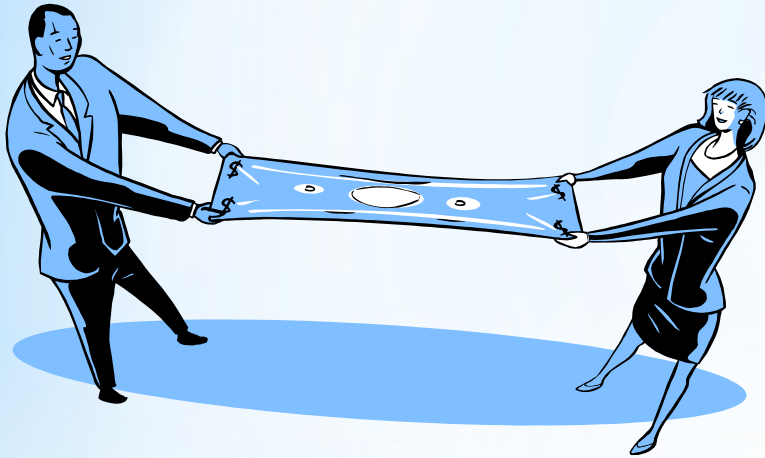


# Council Budget Retreat Water and Sewer Project and Issues Update



# Sewer Main Rehabilitation and Improvements

## *Water and Sewer Improvements Update*

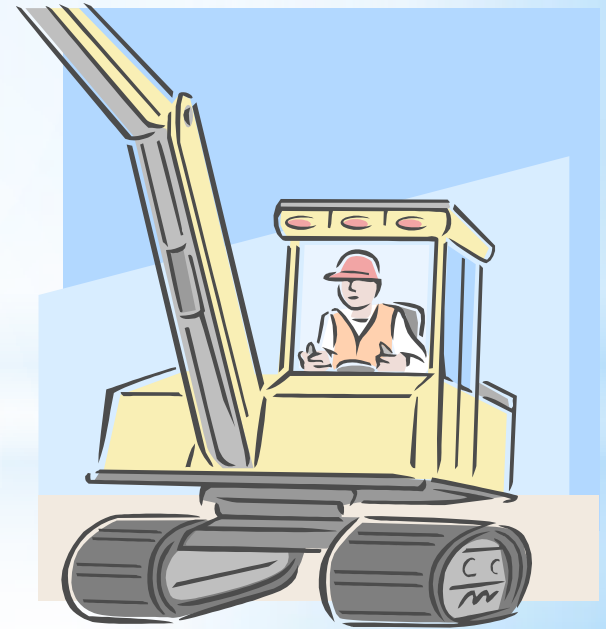


Water and Sewer Infrastructure needs are always difficult to fund, but today's economic situation continues to compound that challenge.

Only critical needs for Water and Sewer improvements have been considered during the last two years and various projects that are eligible to receive funding through grants or loans with some principal forgiveness.

## *Water and Sewer Improvements Update*

During the past nine years (2002 - 2011), we have spent approximately \$13,399,000 to address a multitude of various sewer needs. Of this amount \$1,362,078 has been in the form of a grant or principal forgiveness loan that did not have to be repaid.



The next four slides are a summary of Sewer Projects completed or underway between 2002 and February 2012.

## ***Water and Sewer Improvements Update***

- Sewer Projects 2002 to June 2004

Basin	Project Description	Date (Start/Completion)	Cost	Grants
	City of Eden Sanitary Sewer Rehabilitation			
Meadow Greens Dan River Covenant Branch	Design, Engineering, CA, CO, Survey	2002/2003	\$94,625.72	\$0.00
Meadow Greens Dan River Covenant Branch	Construction of Project	2003	\$323,710.00	\$0.00
	Construction of Project		\$208,693.25	\$0.00
	Construction of Project		\$154,532.25	\$0.00
All Basins	Comprehensive Wastewater Master Plan	Jun-02 - Aug-03	\$82,682.00	\$40,000.00
Dry Creek	Sanitary Sewer Evaluation Study (Smoke Testing)	Jan-03 - Aug-03	\$45,200.00	\$0.00
Meadow Greens Dan River Covenant Branch	Flow Isolation in Subsystems	Jul-03 - Dec-03	\$18,400.00	\$0.00
Meadow Greens Covenant Branch Dan River Kuder Street	Pump Station Evaluation	Sept-03 - Jun-04	\$62,000.00	\$0.00

