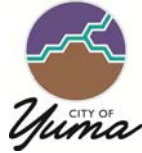


CITY OF YUMA
UTILITIES DEPARTMENT



***WATER
CONSERVATION
PLAN***



September 2015

City of Yuma

Utilities Department

Water Conservation Plan

Section 1. General

1.1 Introduction

Water supply planning is critical to Yuma if we are to produce enough water to sustain our existing community, meet growth and comply with Arizona's System Water Plan requirement. Yuma has a history of being a rapidly growing desert city, and was one of the fastest growing communities in the country. Although growth has slowed due to the nationwide economic downturn, it has not stopped, and neither does our diligence. While we wait for the numbers to increase once again to their former highs, we still recognize that with any increase in development comes an increased need for potable water. Although the City of Yuma has a sizeable allotment of water from the Colorado River, the increase in demand places a significant strain on the City's water treatment facilities and water delivery systems. As new service connections tap into existing lines and daily demand grows, the risk of system failure and facility breakdowns becomes a significant threat.

The least expensive way to provide water for growth and to assure an adequate supply for the future is by wisely managing and carefully using the water we already have. Conservation is an essential component of water planning because it provides flexibility in the development of water infrastructure and treatment projects.

Water conservation cannot be imposed; it must be voluntarily and willingly accepted, and the responsibility must be shared between the City and the citizens of Yuma. Only when our citizens embrace and practice a conservation ethic and adopt water conservation as a part of their southwest lifestyle, can the City succeed in meeting its long-term water supply goals. Our 2015 Water Conservation Plan is proposed as a long-term partnership between the citizens of Yuma and the City to pursue a sustainable water future by exercising wise stewardship over our water resource.

1.2 History

Both the City and County were named for the original inhabitants, the Yumas. The Yumas were a combination of Indian tribes of the lower Colorado Region, which consisted of the Quechans, Cocopahs, and the Mohaves. In its early years, Yuma was identified by several names. From 1854 until 1858, Yuma was known as Colorado City, and from 1858 until 1873 it was named Arizona City. Yuma received its present name from the Territorial Legislature in 1873. Yuma's history dates back to 1540 when Hernando de Alarcon, the Spanish explorer, became the first European to see the site of the present day City of Yuma. From 1540 to 1854, Yuma was under the flags of Spain and Mexico, but in 1854 became a territorial possession of the United States through the Gadsden Purchase. In the 1850's, Yuma became the major river crossing of the California gold seekers. From the 1850s to the 1870s, steamboats on the Colorado River transported passengers and goods to mines, ranches and military outposts in the area, serving the ports of Yuma, Laguna, Castle Dome, and others.

1.3 Location

Nestled in the Yuma and Gila Valleys, the City of Yuma lies in the southwest corner of the United States' Lower Sonoran Desert on the California-Mexico-Arizona border, near the convergence of the Colorado and Gila rivers.

1.4 Population

With approximately 95,717 full time residents, Yuma is the third largest metropolitan area in the State as well as Arizona's 11th largest city (2013). The Utilities Department serves approximately 110,000 full time residents who live both inside and outside the City's boundaries.

Yuma's climate blends pleasant desert sunshine with the waters of the Colorado River, making it a popular destination for approximately 90,000 winter visitors. Both the Marine Corps Air Station and the nearby U.S. Army Yuma Proving Ground provide a military presence.

1.5 Weather

Yuma's weather is characteristic of the Lower Sonoran Desert. Summer temperatures reach well above 100°F. The record daytime high temperature is 124°F. In comparison, winters are generally mild, with night time low temperatures rarely falling below 50°F. The record low temperature is 22°F. Average annual rainfall is generally less than 3 inches with July and August usually being the wettest months. Yuma is Arizona's warmest winter city. Touted as the sunniest place in the world, Yuma tops the list for the nation with an average of 90% possibility of sunshine in a year.

Table 1.5.0 Weather Averages

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. High	70°	75°	80°	87°	95°	104°	107°	106°	101°	90°	77°	69°
Avg. Low	46°	49°	53°	58°	65°	73°	81°	81°	75°	64°	52°	46°
Mean	58°	62°	67°	73°	80°	89°	94°	94°	88°	77°	65°	58°
Avg. Precip.	0.38 in	0.29 in	0.27 in	0.09 in	0.05 in	0.02 in	0.23 in	0.61 in	0.26 in	0.26 in	0.14 in	0.42 in

Section 2. Water System

2.1 General

Based on calendar year 2014, the City of Yuma currently uses approximately 8 billion gallons of water a year. This is 33% of the total annual water supply available to the City. Although enough water is available to adequately supply Yuma today, history shows demand will only increase over time.

Water system profile data is included in the following Table 2.1.0.

Table 2.1.0 Water System Profile

Service Characteristics				
Estimated Number of Customers			110,000	
Estimated Service Area			74 sq miles	
Estimated Distribution Piping			527 miles	
Total Service Connections			29,400	
Residential Service Connections			24,990	
Non-Residential Service Connections			4,410	
Water Supply Allocations				
Colorado River Water			50,000 Ac-Ft	
Converted Water (YCWUA) Estimated			25,000 Ac-Ft	
Returned Water			8,793 Ac-Ft	
Ground Water			2,788 Ac-Ft	
Water Demand				
	Main Street		Agua Viva	
2014	Volume	% Capacity	Volume	% Capacity
Annual Demand	5.3 billion gallons	34.1%	3.4 billion gallons	27.1%
Avg. Daily Demand	14 million gallons	34%	9.4 million gallons	27.1%
Peak Day Demand	18.4 million gallons	44.5%	11.2 million gallons	38%
Per Capita Demand				
2014	Gallons	Cubic Ft.	Acre-Ft.	
Annual	69,912	9,346.52	0.214548099	
Daily	192	25.6	0.000587803	

2.2 Water Supply

The City of Yuma receives its water supply from two sources: the Colorado River and groundwater. Water from these two sources supplies the City’s water system which is divided into two separate pressure zones.

Colorado River water is diverted at Imperial Dam pursuant to the City’s water rights and contracts with local water districts and the United States Bureau of Reclamation (USBR) and is delivered through the facilities of the Yuma County Water Users Association (YCWUA) and the Gila Gravity Canal System. The City’s contract with USBR specifies providing water to the City for municipal and domestic use at a base amount of 50,000 acre feet per year. In addition to the base allotment, the City has acquired delivery rights to 25,000 additional acre feet of water making a total annual water allotment of approximately 75,000 acre feet. The agreement also allows the City to convert agricultural allocations to municipal and industrial uses and to receive return flow credits.

The City of Yuma receives approximately 85% of its raw water from the Colorado River; 50% is delivered to the Main Street Water Treatment Facility by the Yuma County Water Users Association, and 35% is delivered to the Agua Viva Water Treatment Facility by the Gila Gravity Canal System operated by the Yuma Mesa Irrigation District. The remaining 15% is a

seasonal blend of groundwater from the 3 wells located at the Agua Viva Water Treatment Facility.

