

# Asset Management Tools

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March 15, 2012

Murfreesboro, TN



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# Session Objectives

- To understand your asset management and capital planning efforts
- To show the connection between asset management and energy management
- To learn what tools are available for asset management

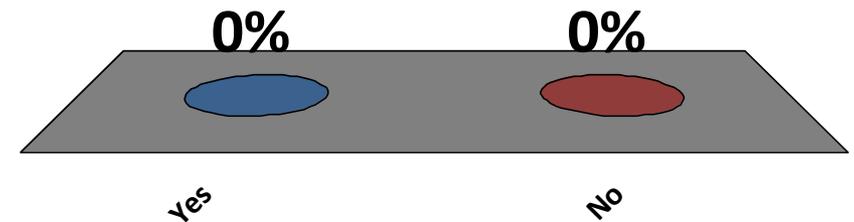


# Capital Improvement Timeline

- Asset Management Plan
  - For capital expenses in the long term (~20 years)
- Capital Improvement Plan
  - Specify projects and accurate estimates of cost.  
Plan where money will come from (~5 years)
- Capital Improvement Budget
  - Commits funds for the planned capital projects  
(1–2 years)

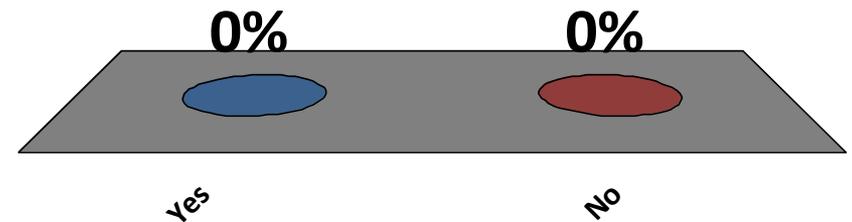
# Does your utility have an asset management plan (long-term)?

1. Yes
2. No



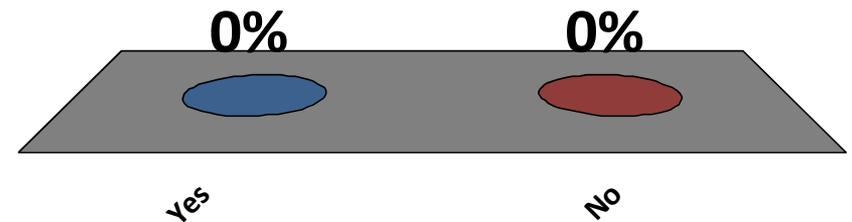
# Does your utility have a capital improvement plan (~5 year term)?