## ***Water and Sewer Improvements Update***

- Sewer Projects July 2004 to October 2008

Basin	Project Description	Date (Start/Completion)	Cost	Grants
	City of Eden Sanitary Sewer Rehabilitation			
	Meadow Greens, Covenant Branch, Dan River and Kuder Street Sanitary Sewer Lift Station Improvements-Special Order by Consent Phase 4			
	Professional Services	Jul-04 - Oct-09	\$483,441.50	\$0.00
Meadow Greens	Construction (Replacement)	Jul-04 - Oct-09	\$1,460,230.00	\$0.00
Dan River				
Covenant Branch				
Kuder Street	Construction (Rehabilitation)		\$1,939,169.30	\$0.00
	Meadow Greens, Covenant Branch, and Dan River Sanitary Sewer Outfall and Collector Improvements-Special Order by Consent Phase 1 through 3			
	Professional Services	Aug-04 -Dec-08	\$1,171,268.96	\$0.00
Meadow Greens	Construction (Replacement, Point Repairs, Manhole Repairs)	Sept-05-Dec-08	\$4,920,131.04	\$500,000.00
Covenant Branch				
Dan River				
Kuder Street	Kuder Street Wastewater Collection Subsystem Sanitary Sewer Evaluation (Initialize Smoke Testing and Conduct Flow Isolation)	Dec-04 - Apr-05	\$44,040.00	\$40,000.00
New Street	Sewer Service to MGM Transport Building	Oct-05 - Nov-05	\$4,999.60	\$0.00
Dry Creek	Continuation of Wastewater Collection Subsystem Sanitary Sewer Evaluation Study (Manhole Inspection, Smoke Testing and Flow Isolation in Bridge Street; Manhole Inspection and Dye Testing in Kuder Street and CCTV Inspection in Kuder Street and Dry Creek)	Jan-07 - Oct-08	\$538,363.75	\$0.00
Bridge Street				
Kuder Street				

## ***Water and Sewer Improvements Update***

- Sewer Projects June 2008 to July 2010

Basin	Project Description	Date (Start/Completion)	Cost	Grants
	City of Eden Sanitary Sewer Rehabilitation			
Kuder Street	Smith River Sanitary Sewer Improvements Phase 1 - Replacement of the Irving Canal Aerial Crossing and Replacement of receiving section to enable shutdown of high priority sewer along the Smith River	June-08-Dec-09	\$ 606,690.00	\$ 303,345.00
Dry Creek	Dry Creek Sanitary Sewer Improvements Phase 1 -Immediate point repairs and replacement of two sections of sewers on Dry Creek Outfall	June-08-Dec-09	\$ 348,159.20	\$ 174,079.60
Dry Creek	Cargill Force Main - Approximately 2,310 linear feet of new 4-inch force main to redirect Cargill sewer from Dry Creek WWTP to Railroad Pump Station so Dry Creek WWTP could be taken off line	Nov-09-Jul-10	\$ 282,948.81	\$ 254,653.93

