

Annual Water Conservation Summary Report for 2009

City of Kennewick
Water System ID. - 38100Q

Introduction:

The following annual water conservation report will update the data collection element as outlined in our City of Kennewick - Water System Plan, Section 3, April, 2002 for calendar year 2009. This report consists of a progress summary of water conservation actions and measures taken by the City in 2009, compares data for the past 3 calendar years, and identifies those Water Conservation efforts planned in future years.

Water Conservation Data Collection Elements:

Requirements

Type of Data	Units of Measure	Frequency of Collection
Source of Supply Meter Readings	Cubic Feet	Collect: Read daily but report only monthly and annual totals
Peak Day/Peak Month	Cubic Feet Pumped from the Supply Sources	Collect: Each year's peak day and peak month totals
Emergency Interties - Amount Imported	Cubic Feet	Collect: Monthly total
Wholesale - Amount Purchased	Cubic Feet	Collect: Monthly total
<u>Service Meter Readings</u>		
Single-Family – Domestic and Irrigation component (Begun in 2006)	Total Cubic Feet Used by this Customer Class	Collect: Monthly totals
Multi-Family – Domestic and irrigation component (Begun in 2006)	Total Cubic Feet Used by this Customer Class	Collect: Monthly totals
Commercial/Industrial – irrigation component (Begun in 2006)	Total Cubic Feet Used by this Customer Class	Collect: Monthly totals
Government/Municipal	Total Cubic Feet Used by this Customer Class	Collect: Monthly totals
Agriculture	Total Cubic Feet Used by this Customer Class	Collect: Monthly totals
Emergency Interties - Amount Exported	Cubic Feet	Collect: Monthly total
Wholesale - Amount Sold	Cubic Feet	Collect: Monthly total
Non- Revenue -Accounted for Water	Cubic Feet	Collect: Annual total
Total Accounted for Water	Cubic Feet	Collect: Annual total
Unaccounted for Water	Cubic Feet	Collect: Annual total
Population Served	Estimate the number of customers & connections served in the residential classes and the number of connections served in the commercial, government, industrial and agriculture classes.	Collect: Annual totals
Economic Data	Existing Water Rates for each class	Existing water rates
Conservation Data	Report the type of measure, the level of implementation of duration of the measure and the date at which they were begun.	Collect: Once per year

