure to provide the customers with the levels of service specified. The Level of Service goals are defined across the four service areas identified below and a performance target is defined for each goal as a measure for the Level of Service goal. Changes to the levels of service goals and how the utility addresses the issues will affect funding requirements and how well the utility can provide the proper service to the community.

The target levels of service that the utility has chosen to meet are presented in Table 3-1. This table lists the Level of Service goals and measures the success of each goal.

**Table 3-1. Level of Service Goals - for example table, see Appendix E**



Service Area	Levels of Service		Achieved
	Goal	Performance Targets	
Health, Safety and Security	Reduce the number, frequency and duration of boil advisories.	Reduce the number of water leaks by 20%. Reduce the average length of utility outage to less than a day.	Major performance deficiencies
Asset Preservation and Condition	Improve Preventative Maintenance	Complete all scheduled preventative maintenance tasks within 10 days.	Considerable performance deficiencies
Asset Preservation and Condition	Establish a Predictive Maintenance program	Complete all scheduled monitoring tasks within 10 days.  Escrow \$1,445 monthly for predictive maintenance expenses.	Major performance deficiencies
Asset Preservation and Condition	Development an Asset Replacement Strategy	Escrow \$25,500 annually for Asset Replacement.	Major performance deficiencies
Service Quality and Cost (including Aesthetics, Reliability, Responsiveness and Capacity)	Increase utility rate to improve sustainability and absorb the up-front cost of asset management planning.	Utility Rate Adjustment Pending	Major performance deficiencies
Service Quality and Cost (including Aesthetics, Reliability, Responsiveness and Capacity)	Enact automatic inflationary rate adjustments	Utility Rate Adjustment Pending	Major performance deficiencies

Service Area	Levels of Service		Achieved
	Goal	Performance Targets	
Service Quality and Cost (including Aesthetics, Reliability, Responsiveness and Capacity)	Minimize life-of-asset ownership cost	Begin monitoring the cost of unplanned (emergency) repairs relative to scheduled preventative maintenance.	Meets no performance objectives
Conservation, Compliance and Enhancement	Improve reliability of water distribution through the distribution system	Hire engineer to perform preliminary engineering report and begin project design. Prepare project funding applications for construction start in fall of 2011.	Major performance deficiencies

The above Level of Service goals concentrate upon development and implementation of the initial Asset Management Plan. To be effective Level of Service goals must be SMART (Specific, Measurable, Attainable, Realistic and Time Based).

Once an asset management plan has been implemented you will want to turn your attention to more specific management objectives such as Product Quality, Customer Satisfaction, Employee and Leadership Development, Operational Optimization, Financial Viability, Infrastructure Stability, Operational Resiliency, Community Sustainability, Water Resource Adequacy and Stakeholder Understanding and Support. Guidelines for establishing management goals for each of these topics can be found in the publication entitled “**Effective Utility Management: A Primer for Water and Wastewater Utilities**”. The publication can be obtained at:

[http://epa.gov/waterinfrastructure/pdfs/tools\\_si\\_watereum\\_primerforeffectiveutilities.pdf](http://epa.gov/waterinfrastructure/pdfs/tools_si_watereum_primerforeffectiveutilities.pdf).



## 4 Critical Assets



Some assets are more important than others in making sure that customers receive safe drinking water, or making sure that wastewater is treated effectively, or both. Therefore, the asset management team used the CUPSS software (developed by the U.S. Environmental Protection Agency) to identify and prioritize critical assets and to improve practices used for routine operation and maintenance. This process includes reviewing all assets and recording their conditions (likelihood of failure), criticality to the utility (consequence of failure) and redundancy (the number of back-up assets to help support each asset). This will ensure that the utility delivers the level of service described in the previous section.

The Ohio RCAP Community Water System asset management team has completed a critical asset assessment using the valued judgment method of condition assessment. Maintenance history was provided by the water system operator. Little to no written maintenance records were available. Therefore significant reliance was placed upon the memory of the present and previous water system operators. This information was supplemented with information provided by the Mayor and Safety Service Director. EPA reports and Sanitary Survey results were also utilized the most obvious of which was a long list of boil advisories.

Tables 4-1 list assets critical to maintain the performance of the utility. (For additional information on assets, see the My Check-Up Asset Report)

**Table 4-1. Ohio RCAP Community Water System Critical Asset Inventory**

Asset	Asset Type	Year Installed	Condition	CoF	Capacity	Risk	Replacement Date
Chlorinator	Treatment Equipment	06/01/1975	Fair (Average)	Catastrophic	Full-sized	High Risk – Immediate Attention	02/01/2011
Lab Equipment	Lab / Monitoring Equipment	06/01/1975	Fair (Average)	Major	Full-sized	High Risk – Immediate Attention	02/01/2011
Transmission Main - North Loop	Transmission Mains	01/01/1937	Very Poor	Catastrophic	Undersized	High Risk – Immediate Attention	02/01/2034
Elevated Storage Tank - N Main St	Concrete & Metal Storage Tanks	01/01/1965	Good	Catastrophic	Full-sized	High Risk – Immediate Attention	02/01/2026
Service Lines - North Loop	Service Lines	01/01/1937	Very Poor	Moderate	Full-sized	High Risk – Immediate Attention	02/01/2010
Valves - North	Valves	01/01/1970	Very Poor	Moderate	Full-sized	High Risk –	02/01/2010

Asset	Asset Type	Year Installed	Condition	CoF	Capacity	Risk	Replacement Date
Loop						Immediate Attention	
Computer Controls	Computer Equipment / Software	07/14/2000	Fair (Average)	Moderate	Full-sized	High Risk – Immediate Attention	02/01/2011
Permanganate Feed	Treatment Equipment	06/01/1975	Good	Moderate	Full-sized	High Risk – Immediate Attention	02/01/2010
Backwash Pump	Pumping Equipment	06/01/1975	Fair (Average)	Moderate	Full-sized	High Risk – Immediate Attention	02/01/2010
Red Water Filter	Liquid Waste Handling & Disposal	06/01/1975	Fair (Average)	Moderate	Full-sized	High Risk – Immediate Attention	02/01/2015
Green Sand Filters	Treatment Equipment	06/01/1975	Fair (Average)	Moderate	Full-sized	High Risk – Immediate Attention	02/01/2015
Service Lines - South Loop	Service Lines	01/01/1985	Good	Moderate	Full-sized	High Risk – Immediate Attention	02/01/2020
Transmission Main - South Loop	Transmission Mains	01/01/1985	Good	Moderate	Full-sized	High Risk – Immediate Attention	02/01/2022
Finish Water Meter	Meters	06/01/1975	Fair (Average)	Minor	Full-sized	Medium Risk – Aggressive Monitoring	02/01/2010
Water Meters - North Loop	Meters	01/01/1985	Good	Minor	Full-sized	Medium Risk – Aggressive Monitoring	02/01/2010
Valves - South Loop	Valves	01/01/1985	Good	Moderate	Undersized	High Risk – Immediate Attention	02/01/2026
Water Meters - South Loop	Meters	01/01/1993	Good	Minor	Full-sized	Medium Risk – Aggressive Monitoring	02/01/2013
Clear well	Concrete & Metal	06/01/1975	Good	Major	Full-sized	Medium Risk –	02/01/2057

Asset	Asset Type	Year Installed	Condition	CoF	Capacity	Risk	Replacement Date
	Storage Tanks					Aggressive Monitoring	
Distribution Pipe - North Loop	Distribution / Collection Mains	01/01/1937	Very Poor	Major	Full-sized	Medium Risk – Aggressive Monitoring	02/01/2034

## **5 Operation and Maintenance (O&M) Strategy**

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O&M consists of preventive and emergency / reactive maintenance. In this section, the strategy for O&M varies by the asset, criticality, condition and operating history. The risk matrix in My Check-Up Asset Report provides the utility's assets and identifies the risk value for each asset. This risk matrix and section 4.0 of this document were used as the basis for establishing the maintenance program as a way to make sure that the utility address the highest risk assets. In addition, the maintenance program addresses the level of service performance objectives to ensure that the utility is running at a level acceptable to the customer.