There are two primary water pressure zones in the City's service area. Zone 1 supplies water from the Main Street Water Treatment Facility to the general area of Yuma's north and west valley sections. Zone 2 water sources are the Agua Viva Water Treatment Facility and the 16th Street facility which includes a booster pumping station and 9 million gallons of potable water storage filled from the Main Street Water Treatment Facility. It covers the remaining east and south west portions of the city. Zone 2 supplies water to Zone 1 through the use of pressure reducing valves (PRV). During peak demand periods, the Main Street facility has the ability to supplement the water supplied to Zone 1 when demand is greater than the PRV's can provide.

2.3 Water Storage

The City's storage facilities are designed to operate at a steady rate over an extended period to accommodate fluctuating demands. The City's goal is to have reservoir storage capacity capable of meeting the following three storage requirements:

Operational Storage - Operational storage is provided to balance out the daily demand fluctuations so that extreme demand variations will not be imposed on the sources of supply. A volume of water should be stored during periods of less than average water use sufficient to allow water to be returned to the system to meet the increased demands during periods of high water use. This volume of water is also referred to as equalizing storage and allows the sizing of water production facilities to be based on the maximum day demand rather than the peak hour demand. In the water master plan for the City, a conservative value of 20 percent of maximum day demand was used.

Fire Flow Storage - Fire storage provides a readily available source of water for firefighting. Fire flow duration for determining zone storage requirements is determined by the local fire department, but generally ranges from 4 to 10 hours for multiple fire occurrences within a pressure zone. For planning purposes, population was used to calculate the required fire storage for specific pressure zones. Table 2.3.0 summarizes this data.

Table 2.3.0 Required Fire Flow and Fire Reserve Storage*

Population	Fire Flow		Duration (hr.)	Fire Reserve Storage (mg)
	Gal/min	MGD		
1,000	1,000	1.4	4	0.3
2,000	1,500	2.2	6	0.6
4,000	2,000	2.9	8	1.0
10,000	3,000	4.3	10	1.8
17,000	4,000	5.8	10	2.4
28,000	5,000	7.2	10	3.0
40,000	6,000	8.6	10	3.6
56,000	7,000	10.0	10	4.2
80,000	8,000	11.5	10	4.8
96,000	9,000	13.0	10	5.4
125,000	10,000	14.4	10	6.0

* American Insurance Association

Source: City of Yuma 2000 Water System Master Plan

Emergency Storage - Emergency storage provides a source of water to allow for a continued supply during power outages, mechanical failures, transmission line failures, and scheduled facilities maintenance. A customary rule for emergency storage is 10% of maximum day demand. The required storage for these purposes (Operations, Fire, Emergency) is determined by the Master Plan to be 12.9 million gallons for a population of 95,717. The City's existing storage capacity is 17.5 million gallons, which exceeds the required 12.9 million gallons.

Table 2.3.1 Storage Capacity

Facility	Location	Capacity (MG)
Main Street	Main Street	2
16 th Street Storage Facility	16 th Street	9
Friendship Tower	Avenue A	1.5
Agua Viva	Avenue 9E	5
TOTAL STORAGE		17.5

2.4 Pumping Facilities

The City's distribution system includes pumping facilities at the Main Street facility, the Zone 2 Booster Pumping Station, the Avenue 3E Booster Pumping Station, the 16th Street Booster Pumping Station, and the Agua Viva facility. Table 2.4.0 lists pumping capacities for each station as well as the City's total pumping capacity

Table 2.4.0 Pumping Capacity

Facility	Location	Firm Capacity (gpm)	Total Capacity (gpm)
Main Street	1 st & Main Streets	30,000	36,000
Zone 2 BPS	1 st & Main Streets	9,000	6,000
Avenue 3E BPS	32 nd Street & Avenue 3E	3,000	4,500
16 th Street BPS	16 th Street & I-8	6,500	8,500
Agua Viva	Avenue 9E	5,556	6,250
TOTAL PUMPING CAPACITY		54,056	61,250

Section 3. Water Measurement and Accounting Procedures

3.1 General

All City potable water distribution lines are metered at the point of discharge, except for fire hydrants and fire service lines for structural fire protection. Water customers are metered for water service. These meters are read and recorded monthly by City staff for billing. Most system flushing for water quality is metered and sites where it can't be metered is estimated and accounted for. Construction water taken from a City hydrant is metered through the use of roving construction meters. Construction water for flushing newly installed water mains is estimated and accounted for. The Yuma Fire Department submits a monthly report of estimated water used for firefighting and events.

Along with the water service, domestic bills include sewer and solid waste. The City's Finance Department issues all bills. A record of the water service accounts indicates that 85% of all water accounts are for residential users. In June 2014, the City transitioned from bi-monthly water billing to monthly billing and implemented a new delinquency fee February 2015.

In 2007, the City began phasing out its existing meters to move to an Automated Meter Reading (AMR) system. Large industrial users were phased in first followed by all commercial users and then residential. AMR retrofitting of the entire City system was completed January 2015.

3.2 Water Pricing and Billing

Water pricing and billing is set by Resolution No. R2015-02 effective March 1, 2015. The following Table 3.2.0 shows the City's water rate schedule. The schedule of rates is available on the City of Yuma website: www.yumaaz.gov, Utilities Department (Water/Wastewater Rates Tables/Reports/Form)