2007 - 2009 Water Conservation Data Collection Elements

Type of Data	2007		2008		2009	
Source of Supply Meter Readings in Mcf						
Collector #4	58.87 Mcf		35.91 Mcf		20.28 Mcf	
Collector #5	257.36 Mcf		207.13 Mcf		197.26 Mcf	
Water Treatment Plant	188.55 Mcf		255.29 Mcf		309.40 Mcf	
Total Water System Pumpage	504.78 Mcf		498.33 Mcf		526.94 Mcf	
(Monthly Readings for 2009 on following graphs)						
Peak Day/Peak Month in Mcf						
	<u>July 15, 2007</u>	<u>July 2007</u>	<u>July 28, 2008</u>	<u>July 2008</u>	<u>July 31, 2009</u>	<u>July 2009</u>
Collector #4	0.181 Mcf	5.59 Mcf	0.177 Mcf	3.88 Mcf	0.183 Mcf	4.76 Mcf
Collector #5	1.248 Mcf	29.16 Mcf	1.029 Mcf	30.70 Mcf	1.335 Mcf	34.70 Mcf
Water Treatment Plant	1.140 Mcf	34.58 Mcf	1.240 Mcf	33.02 Mcf	1.670 Mcf	31.60 Mcf
Total Water System Pumpage	2.569 Mcf	69.33 Mcf	2.446 Mcf	67.60 Mcf	3.188 Mcf	71.06 Mcf
Emergency Interties - Amount Imported	None		None		None	
Emergency Interties - Amount Exported –Elliott Lake	0.219 Mcf		None		None	
Wholesale - Amount Purchased	None		None		None	
<u>Service Meter Readings</u>						
Total Consumption	482.494 Mcf		469.470 Mcf		491.145 Mcf	
Single-Family	221.189 Mcf		213.651 Mcf		231.128 Mcf	
* Irrigation – Began tracking in 2006	0.560 Mcf		0.575 Mcf		0.566 Mcf	
Multi-Family	75.928 Mcf		66.884 Mcf		82.570 Mcf	
* Irrigation – Not tracked in 2007	0.000 Mcf		0.000 Mcf		0.000 Mcf	
Commercial/ Industrial	82.743 Mcf		78.429 Mcf		77.655 Mcf	
* Irrigation – Excludes outside commercial	47.691 Mcf		57.541 Mcf		51.548 Mcf	
Municipal/Government – Non-Revenue	54.383 Mcf		52.390 Mcf		47.678 Mcf	
<u>Unmetered Water</u>						
Unmetered Water Reports - Accounted for Water	2.12 Mcf		2.84 Mcf		3.70 Mcf	
Total Accounted for Water – (Service Meter Readings + Annual Unmetered Water Report)	474.834 Mcf		472.310 Mcf		494.845 Mcf	
Unaccounted for Water (See Calculations*)	29.9 Mcf or 5.9% Water Loss		26.0 Mcf 5.2 % Water Loss		32.1 Mcf 6.1 % Water Loss	
<u>Estimated Population Served</u>						
	67,871		68,128		69,454	
<i>Kennebec Population Only* (April Update)</i>	65,315* -Annex. 2795 -8/07		65,860		67,180	
<i>Single Family Residential Connections</i>	17,333		17,592		17,873	
<i>Multi-Family Residential Connections</i>	1,179		1,177		1,170	
<i>Commercial/Industrial Connections</i>	1,877		1,943		1,968	
<i>Municipal/Government Connections</i>	149		148		152	
<i>Agricultural (Not determined separately from above classes)</i>	Not Available		Not Available		Not Available	
<i>Total Active Water System Connections</i>	20,538		20,860		21,163	
Economic Data	Listed in Following Narrative		Listed in Following Narrative		Listed in Following Narrative	
Conservation Data	Listed in Following Narrative		Listed in Following Narrative		Listed in Following Narrative	

Calculations:

(1) Source of Supply Meter Readings

Pumpage in MG per day ÷ 7.48 gal./cu. ft. = pumpage in Mcf per day.

(2) Unaccounted for Water

Unaccounted for water (Mcf) = Total Pumpage (Mcf) - Total Accounted for Water (Mcf)

% Water Loss = Unaccounted for Water (Mcf) / Total Pumpage in Mcf x 100%

(3) Service Meter Readings

- a) Total Consumption is the total of all metered water usage within the City of Kennewick utility service area.
- b) All metered accounts are read on a Bi-monthly basis.
- c) Customer classifications used for this report section include, Single and Multi-Family, Commercial/Industrial, and Government/Municipal. Of these single family, Multi-Family, and Commercial/Industrial now have an irrigation component as well as domestic use component. The Non-Revenue classification reflects the total metered water usage by Government/Municipal –non-revenue accounts.

(4) Unmetered Water

- a) The Unmetered Water element includes water use that is estimated and reported on a City water use form. This category includes water used by City crews, Contractors, Fire Departments, and other uses allowed under the City's Authorized Unmetered Water policy.

(5) Estimated Population Served

- a) City of Kennewick Population is based on the annual City of Kennewick Planning Department updates.
- b) Est. Population Served = {City of Kennewick OFM Population -as of 4/1/2009 + # of outside Active Residential Accts. x 3.0 People/Account}. i.e. - In 2009 this was 67,180 + (758 X 3.0) = 69,454 People.

Economic Data:

The following rate table was in effect during calendar year 2009. It should be noted the City of Kennewick bills every two (2) months. In 2008, annual inflationary billing was adopted at 100% of the CPI, however there was no CPI rate adjustment in 2009. Kennewick serves more than just municipal needs and also has county residential and commercial/industrial connections as well. Each has a different rate structure or schedule as listed in **Table 1.** under the headings of Inside or Outside City.