Unexpected incidents could require changing the maintenance schedule for some assets. This is because corrective action must be taken in response to unexpected incidents, including those found during routine inspections and O&M activities. Utility staff will record condition assessments when maintenance is performed, at established intervals, or during scheduled inspections. Assets rated at the top of the priority ranking are presented below with the maintenance strategies. As an asset is repaired or replaced, its condition will improve and therefore can reduce the overall risk of the asset failing.

The maintenance strategy will be revisited annually.

### **5.1 Preventive Maintenance**

Preventive maintenance is the day-to-day work necessary to keep assets operating properly, which includes the following:

1. Regular and ongoing annual tasks necessary to keep the assets at their required service level.
2. Day-to-day and general upkeep designed to keep the assets operating at the required levels of service
3. Tasks that provide for the normal care and attention of the asset including repairs and minor replacements
4. The base level of preventative maintenance is defined in the equipment owners manual. These preventative maintenance guidelines are supplemented by industry accepted best management practices.

Equipment must be maintained according to manufacturer's recommendations to achieve maximum return on investment. By simply following the manufacturer's suggested preventive maintenance the useful life of equipment can be increased 2 to 3 times when compared to run till failure mode of operation. Communities that have eliminated preventive maintenance practices from their operating budget can achieve positive returns from a relatively small additional investment.

Table 5-1 shows preventive maintenance cost based on best management practices and manufacturer's recommended servicing intervals. Deferred maintenance tasks that have not historically been performed because of inadequate funding or staffing must be projected into future operating budgets to achieve life expectancy projected by the manufacturer and engineer.

**Table 5-1. Ohio RCAP Community Water System Preventive Maintenance Schedule for 2010**

Task Name	Cost(\$)	Frequency	Estimate Annual Cost	Deferred Maintenance
Backwash Pump Amperage - Backwash Pump	25.00	The 1st Tuesday every 1 month(s)	0.00	300.00
Calibrate Finish Water Meter - Finish Water Meter	250.00	Every November 1	0.00	250.00
Calibrate pressure guages - Green Sand Filters	100.00	Every October 1	0.00	100.00
Cathode Protection for North Tank - Elevated Storage Tank - N Main St	3000.00	Every May 1	1500.00	1500.00
Cathode Protection for South Tank - Standpipe Storage Tank - Vine St	3000.00	Every May 1	1500.00	1500.00
Change fluids & filters on Backhoe - Backhoe	350.00	Every February 1	175.00	175.00
Change fluids & filters on Bobcat - Bobcat	450.00	Every March 1	225.00	225.00
Change fluids & filters on pickup truck - Pickup Truck	75.00	Day 1 of every 3 month(s)	150.00	150.00
Change fluids & filters on service truck - Service Truck	75.00	Day 1 of every 3 month(s)	150.00	150.00
Check seal on booster pumps - Booster Pump - S Main St	25.00	The 3rd Tuesday every 3 month(s)	0.00	100.00
Check seals on Backwash Pump - Backwash Pump	15.00	The 2nd Tuesday every 1 month(s)	180.00	0.00
Freeze Protection - Standby Generator	50.00	Every October 1	50.00	0.00
Generator Load Test - Standby Generator	325.00	Every June 1	0.00	325.00
Grease Backwash Pump - Backwash Pump	20.00	The 3rd Wednesday every 1 month(s)	240.00	0.00
Grease booster pump - Booster Pump - S Main St	50.00	The 3rd Tuesday of March	50.00	0.00
Grease High Service Pumps - High Service Pumps	20.00	The 2nd Monday every 1 month(s)	20.00	0.00
High Service Pump Amperage - High Service Pump Motor & Controls	100.00	The 2nd Wednesday every 3 month(s)	0.00	400.00
High Service Pump Rate - High Service Pumps	100.00	The 2nd Wednesday every 3 month(s)	0.00	400.00
High Service Pump Seal Inspection - High Service Pumps	25.00	The 2nd Wednesday every 3 month(s)	100.00	0.00
Hudrant flush program - Fire Hydrants - North Loop	150.00	Day 1 of every 1 month(s)	0.00	1500.00
HVAC Service - WTP - Building & Land	150.00	Every October 5	100.50	49.50
Hydrant flush program - Fire Hydrants - North Loop	150.00	The 2nd Thursday every 1 month(s)	0.00	1800.00
Hydrant Flush program - Flush Hydrants - South Loop	100.00	Every 1 week(s) on Thursday	0.00	5200.00
Inspect Generator - Standby Generator	25.00	The 3rd Tuesday every 1 month(s)	0.00	300.00



Task Name	Cost(\$)	Frequency	Estimate Annual Cost	Deferred Maintenance
Monitor Backwash Pressure - Green Sand Filters	50.00	Every November 1	0.00	50.00
Monitor Booster Pump Amperage - Booster Pump Motor & Controls - S Main St	100.00	Day 1 of every 3 month(s)	0.00	400.00
Monitor Booster Pump Rate - Booster Pump - S Main St	100.00	Day 1 of every 3 month(s)	0.00	400.00
Overhaul Chlorinator - Chlorinator	250.00	Day 1 of every 6 month(s)	250.00	250.00
Red Water Filter Inspection - Red Water Filter	100.00	Every June 1	100.00	0.00
Red Water Filter Media Replacement - Red Water Filter	3000.00	Every August 1	1500.00	1500.00
Service Generator - Standby Generator	70.00	Every September 1	70.00	0.00
Service heater & dehumifer in pump house - Booster Pump - S Main St	50.00	Every September 1	50.00	0.00
Service Raw Water Meter - Raw Water Meter	100.00	Every February 1	0.00	100.00
Service SCADA System - Computer Controls	2000.00	Every February 1	0.00	2000.00
Visual Inspection of Electric Components - Electrical Controls & Wiring	100.00	Every March 1	0.00	100.00
Well #1 Amperage - Well #1 Motor & Controls	45.00	Day 1 of every 6 month(s)	0.00	90.00
Well #1 Draw Down - Well #1	50.00	The 2nd Monday every 1 month(s)	0.00	600.00
Well #1 Pump Rate - Well #1 Pump	40.00	The 2nd Monday every 3 month(s)	0.00	160.00
Well #2 Amperage - Well #2 Motor & Controls	45.00	Day 15 of every 6 month(s)	0.00	90.00
Well #2 Drawdown - Well #2	50.00	Day 15 of every 1 month(s)	0.00	600.00
Well #2 Pump Rate - Well #2 Pump	40.00	Day 15 of every 3 month(s)	0.00	160.00
Update My CUPSS plan	0.00	One Time	0.00	0.00
Update My CUPSS plan	0.00	One Time	0.00	0.00
Update My CUPSS plan	0.00	One Time	0.00	0.00
Update My CUPSS plan	0.00	One Time	0.00	0.00
Valve Exercise Program	125.00	Every 1 week(s) on Thursday	0.00	6500.00
Water Meter Testing & Repair	350.00	The 2nd Tuesday every 1 month(s)	0.00	4200.00
<b>Total Maintenance Cost</b>			<b>6,410</b>	
<b>Total Deferred Maintenance Cost</b>				<b>31,624</b>