Table 3.2.0 Schedule of Water Rates

Schedule of Water Rates						
Effective date each year						
		Mar 1, 2015	Jan 1, 2016	Jan 1, 2017	Jan 1, 2018	Jan 1, 2019
		\$/mo	\$/mo	\$/mo	\$/mo	\$/mo
INSIDE THE CITY						
Base Charge	5/8" meter	\$16.15	\$16.63	\$17.13	\$17.47	\$17.82
Base Charge	3/4" meter	\$16.15	\$16.63	\$17.13	\$17.47	\$17.82
Base Charge	1" meter	\$19.54	\$20.13	\$20.73	\$21.14	\$21.56
Base Charge	1 1/2" meter	\$25.30	\$26.06	\$26.84	\$27.38	\$27.93
Base Charge	2" meter	\$31.04	\$31.97	\$32.93	\$33.59	\$34.26
Base Charge	3" meter	\$56.25	\$57.94	\$59.68	\$60.87	\$62.09
Base Charge	4" meter	\$84.91	\$87.46	\$90.08	\$91.88	\$93.72
Base Charge	6" meter	\$156.54	\$161.24	\$166.07	\$169.40	\$172.79
Base Charge	8" meter	\$228.16	\$235.00	\$242.05	\$246.89	\$251.83
OUTSIDE THE CITY						
Base Charge	5/8" meter	\$21.48	\$22.12	\$22.78	\$23.24	\$23.70
Base Charge	3/4" meter	\$21.48	\$22.12	\$22.78	\$23.24	\$23.70
Base Charge	1" meter	\$25.99	\$26.77	\$27.57	\$28.12	\$28.67
Base Charge	1 1/2" meter	\$33.65	\$34.66	\$35.70	\$36.42	\$37.15
Base Charge	2" meter	\$41.28	\$42.52	\$43.80	\$44.67	\$45.57
Base Charge	3" meter	\$74.81	\$77.06	\$79.37	\$80.96	\$82.58
Base Charge	4" meter	\$112.93	\$116.32	\$119.81	\$122.20	\$124.65
Base Charge	6" meter	\$208.20	\$214.45	\$220.89	\$225.30	\$229.81
Base Charge	8" meter	\$303.45	\$312.55	\$321.93	\$328.36	\$334.93
RESIDENTIAL INSIDE THE CITY (\$ per hundred cubic feet)						
Usage Charge	0-10 hcf	\$1.42	\$1.46	\$1.50	\$1.53	\$1.56
	11-30 hcf	\$1.65	\$1.70	\$1.75	\$1.79	\$1.83
	31 hcf and above	\$1.90	\$1.96	\$2.02	\$2.06	\$2.10
RESIDENTIAL OUTSIDE THE CITY (\$ per hundred cubic feet)						
Usage Charge	0-10 hcf	\$1.89	\$1.94	\$2.00	\$2.03	\$2.07
	11-30 hcf	\$2.19	\$2.26	\$2.33	\$2.38	\$2.43
	31 hcf and above	\$2.53	\$2.61	\$2.69	\$2.74	\$2.79
MULTI FAMILY INSIDE THE CITY (\$ per hundred cubic feet)						
Usage Charge	0-5 hcf	\$1.42	\$1.46	\$1.50	\$1.53	\$1.56
	6-13 hcf	\$1.65	\$1.70	\$1.75	\$1.79	\$1.83
	14 hcf and above	\$1.90	\$1.96	\$2.02	\$2.06	\$2.10
MULTI FAMILY OUTSIDE THE CITY (\$ per hundred cubic feet)						
Usage Charge	0-5 hcf	\$1.89	\$1.94	\$2.00	\$2.03	\$2.07
	6-13 hcf	\$2.19	\$2.26	\$2.33	\$2.38	\$2.43
	14 hcf and above	\$2.53	\$2.61	\$2.69	\$2.74	\$2.79
COMMERCIAL AND IRRIGATION INSIDE THE CITY (\$per hundred cubic feet)						
Usage Charge	hcf	\$1.59	\$1.64	\$1.69	\$1.72	\$1.75
COMMERCIAL AND IRRIGATION OUTSIDE THE CITY (\$per hundred cubic feet)						
Usage Charge	hcf	\$2.06	\$2.11	\$2.18	\$2.25	\$2.29

3.3 Water Shortage Allocation Policy

The City has a formal Drought Preparedness and Response Plan which lists steps to be taken in the event of a water shortage. It is the City's policy to ensure that water is allocated for public health and fire protection in the event of a shortage.

Section 4. Operation and Maintenance

The overall goal and priorities of the City's Operation and Maintenance Program is to provide water customers with potable water in adequate quantity and quality, as specified by the Arizona Department of Environmental Quality (ADEQ) and the United States Environmental Protection Agency (USEPA). Treatment facilities, pumping stations, storage facilities, and the distribution system have been transitioned through major upgrades, rehabilitations, and expansions to maintain compliance with current regulations. These projects are addressed in the City's Capital Improvement Program. The Capital Improvement Program has been returned to a five year format for budgeting; however, this department continues long range planning with a ten year program draft in order to better forecast and address the water needs of the community.

The City has also added personnel and equipment when possible to address operation and maintenance issues. A rigorous schedule has been established for monitoring and maintaining all facets of the City's water system.

Section 5. Inventory of Water Resources

5.1 Water Quality

The majority of the water supplied to the City of Yuma comes from the Colorado River. The alkalinity of the water from the Colorado River is greater than 120 mg/L with a total organic carbon (TOC) level ranging from 2.0 to 4.0 mg/L. Under current regulations, the City is required to remove 15 percent of the TOC. Based on extensive testing, the City successfully demonstrated the inability to reduce TOC in Colorado River water and the requirement was waived by the Arizona Department of Environmental Quality.

Additionally, the City must also comply with the Surface Water Treatment Rule (SWTR) which requires that treatment be provided to reduce turbidity, microorganisms including *Escherichia coliform*, *Giardia*, *Legionella*, *Cryptosporidium parvum*, viruses, and heterotrophic plate count bacteria (HPC).

The City regularly tests for the following:

- Temperature
- pH
- Total Coliform bacteria
- Radiochemicals
- Chlorine
- Alkalinity
- Turbidity
- *Cryptosporidium*
- Synthetic Organic Chemicals
- Volatile Organic Chemicals

- Pesticides and Herbicides
- Inorganic Chemicals
- Nitrate
- Metals
- Lead and Copper
- Disinfection By-Products
- Unregulated Contaminants (specified by USEPA and ADEQ)

The City depends on groundwater as a significant water source for municipal and industrial use in pressure zone 2. Groundwater is pumped from three wells located at the Agua Viva Water Treatment Facility on Avenue 9E. The City owns and operates the land around the wells and restricts any activities that might contaminate the groundwater. The treatment facility is located above the Basin and Range aquifers of the western United States. These aquifers cover most of Nevada, Eastern California; Southern Nevada, Western Utah, and small portions of New Mexico, Idaho and Oregon.

Table 5.1.0 on the next page includes data from the City's Annual Water Quality Report for 2014. The City conducted more than 4,000 separate analyses for 240 parameters. The Water Quality Report is available at the City's Public Works building and on the City of Yuma website: www.yumaaz.gov, Utilities Department (Water/Wastewater Rates Tables/Reports/Form)