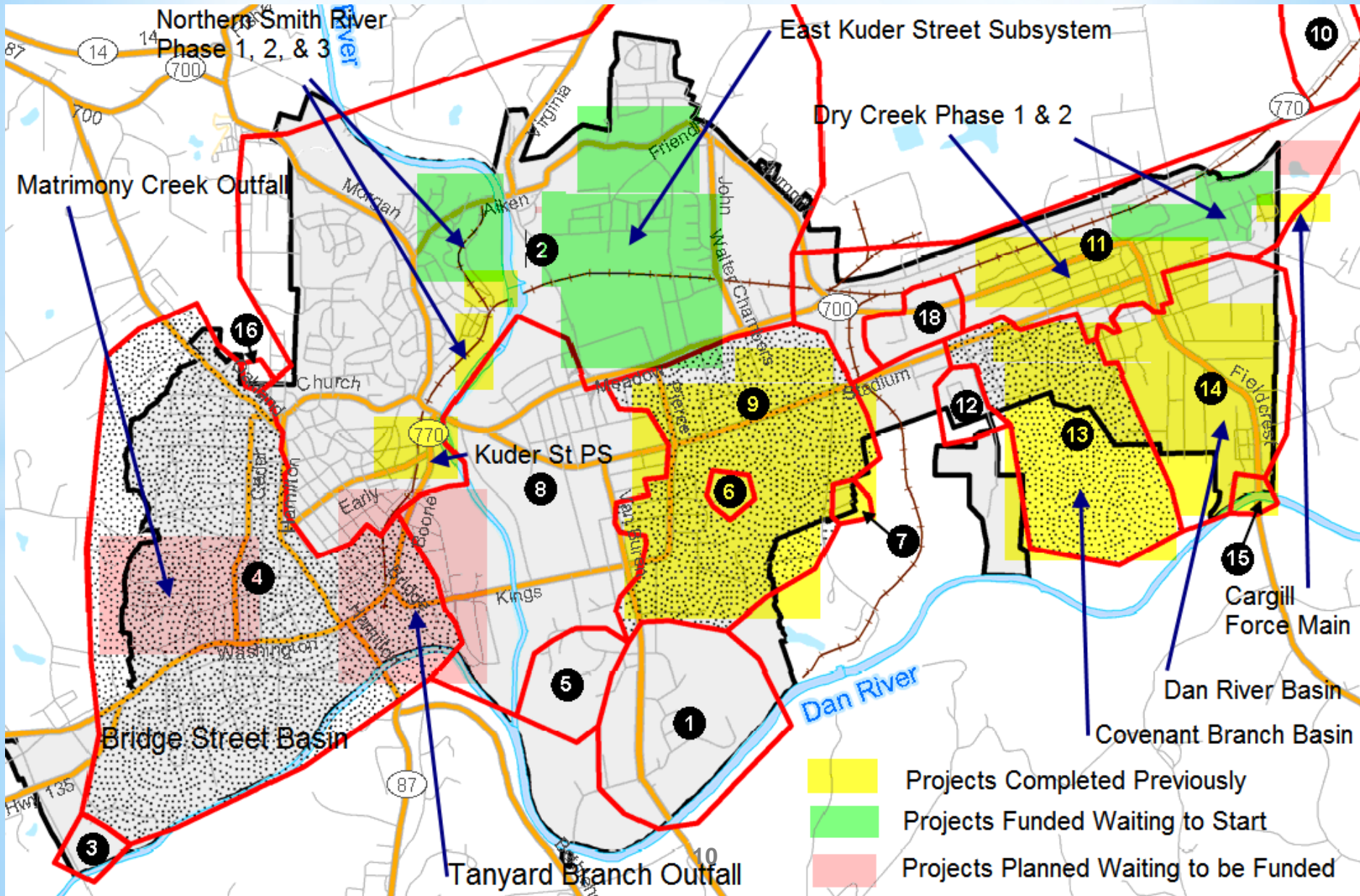


## ***Water and Sewer Improvements Update***

- Sewer Projects June 2008 to February 2012**

Basin	Project Description	Date (Start/Completion)	Cost	Grants
	City of Eden Sanitary Sewer Rehabilitation			
Kuder Street	Design and Bidding of Smith River Sanitary Sewer Improvements Phase 2/3 including CWMTF Grant and CWSRF Loan Application and Funding Approval - New Pump Station and Force Main, Sewer Re-routing and Replacement of Smith River Outfall between Aiken Road and Irving Canal Aerial Crossing to enable shutdown of high priority sewer along the Smith River	June-08-Oct-11	\$ 298,238.26	\$ -
Dry Creek	Design and Bidding of Dry Creek Sanitary Sewer Improvements Phase 2 - Replacement of the Dry Creek Outfall between Main Street and Railroad Pump Station	June-08-Oct-11	\$ 176,859.30	\$ -
Kuder Street	CWSRF Loan Application and Funding Approval for Rock Creek, Blue Creek and Peter Hill Outfall (Kuder Street East) Sanitary Sewer Improvements	Jan-11-Aug-11	\$ 32,500.00	\$ -
Bridge Street	Tanyard Bridge Outfall Evaluation including Engineering Report and Environmental Documentation, CWSRF Loan Application and CWMTF Grant Application	June-11-Feb-12	\$ 102,040.00	\$ 50,000.00
<b>Total Expenditures 2002 to 2012</b>			<b>\$13,398,922.94</b>	<b>\$1,362,078.53</b>

