BERTIE COUNTY

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BERTIE COUNTY BOARD OF COMMISSIONERS

Thursday, March 20, 2014
9:00AM

AGENDA

1. Reconvene - recessed from regular meeting on Monday, March 17, 2014
2. Invocation and Pledge of Allegiance
3. Review Sheriff's salary
4. Health Insurance revised proposal and update of benefit plan options by Donna Nixon of Pierce Group Benefits
5. Green Engineering to review final grant application, proposed capital improvement plan, and the latest water loss reports. Board will be asked to approve various submittals for the grant application and authorize County Manager to execute grant documents
6. EMS preliminary budgets, and revenue updates for FY 2014-2015
7. Federal surplus property – designation of authorized County representatives
8. Financial Update and school capital discussion
9. Actuarial Study Engagement – for other post employment benefits by Cavanaugh Macdonald Consulting
10. Discuss contract mowing for Water Department sites
11. Discuss Mayors & Commissioners Dinner on April 10, 2014
12. New Bertie High School souvenir booklet
13. Adjourn/Recess

Water Loss Comparison Table

Operating Year	Total Water Sold	Total Water Produced	Un Accounted Loss	Per Cent Loss
2010	241,064,000	439,496,000	198,432,000	45%
2011	265,420,000	489,476,000	224,056,000	46%
2012	278,147,000	478,462,000	200,315,000	42%
2013	288,095,000	422,295,021	128,346,000	32%
	1,072,726,000	1,829,729,021	751,149,000	
Average	268,181,500	457,432,255	187,787,250	41%

OVER PUMPING OCCURRENCES
TABLE
Table 6

Year		Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
2010														
							1	1	1	2	3	1	1	10
										2	2	1	1	6
2011														
		2	2	3	4	3	3	3	3	2	3	5	4	37
		1		1			1	1	2	2	1	1	1	11
2012														
		4	3	3	6	5	5	5	4	5	2	6	5	53
		2		1	2	1	1	2	2	2	1	1	2	17
2013														
		4	3	2	3	3	3	8	4	6	4	5	3	48
					1	1	1	2	2	2	2	2	2	15
Total														197
														148
														49

denotes wells that exceeded their allowable pump time one or more times per month

denotes wells that exceeded their allowable pump time every day of that month

Priority Rating System Scoreboard

Item 22. Water Loss Reduction Plan

The County has been experiencing water loss for more than four years. On December 16th, 2013, the Bertie County Board of Commissioners hired Green Engineering, PLLC to conduct an Operations and System Evaluation. Their top priority was water loss. Attached to item 5 under tab 5 is the following:

1. 2012 Water Supply Plan , note page 4 under planning, Unaccounted water for 2012 was 0.571 mgd which equates to 41.9 percent based upon reported water sold for that year of 278,147,000 gallons sold. Bertie County resubmitted their audit values for 2012 to the attention of Mr. Wayne Howard , Department of Water Resources for his review and concurrence. The attached copy of the 2012 Water Supply Plan is now on the web site under the local water supply plan tab.
2. A copy of the last 12 months(2013 water audit) as instructed by the water loss reduction program criteria. After much effort on the staff they still experienced over 31 percent loss for that calendar year.
3. Water loss graph and bar chart for 2013 water loss
4. Table Comparing the last four years of water loss.
5. Spread sheet of the first two months of 2014 for water production and water sold
6. A 2014 first two months Water Audit according to the Water Loss Reduction Criteria
7. Table showing over pumping occurrences in the system where an wells exceeded their 12 hour permitted run time per day
8. Copy of the approved Water Loss Reduction Program by the Bertie County Board of Commissioners.
9. Maps, system map and leak record map

Bertie County Regional Water System

Water Loss Reduction Program

FY 2013-14

I. Water Audit

Each monthly billing cycle, the billing department will conduct an in house audit with the following components included:

A. Amount of Water consumed in gallons Percent of total water produce

B. Graph showing the trends in time of monthly consumption and production.

C. Audit will include the number of days wells were operated and total hours each well is operated per month

D. Total cost of water loss for each billing period

E. Total accounted for water in thousands of gallons will be multiplied by the lowest retail rate in the rate schedule as adopted by the BCBOC.

II. Metering

A. As of July 1, 2013 there were 5,733 connections to the system that were metered and 7 unmetered representing 99.9 percent metered

B. The unmetered connections are all large connections.

C. All water connections effective July 1, 2015 shall be metered

D. Water connections as of July 1, 2013 unmetered

1. Hertford County Road
2. Scotch Hall sub system
3. Mutual Aid interconnect - Town of Windsor
4. Mutual Aid interconnect - Town of Harrelsville

5. Mutual Aid Interconnect - Town of Roxebel

6. Mutual Aid Interconnect - Town of Powellsville

7. Line flushing sites

E. Tankers and pool fillings shall be metered

F. Irrigation will be metered

G. Meter Replacement Policy.

1. Meters are replaced monthly when determined to not meet minimum performance of 98.5 percent accurate or if the meter has stopped measuring.

2. Meters with a 15-year field age are randomly pulled for testing to insure that they meet minimum AWWA standards.

   Those found with below substandard performance are replaced.

3. Approximately 3 percent are replaced per year. This is an estimated figure.

4. All large meters 4-inch and above shall be calibrated to AWWA standards as a minimum every two years. Those meters found to operate below the AWWA standard shall be repaired in the field or replace within 60 days of the recalibration anniversary date or as early as found defective(which ever occurs first).

5. Water Audits are conducted by four regions in the system.

   Effective February 16, 2014 Region II was zoned off to begin an isolated water audit. This region was selected due to excessive tank over flows and well pump run times exceeding their allowable permitted run time, and the apparent large discrepancy in water sold vs. produced.

II. Hidden Leak Detection and Repair

A. 2013 approximately 113.5 Man Hours of time were involved in Leak Repair. Hours/12 billing cycles = hours per billing cycle (113.5/ 12= 9.46 hours per billing Cycle for leak repair.)

B. In December 2013, the water system began conducting a water audit as part of a system evaluation process. Four years of water records was reviewed to quantify the unaccounted for water loss over that period. The visible losses so far have been from excessive tank over flows due to inadequate telemetry controls and lack of tank altitude valves. There has not been any pressure problems experienced due to any repetitive line breaks. The department is hopeful that the remaining imbalance in the system will be from large customer meter calibration and well production meters. The current telemetry system is incapable of providing daily production logs. The Capital Improvement Plan anticipates up grading the current telemetry system in order to manage and track water loss more efficiently.

Once the system is within a 15 percent variance, the department will engage hidden leak detection services from the NCRWA and /or private contractors.

C. The system map shows by number the leaks found and repaired over the calendar year 2013

D. All leaks found or reported are repaired as soon as possible, usually within one business day unless it is determined to be major and service is interrupted. Major Service interruption leaks are repaired as soon as reported.

To date there has not been significant justification to replace any line due to excessive leakage from defective material or construction methods.

As part of our new management strategy, each water line segment leak repair will be tracked. Materials and labor will be kept on each leak to use as a data base to determine if and when a line should be replaced. Those records would be used to justify line replacement in the Capital Improvement Plan (CIP). The current CIP has a 5-year planning horizon. Each year the CIP is updated and one additional year is added.

E. Previous records were not kept for water loss found and the associated repairs made. Effective Jan 1, 2014 the department began to track and manage this item.

Five water leaks were reported and repaired for FY 2013-14 period. All five of these leaks were service line related.

Total Estimate of repair cost to date for FY 2013-14 is approximately $750. Those leaks repaired for this fiscal year so far have been water service line related.

Total estimated water saved in dollars for FY 2013-14 Budget was approximately $2800.

C. Water Loss Budget Planning

1. CIP(Capital Improvement Plan) calls for a new Supervisory Control and Data Acquisition (SCADA) system. One of the major water loss items over the last four years has been excessive tank over flows without alarm and monitoring capability.

2. The budget also calls for master meter vaults to be installed on large mutual aid connections and some installation of meter vaults for measuring sub systems and regions of the water system.

3. The Board is considering updating the current billing software to alert the billing staff of low range usage and zero read activity each billing cycle.

4. Part of the water loss reduction program is additional field staff training to become more aware of how water loss can be more accounted for through membership with the North Carolina Rural Water Association.

5. The CIP request $ 20,000 in the current budget to recondition all existing altitude valves which are currently failing.

IV. Line Location Services

A. 100 percent of all water lines installed to date are recorded in the County GIS data base. (see map attached)

B. Each line extension approved requires the developer to submit as built drawings that are submitted to GIS department to be put into the Bertie County GIS database.

V. Valve Exercising Program

A. Inventory

1. Current GIS data base shows 2826 gate vales
2. Current GIS data Base shows 190 blow off valves
3. Current GIS database shows 315 fire hydrants
4. Current GIS data base shows 2 check valve vaults

B. Exercise Goal

Due to current staffing, our valve exercising goal is to exercise approximately 2 percent of all system valves per billing cycle with a complete rotation over a five year period. This equates to approximately 50 valves per month (600 per year) averaging approximately 2.5 valves per working day.