1. Yes
2. No



# Does your utility have a capital improvement budget?

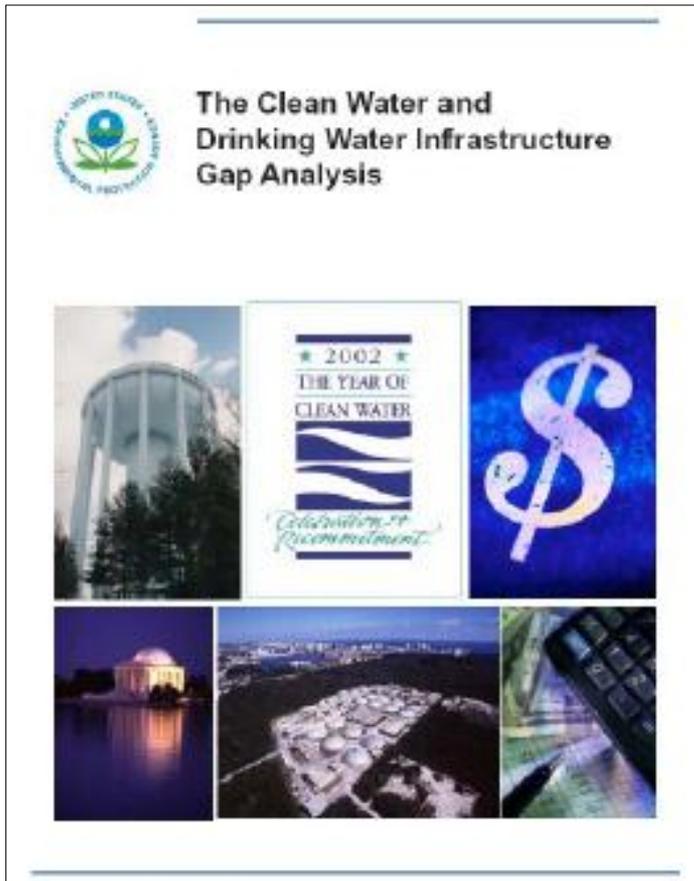
1. Yes
2. No



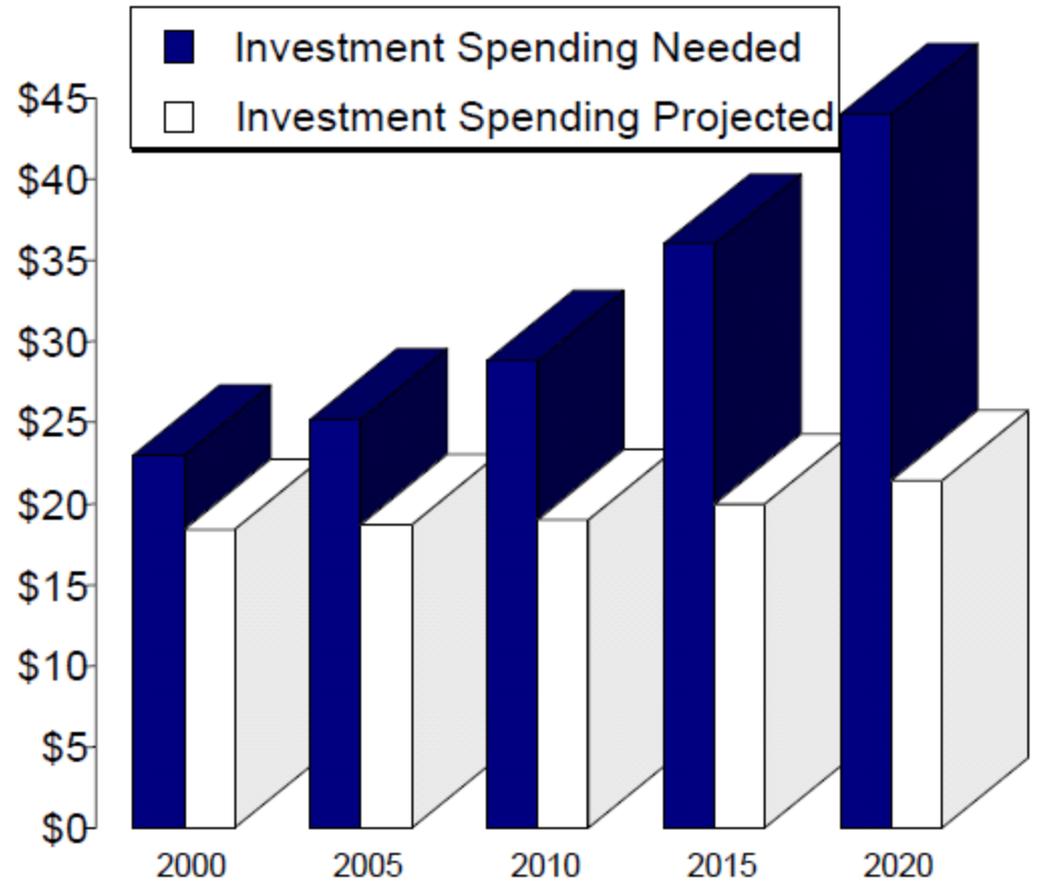
Please share some of your  
experiences with asset  
management and capital planning