# Water and Sewer Improvements Update



## ***Water and Sewer Improvements Update***

Projects currently under way or funding applications pending and awaiting formal review

### **Northern Smith River Phase 2 & 3 and Dry Creek Phase 2**

Loan \$3,144,692

Principal Forgiveness \$1,742,182

### **East Kuder Street Phase 3**

Loan \$2,545,342

Principal Forgiveness \$1,000,000

**Tanyard Branch Outfall (Subsystem of Bridge Street Basins) – Application Submitted**

Loan \$3,031,949

Principal Forgiveness CWSRF \$1,000,000

Principal Forgiveness CWMTF \$ 500,000

**Upper Matrimony Creek Outfall Evaluation – Applied For Grant**

Matching Funds \$50,170

Assistance Grant \$40,000

# Berry Hill Regional Mega Park Sewer Project

Funding included in the FY 2011-12 budget equals \$1,800,000. Of that total, \$769,000 is in the form of a grant from the Golden Leaf Fund



# Two Inch Water Line Improvements

## *Water and Sewer Improvements Update*

During the past couple of years the primary focus of our water related capital improvement projects has been the 2 inch water line replacement program.

This is an extensive and ongoing Citywide project that requires a lot of engineering work, permitting, bidding, construction, inspection, and funding for each street as we progress. A tremendous amount of the engineering, bidding, and inspections have been handled in house by our staff.



## Waterline Improvements

### Recently completed projects:

- French St & Ridge Ave. - completed June 2011 (1,323 LF)
- Dillard Ct & Boyles Cir. – completed April 2011 (1,100 LF)
- Henry St & Taylor St – completed June 2011 (1,933 LF)
- Lake Dr & Beech St – completed April 2011 (1,782 LF)
- Weaver St – completed Feb. 2011 (1,320 LF)
- Thompson St & Neil St – completed Feb. 2012 (1,473 LF)
- Total length of these projects: 8,931 LF



## Waterline Improvements

Completion expected by end of June 2012:

- Martin St – (563 LF)
  - Kallem Ct – C&D crew to install 2” PVC WL (500 LF)
  - Carter St – C&D crew to install 2” PVC WL (360 LF)
  - E. Stadium Dr & Dishmon Loop (1,430 LF)
  - Holland St – CDBG project (1,341 LF)
- Total length of these projects: 4,194 LF

## Waterline Improvements

### Easement acquisition & final design phase:

- Lawson St extension (Lawson/Roberts to apt feed) – construction August 2012; 250 LF; est. \$22,000
  - Price St loop connector (Lawson St to Lewis St) – construction Sept. 2012; 950 LF; est. \$80,000
  - Coleman Street (Irving Ave to Center Church Rd) and (Irving Ave to Williams St) - construction late fall 2012; 1,405 LF; est. \$85,000
- Total length of these projects: 2,605 LF  
Estimated cost: \$187,000

## Waterline Improvements

Projects being considered for next few years:  
*(listed in order of priority)*

- Danview Ln & Dodge St (S. Fieldcrest Rd to Shawn St R/W - 560 LF; est. \$30,000)
- Jackson St (W. Moore St north halfway to W. Meadow Rd – 670 LF; est. \$61,000)
- Martin St (Harris St south to dead end – 560 LF; est. \$33,000 )
- First Street (S. Hamilton St to Cedar St – 900 LF; est. \$65,000)
- Circle Dr (Shedd St to Hodges St - 615 LF; est. \$37,000)

## Waterline Improvements

Projects being considered for next few years continued....:

- Maryland Ave (S. Rickman St to Bay St – 1,135 LF; est. \$80,000)
- Highland Dr (end 6” to Lynrock St - 925 LF; est. \$84,000)
- Morehead St (Cherry St to Hollingsworth St – 845 LF; \$65,000)
- Circle Dr (Osborne/Pitcher to Hunter St – 500 LF; est. \$40,000)