\*Additional cost necessary to fully implement the above described maintenance program are specified in the last column. These costs must be budgeted into the annual operating budget in order to achieve the manufacturer’s recommended life expectancy and highest return on investment. Often the greatest obstacle to improved maintenance is staffing. Labor shortages must be addressed before an improved preventive maintenance plan can be implemented.

**5.2 Emergency/Reactive Maintenance**

Reactive maintenance is often carried out because of customer requests or sudden asset failures. Emergency maintenance cost approximately 1/3 more than planned maintenance for the same task. Furthermore, history teaches us that 30 to 70% of emergency maintenance is misdirected. Everyone agrees that deferring failure is never cost effective. However, we often are left little choice but to apply temporary repairs to restore customer service. These temporary fixed often have to be removed before permanent repairs can be installed. Significant cost savings can be achieved by avoiding emergency / reactive maintenance and fixing it right the first time.

The number and cost of unplanned (emergency) repairs relative to of schedule maintenance task is an indicator of the effectiveness of your asset management program. The long term goal of your maintenance program should be to reduce the amount of unplanned (emergency / reactive) maintenance to a reasonable level. As a rule of thumb the cost of emergency maintenance should not exceed 20% of the total maintenance budget.

**Table 5-2. Ohio RCAP Community Water System Emergency/Reactive Maintenance Expenses for 2009**

Task Name	Cost(\$)	Frequency	Estimate Annual Cost
Rebuild High Service Pump Motor - High Service Pump Motor & Controls	2800.00	One Time	2800.00
Repair Water Leak - Distribution Pipe - North Loop	500.00	One Time	500.00
Repair Water Leak - Distribution Pipe - North Loop	1000.00	One Time	1000.00
Repair Water Leak - Distribution Pipe - North Loop	450.00	One Time	450.00
Repair Water Leak - Distribution Pipe - North Loop	1000.00	One Time	1000.00
<b>Total Emergency/Reactive Cost</b>			<b>5,750</b>



### 5.3 Deferred Maintenance

Deferred maintenance is any maintenance, repair, restoration or replacement work that should have been accomplished before now, and that has not been performed. Maintenance can sometimes be deferred for many years without serious repercussions. However the speed at which things wear out increases if maintenance is deferred. Eventually the condition of utility department assets will deteriorate to the point where the effective useful life has been seriously compromised.

In these instances, it may be necessary to selectively rehabilitate or replace worn and unreliable equipment before an effective preventative maintenance program can be implemented. Run-till-failure may be the most economic alternative for some assets. Assets which can not be rejuvenated with improved preventative maintenance will be handled in Section 7.

Remember, you can not cure years of deferred maintenance overnight! Changes in maintenance expense occur very slowly and many years may go by before there is any noticeable change in operating cost. Even with an asserted effort, it may take several years to overcome the adverse impact of seriously deferred maintenance. You can however take comfort in the fact the alternative of not implementing an effective preventative and predictive maintenance program will cost more in the long-run.

## 6 Water Quality

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This section addresses how the Ohio RCAP Community Water System addresses water quality and water efficiency issues under the two major federal statutes governing water are the Safe Drinking Water Act (SDWA), the Clean Water Act (CWA), and State Drinking Water Regulations.

### Source Water Assessments and Protection

The cost of water treatment, as well as the risks to public health, can be reduced by protecting source water from contamination. Ohio RCAP Community Water System has reviewed the source water assessments and protection studies that provide information about the drinking water in Ohio RCAP Community Water System and the community. The study results show that the utility should take the action to help reduce potential sources of contamination and protect drinking water. These issues include the following:

1. Identify from state assessment any key issues that will need to be addressed in the action plan below

The associated actions are identified in the action plan in Section 9.0; for list of contaminants, see Appendix A.

### Total Maximum Daily Loads (TMDLs)

Under CWA section 303(d), states are required to identify waters that do not meet water quality standards after the implementation of nationally required levels of pollution control technology, and to develop TMDLs for those waters. On the basis this determination, pollutant loadings are allocated among pollution sources in a water segment. Appendix B includes the water bodies to which the utility discharges and the causes of impairment.

To address these and future impairments, the asset management team has identified projects in the Capital Improvement Plan Section 7.0 of this plan.

## 6.1 Implementation Strategy to Protect Watersheds

### Water Quality Monitoring Strategy

Water quality monitoring provides the data to characterize waters and identify changes or trends in water quality over time. The collection of monitoring data enables Ohio RCAP Community Water System to identify existing or emerging water quality problems and determine whether current pollution control mechanisms are effective in complying with the regulations.

[Name of utility] uses the [Continuous basis at regular sites (i.e., fixed stations)/ As-needed basis at selected sites, to answer specific questions/ Temporary or seasonal basis; at random sites throughout an area or state/ Emergency basis (such as after a spill)] monitoring strategy and findings are included in the CUPSS application. The monitoring assets are included in Section 2.0 Utility Overview and tasks associated with water quality monitoring are included in Section 5.1.

## Water and Energy Efficiency

The water and energy sectors are highly interdependent. Customers use enormous amounts of energy to withdraw, treat, and distribute water. Identifying approaches to integrate energy efficient practices into the daily management and long-term planning for our utility also contribute to the long-term sustainability of water infrastructure by reducing operation costs and adding to a utility's bottom line.

Ohio RCAP Community Water System is initiating the following steps to encourage water and energy efficiency to aid in forestalling future large capital expenditures in infrastructure and have identified several water and energy efficiency capital improvement project with a total cost of [Enter Costs]:

- Participating in off-peak pumping
- Securing adequate storage
- Purchasing efficient pumps and motors
- Properly sizing equipment to its intended duty/load requirement
- Installing renewable energy technologies on-site or purchasing renewable energy credits
- Using variable speed devices
- Water audits and water loss control programs
- Considering how the utility handles heating, ventilation, air conditioning, and lighting
- Conducting a baseline energy evaluation to assess the utility's energy consumption status.
- Sustainable pricing
- Employing consumer outreach programs (free home water audits, rebate programs, an such)
- Using practices to generate energy (for example, combined heat and power (CHP), also known as cogeneration, is a reliable, cost-effective option for wastewater treatment facilities that have installed, or are planning to install, anaerobic digesters. Biogas from these digesters can be used in a CHP system as "free" fuel to generate reliable electricity and power).