Table 5.1.0 Water Quality Data

REGULATED SUBSTANCES									
Substances	Year Sampled	MCL	MCLG	Main Street Treatment Facility		Agua Viva Treatment Facility		Violation	
				Amount Detected	Range Low-High	Amount Detected	Range Low-High		
Alpha Emitters (pCi/L)	2011	15	0	1.3	NA	NA	NA	No	
Arsenic (ppb)	2014	10	0	2.7	NA	2.4	NA	No	
Barium (ppm)	2014	2	2	0.096	NA	0.090	NA	No	
Fluoride (ppm)	2014	4	4	0.49	NA	0.38	NA	No	
Nitrate (ppm)	2014	10	10	0.28	NA	0.25	NA	No	
Turbidity (NTU)	2014	TT	NA	0.111	0.030-0.111	0.145	0.010-0.145	No	
Uranium (ppb)	2011	30	0	2.8	NA	5.8	NA	No	
DISTRIBUTION SYSTEM									
Substances	Year Sampled	MCL [MRDL]	MCLG [MRDLG]	Amount Detected	Range Low-High	Violation			
Chlorine (ppm)	2014	[4]	[4]	1.12	0.11-1.12	No			
HAA ₅ Stage 2 (ppb)	2014	60	NA	10	5.5-16	No			
TTHMs Stage 2 (ppb)	2014	80	NA	47	28-71	No			
Total Coliform Bacteria (% positive)	2014	5% of monthly samples are positive		0	0.16	NA	No		
TAP WATER SAMPLES FROM HOMES									
Substances	Year Sampled	Action Level (AL)	MCLG	Amount Detected (90 th percentile)	Sites above AL/Total Sites	Violation			
Copper (ppm)	2012	1.3	1.3	0.068	0/100	No			
Lead (ppb)	2012	15	0	0.62	0/100	No			
UNREGULATED SUBSTANCES									
Substances	Year Sampled	Treatment Facility	Amount Detected	Treatment Facility	Amount Detected				
Sodium (ppm)	2014	Main St	120	Agua Viva	120				
Substance	Year Sampled	Main Street Treatment Facility		Agua Viva Treatment Facility		Main Street Maximum Resident Sample Site		Agua Viva Maximum Resident Sample Site	
		Amount Detected	Range Low-High	Detected	Range	Detected	Range	Detected	Range
Bromochloromethane (ppb)	2014	0.066	NA	NA	NA	NA	NA	NA	NA
Chlorate ² (ppb)	2014	82	NA	240	NA	110	NA	230	NA
Chromium [Total] ² (ppb)	2013	NA	NA	0.23	NA	NA	NA	NA	NA
Chromium-6 ² (ppb)	2013	NA	NA	0.032	NA	NA	NA	NA	NA
Molybdenum ² (ppb)	2014	5.4	NA	5	NA	5.2	NA	4.9	NA
Strontium ² (ppb)	2014	1,100	NA	1,000	NA	1,100	NA	1,000	NA
Vanadium ² (ppb)	2014	1.8	NA	1.6	NA	1.7	NA	1.6	NA
The City of Yuma participated in the 3rd stage of EPA's Unregulated Contaminant Monitoring Regulation (UCMR3) program by performing additional tests on our drinking water for 30 unregulated contaminants. UCMR3 benefits the environment and public health by providing EPA with data on the occurrence of contaminants suspected to be in drinking water, in order to determine if EPA needs to introduce new regulatory standards to improve drinking water quality. Any UCMR3 detections are shown in this data table.									

Source: Annual Water Quality Report – Water Testing Performed in 2014

5.2 Water Quantity

Surface Water - The City's main source of water supply is from the Colorado River above Imperial Dam. Water is delivered to the Main Street Water Treatment Facility via the All American and Yuma Main Canals. The City has an annual allocation of 50,000 acre-feet (16.3 billion gallons, or an average of 44.6 mgd) of water from the Colorado River. Also, the City has acquired delivery rights to 25,000 additional acre feet making a total annual water allotment of approximately 75,000 acre feet. Current surface water production for the City averages approximately 21.0 million gallons per day.

Groundwater - The City operates three high capacity wells which serve pressure zone 2. Total groundwater capacity is 9 million gallons per day. Current groundwater production averages 6.0 million gallons per day. These wells were originally intended to be used in the event of an emergency; however, the demand for water in pressure zone 2 has required the City to rely on groundwater. With the completion of the new 29 mgd (Phase 1) Agua Viva Water Treatment Facility in late 2008, these wells are used to supplement production based on demand and to control the development of disinfectant byproducts in the warm summer months. The City owns and operates the land around these wells and restricts any activities that might contaminate the groundwater.

5.3 Water Budget

The overall water budget for the City is summarized in Table 5.3.0

Table 5.3.0 Water Budget

Water Supplies (2014)	
All surface water, imported and originating within the City	24,156.73 acre-feet/year
Groundwater extracted by the City	2,788.46 acre-feet/year
Effective precipitation	0
Reclaimed water used	0
TOTAL	26,945.19 acre-feet/year

Water Demand (2014)	
Municipal and Industrial water use	26,945.19 acre-feet/year
Consumptive environmental use	656 acre-feet/year
Groundwater recharge	0
Water exchanges or transfers	0
Wastewater returned to the Colorado (Return Flow Credits)	(8,793 acre-feet/year)
TOTAL	17,496.19 acre-feet/year

Section 6.0 Water Management

6.1 Challenges

The City currently does not have significant water management issues. However, with the continued growth in population, water conservation measures should be considered to ensure adequate supply for future use.

The annual volume of water available to the City can be summarized as follows:

- Approximately 75,000 acre-feet of Colorado River water per calendar year;

- Consumptive use volume, diversions from the Colorado River less such return flow water thereto as is available for consumptive use in the United States or in the satisfaction of the Mexican Treaty Obligation;
- Converted water to lands in the Valley Division of the Yuma Project.

Assuming that one-third of Yuma’s future water demands meet return flow water criteria (same ratio of current water demands), 75,000 acre feet would be available for annual diversion. This estimate is conservative in that converted water is also available. If we assume that the annual per capita consumption of water remains constant at the current level of 0.26 acre-foot per capita, it appears that at this point in time, the City has adequate water to meet future demand.

One challenge, adverse to conservation, is that the State of California currently exceeds its Colorado River water allocation. Therefore, water conservation measures taken in Arizona and other states, with water rights to Colorado River water, directly benefit the State of California. This situation should be resolved with the measure that directs the State of California to cause Colorado River water diversions to match their allocation within the next few years.

6.2 Goals

As stated previously, at build-out capacity, the City will be close to using its total allocation of Colorado River water. By implementing water conservation measures, the City may be able to reduce the projected water demands, potentially minimizing the need to obtain additional allocation in the future.

The goals of the City’s water conservation plan should include:

- Implementation of a water rate structure that encourages water conservation especially during the summer when large water savings can occur
- Coordination of capital expenditures required for additional water production facilities, pumping stations, storage tanks, and distribution system improvements with projected demand
- Reduction of the potential need to acquire an additional allotment of Colorado River water
- Beneficial use of treated wastewater effluent
- Public awareness of opportunities to conserve water

The timeframes for the goals are as follows:

Water Rate Structure – The current tiered rate structure was implemented Mar 1st, 2015 and includes increases each January up to Jan 1, 2019. As part of the approval discussions, it was determined that the Utilities Dept will review the rates against revenue and demand in approximately two years to determine whether the rates are working as designed. If anomalies are detected, the rates will be revisited. A full comprehensive rate study will be conducted again after the Jan 2019 rates have commenced. The schedule of rates is available on the City of Yuma website: www.yumaaz.gov, Utilities Department (Water/Wastewater Rates Tables/Reports/Form)

Capital Expenditures – The City maintains a five-year Capital Improvement Program for planning and budgeting purposes. The current Program contains detailed capital expenditure projects to be budgeted for 2016 to 2020 with an abbreviated list that covers 2021 to 2025.