Table 1.
Summary of Water Rates 1/1/2009 to 1/1/2010

Customer Class	Inside City	Outside City
Residential		
Base Fee		
Includes 1" meter	\$18.63/bimonthly	\$40.99/bimonthly
Consumption per 100 Cu. Ft.	\$1.803/CCF	\$2.705/CCF
Multi-Family/Commercial/Industrial		
Base Fee		
3/4" meter	\$36.00/bimonthly	\$79.20/bimonthly
1"	\$53.85/bimonthly	\$118.47/bimonthly
1-1/2"	\$95.78/bimonthly	\$210.72/bimonthly
2"	\$125.83/bimonthly	\$276.83/bimonthly
3"	\$191.70/bimonthly	\$421.74/bimonthly
4"	\$281.54/bimonthly	\$619.39/bimonthly
6"	\$425.34/bimonthly	\$935.75/bimonthly
Consumption per 100 Cu. Ft.	\$1.057/CCF	\$2.326/CCF

Note: 1) CCF = Hundred cubic feet or 748 gallons.
 2) Maximum Billing for Multi - family accounts is based on residential rate multiplied by the number of units.

Conservation Data:

The following water conservation actions or program measures were taken during 2009. The Leak Detection Program (identifying and repairing leaking waterlines) has had the greatest overall net effect on water conservation over time. Other initial program efforts begun in 1994 concentrated on water auditing and repair/testing of large industrial meters. In 1999, an annual reservoir leak testing program was added. In 2007 an irrigation component was added to further break out customer classes and manage that usage component. In 2007 a water efficiency goal also was established of 170 gpcd in a public process.

- Leak Detection

This program has returned the largest overall benefit to the City. In 2009 City personnel surveyed the 2009 Overlay project list using SR-22 and LC-2100 leak survey equipment. Additionally, we investigated and surveyed in map quarter sections for a total of 15.78 miles. One main line leak and one leaking fire hydrant that did not seat properly were found. Total leak loss amounted to 160,923 gallons per year or 0.0215 Mcf. Overall program benchmarks were initially 0.17 Mcf/mile and have dropped overall to ~0.106 Mcf/mile of water main surveyed. Benchmark values have declined as newer and lower prioritized areas are surveyed. Also in 2009 we were not able to survey as much as we would have liked due to budget and personnel. To date the program has surveyed roughly 365 miles of water distribution main. Repairs to identified leaks have resulted in an overall cumulative conserved water estimate of 38.92 Mcf for the program, since it was initiated in 1994. This program has accounted for about 75% of our overall water conservation savings.

- Routine Reservoir Leak Testing Program

As part of our annual leak testing program of the City's twelve (12) reservoirs or tanks, eleven (11) were leak tested in 2009 including the Water Treatment Plant Clearwell. Five (5) reservoirs were found to have some measurable leakage. 18th & Kellogg 10 MG reservoir had the highest leakage rate at (0.37%) but met AWWA specs of <0.75% in 72 hours. This was followed by 19th and Olympia Reservoir the eastside at 0.06%. All rates were however well within current AWWA standards. Since July of 2000, total conserved water estimated for the program is 5.88 Mcf annually. 5 reservoirs were cleaned and inspected. In 2010 a project to replace the drain valve at the 18th & Kellogg Reservoir was completed. This program contributes 11% of the overall water conservation savings.

- Large Meter Testing Program

This program has maintained it's effectiveness in reducing water loss. Part of this can be related to increased customer awareness from a financial as well as from an environmental aspect. This program began on June 6, 2009 and ended August 24, 2009. In terms of maintenance, large meters greater than 2-inch typically underregister water usage and become a source of Unaccounted for Water or water loss. All existing 81 large meters were tested in 2009. 71 of those tested met the 95% or better accuracy criteria over the three flow ranges (low, medium and high) used in the tests. All 10 low registering meters were repaired and able to meet the flow criteria. Final overall average accuracy of all 81 large meters was 98%. In addition five (5) new 3 inch meters were installed in 2009 and 100% accuracy was assumed from the factory.

Consumption by the Commercial/Industrial classification accounts for most of the large meters. Total estimated water conserved by the program remains at 6.3 Mcf on an ongoing annual basis. This is about 12% of our overall water conservation savings. At a \$1.057 rate per 100 cu. ft. in 2009 this amounts to \$66,590. This Customer Class also uses the largest amount of irrigation water annually of all user groups.