# Asset Management is something every utility should focus on...



Source: Steve Allbee, USEPA



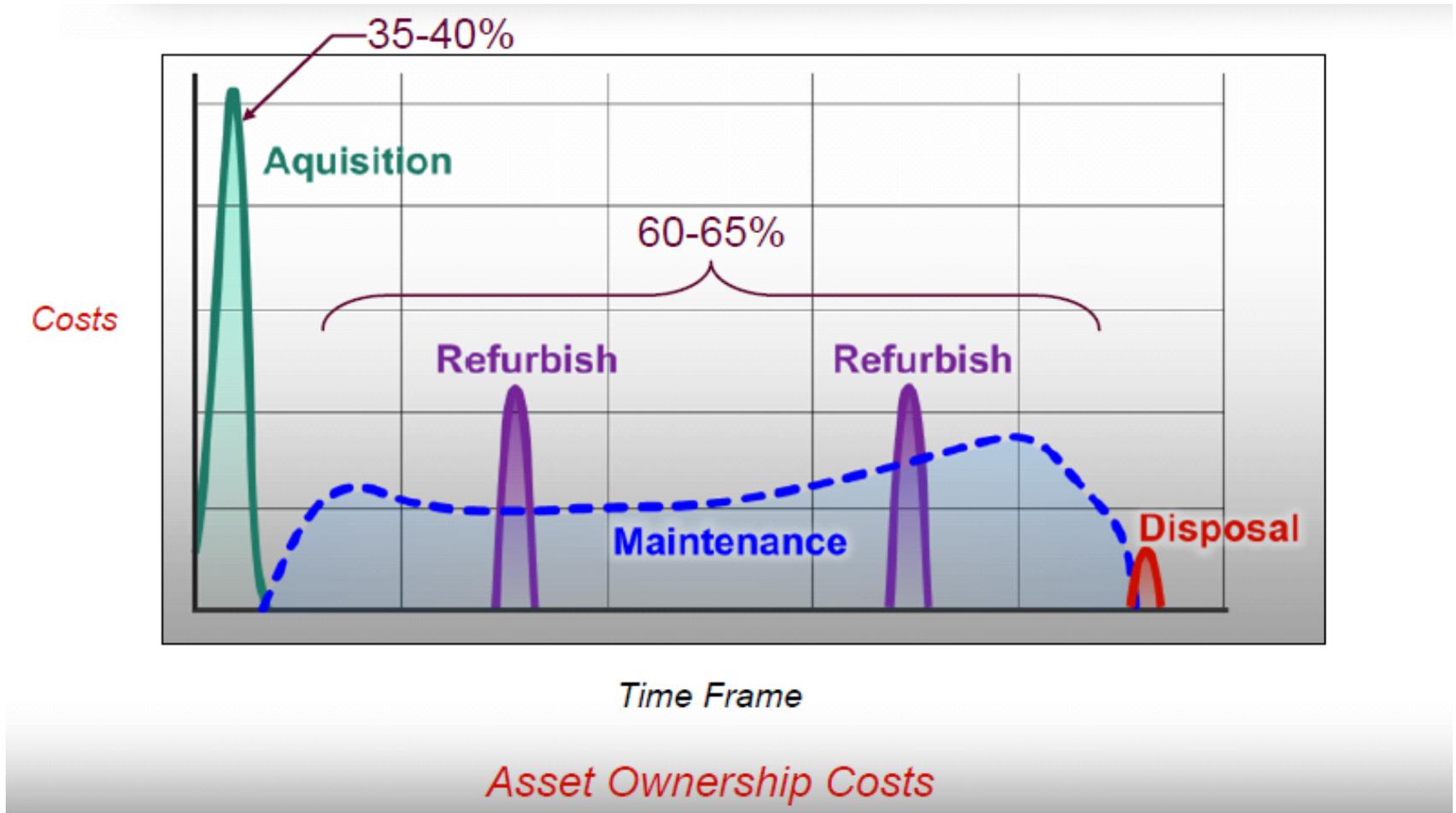
**EPA's projected spending gap through 2020**

# ...But especially for energy management

1. Taking an inventory.
2. Prioritizing your assets.
3. Developing an asset management plan.
4. Implementing your asset management plan.
5. Reviewing and revising your asset management plan.