## Best Management Practices (BMPs)

Adopting BMPs is an emerging trend among the water utility industry. Widespread adoption of better management practices offers great promise to reduce costs and direct system investments using a risk-based approach. BMPs are inherently pollution prevention practices. The asset management team has considered installing several types of BMPs. They include a total implementation cost of [Enter Cost] and conduct BMP activities throughout its preventive maintenance.

## **7 Capital Improvement Program (CIP)**

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The Ohio RCAP Community Water System capital improvement program (CIP) plan is the description of future capital projects. Capital improvement projects generally create a new asset that previously did not exist or they upgrade and improve an existing capacity. The projects can result from growth or environmental needs, such as the following:

1. Expenditure that purchases or creates a new asset or in any way improves an asset beyond its original design capacity
2. Upgrades that increase the capacity of the asset
3. Construction designed to produce an improvement in the standard operation of the asset beyond its present capacity

In addition to capital improvement projects, the asset management team has reviewed and is establishing a renewal (or rehabilitation) strategy. Renewal expenditure is anything that does not increase the asset's design capacity but restores an existing asset to its original capacity. Any improvement projects that require more than simply restoring an asset to its original capacity are deemed to be a renewal project, such as the following:

1. Activities that do not increase the capacity of the asset (i.e., upgrade and enhance the assets restoring them to their original size, condition, and capacity)
2. Rehabilitation involving improvements and realignment or restores the assets to a new or fresh condition
3. Predictive maintenance completed in support of the preventive maintenance program (Example: Weatherizing, Painting, Roof Replacement, Window and Door Replacements, HVAC Replacements and other short lived capital improvement to long-term assets)

In making renewal decisions, the utility considered several categories other than the normally recognized physical, failure or breakage. Such renewal decisions include the following:

1. Structural
2. Capacity
3. Level of service failures
4. Outdated functionality
5. Cost or economic impact

The utility staff and management know of potential assets that need to be repaired or rehabilitated. Reminders in the CUPSS task calendar let the staff members know when the condition of an asset begins to decline according to the manufacturer's life cycle recommendations of assets. The CUPSS Check-Up Reports also have provided recommendations (replace, repair, or rehabilitate) for each asset. The utility staff members have taken these reminders and recommendations into account.

A summary of the current plan is presented in Table 7-1 and Table 7.2. Because the expected needs of the utility will change each year, the CIP plan will be updated to reflect those changes.

**Table 7-1. Ohio RCAP Community Water System Capital Improvement Projects**

Capital Improvement Project	Total Cost	Annual Savings	Type of Capital Improvement Project	Year to Conduct
Pull, Inspect & Repair Well #1 Pump	\$4000.00	\$800.00	Support of Preventive Maintenance	2014
Pull, Inspect & Repair Well #2 Pump	\$4000.00	\$800.00	Support of Preventive Maintenance	2017
WTP - HVAC	\$20,000.00	\$1,000.00	Support of Preventive Maintenance	2029
WTP - Roof	\$20,000.00	\$1,000.00	Support of Preventive Maintenance	2029
WTP - Window / Door	\$12,000.00	\$480.00	Support of Preventive Maintenance	2034
WTP - Gen. Repairs	\$50,000.00	\$1,250.00	Support of Preventive Maintenance	2049
Green Sand Filter Media Replacement	\$15,000.00	\$3,000.00	Support of Preventive Maintenance	2014
Drain, Clean & Inspect Clearwell	\$5,000.00	\$1,000.00	Support of Preventive Maintenance	2014
Paint & Rehab. N Main St. Tank	\$60,000.00	\$4,000.00	Support of Preventive Maintenance	2025
Paint & Rehab. Vine St Tank	<u>\$60,000.00</u>	<u>\$4,000.00</u>	Support of Preventive Maintenance	2025
<b>Total</b>	<b>\$250,000</b>	<b>\$17,330</b>		

Table 7.1 reports the annual savings necessary to support of preventative maintenance. This is the amount of money necessary to pay for predictive maintenance. Predictive maintenance involves the rehabilitation and replacement of short lived components to long term asset. The long-term asset management goal is to save 100% of predictive maintenance cost. You may not be able to save enough money to fund predictive maintenance during early years of this plan. Our intermediate goal is to fully fund predictive maintenance from savings within 10 years.

Asset replacement costs are handled in Table 7.2. Remaining useful life of water department assets was adjusted to reflect the proposed improvements in our preventative and predictive maintenance program. The projected remaining useful life for most assets was doubled when compared to traditional engineering estimates of life expectancy. We believe this to be conservative estimate that can be adjusted in subsequent reports.

**Table 7-2. Ohio RCAP Community Water System Capital Improvement Projects**

Capital Improvement Project	Total Cost	Annual Savings	Type of Capital Improvement Project	Year to Conduct
Land - Wellfield	\$280,000.00	\$869.57	Rehab/Replace	2252
Well #1	\$27,000.00	\$360.00	Rehab/Replace	2041
Well #1 Pump	\$20,000.00	\$666.67	Rehab/Replace	2025
Well #1 Motor & Controls	\$20,000.00	\$645.16	Rehab/Replace	2026
Well #1 Raw Water Line	\$67,500.00	\$888.16	Rehab/Replace	2042
Well #2	\$34,000.00	\$465.75	Rehab/Replace	2045
Well #2 Pump	\$20,000.00	\$666.67	Rehab/Replace	2025
Well #2 Motor & Controls	\$20,000.00	\$256.41	Rehab/Replace	2010
Well #2 Raw Water Line	\$54,000.00	\$1,421.05	Rehab/Replace	2010
WTP - Building & Land	\$100,000.00	\$1,190.48	Rehab/Replace	2059
Electrical Controls & Wiring	\$30,000.00	\$697.67	Rehab/Replace	2043
Standby Generator	\$25,000.00	\$961.54	Rehab/Replace	2026
Computer Controls	\$15,000.00	\$1,363.64	Rehab/Replace	2011
Lab Equipment	\$12,000.00	\$333.33	Rehab/Replace	2011
Raw Water Meter	\$500.00	\$25.00	Rehab/Replace	2018
Permanganate Feed	\$3,000.00	\$85.71	Rehab/Replace	2010
Green Sand Filters	\$50,000.00	\$1,250.00	Rehab/Replace	2015
Backwash Pump	\$10,000.00	\$285.71	Rehab/Replace	2010
Red Water Filter	\$30,000.00	\$750.00	Rehab/Replace	2015
Chlorinator	\$3,000.00	\$83.33	Rehab/Replace	2011
Clearwell	\$150,000.00	\$1,829.27	Rehab/Replace	2057
High Service Pumps	\$8,000.00	\$228.57	Rehab/Replace	2010
High Service Pump Motor & Controls	\$8,000.00	\$228.57	Rehab/Replace	2010
Finish Water Meter	\$1,000.00	\$28.57	Rehab/Replace	2010
Transmission Main - North Loop	\$75,000.00	\$773.20	Rehab/Replace	2034
Elevated Storage Tank - N Main St	\$1,200,000.00	\$19,672.13	Rehab/Replace	2026
Distributon Pipe - North Loop	\$1,395,000.00	\$14,381.44	Rehab/Replace	2034
Valves - North Loop	\$78,000.00	\$1,950.00	Rehab/Replace	2010

