

Draft for Public Review

City of La Junta

Water Conservation Plan Update

June 2015



Prepared by Sustainable Practices

Funded by a generous grant from the Colorado Water Conservation Board



Table of Contents

Organizational Background	1
Purpose and Framework of the Plan.....	3
Water Supply Characteristics.....	4
Customer Water Use Characteristics	9
Forecast Demands	12
Ongoing Water Conservation	14
Capital Budgeting and Operating Expenses.....	15
Water Conservation Goals	16
Identification and Evaluation of Water Conservation and Efficiency Measures and Programs	
Identification	18
Evaluation	26
Implementation	30

Appendices

Appendix A – Current Water Rates

Appendix B – CRS 37-60-126

Appendix C – Relevant City Water Ordinances

Appendix D – AWWA M-36 Methodology

Appendix E – Public Review Notice and Comments

Cover photo courtesy of La Junta Economic Development. Photo by Lex Nichols.

Organizational Background

The City of La Junta is a legally and regularly created, established, organized and existing home rule city, municipal corporation and political subdivision under the provisions of Article 20 Section 6 of the Constitution of the State of Colorado and the Home Rule Charter of the City. La Junta was incorporated in April 1881.

La Junta is located in southeastern Colorado, about 60 miles east of Pueblo. La Junta, which is the most populous City in Otero County, serves as the county seat. La Junta has for more than a hundred years formed a junction for commercial, agricultural, and ranching ventures at this location on the south bank of the Arkansas River in what is primarily short grass prairie country (see Figure 1). The mountains can be seen to the west, but this is rolling prairie land. Farming dominates the landscape in a narrow corridor along the river, while a short excursion north or south of US Highway 50 brings travelers to miles upon miles of grasslands. The City hosts a number of light industries and an airport in an industrial park north of town, a rail yard, and a downtown business district typical of small western towns that serve as county seats.

At the end of 2014, the City's water utility served a full-time population of about 7,850 (including some customers outside of the City Limits) and the City boundaries encompassed about 2.9 square miles.

Figure 1 – Map of the City of La Junta



Purpose and Framework of the Plan

The water conservation plan will be prepared using the State's Water Efficiency Plan Guidance Document and the related Water Conservation Plan Template, to the extent that these references are relevant to the City given its size, nature of its service population (i.e., economic status of the City's service area), and geography (i.e., low in the watershed). The Plan will also utilize the Southeastern Colorado Water Conservancy District's water conservation best management practices (BMP) tool box to help develop an appropriate framework within which water conservation measures and programs can be assessed and considered. Finally, the updated water conservation plan is anticipated to be a living document that is used to guide and direct the real time allocation of resources related to the improvements of local water use efficiency for the management of City infrastructure and customer demands.

The specific components of the updated water conservation plan will include the following:

- Updating the profile of the existing water supply system
- Updating the characterization of current and future water demands including the characterization of non-revenue water and real water loss
- Developing water conservation goals that are consistent with the needs of the City and the available resources
- Integrating updated planning and water efficiency benefits and goals with future water supply needs
- Identifying, evaluating and selecting new and/or continued water conservation programs – for both local and regional implementation
- Developing the implementation and monitoring plan needed to track costs and benefits of implemented water conservation and water efficiency programs

Water Supply Characteristics

The City of La Junta’s potable water supply source includes fourteen groundwater supply wells¹ located in three separate well fields, with a single main supply transmission line to the City’s water treatment plant (see Table 1). The City’s groundwater production wells are located in three well fields – the North well field, the South well field and the West Well Field. All three well fields are located north of the City between the Arkansas River and the Fort Lyon Irrigation Canal. The wells are 36 to 43 feet deep and are permitted to pump a cumulative 16 million gallons per day (MGD), as summarized in Table 2.