## Waterline Improvements

Projects being considered for next few years continued...:

- Caleb St & Ln (Flinchum St to Hudson St – 735 LF; est. \$63,000)
- Haled St (S. Hamilton St to Glenn St – 775 LF; est. \$73,000)
- Maple Street (Irving Ave to Williams St – 560 LF; \$49,000)
- Lynrock St (Highland Park Dr to Bridge St – 175 LF; est. \$9,500)

## Waterline Improvements

Projects being considered for next few years continued....:

- Knott St (Hairston St to S. New St – 585 LF; est. \$48,000)
  - West Ave (Central Ave to end WL – 750 LF; est. \$67,500)
  - Wilson alley (Oak St - Hollingsworth St – 970 LF; est. \$76,000)
  - Briarwood Dr (Maplewood Dr to end – 183 LF; \$9,500)
    - Length of projects on last 4 slides: 11,443 LF
- Estimated cost of projects on last 4 slides: \$890,500

## Waterline Improvements

Other projects being considered include:

- Fire hydrant installations by contractor
- Automatic flushing device installations by contractor
- Evaluation of booster pump stations by consultant
- Calibration of water model by consultant

## Waterline Improvements

Estimated 2" galvanized WL after these projects: 5.1 Miles  
Estimated cost to replace or upgrade: \$1,807,000

Estimated substandard 2" PVC WL after these projects:  
1.46 miles  
Estimated cost to upgrade: \$375,000

Estimated 2" WL that may be galvanized (or old PVC):  
3.55 miles  
Estimated cost to replace or upgrade (if all is galvanized):  
\$1,280,600



# The Automated Meter Reading Project

AMR Project

The long awaited Automated Meter Reading (AMR) was started on January 3, 2012.

The contractor has made excellent progress with the project with only minor issues found as the project has progressed.

The City meter reading schedule is divided into 44 routes. The contractor is moving through the project route by route.

## *Water and Sewer Improvements Update*

AMR Project

As of February 16<sup>th</sup> a total of **1,905** of the 6,998 Meters have been replaced or retrofitted.



As you will remember, \$1,452,260 was allocated for this project with the bid prices for the project as follows:

Meters and transmitter	\$1,214,345
Installation of Meters	\$ 208,215

Currently, our contractor is running ahead of schedule and is anticipated to complete the project before the 18<sup>th</sup> of May.

# ***Water and Sewer Improvements Update***

## AMR Project



## ***Water and Sewer Improvements Update***

AMR Project

The Installers have been and will be working throughout the City in the following order:

### **First Area**

The Oaks Area

Central School Area

Creekridge Area

Van Buren (Businesses) and Bear Slide Areas

Behind Morehead Memorial Hospital and City Hall Areas

### **Second Area**

Highland Drive and Kings Highway Areas

Leaksville Area

Price Street Area

Behind Dyers and 87 North Areas

# ***Water and Sewer Improvements Update***

AMR Project

## **Third Area**

Stoneybrook Apartments Area

North Ridge Area

New Homes behind Mall Area

## **Fourth Area**

Draper Area

Spray and Grand Oaks Area

Blue Creek and Boulevard Areas

Spray Area

Big Meters

# Water and Sewer Improvements With Community Development Block Grants



Water and Sewer Improvements Holland Street

We are currently preparing to start the water line and sewer line upgrades in the Holland Street and Morgan Road Area

Ms. Kelly Stultz, Director of Planning and Inspections and her staff were successful in obtaining a Community Development Block Grant to fund the needed improvements in this area of the City.

## ***Water and Sewer Improvements Update***

### Water and Sewer Improvements Holland Street

The Planning Department received bids for the water lines component of the project on February 16, 2012 with work schedule to begin in April.