Only 17% of the existing valves were exercised in 2012-2013 budgets due to work load, holidays, vacations, sick leave and operational contingencies. Additional Labor is being request to assist with water loss and valve exercising in the FY 2014-15-budget cycle.

Duly adopted this the _____ day of March 2014, upon motion made by Commissioner _____, seconded by Commissioner

_____, and adopted by the following vote:

Ayes: _____ Noes: _____ Absent: ____

Board of Commissioners of the County of Bertie

By: _____

J. Wallace Perry, Chairman of the Board and of the governing body of all Water Districts of Bertie County

ATTEST: _____

Sarah Serdni , Clerk to the Board

Bertie County RWS

2012

The Division of Water Resources (DWR) provides the data contained within this Local Water Supply Plan (LWSP) as a courtesy and service to our customers. DWR staff does not field verify data. Neither DWR, nor any other party involved in the preparation of this LWSP attests that the data is completely free of errors and omissions. Furthermore, data users are cautioned that LWSPs labeled **PROVISIONAL** have yet to be reviewed by DWR staff. Subsequent review may result in significant revision. Questions regarding the accuracy or limitations of usage of this data should be directed to the water system and/or DWR.

1. System Information

Contact Information

Water System Name:	Bertie County RWS	PWSID:	04-08-085
Mailing Address:	P.O. Box 487 Windsor, NC 27983	Ownership:	County
Contact Person:	Ricky Spivey, Sr.	Title:	Water Dept. Superintendent-Operator
Phone:	252-794-5350	Fax:	252-794-5327
Secondary Contact:	Connie Coburn	Phone:	252-794-5350
Mailing Address:	P.O. Box 487 Windsor, NC 27983	Fax:	252-794-5327

PROVISIONAL

Distribution System

Line Type	Size Range (Inches)	Estimated % of lines
Ductile Iron	6-12	4.00 %
Polyvinyl Chloride	2-12	96.00 %

What are the estimated total miles of distribution system lines? 651 Miles
How many feet of distribution lines were replaced during 2012? 60 Feet
How many feet of new water mains were added during 2012? 300 Feet
How many meters were replaced in 2012? 13
How old are the oldest meters in this system? 21 Year(s)
How many meters for outdoor water use, such as irrigation, are not billed for sewer services? 0
What is this system's finished water storage capacity? 3.500 Million Gallons
Has water pressure been inadequate in any part of the system since last update? No

Programs

Does this system have a program to work or flush hydrants? Yes, Weekly
Does this system have a valve exercise program? Yes, Semi-Annually
Does this system have a cross-connection program? Yes
Does this system have a program to replace meters? Yes
Does this system have a plumbing retrofit program? Yes
Does this system have an active water conservation public education program? Yes
Does this system have a leak detection program? Yes

Water Conservation

What type of rate structure is used? Flat/Fixed
How much reclaimed water does this system use? 0.000 MGD For how many connections? 0
Does this system have an interconnection with another system capable of providing water in an emergency? Yes

2. Water Use Information

Service Area

Sub-Basin(s)	% of Service Population	County(s)	% of Service Population
Chowan River (04-1)	80 %	Bertie	100 %
Roanoke River (14-1)	20 %		

What was the year-round population served in 2012? 11,250
Has this system acquired another system since last report? No

Based upon Bertie County RWS 2012 audit, there are approximately 5,733 connections of which 1,204 are inactive. The calculated population is based upon 4,529 connections rounded to 4,500 times 2.5 residents per household equaling 11,250 served.

Water Use by Type

Type of Use	Metered Connections	Metered Average Use (MGD)	Non-Metered Connections	Non-Metered Estimated Use (MGD)
Residential	4,500	0.412	0	0.000
Commercial	22	0.011	0	0.000
Industrial	1	0.201	0	0.000
Institutional	6	0.090	0	0.000

How much water was used for system processes (backwash, line cleaning, flushing, etc.)? 0.001 MGD

Based upon Bertie County RWS 2012 annual billing summary, the active customer count (4,500 connections) showed a total residential net water sold in that category of 150,905,000 gallons.

Water Sales

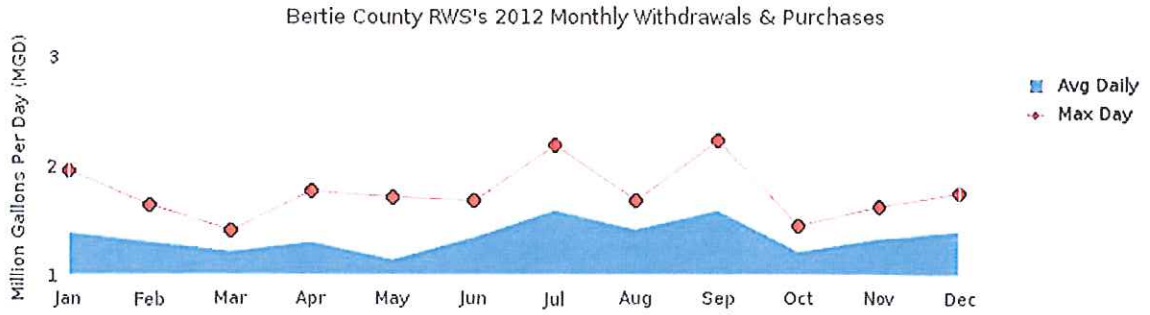
Purchaser	PWSID	Average Daily Sold (MGD)	Days Used	Contract MGD	Contract Expiration	Contract Recurring	Required to comply with water use restrictions?	Pipe Size(s) (Inches)	Use Type
Aulander	04-08-015	0.000	0				Yes		Emergency
Harrellsville	04-46-040	0.000	0	0.000	2016	Yes	Yes	6	Emergency
Hertford County Rural Water	04-46-045	0.001	366	0.000	2015	Yes	Yes	6	Regular
Lewiston-Woodville	04-08-020	0.046	366				Yes		Regular
Powellsville	04-08-040	0.000	0				Yes		Emergency
Roxobel	04-08-050	0.000	0				No		Emergency
Windsor	04-08-010	0.000	0			Yes	Yes		Emergency

Bertie County RWS has a sales contract with Lewiston-Woodville which has no minimum or maximum limits.

3. Water Supply Sources

Monthly Withdrawals & Purchases

	Average Daily Use (MGD)	Max Day Use (MGD)		Average Daily Use (MGD)	Max Day Use (MGD)		Average Daily Use (MGD)	Max Day Use (MGD)
Jan	1.373	1.956	May	1.129	1.711	Sep	1.568	2.230
Feb	1.288	1.636	Jun	1.327	1.676	Oct	1.197	1.442
Mar	1.198	1.397	Jul	1.575	2.185	Nov	1.315	1.612
Apr	1.279	1.758	Aug	1.395	1.670	Dec	1.380	1.746



Ground Water Sources

Name or Number	Average Daily Withdrawal (MGD) MGD	Days Used	Max Day Withdrawal (MGD)	12-Hour Supply (MGD)	CUA Reduction	Year Offline	Use Type
01	0.150	359	0.554	0.400			Regular
02	0.095	363	0.259	0.400			Regular

03	0.000	0	0.000	0.252	2003	Emergency
04	0.000	0	0.000	0.252	2011	Regular
06	0.230	355	0.598	0.288		Regular
07A	0.157	333	0.346	0.126		Regular
08	0.112	311	0.430	0.259		Regular
09	0.097	254	0.499	0.259		Regular
10	0.176	248	0.653	0.238		Regular
11	0.123	300	0.575	0.216		Regular
12	0.244	305	0.485	0.288		Regular
13	0.105	256	0.303	0.252		Regular
14	0.085	279	0.435	0.288		Regular

Ground Water Sources (continued)

Name or Number	Well Depth (Feet)	Casing Depth (Feet)	Screen Depth (Feet)		Well Diameter (Inches)	Pump Intake Depth (Feet)	Metered?
			Top	Bottom			
01	365	340	326	351	10	351	Yes
02	365	340	322	355	10	355	Yes
03	412	412	228	402	10	402	Yes
04	409	377	289	399	10	399	Yes
06	441	431	323	431	10	330	Yes
07A	513	503	235	503	10	300	Yes
08	490	482	352	472	10	374	Yes
09	460	450	400	445	10	410	Yes
10	415	415	327	405	12	232	Yes
11	443	443	379	433	12	282	Yes
12	374	374	379	433	12	233	Yes
13	373	266	265	365	12	244	Yes
14	505	445	445	495	12	218	Yes

Are ground water levels monitored? Yes, Quarterly

Does this system have a wellhead protection program? Yes

The difference in the monthly average usage and the average daily use from the sum of the groundwater and purchased water sources is due to rounding.

The 12-hour supply values are taken from a Hobbs Upchurch & Associates hydraulic model completed in 2012 and verified by Green Engineering field audit.