The groundwater is treated for potable use using reverse osmosis (RO) and green sand pressure filters for dissolved solids reduction. The treatment method employs two distinct processes, one for the RO unit and one for the filter unit. The two process streams create treated water that is blended in a 0.4 million gallon clear well, chlorinated, and adjusted for pH prior to pumping to

Table 1 Summary of La Junta’s Water Supply		
Water Sources	14 groundwater production wells	Blended from RO and Green Sand Filters, Chlorinated and pH Adjusted
Master Meter	14 master meters at all wells; 1 master meter prior to treatment; meter on brine and backwash flows	Well master meters tested every 3 years for accuracy
Meter Readings	Monthly (~1 st of the month)	Manual meter reading
Billings	Monthly (10 th and 20 th of the month)	Hardcopy data provided to billing department to support bill preparation

Table 2 Summary of Groundwater Production Wells					
Well Number	SEO Well Permit Number	Date of Appropriation	Designated Use	Decreed Flow	Well Depth
1	14385	Sept, 19, 1892	Municipal	1.5 cfs	40.5’
2	14386	Dec 31, 1902	Municipal	1.5 cfs	40.5’
3	14387	Dec 31, 1902	Municipal	1.55 cfs	40’
4	14388	Dec 31, 1902	Municipal	1.55 cfs	40’
5	RF-302	Dec 31, 1902	Municipal	1.55 c5fs	40’
6	14390	Dec 31, 1902	Municipal	1.11 cfs	36’
7	14391	Dec 31, 1902	Municipal	1.24 cfs	38’
8	RF-301	Dec 31, 1902	Municipal	1.34 cfs	36’
9	RF-13	Dec 31, 1902	Municipal	2.67 cfs	39’
10	RF-14	Dec 31, 1902	Municipal	2.5 cfs	40’
11	881-F	Dec 31, 1902	Municipal	2.07 cfs	39’
12	2516-F	June 14, 1960	Municipal	2.05 cfs	43’
13	RF-12	Dec 31, 1925	Municipal	2.23 cfs	39’
14	14381	Aug 31, 1947	Industrial	0.047 cfs	601’
15	6891	May 31, 1954	Municipal	640 AF	42’

¹ The City has one deep well which is permitted for industrial use in addition to the fourteen wells permitted for municipal use.

distribution.

The City maintains five pressure zones served by five booster pump stations. Once the potable water is treated, blended and disinfected, it is stored in six different storage tanks placed strategically throughout the five pressure zones. These tanks have a combined capacity of 4.9 million gallons and provide reserve for peak demands and fire flows.

It is important to note that the City's well permits, presented in Table 2, require augmentation to offset depletions to senior water rights holders since the 1996 Arkansas Basin Well Pumping Rules were enacted. The augmentation water is provided through a combination of the following:

- Fryingpan-Arkansas Project Water releases from Pueblo Reservoir
- Lawn watering return flows
- Wastewater return flows
- Returned RO brine
- Available leased water

In recent years, the City has purchased 888 shares from the Holbrook Canal Company for future augmentation use. La Junta is also a project participant in the Arkansas Valley Conduit (AVC) with the Southeastern Colorado Water Conservancy District (hereafter "the District") and the Master Contract for use of Pueblo Reservoir to store non-project water (to be administered by the District). Given that the City has adequate groundwater rights, and the population in the City has been steady over the past 10 years, the City does not have concerns regarding water supply availability. However, the City does have reasons to improve water use efficiency and better manage system wide water loss as energy costs continue to increase, as does the cost of providing water. In addition, the City desires to improve the overall management of its water resources portfolio to improve water availability in the region (e.g., through reducing transit losses and inefficiencies) and control detrimental impacts related to source water quality (which effect water use efficiency and overall water supply needs).

Noteworthy is that the City's water treatment facility has been sized to meet the peak daily demand created as a result of seasonal water use – specifically peak days in July and August. Reductions in peak daily demand, which is tied to weather conditions more so than population change, is likely to be a driver for future City water conservation efforts. The WTP peak daily capacity is 6.6 million gallons per day (mgd), whereas, past peak daily demand has reached 4.68 mgd in July 2012, which is about 70% of capacity. Therefore, it is in the interest of the City to control customer water use demand to best leverage the existing capacity of the City's WTP and maintain a safe gap between treatment plant capacity and peak daily demand.

A summary of the water production from the groundwater production wells and the water that is placed into distribution after treatment is presented in Table 3. As indicated from these data, the treatment system reject and related brine waste is on average about 1/3 of the water that is produced for treatment. The brine waste is returned to the river, for return flow credits, via the wastewater treatment plant. This treatment system has been in place since 2004.