Various projects for the treatments facilities and distribution system are included throughout the years based on production, demand, and equipment and infrastructure life expectancy. This Program is available on the City of Yuma website: www.yumaaz.gov, Development Department (Capital Improvement Program)

Colorado River water allotment sustainment, treated wastewater effluent benefits, and public awareness opportunities - The goals to conserve and thereby sustain the City's Colorado River water allotment are ongoing through many different efforts of personal and electronic public outreach, wastewater reuse, and various aspects of running efficient and cost effective operations. The conservation goals and outreach items detailed in this Water Conservation Plan are intended to continue from 2015 to 2020 but will be adjusted as determined to maintain savings and conservation promotion at the highest levels.

Section 7.0 Existing Water Conservation Measures

7.1 General

Over the years, Yuma has participated in several water conservation efforts independently of a written Water Conservation Plan. These include:

- “Water Conservation Facts” Pamphlet - In 1999, the Water Division published the "Water Conservation Facts" pamphlet to educate customers on water conservation measures they could implement at home. Examples of these measures included information on low-flow plumbing fixtures and water-efficient landscaping. This pamphlet has been retired in favor of more recently published items that are easy to read and contain updated ideas.
- Water Conservation Outreach Material: Landscaping – Xeriscape landscaping promotes water conservation through creative landscaping. The Utilities Department continues to promote conservation with xeriscape by providing “Landscape Plants for Arizona Desert” purchased through Arizona Municipal Water Users Association (AMWUA) for our customers.

The department also has available for our customers a booklet titled “Landscape Water by the Numbers”, also *A Guide for the Arizona Desert*, and landscape watering guidelines cards and measuring guides purchased through AMWUA. They all encourage limited turf areas, efficient irrigation, soil improvements, use of mulches, use of drought resistant ground cover plants, and appropriate maintenance.

- Water Conservation Outreach Material: Leak Detection – Also purchased from AMWUA and provided to our customers is the booklet “Find & Fix Leaks That Are Draining Your Budget”, available in English and Spanish. We also provide the pamphlets “Preventing Water Waste” and “How Water Works” that are purchased from American Water Works Association and given to customers who inquire about their high usage billings or who may receive high read leak alert notices. They all provide quick and easy guidelines for leak detection and ways to improve home plumbing conservation efforts.
- Yuma Area Water Festival - The Utilities Department sponsors an annual Project WET Water Festival for 500 fourth grade students. The Festivals instill a deeper understanding of water in the earth system and Arizona's water resources through this community water

festival event, teacher professional development workshops, and extensive volunteer and community involvement.

- Inverted Block Water Rates Structure - The most effective tool in managing water consumption is water pricing. By increasing the unit cost of water, demand is reduced. A tiered block rate structure creates a volume based rate structure for those water users. With this pricing method, the unit rate for water consumption increases as the usage block increases. This has long been considered one of the most effective ways to reduce water consumption while still providing water at fair rates.
- Low-Flow Plumbing Fixtures - The City requires the use of low-flow plumbing fixtures as shown in table 7.1.0. Additionally, evaporative cooling systems and decorative fountains shall be equipped with water recycling or reuse systems.

Table 7.1.0 Water Conservation Plumbing Requirements

Maximum flow rates and consumption for Plumbing Fixtures and fixture fittings	
Fixture Fitting	Maximum Flow Rate or Quantity (b)
Lavatory, private	2.2 gpm at 60 psi
Lavatory, public (metering)	0.25 gallons per metering cycle
Lavatory, public (Other than metering)	0.5 gpm at 60 psi
Shower head (a)	2.5 gpm at 80 psi
Sink faucet	2.2 gpm at 60 psi
Urinal	1.0 gallon per flushing cycle
Water closet	1.6 gallons per flushing cycle
Other Fixtures	Not regulated to water usage

NOTES:

1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/min., 1 pound per square inch (psi) = 6.895 kPa

a. A hand-held shower spray is a shower head.

b. Consumption tolerances shall be determined from referenced standards

Source: 2006 International Plumbing Code, Table 604.4

- Operation and Maintenance Program - The City's current maintenance program includes a leak detection program along with an aggressive in-house water service line replacement program. This involves replacing polyethylene (PE) lines with PEX piping throughout entire subdivisions identified as having failing PE services. This prevents loss from slow leaks in targeted areas.
- Landscaping Regulations - The City's Landscaping Ordinance provides minimum standards for the selection, location and maintenance of plants and other landscaping materials to maximize the benefit to the community and the individual property owner and, at the same time, contribute to the conservation of the community's water resources through use of drought tolerant plants, efficient irrigation, reduced turf areas, proper maintenance, and the fundamentals of Xeriscape landscaping. The regulations contained in the ordinance also address the use of ground cover to minimize soil erosion which further enhances the water conservation efforts.

- Water Meter Replacement Program - In 1991, the Utilities Division conducted an internal audit that compared the water production records of City water treatment facilities against customer consumption billing records. During the summer months, production records reflected up to 25 percent water loss with only a fraction being accounted for.

Since the unaccounted for water loss was approximately double that of generally acceptable standards, several City departments met to discuss and resolve the issue. These departments included Fire, Customer Services and Public Works. From these discussions and field investigations, a water meter replacement program was implemented to correct the suspected cause of loss.

Initial results and testing of existing meters confirmed them to be the cause of the disparity between production and billing records. The majority of the meters tested were 15 to 20 years old, some up to 50 years old. In almost every case, the meters failed to accurately record all of the water being used. The City has continued the program, testing and replacing meters to maintain the highest amount of meter accuracy and minimal water loss.

- Automated Meter Reading (AMR) - In 2007, the City began phasing out its existing manually read meters and moving to an Automated Meter Reading (AMR) system. With AMR, custom reports are generated indicating unusually high usages and leak alerts. Currently, only unusually high usage customers receive manually delivered door hanger notices. It is the City's intention to implement an automated electronic high use/leak alert in the future so all customers who appear on these reports could be notified. The planning for this project is set to begin fiscal year 2016 with funds budgeted for software programming. Response to the alerts in the form of leak repairs or conservation is voluntary and at the customers' expense. In the event of drought conditions however, this alert notification process can be used to identify accounts with chronic leaks to issue warnings and eventual forced repairs or shut offs to prevent unnecessary waste of the precious commodity.
- Water Conservation Grant Opportunities - The City has partnered with the United States Bureau of Reclamation twice in the 2013 and 2014 Water Conservation Field Services – Yuma Area Office grant programs. The grant funds were used to accelerate AMR retrofitting to bring completion of the project sooner, so the City can eventually move to an automated electronic high use/leak alert system sooner. The account customers retrofitted with AMR from the grant funds received manually delivered door hanger leak alerts notices along with preventing wasted water and leak detection pamphlets. The results from the grant projects are used to gauge the response to alert notifications and estimate the degree of water conserved or saved by the alert notification process.
- Monthly Billing - The City has billed utilities on a bi-monthly basis ever since obtaining the water company from a private entity. In April 2014, the City transitioned to monthly billing, offering customers an easier monthly bill amount to pay. This has the added benefit of customers being made aware of an unusually high bill within a month versus two months, thereby having the ability to take action sooner to make repairs or conserve, reduce their bill amount, and prevent water waste. A new delinquency fee was implemented February 2015 to promote timely payments while also assisting those customers with the inability to pay in full on an initial due date by providing an extended due date.