Water Purchases From Other Systems

Seller	PWSID	Average Daily Purchased (MGD)	Days Used	Contract		Recurring	Required to comply with water use restrictions?	Pipe Size(s) (Inches)	Use Type
				MGD	Expiration				
Harrellsville	04-46-040	0.000	0	0.000	2016	Yes	Yes	6	Emergency
Powellsville	04-08-040	0.000	0				Yes		Emergency
Roxobel	04-08-050	0.002	366	0.000	2015	Yes	Yes	6	Regular
Windsor	04-08-010	0.000	0			Yes	Yes		Emergency

Bertie County RWS has a verbal contract with Roxobel to serve approximately 20 connections. The connection has no master meter; the County reads the individual county meters and sends the aggregate usage amount to Roxobel to be billed. 2012 usage from Roxobel is 554,000 gallons (0.00153 MGD).

4. Wastewater Information

Monthly Discharges

	Average Daily Discharge (MGD)		Average Daily Discharge (MGD)		Average Daily Discharge (MGD)
Jan	0.000	May	0.000	Sep	0.000
Feb	0.000	Jun	0.000	Oct	0.000
Mar	0.000	Jul	0.000	Nov	0.000
Apr	0.000	Aug	0.000	Dec	0.000

How many sewer connections does this system have? 0

How many water service connections with septic systems does this system have? 4,523

Are there plans to build or expand wastewater treatment facilities in the next 10 years? No

Most of Bertie County RWS Industrial and Institutional customers are on sewer not owned or operated by Bertie County RWS. All other customers are on septic systems.

5. Planning

Projections

	2012	2020	2030	2040	2050	2060
Year-Round Population	11,250	11,362	11,476	11,706	11,823	11,942
Seasonal Population	0	0	0	0	0	0
Residential	0.412	0.417	0.421	0.426	0.430	0.434
Commercial	0.011	0.011	0.011	0.011	0.011	0.011
Industrial	0.201	0.203	0.205	0.207	0.209	0.211
Institutional	0.090	0.090	0.090	0.090	0.090	0.090
System Process	0.001	0.001	0.001	0.001	0.001	0.001
Unaccounted-for	0.571	0.100	0.100	0.115	0.120	0.125

Bertie County RWS usage projections assumes a 1% growth per year in all but the Institutional category and 1% Residential connections growth assumes 2.5 persons per connection.

Demand v/s Percent of Supply

	2012	2020	2030	2040	2050	2060
Surface Water Supply	0.000	0.000	0.000	0.000	0.000	0.000
Ground Water Supply	3.266	3.014	3.014	3.014	3.014	3.014
Purchases	0.002	0.002	0.002	0.002	0.002	0.002
Future Supplies		0.000	0.000	0.000	0.000	0.000
Total Available Supply (MGD)	3.268	3.016	3.016	3.016	3.016	3.016
Service Area Demand	1.286	0.822	0.828	0.850	0.861	0.872
Sales	0.047	0.047	0.047	0.047	0.047	0.047
Future Sales		0.000	0.000	0.000	0.000	0.000
Total Demand (MGD)	1.333	0.869	0.875	0.897	0.908	0.919
Demand as Percent of Supply	41%	29%	29%	30%	30%	30%

The purpose of the above chart is to show a general indication of how the long-term per capita water demand changes over time. The per capita water demand may actually be different than indicated due to seasonal populations and the accuracy of data submitted. Water systems that have calculated long-term per capita water demand based on a methodology that produces different results may submit their information in the notes field.

Your long-term water demand is 37 gallons per capita per day. What demand management practices do you plan to implement to reduce the per capita water demand (i.e. conduct regular water audits, implement a plumbing retrofit program, employ practices such as rainwater harvesting or reclaimed water)? If these practices are

covered elsewhere in your plan, indicate where the practices are discussed here. Bertie County RWS is working with Green Engineering to find where their losses are occurring. Green Engineering has found elevated storage tanks overflowing due to control issues and certain wells are exceeding their allowable run times. Bertie County staff understands they have a control issue and current telemetry is no longer capable of managing the system in a manner that will identify unusual trends, archive usage records, and manage the maximum hours each well is permitted to run.

Are there other demand management practices you will implement to reduce your future supply needs? N/A

What supplies other than the ones listed in future supplies are being considered to meet your future supply needs? N/A

How does the water system intend to implement the demand management and supply planning components above? N/A

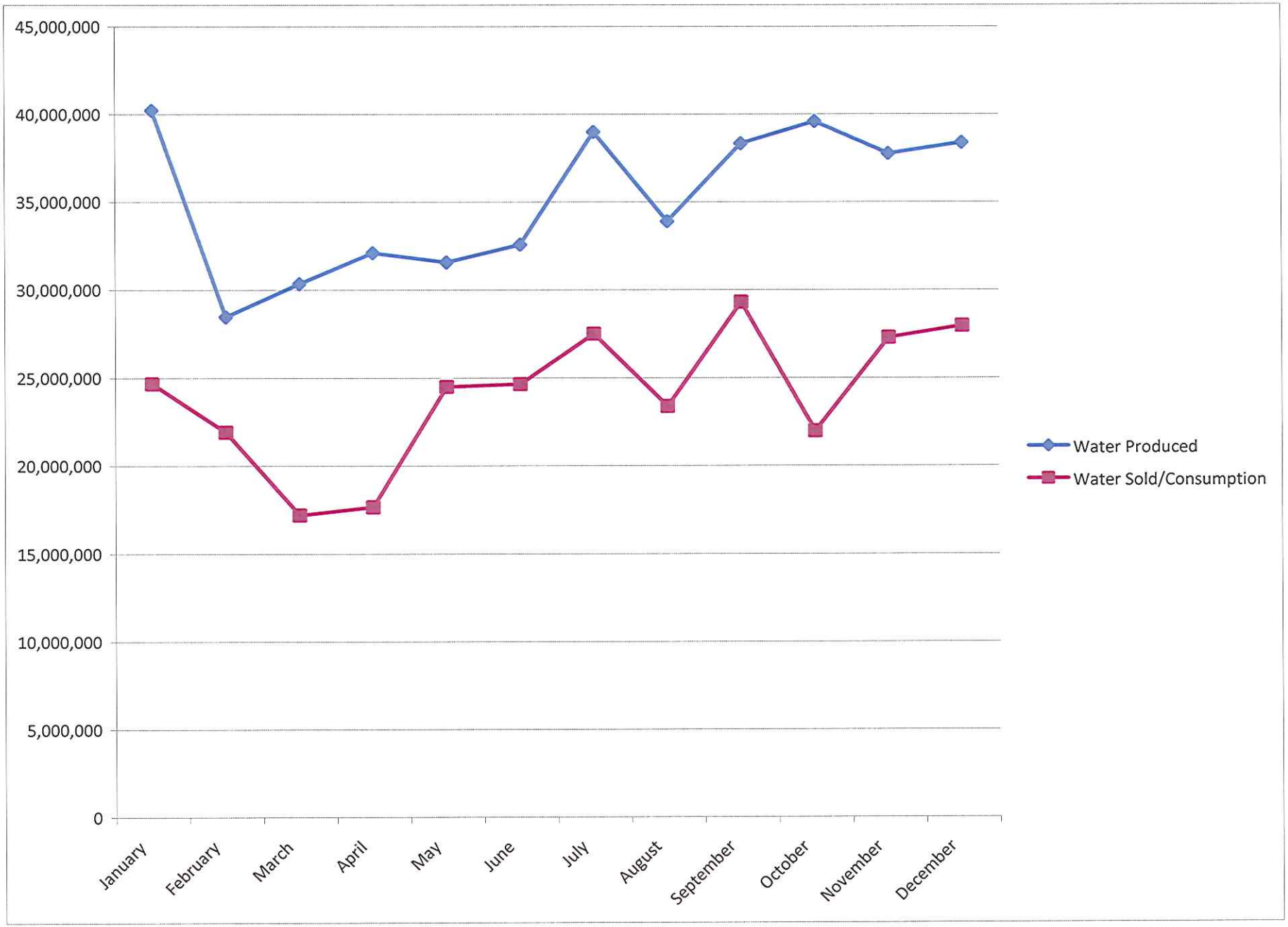
Additional Information

Has this system participated in regional water supply or water use planning? No

What major water supply reports or studies were used for planning? Preliminary Engineering Report for Water System Improvement

Please describe any other needs or issues regarding your water supply sources, any water system deficiencies or needed improvements (storage, treatment, etc.) or your ability to meet present and future water needs. Include both quantity and quality considerations, as well as financial, technical, managerial, permitting, and compliance issues: If Bertie County Water District II decide to move forward with the Water System Improvement Plan to serve Bal Gra Harbour. All expenses will be paid by Bal Gra Harbour.