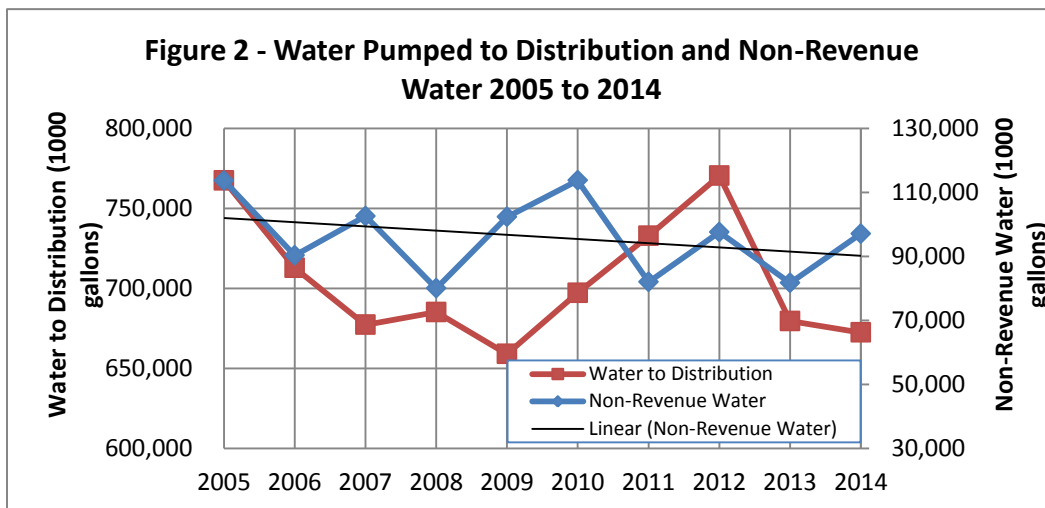
Table 3
Summary of Produced and Sold Water 2005-2014 (in thousands of gallons)

Year	Water Produced	Brine Waste	% Brine	Water to Distribution	Water Sold	% Difference ¹	Population ²
2005	1,145,589	378,106	33.0%	767,483	653,799	14.8%	7,146
2006	1,019,633	306,810	30.1%	712,823	622,507	12.7%	7,064
2007	970,346	293,076	30.2%	677,270	574,695	15.1%	6,980
2008	1,034,002	348,876	33.7%	685,126	605,093	11.7%	6,989
2009	976,444	317,444	32.5%	659,000	556,641	15.5%	7,000
2010	1,027,889	330,730	32.2%	697,159	583,379	16.3%	7,122
2011	1,098,955	366,091	33.3%	732,864	650,851	11.2%	7,154
2012	1,162,086	391,588	33.7%	770,498	672,916	12.7%	7,114
2013	1,099,052	419,546	38.2%	679,506	597,779	12.0%	7,079
2014	1,032,605	360,152	34.9%	672,453	575,377	14.4%	7,100
		Average	33.2%			13.6%	

¹ this represents the percentage of water to distribution that is considered non-revenue water² (water to distribution less water sold divided by water to distribution) except 2014 which was estimated based on an expected growth of 0.3%.

² From US Census Bureau, reported for July of each year (https://www.google.com/?gws_rd=ssl#q=la+junta+colorado+population). Also note that the City serves additional persons through system interconnects with other local water utilities and companies (see footnote 6); however these demands are not included in the population served.

Water sales from 2005 through 2014 are presented in Table 3, as is the percent of water pumped to distribution that is non-revenue generating. Figure 2 presents a graphic representation of water pumped to distribution and percentage of non-revenue water for the period from 2005 to 2013.



² According to the American Water Works Association (AWWA), non-revenue water consists of a combination of authorized unbilled water use (e.g., water used for flushing hydrants, street cleaning, fire fighting, etc.) and real and apparent water losses. Real losses are those losses of water that occur as a result of leaks. Apparent losses are losses that occur as a result of theft, inaccurate meter readings, and/or other systematic data handling issues.