Source: EPA's "Asset Management: A Handbook for Small Systems"

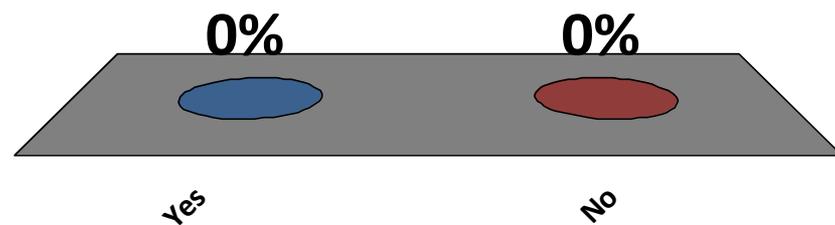
# Capital Investments are Just the Tip of the Iceberg...



Source: Steve Allbee, USEPA

# Has your utility incorporated energy costs into your asset management plans?

1. Yes
2. No



# Asset Management & Capital Planning Tools





# Asset Management: A Handbook for Small Water Systems

One of the Simple Tools for Effective  
Performance (STEP) Guide Series



[http://www.epa.gov/safewater/smallsystems/pdfs/guide\\_smallsystems\\_asset\\_mgmnt.pdf](http://www.epa.gov/safewater/smallsystems/pdfs/guide_smallsystems_asset_mgmnt.pdf)

# Asset Management: A Best Practices Guide

- [http://water.epa.gov/infrastructure/drinkingwater/pws/cupss/upload/guide\\_smallsystems\\_assetmanagement\\_bestpractices.pdf](http://water.epa.gov/infrastructure/drinkingwater/pws/cupss/upload/guide_smallsystems_assetmanagement_bestpractices.pdf)



**EPA**  
United States  
Environmental Protection  
Agency

## Asset Management: A Best Practices Guide

Introduction	
<i>Purpose</i>	<p>This guide will help you understand:</p> <ul style="list-style-type: none"> <li>What asset management means.</li> <li>The benefits of asset management.</li> <li>Best practices in asset management.</li> <li>How to implement an asset management program.</li> </ul>
<i>Target Audience</i>	This guide is intended for owners, managers, and operators of water systems, local officials, technical assistance providers, and state personnel.

Asset Management	
<p>Asset management is maintaining a desired level of service for what you want your assets to provide at the lowest life cycle cost. Lowest life cycle cost refers to the best appropriate cost for rehabilitating, repairing or replacing an asset. Asset management is implemented through an asset management program and typically includes a written asset management plan.</p>	

Challenges faced by Water Systems	Benefits of Asset Management
<ul style="list-style-type: none"> <li>Determining the best (or optimal) time to rehabilitate/repair/replace aging assets.</li> <li>Increasing demand for services.</li> <li>Overcoming resistance to rate increases.</li> <li>Diminishing resources.</li> <li>Rising service expectations of customers.</li> <li>Increasingly stringent regulatory requirements.</li> <li>Responding to emergencies as a result of asset failures.</li> <li>Protecting assets.</li> </ul>	<ul style="list-style-type: none"> <li>Prolonging asset life and aiding in rehabilitate/repair/replacement decisions through efficient and focused operations and maintenance.</li> <li>Meeting consumer demands with a focus on system sustainability.</li> <li>Setting rates based on sound operational and financial planning.</li> <li>Budgeting focused on activities critical to sustained performance.</li> <li>Meeting service expectations and regulatory requirements.</li> <li>Improving response to emergencies.</li> <li>Improving security and safety of assets.</li> </ul>

Implementing Asset Management: Five Core Questions Framework
<p>A good starting point for any size water system is the five core questions framework for asset management. This framework walks you through all of the major activities associated with asset management and can be implemented at the level of sophistication reasonable for a given system. These five core framework questions provide the foundation for many asset management best practices. Several asset management best practices are listed for each core question on the following pages. Keep in mind that these best practices are constantly being improved upon.</p>




# Asset Management for Local Officials

 **Asset Management for Local Officials**

This fact sheet will help you understand:

- The basics of asset management for local officials.
- Local officials' vital role in successfully implementing an asset management program.