Capital Improvement Project	Total Cost	Annual Savings	Type of Capital Improvement Project	Year to Conduct
Fire Hydrants - North Loop	\$96,250.00	\$2,187.50	Rehab/Replace	2019
Service Lines - North Loop	\$131,250.00	\$1,797.95	Rehab/Replace	2010
Water Meters - North Loop	\$26,250.00	\$1,050.00	Rehab/Replace	2010
Booster Pump - S Main St	\$30,000.00	\$1,764.71	Rehab/Replace	2010
Booster Pump Motor & Controls - S Main St	\$60,000.00	\$3,000.00	Rehab/Replace	2013
Transmission Main - South Loop	\$202,500.00	\$5,472.97	Rehab/Replace	2022
Standpipe Storage Tank - Vine St	\$1,000,000.00	\$15,873.02	Rehab/Replace	2048
Distribution Pipe - South Loop	\$5,250,000.00	\$50,970.87	Rehab/Replace	2088
Valves - South Loop	\$110,000.00	\$2,682.93	Rehab/Replace	2026
Flush Hydrants - South Loop	\$120,000.00	\$2,608.70	Rehab/Replace	2031
Service Lines - South Loop	\$562,500.00	\$16,071.43	Rehab/Replace	2020
Water Meters - South Loop	\$97,500.00	\$4,875.00	Rehab/Replace	2013
Service Truck	\$45,000.00	\$4,500.00	Rehab/Replace	2012
Pickup Truck	\$18,000.00	\$1,800.00	Rehab/Replace	2015
Backhoe	\$50,000.00	\$1,724.14	Rehab/Replace	2038
Bobcat	\$35,000.00	\$1,206.90	Rehab/Replace	2038
<b>Total</b>	<b>\$11,570,250</b>	<b>\$169,943</b>		

Capital Improvement Project	Total Cost	Annual Savings
<b>Total</b>	<b>\$11,570,250</b>	<b>\$169,943.73</b>
20% Target	\$2,314,050	\$33,988
<b>15% Target</b>	<b>\$1,735,538</b>	<b>\$25,492</b>
10% Target	\$1,157,025	\$16,995

Self funding 100% of capital replacement cost is not a realistic goal for Poedunk. Instead we have chosen to target 15% of projected replacement cost. This figure should

be adequate to pay for pre-construction soft cost.

By paying for preliminary engineering and design from savings the project can be shovel ready as soon as construction financing is secured. Shovel ready projects have a greater probability of securing low interest loans and grants thereby reducing asset replacement cost. **Large capital purchased will continue to be financed by loans and grants with local contribution equal to pre-construction project soft cost.**

## **8 Financial Management Strategy**

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This section describes the Ohio RCAP Community Water System financial condition and its strategy for future financing. Expenses greater than \$10,000 are considered capital costs. Capital costs are one time expenses (not including labor) used to replace or upgrade, because of capacity, a part of the utility. Capital costs do not include any O&M costs.

Costs for water are funded through general rates (xx%), targeted rates (xx%) and fees and charges (xx%). External financing for capital expenses exceeding [\$xx] will be financed through [how will the utility finance capital expenses loans, rates, grants]. For details of capital projects, see the CIP plan. Table 8-1 below presents the estimated external financing.

If large expenses are required for expansion or upgrades, the Ohio RCAP Community Water System plans to pay for the improvements through [user enters the financing methods]. The utility(ies) estimates that it will spend a total of \$xx on water over the next 10 years to accommodate growth in the town, compliance with state and federal regulations, and introduce new drinking water or wastewater requirements. A detailed financial summary for the next 10 years is presented in Table 8-1.

Financial ratios are used to determine the financial health of a utility. The utility used the following Operating, Debt, Sales and Expense Ratios to shed light on the financial status of the utility and are included in Appendix E of this report.

### **8.1 Financial Forecast**

The Financial Forecast shows predicted values of both revenue and expenses for the asset management teams using the values provided in the financial history, see Appendix D. The projections are used to help the utility plan for and predict future expenses and revenue and how to better finance capital improvement projects by acquiring loans or grants or by planned rate changes.

### **8.2 Total Expenditure**

The following table illustrates the forecasted financial needs for the next 10 years. The actual expenditure in FY 2008 and FY 2009, and the approved budget for 2010, is also shown for comparison.