WATER LOSS REDUCTION PLAN 2013 REPORT



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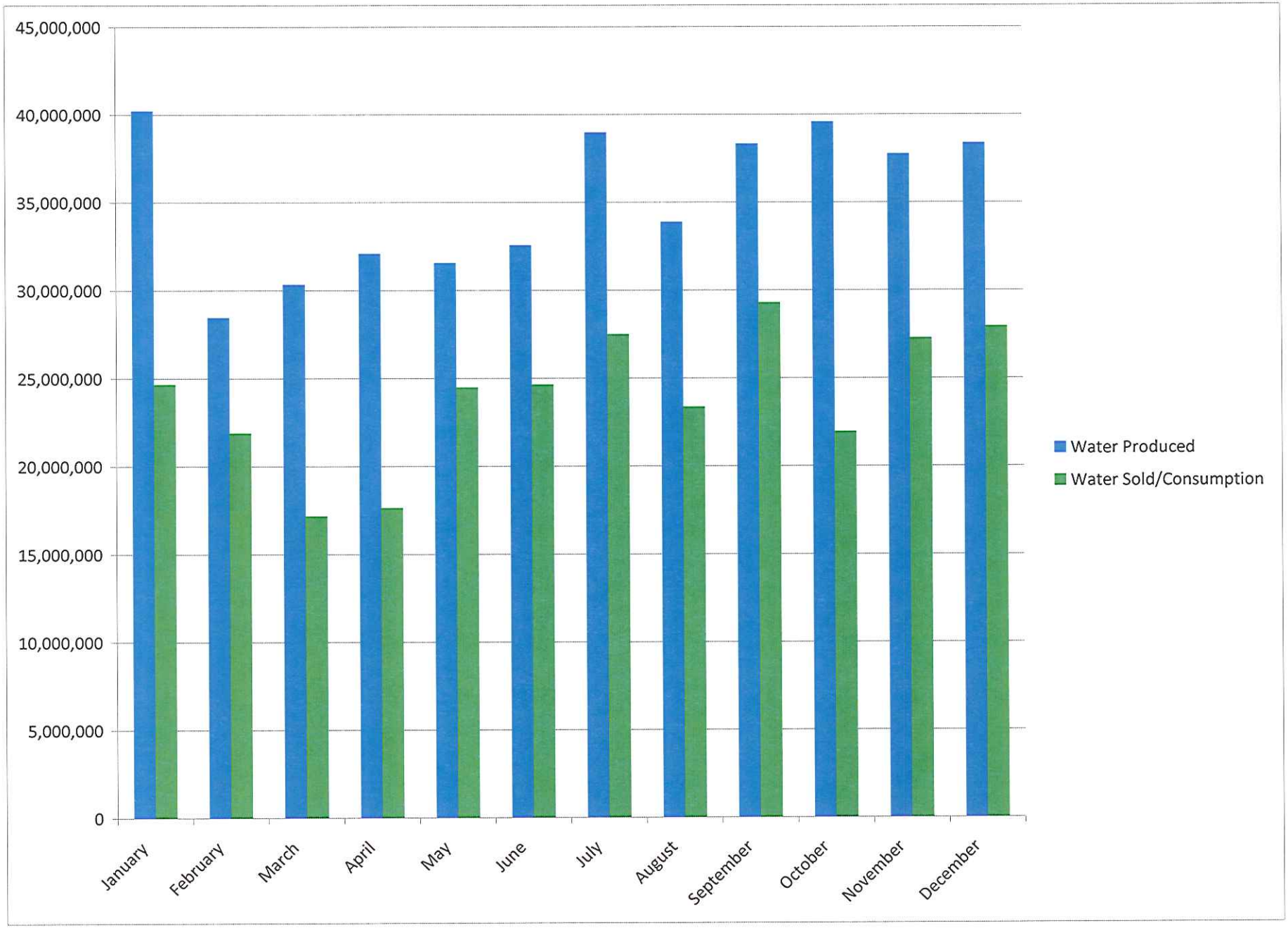
WATER LOSS REDUCTION PLAN 2013 REPORT



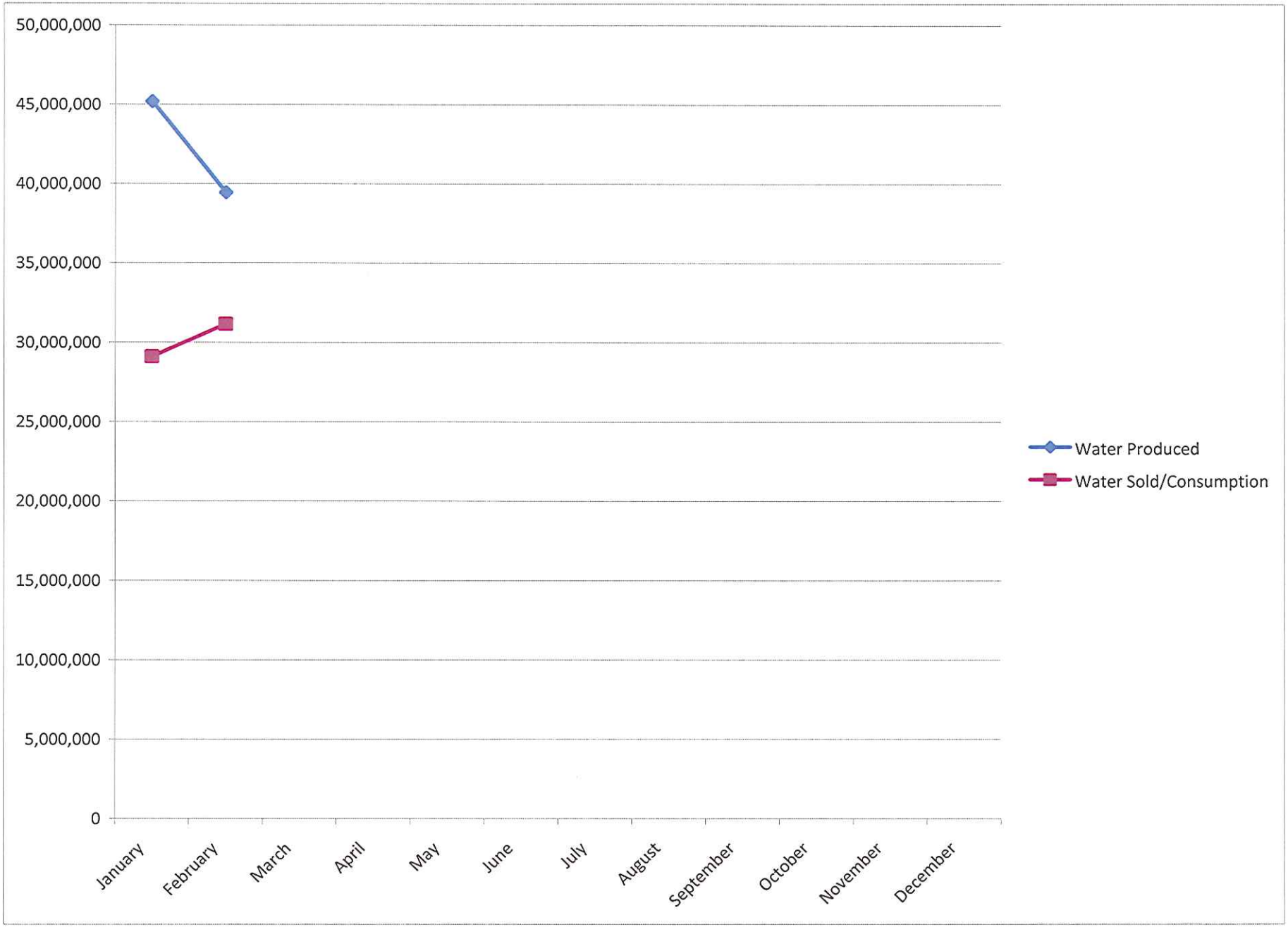
WATER LOSS REDUCTION PLAN

2013

Bertie County Regional Water System

	January	February	March	April	May	June	July	August	September	October	November	December	Totals & Averages
Water Produced	40,252,000	28,485,000	30,354,000	32,105,000	31,570,000	32,579,000	38,986,021	33,897,000	38,335,000	39,582,000	37,767,000	38,383,000	422,295,021
Water Sold/Consumption	24,682,000	21,913,000	17,200,000	17,658,000	24,500,000	24,658,000	27,520,000	23,384,000	29,322,000	21,975,000	27,302,000	27,981,000	288,095,000
Water Loss	15,570,000	6,572,000	13,154,000	14,447,000	7,070,000	7,921,000	11,466,021	10,513,000	9,013,000	17,607,000	10,465,000	10,402,000	134,200,021
Total Accounted for Water Loss	31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000	365,000
Total Unaccounted for Water Loss	15,539,000	6,544,000	13,123,000	14,417,000	7,039,000	7,891,000	11,435,021	10,482,000	8,983,000	17,576,000	10,435,000	10,371,000	133,835,021
Percent of Total Water Produced (Sold)	61.32%	76.93%	56.66%	55.00%	77.61%	75.69%	70.59%	68.99%	76.49%	55.52%	72.29%	72.90%	68.33%
Percent of Total Water Produced (Lost)	38.68%	23.07%	43.34%	45.00%	22.39%	24.31%	29.41%	31.01%	23.51%	44.48%	27.71%	27.10%	31.67%
Total Cost of Water Loss	$50,602.50	$21,359.00	$42,750.50	$46,952.75	$22,977.50	$25,743.25	$37,264.57	$34,167.25	$29,292.25	$57,222.75	$34,011.25	$33,806.50	$436,150.07