This fact sheet is intended for local officials who are directly or indirectly involved in decisions affecting water systems.

**Asset Management**

Asset management is maintaining a desired level of service for what you want your assets to provide at the lowest life cycle cost. Lowest life cycle cost refers to the best appropriate cost for rehabilitating, repairing, or replacing an asset. Asset management is implemented through an asset management program and typically includes a written asset management plan. Water systems need asset management to:

- Address aging water infrastructure assets before they fail.
- Keep assets productive, and not allow them to become disruptive liabilities.
- Treat all decisions as investment decisions to maximize limited financial resources.
- Make costs transparent to support financial decisions.

Asset management requires:

- Support and involvement of local officials who have the authority and willingness to commit public resources and personnel to maintain community assets.
- A commitment of time and money to make cost-effective asset decisions (spending some money in the short-term to save more money over the long-term).
- A team made up of key decision makers.

**Improving Service and Maintaining Infrastructure Through Asset Management**

A sustainable water service delivers safe, clean water to its customers' satisfaction while managing infrastructure assets to maximize their useful life. An asset management plan will help you "tell the story" of water system assets to the community in a way that is understandable. Small systems that have simple asset management plans can benefit as much as large systems that have complex plans. Asset management will enable your system to:

- Have more efficient and focused operations.
- Choose capital projects that meet the system's true needs.
- Base rates on sound operational decisions.
- Improve its financial health.
- Reduce environmental violations due to failed or poorly performing assets.
- Improve the security and safety of infrastructure assets.

**The Five Core Questions Framework for Asset Management**

A good starting point for any system are five core framework questions, which walk you through all of the major activities associated with asset management.

1. **What is the current state of my system's assets?**  
Your water system's assets are part of your community's total assets. A decline in the value of your infrastructure indicates insufficient funding of asset management.
2. **What is my required "sustainable" level of service?**  
Knowing your required "sustainable" level of service will help you implement an asset management program and communicate to stakeholders what you are doing. The required level of service is the basis for justifying your user rates.

- [http://water.epa.gov/infrastructure/drinkingwater/pws/cupss/upload/guide\\_small\\_systems\\_assetmanagement\\_localofficials.pdf](http://water.epa.gov/infrastructure/drinkingwater/pws/cupss/upload/guide_small_systems_assetmanagement_localofficials.pdf)



# Building An Asset Management Team



## Building an Asset Management Team

This fact sheet will help you understand:

- How forming and having a team can help your water system successfully implement an asset management program.
- The components of a successful asset management team.

This fact sheet is intended for local officials, owners and operators of water systems, technical assistance providers, and state personnel.

### Making the Commitment

Asset management requires an investment in time and resources. Asset management is not a 1-year project, or even a 5-year project. It is a continual, fundamental change in the way infrastructure assets are managed. Successful asset management programs are characterized by a commitment to:

- Spending time and money to implement the program.
- Focusing on making cost-effective asset decisions.
- Providing a sustainable level of customer service for the community.

To achieve this level of commitment, asset management is implemented by a team that is:

- Supported by political leaders who have the authority and willingness to commit public resources and personnel.
- Made up of key decision makers who represent the departments involved with asset management.

### Creating and Maintaining an Asset Management Culture

Thinking about your assets differently can be the first step towards having a sustainable water system. With the limited resources of most systems, shifting away from reacting to events and towards making strategic plans can lead to real savings. Asset management focuses on the long-term life cycle of an asset and its sustained performance, not on the day-to-day aspects of the asset. It involves a shift in a water system's philosophy characterized by:

- Changing the management culture.
- Understanding that all asset decisions are investment decisions.
- Focusing on continual improvement driven by results (sustainability).

Changing the culture requires champions who use a team approach to promote and articulate the benefits of asset management. The champions are the motivating force behind the team that can consist of operators, managers, elected officials, and stakeholders. Each team member fulfills a role and function in implementing an asset management program.