Results of Previously Implemented Water Conservation Measures - In general

The general success of the City's water conservation measures is seen in the minimal increase in per capita water use. Given Yuma's history of rapid growth rate, an increase in the per capita use of only 0.01 acre-feet over the past eight years is excellent.

Continually providing updated and relevant conservation and leak control materials to the public helps customers identify improvements which they can implement voluntarily. The outreach through the City's public areas, website, media outlets and school programs has grown significantly as more methods to reach out are made available through advanced technology and partnerships.

The impact of the meter change-out program has been significant. Currently unmetered water loss is approximately eight percent, a major reduction from the 25 percent previously noted. The City has continued this program to ensure a continued accurate accounting of water use through the meters. The AMR profile has been a significant tool for customers to receive their usage in an hourly format and see the over excess in usage, leaks, and sprinkler timers.

Section 8.0 The Water Conservation Plan

8.1 General

There are many ways the City can encourage conservation with little cost. Some aspects in the conservation process are already in place. With continued use of these measures, revamping others, and initiating new programs, the City of Yuma will be well on its way to implementing a very successful water conservation program.

The City's water conservation measures are divided into two groups: Fundamental and Additional water conservation measures. In general, fundamental measures include those practices identified by the U.S. Bureau of Reclamation as critical and essential to a successful water conservation plan. Additional measures are those activities which the USBR guidelines list for the City's review.

8.2 Fundamental Water Conservation Measures

In its guidelines, the United States Bureau of Reclamation lists four critical water conservation measures that are essential to a successful water conservation plan.

- Water Measurement and Accounting System - As previously noted, all City potable water distribution lines are metered at the point of discharge, except for fire hydrants and fire service lines for building fire protection. In addition, the City regularly changes out water meters so that the service life for a water meter is optimized, to ensure a continued accurate accounting of water use.
- Water Pricing Structure - The most effective tool in managing water consumption is water pricing. By increasing the unit cost of water, demand is reduced.

Yuma follows the national pattern in reducing water use in response to real increases in the price of water; i.e. increases above inflation:

- a. For indoor use, a ten percent increase in price will bring about a one percent drop in use.

- b. Outdoor use is more responsive to pricing pressure, with demand dropping an average three to five percent as a result of a price increase of ten percent.

The City has a three tiered inverted block rate structure for all residential and multi-family water customers, which acts as an incentive for water conservation. Previously, a comprehensive water rate study was conducted by an outside consultant who reviewed the City's existing water rate schedule and proposed a new rate schedule. Yuma's City Council adopted the proposed schedule in late November 2006. That rate structure maintained the tiered block rate structure but simplified customer categories and included annual rate charges through 2011.

In February 2014, the City contracted for a new comprehensive utility rates study. A rates schedule was selected and passed by City of Yuma Council action, becoming effective March 2015. The tiered inverted block rate structure remains with the second and third tiers adjusted to a higher rate and the first tier receiving less of an increase. This was implemented in response to concerns for low income customers who generally use the minimal amount of water and cannot lower their domestic consumption. It remains effective as a voluntary conservation tool on the second and third higher cost tiers for those customers who may be able to conserve and thereby lower their monthly bills at their choosing.

- Information and Education Programs - Public education is a very important part of any water conservation plan. Although public education itself may not decrease water usage, when combined with other conservation measures, public education can have a significant impact on water use.

The Utilities Department offers several education pamphlets to our customers to learn about water conservation and leak detection. They are free and available at the Public Works building lobby and the Customer Service Utility Bill Payment Counter at City Hall. Additionally, the leak detection pamphlets are given to customers by Meter Readers and Field Representatives who meet with customers to discuss their high bills:

“Landscape Plants for the Arizona Desert”

“Landscape Water by the Numbers” *A Guide for the Arizona Desert*

Landscape watering guidelines cards and measuring guides

“Find & Fix Leaks That Are Draining Your Budget”, a booklet in English and Spanish.

“Preventing Water Waste”

“How Water Works”

A conservation message and some brochures, along with the Water Conservation Plan are also available electronically on the City of Yuma website: www.yumaaz.gov, Utilities Department (Water Conservation section)

A valuable opportunity to reach out to the public is the annual Drinking Water Week campaign. During this time, the City offers treatment plant tours, radio and news interviews, demonstration props, water conservation pamphlets, drawing contests for school children, and other methods to educate consumers on water as a real commodity and a valued resource. The Utilities Department also sponsors an annual Project WET Water Festival for 500 fourth grade students. The Festivals instill a deeper understanding of water in the earth system an

Arizona's water resources through a community water festival event, teacher professional development workshops, and extensive volunteer and community involvement.

As of January 2015, every customer now has AMR technology on their water meter. With AMR, hourly water usage is recorded and stored in the transmitter for several months. Upon receipt of a high bill, the stored data can be downloaded in a graph and hour-by-hour usage profile and given to a customer upon request. With this profile, the customer can visualize how much water is lost per hour by over irrigating and see the date and hour when a leak started, along with its progression. The customer is taught how to read their meter and watch the leak indicator to monitor for leaks and prevent another high bill. Educational materials on identifying leaks are made available to them. The AMR profile is a direct informational document that personalizes water usage for the customer.

A new tri-partnership dual-purpose program is coming in the fall of 2015. The Utilities Department is teaming with AmeriCorps by sponsoring an individual to be hired specifically to develop a Low Income Water and Housing Assistance Program. This program will include the Department's new Low Income Utility Assistance Payment Program funded by the City and administered by Western Area Council of Governments (WACOG). It is scheduled to be launched late 2015. The Water and Housing Assistance Program will offer education to recipients of the payment assistance in the form of water conservation guidelines and an AMR profile with discussion, along with methods for budgeting and obtaining other energy savings, all with the intent to assist low income and crisis mode customers with managing their utility services to prevent disconnection due to non-payment.

- Water Conservation Coordinator - The Treatment Division's Water Quality Assurance Supervisor has been performing the duties of the Water Conservation Coordinator. These duties include:
 - a. Coordinate water conservation measure activities of the City.
 - b. Monitor effectiveness of implemented measures.
 - c. Develop informational literature to promote water conservation programs.
 - d. Coordinate internal and external program activities (Project WET and the Annual Children's Water Festival)

8.3 Additional Water Conservation Methods

In its guidelines for a Water Conservation Program, USBR lists additional water conservation measures that should be reviewed by the City.