- Unmetered Water Reporting

In March 1996, the City of Kennewick began the Unmetered Water Program to identify and better track unmetered water usage. Such uses include operation and maintenance activities such as; main breaks, street sweeping, flushing hydrants, dust control, fire response by the City, County and private parties as well. This program has increased the awareness of City Departments, outside agencies and Contractors. The Unmetered Water Report for 2009 shows 27.689 MG or 3.70 Mcf can be accounted for by these uses. This quantity of water is estimated or determined by volume measure. In 2009 most Contractor hydrant meters were removed from this category and billed as Commercial/Industrial use. In 2009 City project meters will be reported under the Municipal/Government element as these are metered and non-revenue use.

- Residential Meter Repair / Replacement Program

In 2009, 291 - ¾" through 2 inch new meters were set. 430 were repaired and put back in operation.

- Source Meter Accuracy

The City of Kennewick has 2 sources of water, the Ranney Collectors (#4 & #5) in Columbia Park that have master meters on North and South header lines and those that monitor raw and finished water at the Kennewick Water Treatment Plant. Collector #4 meter was factory calibrated and approved on 1/9 and again on 6/1 of 2009. Townsend Controls calibrated both #5 meters on April 13, 2009 prior to operation. Both Raw and Finished water meters at the Kennewick Water Treatment Plant were checked for proper operation on September 10, 2009 by Total Energy Management. No errors or issues were found.

- Consumer Water Audits Performed

The City began a Water Audit Program for Large Water Users. This program is being implemented for water meters 6-inch and greater. The City currently has a total of 5 water meters that fall into this category. An additional audit of Sun Meadows Mobile Home Park was performed in 2009 so 3 of the 5 are now complete.

- Water Use Efficiency Goal

The City established water use efficiency goals through a public process in 2007. On November 20, 2007 Resolution No. 07-33 was adopted establishing a City water use efficiency goal of maintaining an annual average per capita demand below 170 gallons per day. In 2009, the actual calculated demand value for pumped water was 155 gallons per capita per day. This meets that goal and is slightly more than 150 gpcd calculated in 2008.

Future Water Conservation Measures:

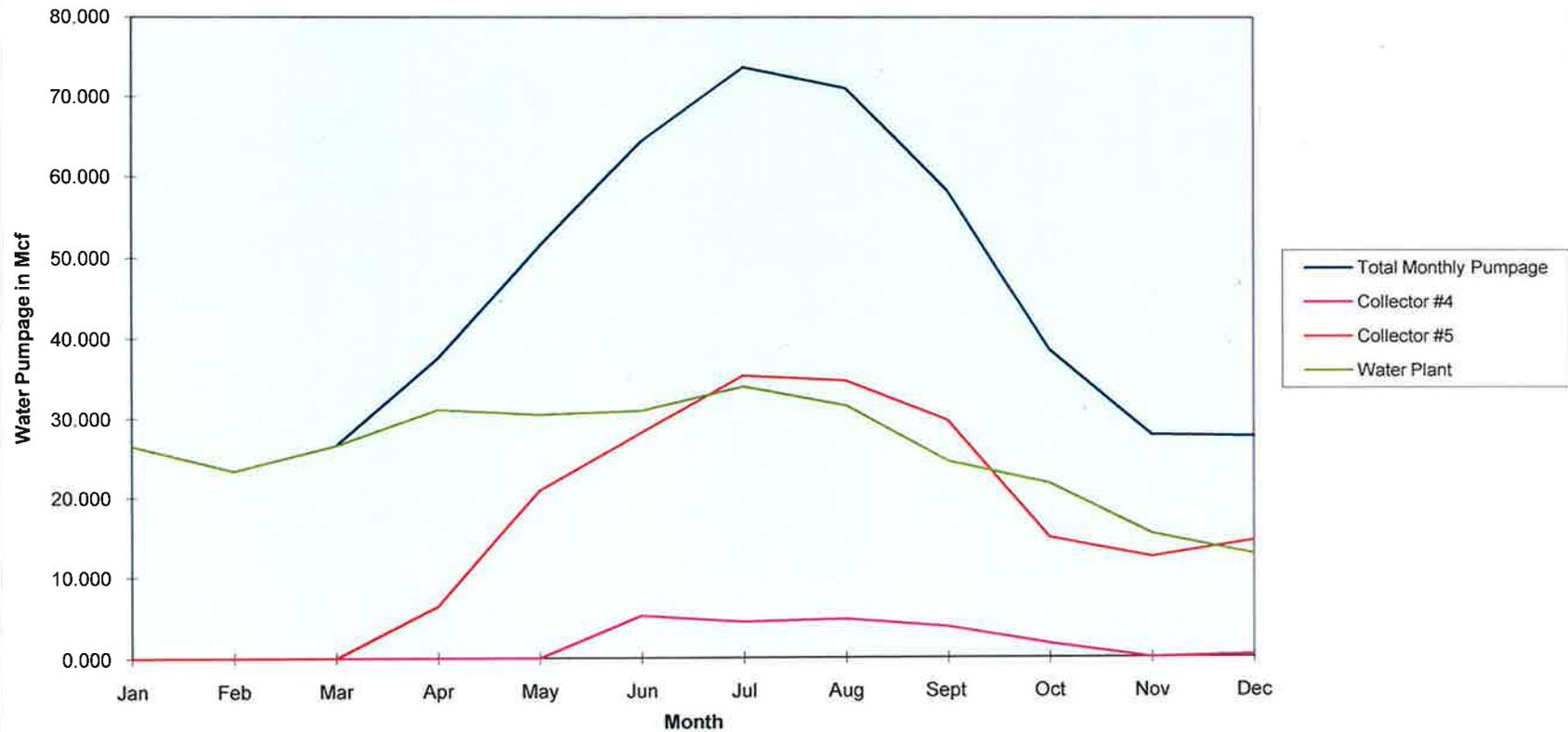
The City of Kennewick plans to continue our existing Water Conservation programs in 2010. The following Water Conservation related items are currently scheduled for completion in 2010:

- Continue water distribution main leak survey audits of overlays and other identified areas.
- Continue Annual Reservoir Leakage Testing program
- Participate in Public Outreach & Education program.
- Continue Voluntary Residential Retrofit program for showerheads etc.
- Continue Annual Large meter (>2-inch) inspection, repair & testing program.
- Continue with Residential Meter Repair/Replacement Program.
- Continue large water user audit program.

City of Kennewick

Water Conservation Summary Report for 2009

2009 Monthly Water Pumpages by Source

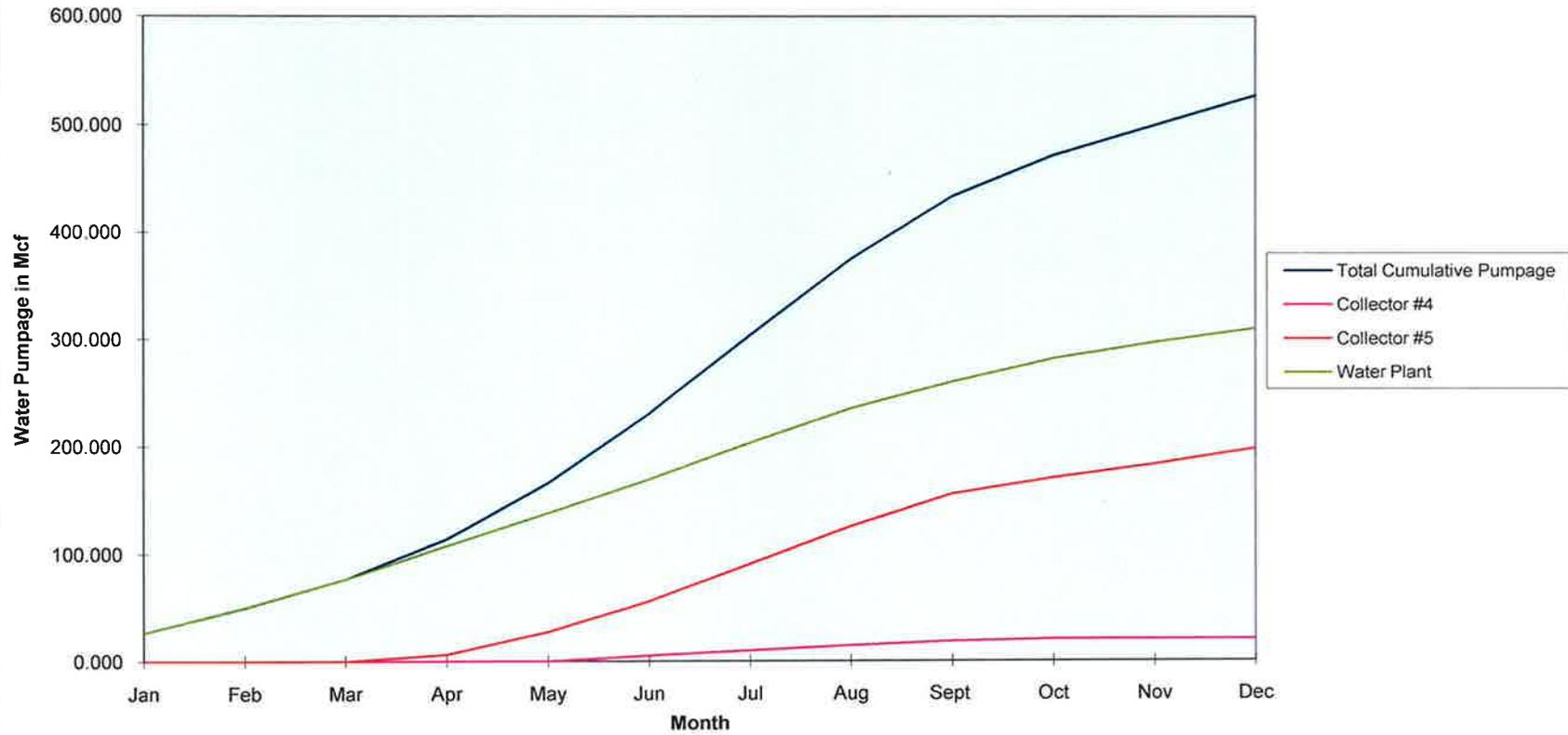


Water Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Total Monthly Pumpage	26.543	23.392	26.618	37.495	51.409	64.357	73.731	71.064	58.163	38.490	27.933	27.745
Collector #4	0.000	0.000	0.000	0.000	0.000	5.202	4.448	4.759	3.807	1.734	0.000	0.334
Collector #5	0.000	0.000	0.000	6.381	20.930	28.198	35.318	34.702	29.742	14.932	12.511	14.544
Water Plant	26.543	23.392	26.618	31.115	30.479	30.957	33.966	31.603	24.614	21.823	15.422	12.866

City of Kennewick

Water Conservation Summary Report for 2009

2009 Cumulative Water Pumpages by Source



Water Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Total Cumulative Pumpage	26.543	49.935	76.552	114.048	165.456	229.814	303.545	374.609	432.771	471.261	499.194	526.938
Collector #4	0.000	0.000	0.000	0.000	0.000	5.202	9.650	14.408	18.215	19.950	19.950	20.284
Collector #5	0.000	0.000	0.000	6.381	27.311	55.508	90.826	125.528	155.270	170.202	182.714	197.258
Water Plant	26.543	49.935	76.552	107.667	138.146	169.103	203.069	234.672	259.286	281.109	296.530	309.396

Data Interpretation and Conclusions:

The data collection elements from 2007 - 2009 show the following:

- *Unaccounted for Water or Water loss in Kennewick remained relatively constant throughout the period ranging from 5.2% to 6.1%. Weather does have an effect on all meter classes as in 2009 almost all Customer classes increased. These values still however fall within the bounds of our source metering accuracy (2%). Overall the water leak detection program is shown to be the most efficient water conservation measure. It accounts for 75% of our overall water conservation savings since the program began in 1994. Some other key points or data observations are:*
 - 1) *Estimated service population has continued to rise during the 3-Year report interval. Overall rate was 2.3% and was 1.9% in 2009 alone.*
 - 2) *Annual Pumpage has increased by 5.7% during this same period. Some of this is strongly driven by weather-related conditions as we had more pumpage in all customer classes in 2009.*
 - 3) *Annual Peak Monthly Pumpage rose during the period by 2.5%. Annual Peak Daily Pumpage rose 31%. These increases are due to an irrigation district canal break that occurred in July. Many of the irrigation district customers had substantial increases in their potable water use while irrigation service was interrupted. Both higher annual peak month and peak daily pumpages were experienced in 2009 than 2008.*

Summary:

The Water Conservation program in 1994 showed our Water Loss was about 17.3%. Some of the reasons for the ~11% overall improvement in reducing this water loss can be attributed directly to the following Water Conservation measures or programs.