### Components of a Successful Asset Management Team

The team should have the authority and resources to answer the core questions that lead to asset investment decisions. An asset management team:

- Is flexible and encourages critical thinking.
- Creates opportunities for sharing ideas and information through open and transparent debate.
- Works through problems and shares the success, not the blame.
- Fosters an atmosphere that builds trust and develops partnerships.
- Uses existing elements of asset management as a basis for the program.
- Starts implementation during planning to achieve early gains.

- [http://water.epa.gov/infrastructure/drinkingwater/pws/cupss/upload/guide\\_smallsystems\\_assetmanagement\\_teammanagement.pdf](http://water.epa.gov/infrastructure/drinkingwater/pws/cupss/upload/guide_smallsystems_assetmanagement_teammanagement.pdf)



# What to Include in Your Capital Plan

UNC ENVIRONMENTAL FINANCE CENTER  
www.efc.unc.edu/projects/capitalplanning.html  
Last Updated February 2011

## What to Include in Your Capital Plan: A Reference Guide for North Carolina Water and Wastewater Utilities

[Click to go to:](#)

- [Introduction and Purpose of this Reference Guide](#)
- [Layout of the Reference Guide](#)
- [Viewing the Categories and Elements of Capital Planning](#)
- [Detailed List of All Sources' Requirements and Recommendations](#)
- [Summary by Type of Source](#)
- [Quick-view Summary of Inclusions by Source Without Details](#)

### Introduction and Purpose of this Reference Guide

It is important for water and wastewater utilities to create, maintain and follow a plan to invest in their capital assets; whether to rehabilitate, replace or install new assets. Capital infrastructure costs account for a very large portion of utilities' total costs. Without proper long-term planning, utilities run the risk of not being able to pay for capital costs when they need to, leading to deteriorating service and, ultimately, public health risks.

The plans often take the form of Capital Improvement Plans (CIP) and/or Asset Management Plans. What to include in these plans is up to the utility. However, a few external factors could influence what a utility chooses to include in its plan. Funding agencies often require submission of specific information that can/should be collected in the capital plans, and some even specify the need for an approved CIP or Asset Management Plan. Likewise, other agencies often require submission of specific information in Reporting Forms that can/should be collected in the capital plans. Free CIP and Asset Management-creation software have their own requirements. Finally, there are several "Best Practice Guides" that make recommendations on what to include in capital plans.

This reference guide lists the requirements and recommendations made by many of the sources that influence what utilities in North Carolina include in their capital plans. Listing all of these sources in one document provides you with a reference that allows you to quickly compare and assess what you may want to include in your capital plan, following the recommendations of sources you choose to follow. Although the guide was written specifically for NC utilities, utilities in other states may also find it useful.

This reference guide may be updated occasionally. To check for updates, and for more information on capital planning, go to [www.efc.unc.edu/projects/capitalplanning.html](http://www.efc.unc.edu/projects/capitalplanning.html)

- Reference guide and webpage of resources
- <http://www.efc.unc.edu/projects/capitalplanning.html>

# Software: In-House

**Water Main Data**

**OWASA**

**Water Main Rehabilitation/Replacement Prioritization Model**

Object ID: 12609 Water Main Group: <Edit Groups>

**Street Name** (circled in red): KROGER CENTER

**Pipe Location:** Fields with bold black titles are used in PAN calculations

**Pipe Properties:**

Length (ft.): 94 Diameter (in.): 8

Material: Asbestos Cement Edit List

Original Internal Lining: Edit List

Joint Type: Edit List

HWC Factor:

Pipe Class:

Pipe Type: Finished

System Critical Water Main?: No

Total Breaks/Leaks in last 10 years: 1

Maximum Static Water Pressure (psi): 140

Recalculate PANs

**Prioritization Criteria:**

Hydraulic Performance	Corrosive Soil	Water Main Material	Maximum Static Water Pressure	Location	Critical Customer
PAN Calculation Criteria	Life Expectancy	Breaks & Leaks	Water Quality	Water Main Importance	

**Prioritization Criteria** (circled in red)

To Adjust PAN Calculation Criteria, Select a Tab

Composite PAN For This Water Main From Last Model Run:

272 → PAN (circled in red)

Model Results Last Generated On: 14-Apr-2003

Record: 1 of 6141



# Software: CUPSS (EPA)



**CUPSS Check Up Program for Small Systems**      Set-up | Switch Utility | Create User | Help | Training | Exit

My Home   
 My Inventory   
 My O & M   
 My Finances   
 My Check up   
 My CUPSS Plan

Welcome Back Helen, Beauty View Acres Subdivision - DW

What would you like to do today?