**Table 8-1. Ohio RCAP Community Water System Total Expenditure Summary - Actual/Forecast** 

FY 2008 Actual	FY 2009 Actual	FY 2010 Budget	Expense/Revenue	Typical Year	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
			<b>Water Supply</b>											
0.0%	0.0%	0.0%	<b>Annual Growth</b>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		825	<b>Number of Customers</b>	825	825	825	825	825	825	825	825	825	825	825
		\$30	<b>Average Customer Bill</b>	\$34	\$30	\$31	\$32	\$33	\$34	\$35	\$36	\$37	\$38	\$39
\$77,877	\$14,296	\$14,296	Cash on Hand	\$81,498	\$19,082	\$28,964	\$54,043	\$79,624	\$46,966	\$73,405	\$107,274	\$141,819	\$114,555	\$149,247
2.0%	2.0%	2.0%	Interest Rate											
0%	0%	0%	Average Inflation	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
			<b>Revenues</b>											
\$296,640	\$297,000	\$402,900	Revenue from User Rates	\$496,400	\$433,500	\$446,500	\$459,500	\$473,000	\$487,500	\$502,000	\$517,000	\$532,000	\$548,000	\$565,000
\$1,077	\$200	\$200	Interest	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
\$0	\$0	\$0	Revenue from Grants	\$25,000	\$0	\$0	\$0	\$0	\$150,000	\$0	\$0	\$0	\$100,000	\$0
\$0	\$0	\$0	Revenue from Loans	\$93,000	\$0	\$30,000	\$0	\$0	\$500,000	\$0	\$0	\$0	\$400,000	\$0
\$0	\$0	\$0	Savings Withdraw	\$13,625	\$0	\$15,000	\$0	\$0	\$58,750	\$0	\$0	\$0	\$62,500	\$0
\$3,200	\$5,769	\$2,000	Other Revenues	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
\$300,917	\$302,969	\$405,100	<b>Total Revenues</b>	\$628,025	\$433,500	\$491,500	\$459,500	\$473,000	\$1,196,250	\$502,000	\$517,000	\$532,000	\$1,110,500	\$565,000
			<b>Expenses</b>											
\$12,000	\$15,000	\$15,525	Chemicals	\$17,798	\$15,525	\$15,991	\$16,470	\$16,965	\$17,474	\$17,998	\$18,538	\$19,094	\$19,667	\$20,257
\$5,350	\$5,450	\$5,641	Billing Costs	\$6,467	\$5,641	\$5,810	\$5,985	\$6,164	\$6,349	\$6,539	\$6,736	\$6,938	\$7,146	\$7,360
\$5,000	\$5,000	\$5,175	Equipment	\$5,933	\$5,175	\$5,330	\$5,490	\$5,655	\$5,825	\$5,999	\$6,179	\$6,365	\$6,556	\$6,752
\$15,000	\$10,000	\$12,420	Contracts	\$14,238	\$12,420	\$12,793	\$13,176	\$13,572	\$13,979	\$14,398	\$14,830	\$15,275	\$15,733	\$16,205
\$0	\$1,000	\$1,035	Training Costs	\$1,187	\$1,035	\$1,066	\$1,098	\$1,131	\$1,165	\$1,200	\$1,236	\$1,273	\$1,311	\$1,350
\$4,500	\$5,000	\$5,175	Monitoring & testing	\$5,933	\$5,175	\$5,330	\$5,490	\$5,655	\$5,825	\$5,999	\$6,179	\$6,365	\$6,556	\$6,752
\$1,000	\$1,400	\$1,139	Other	\$1,306	\$1,139	\$1,173	\$1,208	\$1,245	\$1,282	\$1,320	\$1,360	\$1,401	\$1,443	\$1,486
\$14,000	\$13,000	\$13,662	Insurance	\$15,662	\$13,662	\$14,072	\$14,494	\$14,929	\$15,377	\$15,838	\$16,313	\$16,803	\$17,307	\$17,826
\$8,000	\$11,200	\$11,696	Maintenance	\$13,408	\$11,696	\$12,047	\$12,408	\$12,781	\$13,164	\$13,559	\$13,966	\$14,385	\$14,816	\$15,261
\$16,000	\$18,000	\$18,630	Utilities	\$21,357	\$18,630	\$19,189	\$19,765	\$20,358	\$20,968	\$21,597	\$22,245	\$22,913	\$23,600	\$24,308
\$3,000	\$3,000	\$3,000	Lease and mortgage	\$3,439	\$3,000	\$3,090	\$3,183	\$3,278	\$3,377	\$3,478	\$3,582	\$3,690	\$3,800	\$3,914
\$500	\$500	\$518	Fees	\$594	\$518	\$534	\$550	\$566	\$583	\$601	\$619	\$637	\$656	\$676
\$500	\$500	\$518	Security	\$594	\$518	\$534	\$550	\$566	\$583	\$601	\$619	\$637	\$656	\$676
\$7,600	\$5,000	\$6,107	Supplies	\$7,001	\$6,107	\$6,290	\$6,479	\$6,673	\$6,873	\$7,080	\$7,292	\$7,511	\$7,736	\$7,968
\$2,000	\$7,000	\$4,037	Emergency	\$4,628	\$4,037	\$4,158	\$4,283	\$4,411	\$4,544	\$4,680	\$4,820	\$4,965	\$5,114	\$5,267

FY 2008 Actual	FY 2009 Actual	FY 2010 Budget	Expense/Revenue	Typical Year	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
\$500	\$500	\$518	Services	\$594	\$518	\$534	\$550	\$566	\$583	\$601	\$619	\$637	\$656	\$676
\$59,000	\$50,000	\$51,750	Salaries, wages, benefits	\$59,326	\$51,750	\$53,302	\$54,902	\$56,549	\$58,245	\$59,992	\$61,792	\$63,646	\$65,555	\$67,522
\$0	\$0	\$32,573	Improved Preventative Maintenance	\$7,341	\$32,573	\$33,550	\$34,557	\$35,593	\$36,661	\$37,761	\$38,894	\$40,061	\$41,263	\$42,500
\$0	\$0	\$17,937	Predictive Maintenance	\$20,563	\$17,937	\$18,475	\$19,029	\$19,600	\$20,188	\$20,794	\$21,418	\$22,060	\$22,722	\$23,404
\$0	\$0	\$0	Other Expenses	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
\$153,950	\$151,550	\$207,056	<b>Sub-Total Annual Operating Expenses</b>	\$237,366	\$207,056	\$213,268	\$219,666	\$226,256	\$233,043	\$240,035	\$247,236	\$254,653	\$262,292	\$270,161
\$0	\$0	\$0	Capital Improvements Projects Required	\$135,625	\$15,000	\$45,000	\$10,000	\$15,000	\$708,750	\$0	\$0	\$0	\$562,500	\$0
\$0	\$165,000	\$165,000	Annual Debt Payment	\$190,585	\$165,000	\$166,579	\$166,579	\$166,579	\$198,373	\$198,373	\$198,373	\$198,373	\$223,809	\$223,809
\$0	\$0	\$0	Annual Reserve Fund Contribution	\$26,750	\$20,000	\$20,000	\$20,000	\$20,000	\$25,500	\$32,400	\$32,400	\$32,400	\$32,400	\$32,400
\$0	\$0	\$0	Emergency Reserve	\$1,800	\$4,500	\$4,500	\$4,500	\$4,500	\$0	\$0	\$0	\$0	\$0	\$0
\$0	\$165,000	\$165,000	<b>Total Non-Operating Expenses</b>	\$354,760	\$204,500	\$236,079	\$201,079	\$206,079	\$932,623	\$230,773	\$230,773	\$230,773	\$818,709	\$256,209
\$153,950	\$316,550	\$372,056	<b>Total Cost of Doing Business</b>	\$592,126	\$411,556	\$449,347	\$420,745	\$432,335	\$1,165,667	\$470,808	\$478,009	\$485,426	\$1,081,001	\$526,370
\$146,967	(\$13,581)	\$33,044	<b>Cash Surplus / Deficit</b>	\$35,899	\$21,944	\$42,153	\$38,755	\$40,665	\$30,583	\$31,192	\$38,991	\$46,574	\$29,499	\$38,630

Asset Plan implementation will require an additional upfront investment in improved preventative maintenance. Additional revenues will also be needed to support Rehabilitation / Replacement Escrow account deposits. Most communities will need to enact a rate increase to implement their asset management plan. Poedunk is no different.

Unfortunately, for the citizens of Poedunk the water department was already experiencing serious financial distress. A cash surplus of \$146,967 on 12/31/2006 has eroded to \$(13,581) as of 12/31/2009. Industry experts recommend that public utilities maintain a minimum of 90 days worth of working capital. Poedunk does not currently maintain any form of emergency fund or debt service reserves.

CUPSS My Financial section will help you plan and schedule long-term capital improvement projects. However, CUPSS provides very little assistance with utility rate analysis and structuring. The below supplemental Excel spreadsheet was developed to work through the rate analysis and structuring. This spreadsheet was developed using the principles taught in our 301 Board Training course entitled "Asset Management, Budgeting and Rate Setting".