Table 2.

Water Conservation Measures and Estimated Water Reduction Summary

Program Measure	2009	Cumulative Total Water Reduction Since 1994
Leak Detection program	0.0215 Mcf	38.93 Mcf
Large Meter Testing	NA	6.3 Mcf
Residential retrofit	NA	0.88 Mcf
Reservoir Leak Sealing	0.00 Mcf	5.88 Mcf

Total	0.0215 Mcf	52.0 Mcf or 1.07 MGD (~9.8% of our annual pumpage in 2009)
-------	------------	--

The Table above shows Water Conservation programs have accounted for 52.0 Mcf of saved water in Kennewick, since they began in 1994. In 2009, they saved 0.0215 Mcf. Some outside factors for improving our water loss picture since 1994 can be related to ongoing and previous residential low-flow showerhead replacement programs and initiating a reservoir leak program in 2000. Reduction in water usage can also be attributed, however, to heightened water conservation awareness through local publicity of salmon Endangered Species Act listings, the Columbia River program and related environmental news. Water Conservation awareness also has been heightened by establishing water conservation goals in a public process in 2007. Breakout in our commercial class of irrigation vs. normal usage has helped as usage for that class decreased substantially since 2008 ~10%. Also Educational outreach in our local schools and also the posting of water conservation related brochures and Consumer Confidence Reports on our City Webpage have helped.

A Regional Water Supply System is still fine tuning the municipal water rights legislation definitions. Mitigation still needs to be resolved with Ecology regarding the Quad-City Water Rights and currently new demand forecasts are being calculated. Kennewick realizes the practical importance of continuing our water conservation efforts, in light of periodic drought conditions and continued growth. Drought conditions are predicted to impact our area again in 2009. The Columbia River may not be as affected as other water sources but the City realizes the need to be proactive in the water conservation as it ties directly to the economic vitality and future of our area.

The City of Kennewick and their partners in the Quad-City Water Rights comply with and endorse Department of Health water use efficiency rules. Water Use Efficiency rules outline conservation and M&O measures utilities must undertake and set operational criteria that must be met to receive future water allocation. Part of this initiative included conducting a public Water Conservation goal setting process. This was completed in 2007 and established a daily per capita water usage goal of 170 gallons of water per day.

In 2009 there are some factors on the horizon that will affect the City's ability to supply water to our citizens and local industries. Positive issues remain, the Department of Ecology grant for a pilot Aquifer Storage and Recharge Pilot study for the Southridge area and Department of Ecology and their agreements for the Lake Roosevelt drawdown signed in 2007. These factors promise to mitigate future municipal water supply issues for our area and others on the Columbia River. As Water Right Adjudication in the Yakima Valley was completed in 2009, water resources and related municipal planning processes provided by law continue to gain clarity. In particular water mitigation processes that will allow Columbia River allocation are getting more defined on an ongoing basis. Mitigation and the timing of the drawing down of Lake Roosevelt are the critical mitigation process issues and have moved forward and should continue to resolve in 2010. On the horizon are other environmental issues that will have an effect water resources and quality. Climate Change and Greenhouse Gas Emission may have a positive effect. Resurrecting options for breaching the Snake

River dams through the NMFS Biological Opinion for Salmon would not only severely challenge the region economically but also lead to potential water quantity and quality problems during summer months when the region needs it most.

Regardless of the outcome these efforts take, the City realizes water conservation will continue to play a crucial role in the future of our area. Kennewick and the Quad-Cities region look forward to providing data and support to the Washington Departments' of Ecology and Health efforts as they continue to develop and refine water resource planning and other programs for utility water conservation programs in the future.