- ***Municipal and Industrial Water Conservation***
 - a. Additional incentive pricing - The City of Yuma currently has a three-tiered volume rate structure for all residential and multi-family users. Effectively, the second and third tiers act as "penalty blocks" to control the excessive use of water. This rate structure should be very effective, especially during the summer, when there is greatest opportunity for savings because of excessive irrigation.
 - b. Residential and governmental audit and incentive programs - The City currently does not have an audit and incentive program in place. The City is researching a program to provide interior and exterior water audits for single-family residential, multi-family residential, and governmental/institutional customers. Included in the evaluation is the

possibility of providing information regarding plumbing retrofits or fixtures, such as low-flow showerheads or replacing existing toilets with ultra-low flush (ULF) toilets.

The audits will allow the City to evaluate potential interior and exterior water savings by each participating customer and the potential cost savings to the customers. It is also important that the City evaluate internal costs of implementing such programs before putting them into action. Similar programs have been implemented in the cities throughout Arizona, including Phoenix, Glendale and Mesa. These cities provide water saving tips on their websites and offer landscape workshops and rebate programs to their residents.

All conservation programs require some level of customer contact. A variety of contact methods exist and all differ in terms of cost and the potential rate of success in reaching the target population. The method selected will depend on the desired goals of the program participation and the type of conservation program. Program costs must be thoroughly investigated before such an activity could be undertaken by the City.

Meanwhile, AMR provides a broad method to audit customer usages on an individual basis and in arranged groups such as routes. The technology is continually evolving and the possibilities of data mining over an entire customer base, searching for increases or decreases in specified areas, and targeting patterned anomalies are anticipated in the future. This information will be useful when classifying accounts for auditing and incentive programs.

- c. Commercial and industrial audit and incentive program - Commercial conservation depends on participation and implementation of programs by the individual establishments for its success because the water use habits of the individual establishments differ significantly. Commercial and Industrial water use is typically many times greater than the amount of water used by single-family residential customers. For this reason, commercial and industrial audits can have a large impact on conservation.

One way to encourage conservation is through the participation of commercial and industrial users in an audit program similar to that for residential and governmental users. Because of the diversity of commercial and industrial establishments present in the City's service area, the City may want to retain the services of an independent entity (university, consultant or non-profit agency) to conduct the audits. Program cost must be thoroughly investigated before such an activity could be undertaken by the City.

- d. Landscape programs - The City's Landscaping Regulations include provisions that promote water efficient landscaping through the use of drought tolerant plants, efficient irrigation reduced turf areas, proper maintenance, and the fundamentals of xeriscape. Promotional materials listing drought tolerant plants are made available to the public in hard copy and electronically.

Incentives such as landscape rebate programs for customers who install low-water-use xeriscape landscape do exist in some areas, however the program cost must be thoroughly investigated before such an activity could be undertaken here.

The City does not have xeriscape incentives in the form of rebates or per-unit cost reductions in its current rate structure. With the past years of economic downturn and slow recovery, the 2014 rate study found that the per unit water cost charges could not support an incentive program that would pass the cost onto other consumers and still remain affordable. Commercial customers do have the option to install an irrigation-only water meter. The benefits achieved are that there are no sewer fees on that water used. The usage on the meters is separated on the billing so the customer can clearly see and track domestic as well as irrigation usage. An AMR profile can be obtained on the separately identified irrigation meter to indicate if leakage or overwatering is suspected.

- e. Distribution System Audit Program - As previously discussed, the City conducted an internal audit of its distribution system and found that up to 25 percent of the treated water was unaccounted for in the consumption records. The resulting meter replacement program reduced the unaccounted for volume to approximately eight percent. Accordingly, the City has adopted a regular program of changing out water meters so that the service life for a water meter is optimized to ensure a continued accurate accounting of water use.

Beginning in 2007, the City began phasing out its existing meters and moving to an Automated Meter Reading (AMR) system. AMR is the wave of the future and is a significant conservation asset. Leak detection, water meter consumption reports, leak alert reports, and data acquisition are some of the main benefits. Large industrial users were phased in first followed then by commercial and residential customers. Bi-monthly water billing has transitioned to monthly billing. Monthly AMR reports identify issues and prompt quicker action.

Future consideration for AMR customers is an automatic electronic high use/leak alert notification program. The City anticipates the development of this program to begin in fiscal year 2016 with funding identified for the software programming. The customer can choose to make voluntary changes to conserve water consumption or repair leaks and prevent another high use bill. More technology in the works is an on-line option and smartphone applications. This future technology will enable customers to know how much they are consuming in between billings, view consumption graphs, set up alert procedures, and gain control of their water usage activity better than ever before.

Auditing areas of concern due to high numbers of service leaks prompted the department's in-house PE to PEX water service line replacement program. This program encompasses whole subdivisions as failing service lines are replaced before they develop into high potential leaks.

- f. Drought/Water Shortage Contingency Plan - As previously discussed, the City has a written formal policy and procedures regarding water shortage allocation. The City's plan is consistent with the requirements of the Arizona Department of Water Resources and includes the four stages identified in the DWR guidance as well as consumption reduction goals, actions required, and user restrictions.

It is important for the City to provide for equal sharing of the water supply during a shortage. If the proportion of rationing is not equal, an explanation of the reasons must be

clearly communicated to the public. During a water shortage, it is also important for the City to discontinue all hydrant flushing and to intensify the distribution system leak detection and repair program.

During an extreme shortage, voluntary rationing may not be enough and mandatory conservation may be required. AMR High Use and Leak Alert reports will assist to identify accounts with chronic leaks for necessary action steps. Special ordinances may be used to enforce the mandatory conservation measures.

To plan for the potential of a raw water supply shortage to Zone 2 due to canal outages, the City is in design phase for a raw water storage impoundment, expected to hold up to a two week water supply for the Agua Viva Water Treatment Facility. This impoundment will be created as a lake benefitting the environment and aesthetically pleasing while functioning as an emergency water storage basin.

Wastewater Reclamation and Recycling Programs - The City currently does not have a formal wastewater reclamation and recycling program. Reclaiming wastewater effluent for reuse in the Yuma area is difficult at best and would have a less than beneficial impact on the credits the City receives for water returned to the Colorado. The possibility of discharging treated wastewater to wetlands adjacent to the Colorado River though presents several opportunities the City may wish to consider in the future. The City recognizes that reclamation and reuse of wastewater effluent can have a direct impact on the demand for potable water so reuse and reclamation are implemented in other ways.

An example of reclamation and reuse is the flow augmentation in Yuma's East Wetlands. In concert with the Arizona Department of Environmental Quality, the City will discharge approximately 1.5 acre-feet of spent filter backwash water to the East Wetlands project to augment flow from the Colorado into the wetlands. This wetlands is an excellent example of habitat restoration and currently supports a number of endangered and threatened bird species which have returned to the area. Flow augmentation with the City spent filter backwash water is critical to the survival of this wetlands and its wildlife.