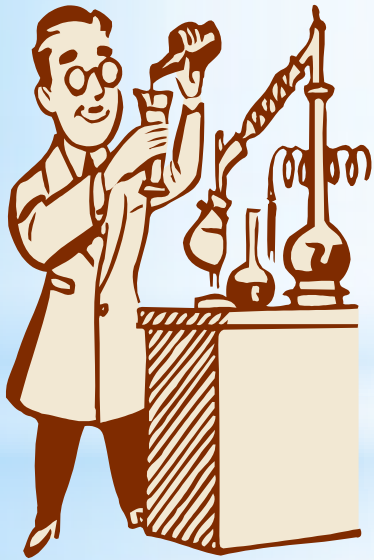
The Water and Sewer components of this project are expected to be completed by the end of August 2012

# Disinfection/Disinfection Byproducts Regulations

## Our Trihalomethane Issues

Disinfection/Disinfection Byproduct Compliance

The water plant staff is currently doing studies and researching ways the City can be compliant with the Disinfection/Disinfection Byproducts Regulations.



Compliance will depend on our ability to control the formation of Trihalomethanes, Haloacetic Acids, and the removal of Total Organic Carbon from our raw water.

## *Water and Sewer Improvements Update*

### **Disinfection/Disinfection Byproduct Compliance**

While in the process of trying to pick the low hanging fruit for the past year to reduce our Trihalomethanes (THMs), the Water Plant was thrown and forced to deal with a serious curve ball.

While working to analyze our data last spring, the staff realized there was a problem upriver on the Dan River. A boat trip and sampling expedition was arranged to find the source.

## *Water and Sewer Improvements Update*

### Disinfection/Disinfection Byproduct Compliance

Personnel from the Water Plant, North Carolina Rural Water Association, and Dan River Basin Association went upriver to find the source of high THMs and chlorides the water plant was seeing.

This sampling effort was successful and we found that water coming from the tailing pond at Belews Creek Steam Station owned and operated by Duke Energy was the source.

## *Water and Sewer Improvements Update*

### Disinfection/Disinfection Byproduct Compliance

The discharge was found to contain bromide and this was confirmed to be giving us higher than normal THMs.

Duke Energy was contacted and discussions began immediately to resolve this issue.

Duke Energy has been very cooperative from the start and is working with us to find a solution.

## *Water and Sewer Improvements Update*

### Disinfection/Disinfection Byproduct Compliance

The Duke Energy Belews Creek Steam Station installed a new system in 2007 on the smoke stacks to capture the discharge from going into the air from burning coal.

Unfortunately, the captured discharge material contains the bromide that ultimately becomes a liquid waste discharge that is released into the Dan River.

The Madison Water Plant, Eden Water Plant, Duke Energy, Public Water Supply, and Water Quality of the NC Department of Natural Resources have been working together to resolve this issue.



## ***Water and Sewer Improvements Update***

### **Disinfection/Disinfection Byproduct Compliance**

The Madison Water Plant, because of its smaller daily production has been acting as a pilot plant to test processes to remove bromide with help from Duke.

The Madison Water Plant sees higher concentrations of bromide than Eden. Logics dictates that if a solution is found that works in Madison, then it should work even better in Eden, due to the lower concentrations of bromide we see due to more dilution in the river.

**Disinfection/Disinfection Byproduct Compliance**

Eden has continued to try other technical treatment processes to reduce bromide or Total THMs in the mean time while Madison tests.

Eden has tried using polyaluminum chloride to settle out the bromide before it is chlorinated in the plant filters.

## ***Water and Sewer Improvements Update***

### **Disinfection/Disinfection Byproduct Compliance**

Eden has started a very aggressive flushing program to lower our water age in the distribution system. Flushing has shown positive results, but is not enough alone to control the THMs.

Eden began testing potassium permanganate on February 14<sup>th</sup>, to see if oxidizing the organic carbon in the raw water would lower the overall THMs.

## *Water and Sewer Improvements Update*

### Disinfection/Disinfection Byproduct Compliance

Madison will begin the testing of a PAX mixer/aeration system in their plant clearwell sometime after a February 21<sup>st</sup>, meeting with PAX representatives.

This process will receive financial assistance by Duke Energy. In this process, aeration will volatilize the components of bromide out into the air.

## ***Water and Sewer Improvements Update***

### **Disinfection/Disinfection Byproduct Compliance**

Eden has purchased PAX mixers to go in our elevated storage tanks to reduce water age and aerate the water to reduce total THMs and bromide, if this process is successful.

Eden is also looking at a PAX mixer - aeration system for our clearwells. The company currently promises a 40% reduction in THMs and the process promises reduction of bromide.