### Ohio RCAP Community

	Projections			Typical	Methodology	Data Collection			
	Budget 12/31/12	Budget 12/31/11	Budget 12/31/10			Historical 12/31/09	Historical 12/31/08	Historical 12/31/07	Historical 12/31/06
Number of Customers	825	825	825	825	Zero Growth	825	824	823	827
Number of EDU	850	850	850	850	Zero Growth	850	849	848	852
<b>Rate Increase</b>	<b>3.0%</b>	<b>7.6%</b>	<b>31.7%</b>						
Effective Date of Water Rate	1/1/2012	1/1/2011	1/1/2010	1/1/2000		1/1/2000	1/1/2000	1/1/2000	1/1/2000
Base Rate	28.33	27.50	24.50	30.00		30.00	30.00	30.00	28.50
Base Amount	2,000	2,000	2,000						
Usage Rate / 1000	6.18	6.00	6.00						
Typical Residential Bill for 4500 gallons of usage	43.78	42.50	39.50			30.00	30.00	30.00	28.50
Percentage of MHI	1.46%	1.42%	1.32%	36,000	2000 Census	1.00%	1.00%	1.00%	0.95%
	<b>Budget</b>	<b>Budget</b>	<b>Budget</b>	<b>Typical</b>		<b>Historical</b>	<b>Historical</b>	<b>Historical</b>	<b>Historical</b>
	<b>12/31/12</b>	<b>12/31/11</b>	<b>12/31/10</b>	<b>Year</b>		<b>12/31/09</b>	<b>12/31/08</b>	<b>12/31/07</b>	<b>12/31/06</b>
<b>Revenue</b>									
Total Water Sales	446,505	433,500	402,900	296,640	Avg. 2007 - 2009	297,000	296,640	296,280	282,834
Bulk Sales	2,000	2,000	2,000	2,000	2009 Actual	2,000	1,200	850	750
Interest	200	200	200	200	2009 Actual	200	1,077	2,180	2,770
General Fund Transfers						1,769			
New Service Taps	-	-	-	-		2,000	2,000	-	4,000
<b>Total Revenue</b>	<b>448,705</b>	<b>435,700</b>	<b>405,100</b>	<b>298,840</b>		<b>302,969</b>	<b>300,917</b>	<b>299,310</b>	<b>290,354</b>
<b>Inflation Rate</b>	<b>3.50%</b>	<b>3.50%</b>	<b>3.50%</b>						
<b>Expenses</b>									
Repair & Maintenance	12,529	12,105	11,696	11,300	Avg. 2006-2009	11,200	8,000	13,000	13,000
Equipment	5,544	5,356	5,175	5,000	Avg. 2006-2009	5,000	5,000	5,000	5,000
Salaries / Wages / Benefits	55,436	53,561	51,750	50,000	2009 Actual	50,000	59,000	55,000	50,000
Supplies	6,541	6,320	6,107	5,900	Avg. 2006-2009	5,000	7,600	6,500	4,500

# Asset Management Plan

01/28/2010

Chemicals	16,631	16,068	15,525	15,000	2009 Actual	15,000	12,000	9,800	9,900
Contracts	13,305	12,855	12,420	12,000	Avg. 2006-2009	10,000	15,000	10,000	13,000
Utilities	19,957	19,282	18,630	18,000	2009 Actual	18,000	16,000	17,000	12,500
Monitoring & Testing	5,544	5,356	5,175	5,000	2009 Actual	5,000	4,500	3,800	3,700
Emergency	4,324	4,178	4,037	3,900	Avg. 2006-2009	7,000	2,000	2,500	4,100
Rent * Mortgage	3,000	3,000	3,000	3,000	Avg. 2006-2009	3,000	3,000	3,000	3,000
Insurance	14,635	14,140	13,662	13,200	Avg. 2006-2009	13,000	14,000	15,000	10,800
Services	554	536	518	500	Avg. 2006-2009	500	500	500	500
Training Cost	1,109	1,071	1,035	1,000	2009 Actual	1,000	-	100	-
Billing Cost	6,043	5,838	5,641	5,450	2009 Actual	5,450	5,350	5,200	5,000
Fees	554	536	518	500	Avg. 2006-2009	500	500	500	500
Security	554	536	518	500	Avg. 2006-2009	500	500	500	500
Other	1,220	1,178	1,139	1,100	Avg. 2006-2009	1,400	1,000	1,000	1,000
Non Typical Expenses			-	-		50,000	-	35,000	10,000
Improved Preventative / Predictive Maintenance	35,062	33,876	32,731	31,624	Asset Management	-	-	-	-
Rehabilitation Escrow per Asset Management Plan	19,214	18,564	17,937	17,330	Asset Management	-	-	-	-
<b>Total Expenses</b>	<b>202,540</b>	<b>195,793</b>	<b>189,273</b>	<b>182,974</b>		<b>201,550</b>	<b>153,950</b>	<b>183,400</b>	<b>147,000</b>
Debt #1 (Existing Debt Service)	165,000	165,000	165,000	165,000		165,000	165,000	165,000	165,000
Debt #2 (Deferred Maintenance - _____ yr.)	-	-	-	-		-	-	-	-
Debt #3 (Capital Project - _____ yr.)	-	-	-	-		-	-	-	-
<b>Total Debt Payment</b>	<b>165,000</b>	<b>165,000</b>	<b>165,000</b>	<b>165,000</b>		<b>165,000</b>	<b>165,000</b>	<b>165,000</b>	<b>165,000</b>
Emergency Fund (12.5% Expenses)	5,064	4,895	4,732	4,574	12.5% O&M / 5 yrs. 10% Payment / 10 yrs.	-	-	-	-
Debt Service Reserve (10% Annual Payment)	16,500	16,500	16,500	16,500		-	-	-	-
Replacement Escrow per Asset Management Plan	24,492	24,492	-	24,492	Asset Management	-	-	-	-
Capital Improvement & Regulatory Compliance	-	-	-	-		-	-	-	-
<b>Total Capital Funds</b>	<b>46,056</b>	<b>45,887</b>	<b>21,232</b>	<b>45,566</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Total Required</b>	<b>413,596</b>	<b>406,679</b>	<b>375,505</b>	<b>393,540</b>		<b>366,550</b>	<b>318,950</b>	<b>348,400</b>	<b>312,000</b>
Cash Surplus / Deficit	35,109	29,021	29,595	(94,700)		(63,581)	(18,033)	(49,090)	(21,646)
Cash Flow Margin	7.8%	6.7%	7.3%						
<b>Utility Department Accounts</b>									
General Operating Account	108,021	72,912	43,891	14,296		14,296	77,877	95,910	145,000

Emergency Fund	14,405	9,437	4,637	-	-	-	-	-
Debt Service Reserve Fund	49,500	33,000	16,500	-	-	-	-	-
Rehabilitation & Replacement Escrow	104,699	60,993	17,937	-	-	-	-	-
Capital Improvement Fund	-	-	-	-	-	-	-	-
<b>Total Water Fund Accounts</b>	<b>232,619</b>	<b>147,618</b>	<b>68,903</b>	<b>14,296</b>	<b>14,296</b>	<b>77,877</b>	<b>95,910</b>	<b>145,000</b>

**Implementation of revenue supporting rate adjustment is the first and most critical step in implementation of this Asset Management Plan.** A rate increase must be enacted ASAP. The above example shows the impact of changing the rate structure from a flat level billing to a proportional to use rate structure. Approximately half of this rate adjustment is necessary to resolve ongoing operating deficits. The balance of the rate increase will be used to fund the Asset Management Rehabilitation and Replacement Escrow account.