WATER LOSS REDUCTION PLAN 2013 REPORT



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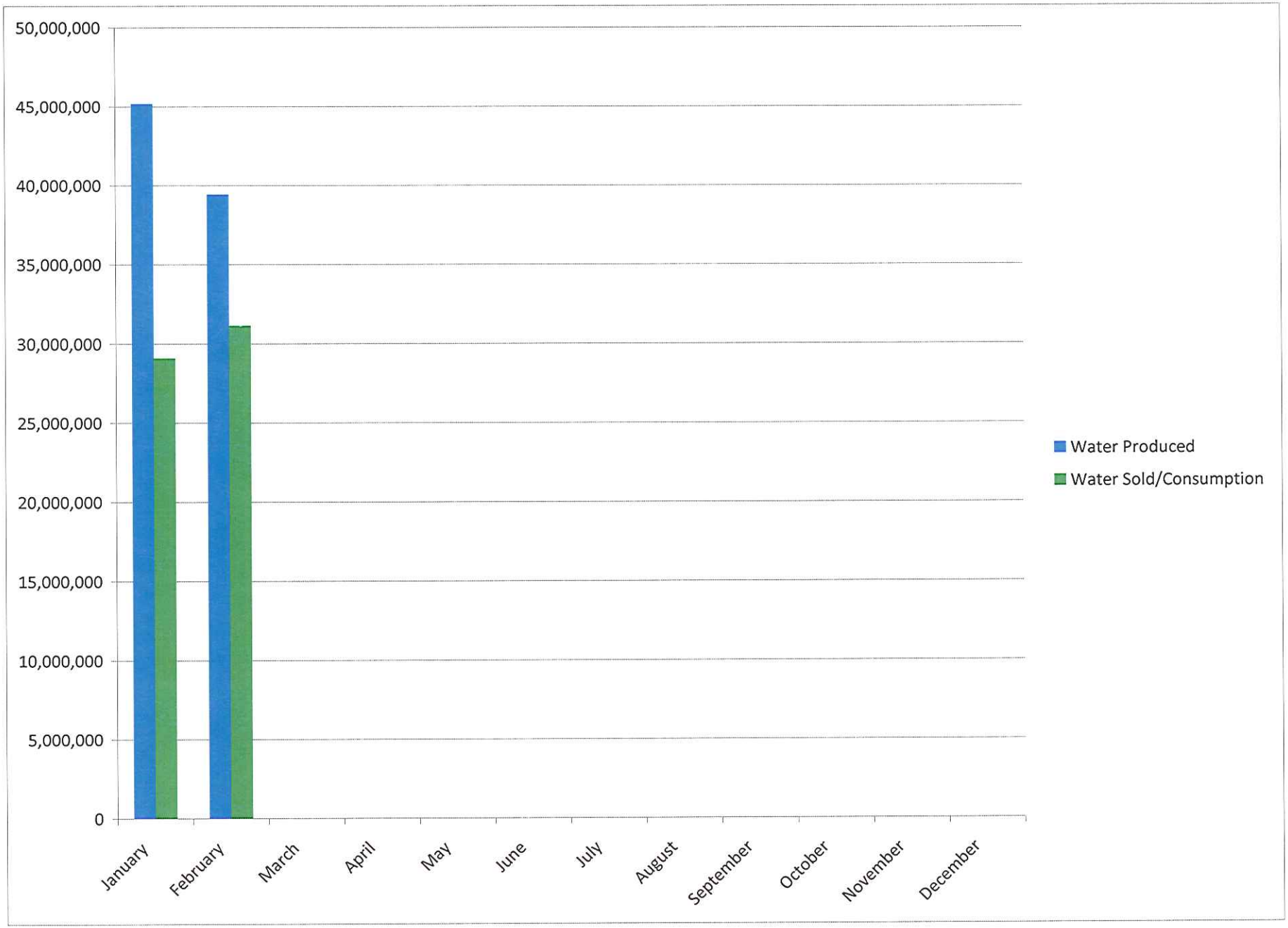
WATER LOSS REDUCTION PLAN 2013 REPORT



WATER LOSS REDUCTION PLAN

2014

Bertie County Regional Water System

	January	February	March	April	May	June	July	August	September	October	November	December	Totals & Averages
Water Produced	45,203,000	39,444,000											84,647,000
Water Sold/Consumption	29,110,300	31,169,400											60,279,700
Water Loss	16,092,700	8,274,600											24,367,300
Total Accounted for Water Loss	31,000	28,000											59,000
Total Unaccounted for Water Loss	16,061,700	8,246,600											24,308,300
Percent of Total Water Produced (Sold)	64.40%	79.02%											11.95%
Percent of Total Water Produced (Lost)	35.60%	20.98%											4.71%
Total Cost of Water Loss	$52,301.28	$26,892.45											$79,193.73

BERTIE COUNTY REGIONAL WATER SYSTEM

ANNUAL WELL PRODUCTION

2014 REPORT

	Well 1	Well 2	Well 3	Well 4	Well 6	Well 7	Well 8	Well 9	Well 10	Well 11	Well 12	Well 13	Well 14	Total Pumped
January	D3	D3	D1	D1	D2	D2	D4	D4	D1	D1	D1	D4	D4	
12 Hr Supply(gpd)	400,000	400,000	252,000	252,000	288,000	126,000	259,200	259,200	237,600	216,000	288,000	252,000	288,000	
Pump Rating GPM	400	400			350	175	360	360	330	300	500	350	400	
Pump Output GPM	358	409			212	179	365	387	512	315	667	278	266	
Beginning Read	717,621	578,139			417,915	346,213	502,871	649,101	297,848	294,748	436,696	250,054	48,729	
End Read	719,764	579,905			426,408	353,869	505,013	657,255	299,752	295,240	444,807	250,622	51,632	
Total Calculated	2,143,000	1,766,000			8,493,000	7,656,000	2,142,000	8,154,000	1,904,000	492,000	8,111,000	568,000	2,903,000	44,332,000
Total Pumped Reported	2,215,000	1,741,000			8,493,000	7,658,000	2,278,000	8,420,000	1,904,000	492,000	8,406,000	568,000	3,028,000	45,203,000
Avg	71,452	56,161			273,968	247,032	73,484	271,613	86,545	25,895	271,161	40,571	97,677	
Days Operated	31	31			31	31	31	31	22	19	31	14	31	
Max day	89,000	72,000			590,000	291,000	246,000	448,000	188,000	107,000	367,000	184,000	179,000	
Hours Run	103	71			669	713	104	363	62	26	210	34	190	
Permitted hours allowed	372	372			372	372	372	372	372	372	372	372	372	
February														
Pump Output GPM	374	374			206	181	365	383	479	332	693	299	279	
Beginning Read	719,836	579,947			426,408	353,871	505,149	657,521	299,750	295,248	445,102	250,622	51,757	
End Read	722,893	581,919			432,383	359,099	507,638	660,996	302,828	296,317	450,962	253,051	55,343	
Total Calculated	3,057,000	1,972,000			5,975,000	5,228,000	2,489,000	3,475,000	3,078,000	1,069,000	5,860,000	2,429,000	3,586,000	38,218,000
Total Pumped Reported	3,165,000	2,063,000			6,064,000	5,297,000	2,606,000	3,764,000	3,078,000	1,196,000	5,860,000	2,550,000	3,801,000	39,444,000
Avg	158,250	93,773			224,593	189,179	93,071	134,429	109,929	70,353	225,385	115,909	135,750	
Days Operated	20	22			27	28	28	28	26	17	26	22	28	
Max day	568,000	93,773			332,000	189,179	183,000	289,000	244,000	288,000	453,000	321,000	230,000	
Hours Run	141	92			491	489	119	164	107	60	141	142	227	
Permitted hours allowed	372	372			372	372	372	372	372	372	372	372	372	
March														
Beginning Read														
End Read														
Total Pumped														
Avg														
Days Operated														
Max day														
Hours Run														
April														
Beginning Read														
End Read														
Total Pumped														
Avg														
Days Operated														
Max day														
Hours Run														
May														
Beginning Read														
End Read														
Total Pumped														
Avg														
Days Operated														
Max day														
Hours Run														
June														
Beginning Read														

End Read															
Total Pumped															
Avg															
Days Operated															
Max day															
Hours Run															

						BERTIE COUNTY REGIONAL WATER SYSTEM								
						ANNUAL WELL PRODUCTION								
						2014 REPORT								
	Well 1	Well 2	Well 3	Well 4	Well 6	Well 7	Well 8	Well 9	Well 10	Well 11	Well 12	Well 13	Well 14	Total Pumped
July	D3	D3	D1	D1	D2	D2	D4	D4	D1	D1	D1	D4	D4	
12 Hr Supply(gpd)	400,000	400,000	252,000	252,000	288,000	126,000	259,200	259,200	237,600	216,000	288,000	252,000	288,000	
Beginning Read														
End Read														
Total Pumped														
Avg														
Days Operated														
Max day														
Hours Run														
August														
Beginning Read														
End Read														
Total Pumped														
Avg														
Days Operated														
Max day														
Hours Run														
September														
Beginning Read														
End Read														
Total Pumped														
Avg														
Days Operated														
Max day														
Hours Run														
October														
Beginning Read														
End Read														
Total Pumped														
Avg														
Days Operated														
Max day														
Hours Run														
November														
Beginning Read														
End Read														
Total Pumped														
Avg														
Days Operated														
Max day														
Hours Run														
December														
Beginning Read														
End Read														
Total Pumped														
Avg														
Days Operated														
Max day														
Hours Run														