[Do Some Training](#)



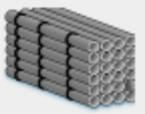
[Enter a New Task or Work Order](#)



[Create or Update My Schematic](#)



[Search Asset and Maintenance](#)



[Create or Update My Inventory](#)



[Enter My Finances](#)



[Print My Check Up Reports](#)



[Work on My CUPSS Plan](#)

### My Calendar

April 2008

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	1	2	3
4	5	6	7	8	9	10

### My Messages and Alerts

**Popup Messages Are Off. Click To Turn On.**

Reminder - Today's Tasks	8
Tasks Currently Past Due	160
Assets Needing Update	0
Number of High Risk Assets	2

<http://www.epa.gov/cupss/>

# Software: CAPFinance (EFC @ Boise State)



**CAPFinance™**  
is a user-friendly  
Program designed for  
Windows PCs

<http://efc.boisestate.edu/efc/Tools/tabid/58/Default.aspx>



# CIP Tool in MS Excel (EFC @ UNC)

<http://www.efc.unc.edu/tools.htm#CIPTool>

Free, simplified CIP tool using only MS Excel (EFC @ UNC)

Combined Water & Sewer Rates		Current Year	Usage Billed to Customers in FY06		
Uniform Rate (per 1,000 gals)	\$ 4.50	FY06			
Minimum Charge	\$ 24.00	Current Residential Bill (5kgal/mo.): \$ 37.50	Number of Customers	Residential 450	Non-residential 30
Volume Included with Min Charge (1,000's of gals)	2,000		Total Usage (1,000's GPM)	1,575	5,735
Existing Capital Reserves	\$ 950,000		Annual Customer Base Growth	0.0%	0.0%
Interest Rate on Reserves	5.0%				
<b>Revenues and Expenses in FY06</b>					
Annual Operating and Non-operating Revenues	\$ 335,249				
Annual O,M,G&A Expenditures	\$ 225,360				
Annual Expenditure Growth	2.5%				

*This model does not prescribe rate increases. Projections are purely illustrative. For example, a utility might choose to mitigate large future rate increases by spreading them out in the intervening period.*

Click to view long term trends in Average Bill, Financial Reserves and Capital Investment



Total Revenues

Expenditures

Pre-existing Debt Service

From Capital Projects (below)

Total Expenditures

Net Income

Financial Reserves

New Rate per 1,000 gals

Avg. Customer Bill (5,000 gals)

**1-Year Increase in Customer Bill for 5,000 gals**

*Increase for Large Users*

Required inputs are blue.