First year cash surpluses will be used to rebuild the community’s working capital position. Asset management replacement escrow deposits will be delayed until cash reserves have been rebuilt. Replacement escrow deposits are scheduled to begin in year 2. An additional base rate increase of \$3.00 per EDU should be enacted on 1/1/2011 to support these saving account deposits.

Rate adjustments to support your asset management planning endeavors will likely need to be implemented in phases to mitigate customer rate burden. We recommend that multi-year rate adjustments be enacted to avoid the need to publicly debate the rate increase multiple times. Subsequently we are recommending an automatic 3.0% inflationary rate increase on January 1 of each year.

Ohio RCAP is currently working with Ohio Water Development Authority on a booklet entitled the “The Art and Science of Utility Rate Analysis and Structuring”. This two volume booklet should be available in the spring of 2010. This booklet will walk you step by step through the rate analysis and structuring process.

In addition, Boise State University Environmental Finance Center is working on link between their Dashboard program and CUPSS. Dashboard will allow you to interactively evaluate various financial management measurements with visual output similar to the gauges on an automotive dashboard. The Dashboard program link has already been built into CUPSS.

## 9 Action Plan

The Ohio RCAP Community Water System Asset Management Plan refers to many objectives, targets, maintenance and improvements for the utility. Table 9-1 brings all these items together to clearly identify the actions required to successfully implement the Asset Management Plan. For example action items, see Appendix F.

**Table 9-1 Action Plan Table**

Urgency	Service (All, W, WW)	Issue	Corrective Action Plan	Performance Target No.	Target Date for Completion	Status	Final Completion Date
Medium	W	Reduce the number of water leaks by 20%. Reduce the average length of utility outage to less than a day.	<p>An aggressive monitoring program will be undertaken to locate and replace the worst sections of pipe in the old distribution system.</p> <p>Pipe replacement projects will be developed based upon frequency of pipeline breaks and number of customers impacted. Pipelines located under village streets will be replaced in advance of scheduled street resurfacing projects.</p>	Reduce the number of water leaks by 20%. Reduce the average length of utility outage to less than a day.	12/31/2010	In Progress	
High	W	Complete all scheduled preventative maintenance tasks within 10 days.	<p>Establish CUPSS preventative maintenance work orders on all inventoried assets to schedule maintenance in per equipment manufacturer recommendations and industry recognized best management practices.</p> <p>Existing utility department revenues are inadequate to support an effective preventative maintenance program. <b>An additional \$31,624 must be appropriated into the annual O&amp;M budget. A utility rate increase will be necessary to sustain the improved preventative maintenance program</b></p>	Complete all scheduled preventative maintenance tasks within 10 days.	6/1/2010	In Progress	



Urgency	Service (All, W, WW)	Issue	Corrective Action Plan	Performance Target No.	Target Date for Completion	Status	Final Completion Date
High	W	<p>Complete all scheduled monitoring tasks within 10 days.</p> <p>Escrow \$1,445 monthly for predictive maintenance expenses.</p>	<p>Develop equipment condition monitoring techniques using CUPSS work orders. Monitoring information will be used to schedule equipment overhauls. Monitoring information will also be used to predict and hopefully mitigate future equipment failures.</p> <p>A Rehabilitation &amp; Replacement Escrow account needs to be established with minimum annual deposits adequate to finance all anticipated equipment rehabilitation from savings within 10 years.</p> <p><b>The predictive maintenance program dedicates the minimum recommended amount of capital reserves. An annual escrow deposit of \$17,330 is required. Escrowed funds must be housed in dedicated bank account.</b></p>	<p>Complete all scheduled monitoring tasks within 10 days.</p> <p>Escrow \$1,445 monthly for predictive maintenance expenses.</p>	6/1/2010	In Progress / Not Started	
Medium	W	<p>Escrow \$25,500 annually for Asset Replacement.</p>	<p>Annual Rehabilitation &amp; Replacement Escrow account deposits need to include money for the eventual replacement of inventoried assets.</p> <p><b>We recommend funding 15% of projected asset replacement cost or \$25,492 annually. Escrowed funds must be housed in dedicated bank account.</b></p>	<p>Escrow \$25,500 annually for Asset Replacement.</p>	12/31/2011	Not Started	

Urgency	Service (All, W, WW)	Issue	Corrective Action Plan	Performance Target No.	Target Date for Completion	Status	Final Completion Date
High	W	Utility Rate Adjustment Pending	<p>A utility rate increase must be implemented to fulfill the goals of this Asset Management Plan. Utility rates have remained unchanged of three years. Furthermore it appears that prior rate adjustments failed to keep pace with inflation. Maintenance had to be deferred because revenues were inadequate to sustain the business.</p> <p><b>The initial rate adjustment will need to both correct for ongoing revenue deficiencies and provide for future asset management. Goals of this asset management plan can not be achieved without a rate increase.</b></p>	Utility Rate Adjustment Pending	3/31/2010	In Progress	
Medium	W	Utility Rate Adjustment Pending	<p>An automatic 3.0% rate increase is recommended. Implementation of automatic annual rate adjustments will both stabilize revenue to the utility system and reduce rate burden to the customers.</p>	Utility Rate Adjustment Pending	3/31/2010	In Progress	
Low	W	Begin monitoring the cost of unplanned (emergency) repairs relative to scheduled preventative maintenance.	<p>Reduce the number and cost of emergency maintenance relative to scheduled maintenance task. A reduction in number and cost of emergency repairs is an indicator of the effectiveness of your asset management program.</p> <p><b>While changes in cost structure occur very slowly, a 20 to 30% life cycle cost reduction is achievable based upon a review of Australia's advanced asset management program.</b></p>	Begin monitoring the cost of unplanned (emergency) repairs relative to scheduled preventative maintenance.	12/31/2010	In Progress	

Urgency	Service (All, W, WW)	Issue	Corrective Action Plan	Performance Target No.	Target Date for Completion	Status	Final Completion Date
Medium	W	Hire engineer to perform preliminary engineering report and begin project design. Prepare project funding applications for construction start in fall of 2011.	<p>Segments of the old downtown distribution system are over 75+ years old including the primary transmission main. This transmission main is critical to water distribution throughout the entire system. Replacement of this water transmission main will require \$75,000.</p> <p>However, the community would like to upgrade the line from 8 inch to 12 inch to facilitate future development. The requested upgrade will increase the cost of water line replacement from \$75,000 to \$175,000.</p>	Hire engineer to perform preliminary engineering report and begin project design. Prepare project funding applications for construction start in fall of 2011.	9/1/2011	Not Started	

**9.1 Review Schedule**

The Ohio RCAP Community Water System is/are scheduled to review this plan annually and update the community on new information and changes on 02/11/2010.