BERTIE COUNTY REGIONAL WATER SYSTEM
ANNUAL WELL PRODUCTION
2014 REPORT

	Well 1	Well 2	Well 3	Well 4	Well 6	Well 7	Well 8	Well 9	Well 10	Well 11	Well 12	Well 13	Well 14	Total Pumped	
Annual Report	D3	D3	D1	D1	D2	D2	D4	D4	D1	D1	D1	D4	D4		
12 Hr Supply(gpd)	400,000	400,000	252,000	252,000	288,000	126,000	259,200	259,200	237,600	216,000	288,000	252,000	288,000		
Pump Rating GPM	400	400	350	350	420	175	360	360	330	300	500	350	400		3.354
Total Hours Run	244	163			1,160	1,202	223	527	169	86	351	176	417		
Annual Average Daily(mgd)	0.105	0.072			0.251	0.220	0.083	0.207	0.104	0.047	0.250	0.087	0.116		
Days Used	51	53			58	59	59	59	48	36	57	36	59		
Max Day Withdrawal MG	0.568	0.093			0.59	0.291	0.183	0.448	0.244	0.288	0.453	0.321	0.230		
Total Water Produce To Date	5,380,000	3,804,000			14,557,000	12,955,000	4,884,000	12,184,000	4,982,000	1,688,000	14,266,000	3,118,000	6,829,000	84,647,000	
Total for year														84,647,000	
Annual Avg Daily Flow(365)														1,434,695	

Feb 2014 Booster Report	Booster I	Booster II	Booster III
Pump Rating GPM	500	300	500
Pump Output GPM	431	243	500
Total Hours Run	89	115	50
Begin Reading	191,472,000	568,796,000	282,384,000
End Reading	193,772,000	570,475,000	283,885,000
Total Pumped	2,300,000	1,679,000	1,501,000
Average Daily(mgd)	0.209	0.140	0.107
Days Used	11	12	14

Bertie County Regional Water System Sales Report

2014

2014	DISTRICT I & III GALLONS USED				DISTRICT II & IV GALLONS USED				AUDIT CALCULATIONS					
	BOOK 1	BOOK 2	BOOK 3	BOOK 4	BOOK 5	BOOK 6	BOOK 7	Herford Co.	Total Sold	Total Pumped	Accounted Loss	Un Accounted Loss	Gallons per Day	Per Cent loss
JANUARY	2,614,000	2,743,000	4,285,000	2,498,000	11,228,000	960,000	4,738,000	44,300	29,110,300	45,203,000	31,000	16,061,700	518,119	35.53
FEBRUARY	1,456,000	2,110,000	3,842,000	1,734,000	14,094,000	1,257,000	6,618,000	58,400	31,169,400	39,444,000	28,000	8,246,600	294,521	20.91

Water Loss Comparison Table

Operating Year	Total Water Sold	Total Water Produced	Un Accounted Loss	Per Cent Loss
2010	241,064,000	439,496,000	198,432,000	45%
2011	265,420,000	489,476,000	224,056,000	46%
2012	278,147,000	478,462,000	200,315,000	42%
2013	288,095,000	422,295,021	128,346,000	32%
	1,072,726,000	1,829,729,021	751,149,000	
Average	268,181,500	457,432,255	187,787,250	41%

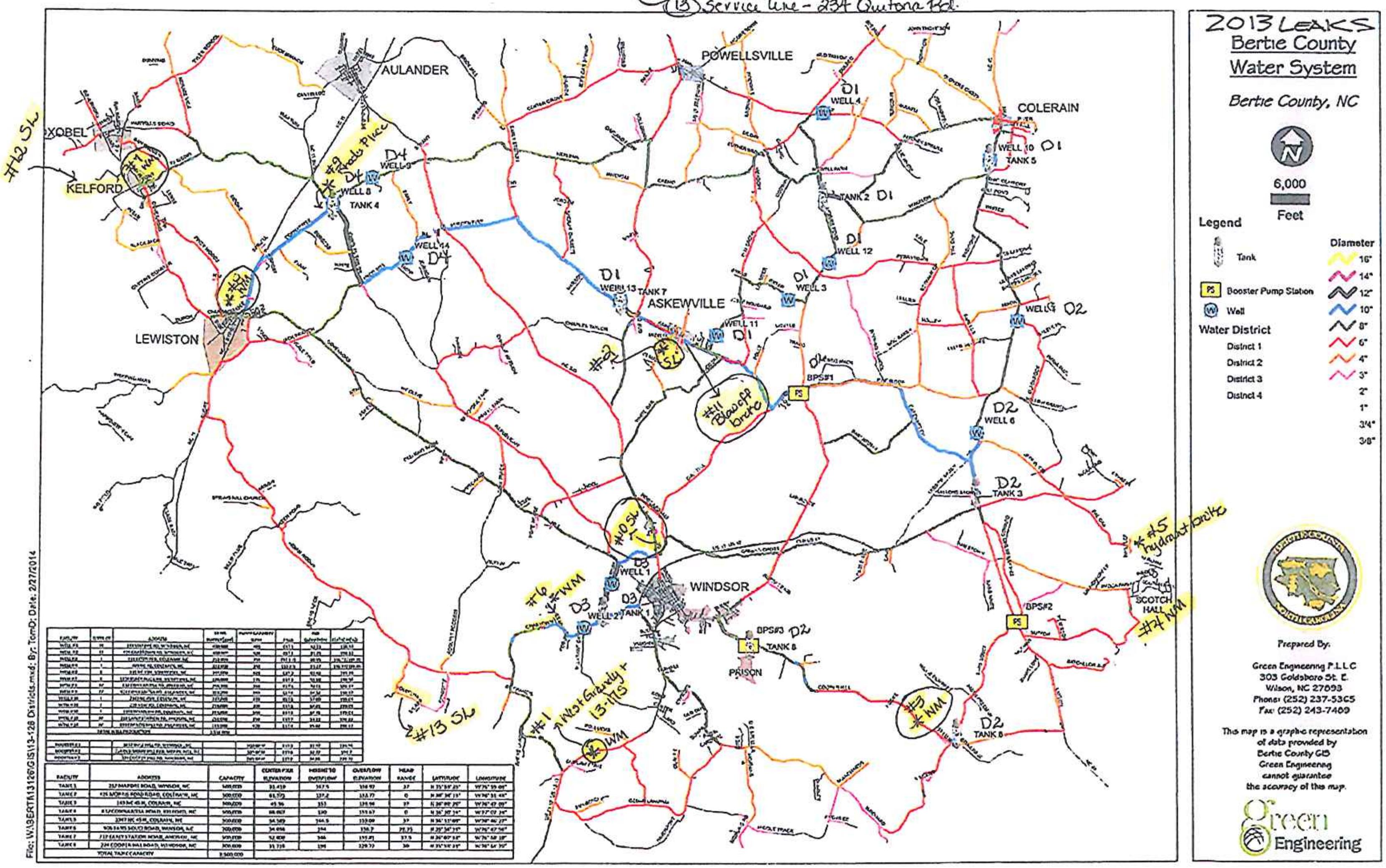
OVER PUMPING OCCURRENCES
TABLE
Table 6

Year		Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
2010														
							1	1	1	2	3	1	1	10
										2	2	1	1	6
2011														
		2	2	3	4	3	3	3	3	2	3	5	4	37
		1		1			1	1	2	2	1	1	1	11
2012														
		4	3	3	6	5	5	5	4	5	2	6	5	53
		2		1	2	1	1	2	2	2	1	1	2	17
2013														
		4	3	2	3	3	3	8	4	6	4	5	3	48
					1	1	1	2	2	2	2	2	2	15
Total														197
														148
														49

denotes wells that exceeded their allowable pump time one or more times per month

denotes wells that exceeded their allowable pump time every day of that month

1. Watermain leak - 13-175 + W. Grandy Lane, water ran for about 6 hours.
2. Service line leak - Askewville - Muzzle Lane by D.G. White Service Center
3. watermain leak - 1527 Cooperhill Rd.
4. watermain leak - Scotch Hall
5. hydrant broke corner of Bal Gra + Wheeler Drive
6. watermain leak - 633 Grabtown + Isaac Lane
7. Watermain leak - 208 S. Main St. Kelford, NC
8. watermain leak - NCDOT dropped loader on water mains
9. tank + well #8 @ Rhodes Place had an overflow
10. service line - 435 US 13N
11. school bus backed over blow off @ 147 Askewville - Evans St.
12. service line - 106 Middle St Kelford, NC
13. Service line - 234 Quitona Rd.