## ***Water and Sewer Improvements Update***

### **Disinfection/Disinfection Byproduct Compliance**

Even though we have not yet had a violation of our THMs limit, we are averaging near the upper limit of 80 parts per billion.

Our wholesale customers, Dan River Water and Henry County Public Service Authority have experienced violations of the THMs limits and this resulted in Public Notices to their customers.

## ***Water and Sewer Improvements Update***

### **Disinfection/Disinfection Byproduct Compliance**

We are working with our wholesale customers to assist all we can in an effort to help them lower the THMs in the water they receive.

It's important to remember that our wholesale customers see higher THMs values because of the longer distances to the delivery points. This results in longer water ages and this allows chlorine longer contact time to form more THMs.

## ***Water and Sewer Improvements Update***

### **Disinfection/Disinfection Byproduct Compliance**

We do not anticipate that Duke Energy will have processes in place that will mitigate the discharge of bromide for at least 36 months.

In the meantime, we must still be compliant with the current regulations and those regulations becoming effective in October 2013. Therefore we are aggressively seeking alternatives to treat the water and be in compliance.



## ***Water and Sewer Improvements Update***

### **Disinfection/Disinfection Byproduct Compliance**

For the next six months we will be testing additional lower cost alternatives to reduce the THMs. If we are unable to sufficiently lower our THMs, we will be compelled to move on to more expensive engineered solutions to lower the THMs.

There are at least 8 treatment options/process changes that can be made as proposed by Arcadis, our engineering consultant. Any one or a combination of these may be the best and most cost effective at our water plant.

## *Water and Sewer Improvements Update*

### Disinfection/Disinfection Byproduct Compliance

October 2013 is our compliance deadline. If it's determined that we must construct one or more of the expensive treatment options, we can get an extension of up to two years to complete the construction to achieve compliance.

A summary of possible costs for various treatment approaches for the next 3 years on the next slide.



# Water and Sewer Improvements Update

Eden, NC - Stage 2 Rule Compliance	Expenses	ARCADIS Engineering Services	Other Services (\$)	Capital Cost (\$)	Total Cost (\$)	Budget (\$)			
		Fee (\$)				FY2011-12	FY2012-13	FY2013-14	FY2014-15
Engineering Services									
ARCAIS 1/28/11									
Water System (source, treatment plant, distribution) Sampling/Testing and Planning Future Studies & Tests - General Consultation <sup>(1)</sup>		7,000		0	7,000	5,000	2,000	0	0
Treatability Study <sup>(2)</sup>									
Pilot Testing - Ion Exchange		15,000	15,000	0	30,000	5,000	25,000	0	0
Bench Testing - Alternate Coagulant		25,000	0	0	25,000	5,000	20,000	0	0
Bench Testing - PAC		25,000	0	0	25,000	5,000	20,000	0	0
Pilot Testing - GAC		15,000	15,000	0	30,000	5,000	25,000	0	0
Bench Testing - Chloramines		20,000	0	0	20,000	4,000	16,000	0	0
PAX Mixer/Aeration System for Clearwell		??	??	??	??	??	??	??	??
Chlorine Dioxide System		??	??	??	??	??	??	??	??
Additional cost if tests performed in separate studies		10,000	0	0	10,000	2,000	8,000	0	0
WTP Targeted Condition Assessment Study		50,000	0	0	50,000	0	50,000	0	0
Process Improvements									
Stage 2 Rule Compliance <sup>(3)</sup>		600,000	0	5,130,000	5,730,000	0	300,000	2,750,000	2,680,000
Condition Upgrades		100,000	0	500,000	600,000	0	100,000	250,000	250,000
Water System Modeling - Flushing Program		25,000	0	0	25,000	0	25,000	0	0
Stage 2 Rule Compliance Total:		\$892,000	\$30,000	\$5,630,000	\$6,552,000	\$31,000	\$591,000	\$3,000,000	\$2,930,000

(1) = Does not include outside lab analytical costs; City to provide budget numbers for lab expenses under "Other Services (\$)"

(2) = Assumes all analytical testing is performed by the City

(3) = Assumes Ion Exchange technology is implemented



# Questions