Discharge to wetlands in general provides:

- Support for conservation of Arizona's native wildlife
- Educational opportunities for Arizonans who visit these wetlands; a living laboratory to learn about water, the environment, and the interaction of flora and fauna
- Enhances the aesthetic beauty of the Colorado River
- Involves the public as a partner in the multi-agency conservation effort
- Allows the City to receive return flow credit for water returned to the Colorado

Another example of reuse is the water quality flushing program, whereby flushed water is diverted to the City's wastewater collection system wherever possible to prevent the loss of water to areas where seepage to ground water is not available. This diverted water ultimately returns to the river for users downstream and the City receives the return flow credit.

- g. Plumbing Regulations and Fixture Replacement Programs - As previously discussed, the City's plumbing regulations require all plumbing fixtures in new construction to comply with the Arizona Revised Statutes. A further step might include actively promoting the

retrofitting of old buildings with water saving fixtures and educating residents on the benefits of fixture replacement.

One of the goals of the City/AmeriCorps Low Income Water and Housing Assistance Program under development is to identify grants that would assist residential customers with replacing their home's older high flow and leaking fixtures with low flow alternatives. The proposed incentive to receive these items and no or low cost can potentially reduce water consumption to make their bills more affordable while reducing leaks and preventing water waste.

- ***Agricultural Water Conservation Measures***

At this time, the City has no major agricultural water users in its system. Therefore no agricultural water conservation measures are needed.

Section 9.0 Implementation, Monitoring and Measurements

9.1 Implementation

Implementing any conservation plan can be relatively simple. Motivating consumers to observe the plan, however, can be a daunting task. A good portion of the public may not understand there is a limited supply of water. Many people believe if they pay their monthly bill, they are entitled to use as much water as they want, for whatever reason. Only when water emergency situations arise, do many customers face the reality that the well can "dry up."

A successful conservation campaign needs to motivate consumers to use less water by easing them into being smarter water consumers. The campaign must demonstrate ways to conserve, rather than preach the need to conserve. Above all, any plan needs to be convenient enough to motivate consumers to conserve and implement repairs when needed. Implementation would focus on two aspects: economic benefits and consumer participation. Emphasizing financial benefits would be used as a means for motivating consumers to begin conserving. This would include emphasizing conservation as a method to decrease water bills. Building on the consumer participation through easily obtained information and guidelines, reaching out through public participation activities, and providing relevant information particular to their specific usage patterns makes conservation seem not so daunting, and in fact, empowers them to conserve.

Amid the push for conservation, there will be those who will look toward the City of Yuma government to take the lead in conservation efforts. The City must examine its own internal practices, adjust behaviors, and promote conservation by every means available.

Fundamental measures - The City has implemented all four of the fundamental water conservation measures listed in Section 8. The City continues to pursue ways to improve its fundamental water conservation measures. The measures currently in effect are:

- All City municipal and industrial water distribution lines are metered at the point of discharge.
- The City's existing three-tiered rate structure is fair and equitable among residential and multi-family customers and promotes water conservation. That rate structure is reviewed and updated through comprehensive rate studies with rate structures adopted by City Council.
- The public education and awareness program is expanding through new material to help homeowners landscape with water efficient foliage and find and fix leaks in their homes.

The City’s newly formatted website which launched September 2015 includes multiple ways to obtain educational materials, along with access to City documents and relevant reports.

- The Water Quality Assurance Supervisor has been designated as the water conservation program coordinator.

Additional measures - Of the additional water conservation measures outlined in Section 8, the recommended actions are:

- Regular review of the City’s water rate schedule to ensure that it remains fair and equitable for all customers and continues to promote water conservation
- Implementation of a system to inform residential and commercial customers of actual water usage
- Review and update of the Drought Preparedness Plan as needed
- Review of opportunities to reclaim and reuse wastewater effluent
- Continuation of water distribution system leak repairs, meter replacement, AMR meter setting, and the PEX waterline replacements
- Begin development of an automatic/electronic high use and leak alert notification program
- Research options for a complete distribution system audit program

Table 9.1.0 Implementation Schedule

Description	Schedule
Increased Public Education Programs	Ongoing
Distribution System Leak Detection Program	Ongoing
Meter Replacement Program	Ongoing
Drought Preparedness and Response Plan Update	Completed July 2014
AMR Transition	Completed January 2015
Existing Water Rates	Implemented March 1, 2015
Comprehensive Utility Rates Study	Completed - New rates effective 03/01/15
Water Conservation Plan Update	Revised Sept 2015 - Adopted Jan 2016
Automated Leak Alert Notification Program	Development to begin FY 2016

9.2 Monitoring and Measurement

As new water conservation measures are implemented, it is important for planning purposes to monitor the impacts of these programs. By determining which measures are the most successful, the City can create the most complete and beneficial program.

9.3 Economic feasibility

The City must be able to determine the economic feasibility of each measure before implementation. A measure may sound good but may not be cost-effective for the City and its customers.

9.4 Public Involvement

It is important for the City to get public involvement in and support for an effective water conservation plan. The City of Yuma Water and Sewer Commission is a governing board

consisting of members from the public who are concerned for the community's water needs now and in future as well as proper wastewater disposal methods and environmental sustainment. They offer to volunteer and are approved to serve by the Yuma City Council. The previous Water Conservation Plan (2006) was presented to the Commission as part of its implementation process at that time. The Utilities Department completed a Water Conservation Plan update in July 2014 and revised the plan again (September 2015) to include a newly implemented water 2015 rates schedule and other pertinent information. The revised 2015 Water Conservation Plan was presented to the City of Yuma Water and Sewer Commission at the January 4th, 2016 meeting where it was adopted and approved that same date. It is available to the public on the City's website, replacing the previous version. The plan is located at: www.yumaaz.gov, Utilities Department; Water Conservation; City of Yuma Water Conservation Plan.

The recommended actions are:

- Continue providing educational pamphlets that provide guidance for finding and fixing water leaks
- Continue providing promotional information regarding drought tolerant plants
- Continue to support Project WET workshops and the Water Festival
- Continue participation and community education efforts through the annual Drinking Water Week
- Continue providing AMR usage profiles when requested
- Continue development of a utilities payment assistance program with a related educational component for low income customers to manage their utilities usages and budgets
- Continue providing the Water Conservation Plan on the website for availability to all

Section 10 Environmental Review

One of the City's mission, vision and core values is to protect the environment and long term community interests at all times. The City recognizes that today's public policy decisions will determine tomorrow's community. Accordingly, the water conservation planning process needs to identify and evaluate the potential for environmental effects, both positive and negative, of implementing the plan. Before implementing any new conservation measures or expanding existing ones, the City should consider assessing any environmental impacts that might result. A formal environmental impact study might be advisable if the new or expanded measure is expected to have widespread impacts.