CAPITAL IMPROVEMENT PROJECTS - 10 YEAR	Annual Construction Cost Inflation Factor	Project Start Year	Project Expenditure/ Construction Period (Yrs)	Estimated Cost if Constructed in FY06	Cost Inflated to Start Year	Less Grants at Time of Construction	Total Cost Inflated to Start Year	Financing	Term	Rate	First Year of CR Allocation	Additional Annual O&M Costs
1 Replace ACP lines with PVC	5%	FY21	1	\$ 76,000	\$ 157,999	\$ -	\$ 157,999	CR	0	0.00%	FY12	\$ -
2 Replace small diameter lines	5%	FY18	1	\$ 107,500	\$ 193,055	\$ -	\$ 193,055	CR	0	0.00%	FY14	
3 Backup emergency generators for wells	5%	FY16	1	\$ 80,000	\$ 130,312	\$ -	\$ 130,312	CR	0	0.00%	FY09	
4 Critical valve replacement at water tank	5%	FY06	1	\$ 10,000	\$ 10,000	\$ -	\$ 10,000	CR	0	0.00%	FY06	
5 Critical valve replacement in distribution system	5%	FY07	1	\$ 10,000	\$ 10,500	\$ -	\$ 10,500	CR	0	0.00%	FY07	
6 Upgrade to automated water meters	5%	FY23	1	\$ 70,000	\$ 160,441	\$ -	\$ 160,441	CR	0	0.00%	FY17	
7 Telemetry for wells and storage tank	5%	FY08	1	\$ 10,000	\$ 11,025	\$ -	\$ 11,025	CR	0	0.00%	FY08	
8 Construct new elevated storage tank	5%	FY18	1	\$ 300,000	\$ 538,757	\$ -	\$ 538,757	CR	0	0.00%	FY06	
9 Waterline extension Phillips Hall Road Hwy 158	5%	FY24	1	\$ 120,000	\$ 288,794	\$ -	\$ 288,794	CR	0	0.00%	FY19	
10						\$ -						
11 Upgrade 10 sanitary sewer pump stations	5%	FY17	1	\$ 190,230	\$ 325,358	\$ -	\$ 325,358	CR	0	0.00%	FY07	
12 CCTV Inspection of Sewer System	5%	FY07	2	\$ 45,000	\$ 47,250	\$ -	\$ 47,250	CR	0	0.00%	FY06	
13 Rehabilitate 8-inch SS Lines	5%	FY24	3	\$ 1,088,000	\$ 2,618,402	\$ -	\$ 2,618,402	CR	0	0.00%	FY08	
14 Rehabilitate 140 SS Manholes	5%	FY14	1	\$ 200,000	\$ 295,491	\$ -	\$ 295,491	CR	0	0.00%	FY08	
15 Annual Sanitary Sewer Inspection	5%	FY06	20	\$ 70,000	\$ 70,000	\$ -	\$ 70,000	CR	0	0.00%	FY06	

# Show How the Plan will Affect Rates, Customers and your Fund

2	Total Revenues				\$ 335,249	\$ 335,249	\$ 335,249	\$ 360,952	\$ 385,348	\$ 400,649	\$ 426,636	\$ 46
3												
4	Expenditures				\$ 225,360	\$ 230,994	\$ 236,769	\$ 242,688	\$ 248,755	\$ 254,974	\$ 261,349	\$ 26
5	Pre-existing Debt Service				\$ -	\$ -						
6	From Capital Projects (below)				0	\$ 57,750	\$ 11,025	\$ -	\$ -	\$ -	\$ -	\$
7	Total Expenditures				\$ 225,360	\$ 288,744	\$ 247,794	\$ 242,688	\$ 248,755	\$ 254,974	\$ 261,349	\$ 26
8												
9	Net Income				\$ 109,889	\$ 46,505	\$ 87,455	\$ 118,264	\$ 136,592	\$ 145,674	\$ 165,287	\$ 19
10												
11	Financial Reserves				\$ 950,000	\$ 1,044,005	\$ 1,183,660	\$ 1,361,107	\$ 1,565,755	\$ 1,789,717	\$ 2,044,490	\$ 2,34
12	New Rate per 1,000 gals				\$ 4.50	\$ 4.50	\$ 4.84	\$ 5.16	\$ 5.36	\$ 5.70	\$ 6.23	\$
13	Avg. Customer Bill (5,000 gals)				\$ 37.50	\$ 37.50	\$ 38.51	\$ 39.47	\$ 40.07	\$ 41.10	\$ 42.69	\$
14	1-Year Increase in Customer Bill for				N/A	0.0%	2.7%	2.5%	1.5%	2.6%	3.9%	0.4
15	5,000 gals				N/A	0.0%	7.5%	6.6%	3.9%	6.4%	9.3%	0.9
16	Increase for Large Users				N/A	0.0%	7.5%	6.6%	3.9%	6.4%	9.3%	0.9
25	Term	Rate	First Year of CR Allocation	Additional Annual O&M Costs	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY
27	0	0.00%	FY12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 15,800	\$ 1



# Questions?



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