BERTIE COUNTY
Regional Water System

Capital Improvement Plan
2013-2020

EXECUTIVE SUMMARY

The capital improvement plan attached herewith is a working tool developed by the Utility staff to give guidance toward the County's water infrastructure development and capital needs program. It consists of an assessment of the current water system and capital project needs over a five-year period. This plan is offered to the Board to seek their guidance and input as they look toward Bertie County's future. This plan should be a helpful fiscal planning tool that allows the utility department to forecast capital demands on revenues and borrowing power to help avoid overextending ourselves financially during the next five years and beyond. BCRWS recommends that the review and approval of this capital improvement plan be accomplished annually as part of the budget process. General approval of this document by resolution does not commit the Board to specific approval of any one project or expenditure, nor does it appropriate money for any project. This would still be accomplished through separate capital project ordinances. The approval by resolution from the Board simply approves the capital improvement plan as a plan for the forecast period.

DESCRIPTION OF COUNTY

Demographics. The county was formed as **Bertie Precinct** in 1722 from the part of Chowan Precinct of Albemarle County lying west of the Chowan River. It was named for James Bertie, his brother Henry Bertie, or perhaps both, each having been one of the Lords Proprietors of Carolina. It is bordered by Hertford County to the north, Chowan County to the East, Martin County to the southwest, Washington County by the southeast, and Halifax County to the northwest.. Bertie County, is the third largest county in land area in North Carolina. The total land area is 741 square miles, of which 699 is made of land mass and 42 of water with an estimated population of 21,282 residents according to the 2010 census. The most eastern edge of Bertie joins the Chowan River which is the boundary between Chowan County. The county is divided into nine townships: Colerain, Indian Woods, Merry Hill, Mitchells, Roxobel, Snake Bite, Whites, Windsor, and Woodville. The county has eight incorporated towns: Askewville, Aulander, Colerain, Kelford, Powellsville, Merry Hill, Roxobel, and Windsor the county seat.

Description of Existing Facilities.

The Bertie County Regional Water System provides water services to approximately 5733 connections which equals 14,333 citizens. The Bertie County Regional system supplies water to the its rural citizens and has emergency interconnections with 4 of the eight towns within the county. It supplies water to the Bertie County Correctional Facility, all County Schools, 27 commercial customers and the Town of Woodville- Lewiston. The Utility also has water purchase contracts with the Town of Roxebel. The Bertie County Regional system utilizes Upper Cape Fear, Lower Cape Fear, and to a lesser degree the Beaufort Aquifers as the source for the system's drinking water and currently has pumping capacity of 3.12 million gallons a day. Bertie County's water system is made up of four county water districts. Each of these districts exists as a separate legal entity pursuant to Chapter 162A, Article 6 of the North Carolina General Statutes. The County maintains and operates the districts for a fee equal to

the districts' debt service amount. This amount is paid from general revenues received from water sales from the various districts.

The Bertie County Water Department was established in 1995. It has grown in the last nineteen years to approximately 5733 water customers, including 29 commercial customers and 8 full time employees. The Bertie County Regional Water System consists of approximately 520 miles of water mains, 3 booster pumping stations, 8 elevated water storage tanks, 13 water supply wells, and totals over 20.8 million dollars in assets. Approximately 70% of County residents now have access to public water. As is apparent from the above history, this department has experienced tremendous growth and accomplishment through the valiant efforts and foresight of past and present Bertie County Commissioners and staff. Their dedication to a countywide water system is the reason for this department's success.

WATER SYSTEM

Water Supply Facilities.

It is believed based upon the NC Division of Water Resources data base information, that the ground water supply for Bertie County should be reliable through 2050. This is based upon the current levels of water in the three primary aquifers that are presently serving the county and municipal use. These are the Beaufort (entire County), Upper Cape Fear (western two thirds of the county), and Lower Cape Fear (almost the entire county). Because the quality of water in the Upper Cape Fear and deeper aquifers is of high quality there is little to no treatment required to meet public health drinking water standards other than disinfection. Currently there are no disinfection by-product issues with the Upper Cape Fear and so there is a heavier demand for this aquifer. The State continues to monitor the ground water levels in Bertie County, and there are presently four monitoring sites maintained which allow measurements from the shallowest to the deepest aquifers. These monitoring wells interface with six different aquifers with constant monitoring for developing a robust database. The State continues to monitor the ground water levels in Bertie County and there are presently four monitoring wells maintained ranging from 662 feet below the earth's surface to 1,194 feet.

These test wells interface with five different aquifers with constant monitoring for developing a robust database.

The County's well supply provides a safe yield of 3,124,800 gallons per day. The production facility is composed of thirteen (13) wells throughout the four water districts. The ground water quality is superior for the region and requires no treatment other than disinfection. However, wells 3 and 4 are considered to be marginal with iron and this plan considers potential treatment the next 5 year planning horizon. The distribution system is compose of 520 miles of pipe ranging from 3/4 inch to 12 inch transmission compose primarily of PVC and Ductile Iron. There is approximately 3,500,000 gallons of overhead storage for emergency reserves and providing adequate pressure for service.

Water Supply Plan.

The State of North Carolina requires that all water systems submit an approved water supply plan annually. This plan has been updated by the Utility Department staff. The most current plan on record with the North Carolina Department of Water Resources is 2012. The purpose of this plan is to provide evidence to the State that the water system is providing adequate planning for the supply of water through a designated planning period. This plan noted that over the last four years the system averaged over 40 percent in unaccounted water loss. The Board has made water loss a high priority and is currently seeking funding to upgrade and replace the systems outdated telemetry system with a Supervisory Control and Data Acquisition System.

Hydrology

The eastern side of Bertie County is bordered by the Chowan River which is considered a valuable natural resource, however it is currently classified as an "impaired" surface water by the Division of Water Quality within the Department of Environment and Natural Resources.

It is anticipated that the Division will implement nutrient limit rules for new development within the entire River Basin. The western side of the County is bordered by the Roanoke River. The primary water source for the Regional System is deep wells and they currently do not pose any impact to the River basins. Currently, Bertie County is excluded from the Central Coastal Plain Capacity Use area(CCPCUA). This controlled zone is separated by the Roanoke River and Martin County.

Water Conservation Measures.

Bertie County is has adopted a Water Shortage Response Plan. The board is currently evaluating the system to determine was loss and considering the adoption of a Water Shortage & Conservation Ordinance that will include the Water Shortage Response Plan . The ordinance is in response to the drought conditions in our area over the last several years. The ordinance will more clearly define the stages of water conservation and what triggers their enactment stages. The Water Shortage Response Plan will also establish a normal irrigation schedule and increased the department's enforcement authority during emergencies. Our water supply is a critical resource that must be protected at all costs. This ordinance change is also critical to infrastructure funding with federal and state agencies.

The staff is recommending in the FY2014-15 budget to install a new Supervisory Control system (SCADA) to facilitate the management of pumping all thirteen wells. There is currently no operational and management control over well production exceeding the allowable permitted hours to run. This system will enable the Operator in Responsible Charge (ORC) to maintain each well within pumping limits . Because of excessive water loss the SCADA system will enable the ORC to maintain production and water loss records on a daily basis which will facilitate the overall management efforts in reducing unaccounted for loss.

Water Distribution System.

Currently there are over 520 miles of water mains from 2 inch to 12 inch in diameter. There remains several communities that do not have service. Currently there are plans to evaluate the un served areas in throughout the county. The department is currently under contract with Green Engineering, PLLC to develop an Operations and Systems Evaluation to address un served areas of the county and to develop policy and plans to improve existing service and plan additional services in those areas that are feasible.

Regional Interconnects. The utility department recognizes the importance of interconnects on both a local and regional basis its role to serve other system during mutual aid needs. These interconnections are also part of the Departments risk management goals. BCRWS currently has emergency interconnects with the Town of Windsor, Town of Harrellsville, Roxobel, and Powellsville.

These connections are of a vital importance in the event of emergency water shortage conditions. The ability to provide and receive additional water from these various sources makes reduces risk and provides for sound regional planning. As our water system continues to grow, there will be additional interconnections with our various neighbors.

FINANCIAL PLANNING

Revenue Projections.

Revenue projections for the next 5 years are difficult if not impossible to correctly predict. They are tied to a myriad of factors including residential and commercial growth in the County, local and regional economic conditions, and the ability of our Department to meet all future water needs throughout the County and region. Before we can attempt to predict future revenues, we need to look at current revenue trends for the last several fiscal years:

BCRWS Operating Revenues

Financial Period	Operating Revenues
FY 03-04	$ 1,432,652
FY 05-06	$ 1,558,018
FY 06-07	$ 1,663,522
FY 07-08	$ 1,792,083
FY 08-09	$ 1,891,198
FY 09-10	$ 1,703,413
FY 10-11	$ 1,931,559
FY 11-12	$ 2,072,802
FY 12-13	$ 2,059,888

The operating revenue table illustrates the revenue generated for the last 9 years. You can see from these figures that revenues increased by over $500,,000. This represents a 31% increase in operating revenues in that time span. The majority of this increase is due to annual inflationary-based increases in water rates and the growth of water infrastructure throughout the County. Note that even thru 2009 - 20011 with the economic down turn the water system grew in revenue. Much of this increase can be attributed to the increase in sales from the AVOCA FARM INDUSTRY and the new NC DOC PRISON.

A consumptive analysis will be conducted during the current year's operating budget which will assess usage block ranges to facilitate the development of a rate increase to recover the down turn of FY 2012-13. The overall financial strategy of the Department is to continue to maximize revenues consistent with an even pace of residential and commercial growth within the County. Expenditures will be kept in line consistent with adequately maintaining treatment and distribution systems while emphasizing regulatory compliance in all areas. BCRWD is at a historical crossroads in the sense that 70% of all County residents have access to water. Additional access to water has been the primary source of a growing revenue base in the past. However, there are still areas within the county that will require water. Because these areas population density is less than the current county average customers per mile , their financing options will be much more challenging. BCRWD has plans to develop a Long Range Financial Plan with a new Master Plan as an integral part of the LRFP. Future revenue growth

will be directly correlated to the Department's ever increasing important role as a regional water provider to surrounding municipalities.

According to the US Bureau of Labor Statistics the annual consumer price index has average approximately 2.3 percent per year over the last 12 consecutive years. The utility staff recommends that the Board consider annual rate adjustments tied to the consumer price index to keep up with inflationary cost relative to operating a viable utility enterprise.

Environmental Education.

In July/August of each year all BCRWS customers are provided with the annual Consumer Confidence Report (CCR) that outlines the water quality delivered to customers. The educational document will be posted on the Bertie County web page for the first time in FY 2014-15. Consumer Confidence Reports are required by the 1996 Safe Drinking Water Act (SDWA) Amendments, these reports give customers information about their water quality. Following this initial report, the report will need to be delivered to all customers by July 1st of each year. Most customers want to be better informed about the quality and safety of their tap water. By providing them with this information, we have an important opportunity to increase public confidence in the quality and safety of their drinking water.

Capital Project Budget Summary.

This capital project budget summary combines all the proposed capital projects discussed earlier in this report. It provides a snapshot of anticipated capital needs over the next five years. The expenditures section shows each projects total budget. The revenue section shows the expected funding sources for each year.

Bertie County Regional Water System

Capital Improvement Plan Budget

EXPENDITURES							
Project Name	Total Cost FY 2013-14	Total Cost FY 2014-15	Total Cost FY 2015-16	Total Cost FY 2016-17	Total Cost FY 2018-19	Total Cost FY 2019-20	Totals
Water System Evaluation	61,000.00						61,000.00
Altitude Valve Reconditioning (6)	12,000.00						12,000.00
Well 6 Rehab		25,000.00					15,000.00
Well 3 Rehab			27,000.00				17,000.00
Well 4 Rehab				29,000.00			19,000.00
SCADA System		1,289,468.00					1,289,468.00
Asset Management plan			35,000.00				35,000.00
Meter Reading Hand Held Equipment	20,000.00						20,000.00
South Windsor System Improvements			1,023,085				950,000.00
Iron Removal Treatment Well 4					50,000.00		50,000.00
Water Line Extensions All Districts			$125,000.00	150,000.00	200,000.00	250,000.00	725,000.00
Generators and transfer switches			50,000.00	50,000.00	50,000.00	50,000.00	200,000.00
Update the 2011 Hydraulic Model		20,000.00					
Ck Valve Vault Reconditioning		20,000.00	20,000.00				40,000.00
Master Meter Vaults		35,000.00	35,000.00	35,000.00	35,000.00		140,000.00
Totals	**$93,000.00**	**$1,419,468.00**	**$1,315,085.00**	**$264,000.00**	**$335,000.00**	**$300,000.00**	3,734,553.00
REVENUES							
	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2018-19	FY 2019-20	Totals
Grants from all sources							
CDBG		1,319,468.00					1,289,468.00
GO Bonds (USDA Rural Dev)							
Revenue Bonds							
State Revolving Loans			210,000.00	235,000.00	335,000.00	300,000.00	1,080,000.00
State Revolving Grants							
State SRF Principal Forgiveness			$1,023,085.00				985,000.00
Private Loans							
Developer Participation							
Reserves	$93,000.00	100,000.00	82,000.00	19,000.00			239,000.00
Totals	**$93,000.00**	**$1,419,468.00**	**$1,315,085.00**	**$264,000.00**	**$335,000.00**	**$300,000.00**	3,734,553.00
Debt Summary							
	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2018-19	FY 2019-20	Totals
Actual New Debt	**$0.00**	**$0.00**	**$210,000.00**	**$235,000.00**	**$335,000.00**	**$300,000.00**	**$0.00**
Planned Rate Increases							
Current Rates/Water	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2018-19	FY 2019-20	Totals
Min charge for availability	20	20	cpi	cpi	cpi	cpi	
$5/1,000 gal for all water	no change	5.35	cpi	cpi	cpi		
$3.25Bulk Rate	no change	3.60 plus cpi	fy 14-15 plus cpi	fy15-16 plus cpi	fy16-17 plus cpi	fy17-19 plus cpi	
% increase	no change	6% estimated	2 .3% estimated	2.3 % estimated	2.3 % estimated	2..3% estimated	

Duly adopted this the _____ day of March 2014, upon motion made by Commissioner __ _____, seconded by Commissioner _____, and adopted by the following vote:

Ayes: _____ Noes: _____ Absent: ____

Board of Commissioners of the County of Bertie

By: _____

J. Wallace Perry, Chairman of the Board and of the governing body of all Water Districts of Bertie County

ATTEST: _____

Sarah Serdni , Clerk to the Board

Item	Description	Qty	Unit Price	Cost
1	SCADA Master, Computer and Peripherals	1	$45,000.00	$45,000.00
2	Redundant Computuer and SCADA Software	1	$13,000.00	$13,000.00
3	Remote Client Connections (PC,Smart Phone, Tablets)	5	$8,000.00	$40,000.00
4	Master Radio and Antenna System	1	$15,000.00	$15,000.00
5	well #1 149 Madre Rd, Windsor	1	$18,500.00	$18,500.00
6	well #2 424 Grabtown Rd,Windsor	1	$18,500.00	$18,500.00
7	well #3 418 Exter Rd, Coletrain, NC	1	$18,500.00	$18,500.00
8	well #4 829 NC42	1	$18,500.00	$18,500.00
9	well #6 535 NC 45N, Merry Hill, NC	1	$18,500.00	$18,500.00
10	well #7 1224 BlackRock Rd, Merry Hill, NC	1	$18,500.00	$18,500.00
11	well #8 632 Connaritsa Rd, Kelford, NC	1	$25,000.00	$25,000.00
	Tank # 4 632 Connaritsa Rd, NC			
12	well #9 924 Connaritsa Rd, Kelford, NC	1	$18,500.00	$18,500.00
13	well #10 2347 NC45N, Colerain, NC	1	$18,500.00	$18,500.00
14	well #11 203 New Rd, Colerain, NC	1	$18,500.00	$18,500.00
15	well #12 1946 Wakelon Rd, Colerain, NC	1	$18,500.00	$18,500.00
16	well #13 212 Early Staion Rd, Ahoskie, NC	1	$18,500.00	$18,500.00
17	well #14, 833 Francis Mill Rd, Aulandaer, NC	1	$18,500.00	$18,500.00
18	Tank # 1 217 Mardre Rd, Windsor, NC	1	$18,500.00	$18,500.00
19	Tank # 2 426 Morris Ford Rd, Colerain,NC	1	$18,500.00	$18,500.00
20	Tank # 3 143 NC45N, Colerain, NC	1	$18,500.00	$18,500.00
21	Tank # 5 2347 NC45N, Colerain,NC	1	$18,500.00	$18,500.00
22	Tank # 6 905 San Suuci Rd, Windsor, NC	1	$18,500.00	$18,500.00
23	Tank # 7 212 Early Station Rd, Ahoskie, NC	1	$18,500.00	$18,500.00
24	Tank # 8 & booster Station # 3,			
	224 Cooper Hill Rd, Windsor, NC	1	$25,000.00	$25,000.00
25	Booster Station # 1			
	1232 Bull Hill Rd, Windson, NC	1	$25,000.00	$25,000.00
26	Booster Station # 2			
	734 Old Merry Hill Rd, Merry Hill, NC	1	$25,000.00	$25,000.00
27	Master meter Vault Avoca	1	$18,500.00	$18,500.00
28	Master meter Vault Lewiston	1	$18,500.00	$18,500.00
29	Spare Parts (13340)	1	$9,000.00	$9,000.00
31	Initial Training (8 hours)	1	$1,600.00	$1,600.00
32	Additional Training (16 hours)	2	$1,600.00	$3,200.00
33	Well head encoder registers	14	$2,200.00	$30,800.00
34	Chlorine Analyzers	16	$6,500.00	$104,000.00
35	Altitude Vaults	7	35,000.00	$245,000.00
36	Sub Total			**$976,600.00**
35	Contingency			$97,600.00
36	Total Construction			$1,074,200.00
37	Engineering (Basic)			$87,440.00
38	Permitting			$1,000.00
39	Land Surveying Costs			0
40	Easement Preparation			0
41	Closing Fee (if applicable)			
42	Construction Administration/Observation			81,828.00
43	Grant and/or Loan Administration			50,000.00
44	Preliminary Engineering Report			15,000.00
45	Enviromental Assessment			$10,000.00
46	Administration Sub-Total			$245,268.00
47	**Total Project Cost**			**$1,319,468.00**