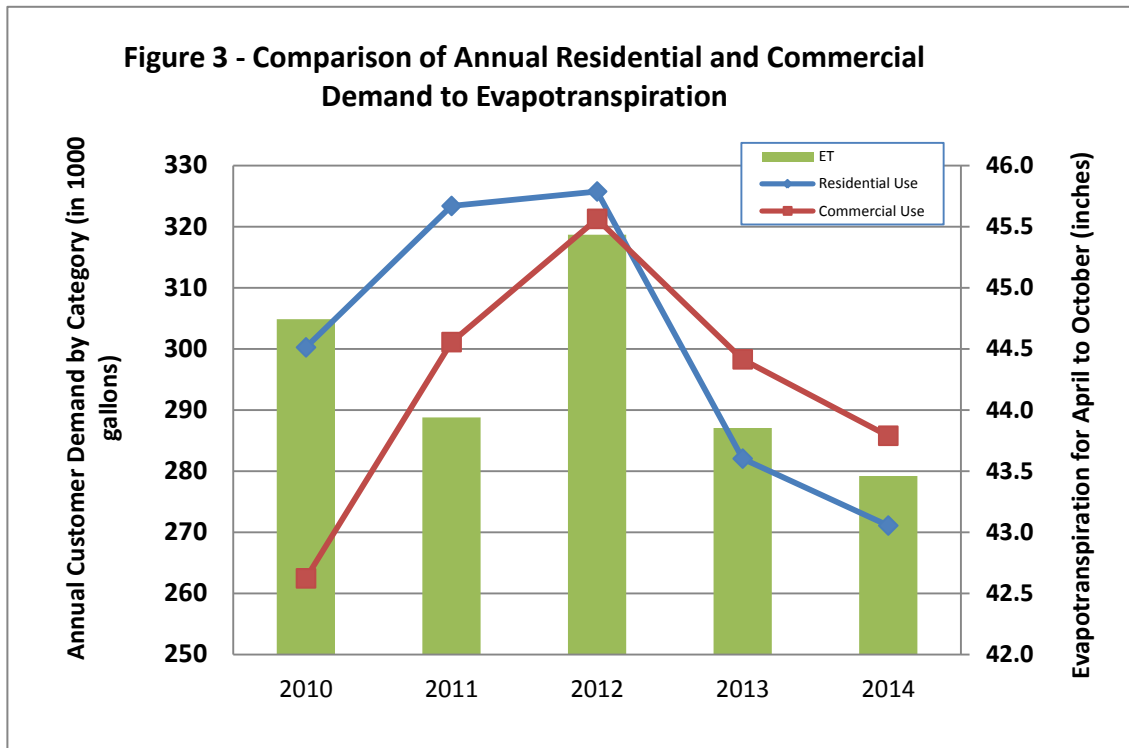
From Table 3 and Figure 2, a number of observations are noteworthy, relevant to the patterns of water use that may influence future City decisions regarding water conservation and water use efficiency. These observations are as follows:

- Population served has not fluctuated more than a few percent over the period of record (dating back to 2005), whereas water produced, water pumped to distribution and water sold have all varied substantially³.
- Water production, water pumped to distribution and water sold all varying in proportion to one another, in part due to the consistency in the dynamics that influence each, meaning that whatever influences water production also influences water pumped to distribution and water sold. For this reason, it appears that customer demand (as indicated by water sold) drives water production and water pumped to distribution.
- Non-revenue water, as indicated in Figure 2, which is in the range of 13-14% of water placed into distribution, has been trending downward over the past 10 years, decreasing by about 10% when comparing the average non-revenue water from 2005 through 2007 to the average of the last three years. This decrease appears to relate to improved water loss tracking, leak detection and repair, and focused capital projects that have replaced poorly performing water lines. Current non-revenue water is in the range of 280 AF per year, which has a cost of about \$250,000 per year in lost revenue to the City (see Appendix B for the City’s water rates).
- Fluctuations in water sold appear to be related more closely to changes in weather than to changes in population. Evapotranspiration (ET), based on the Blaney-Criddle method, changed in a pattern more consistent with demand variations observed from 2009 to 2014 (see Table 4). This is presented graphically in Figure 3, which presents water demand for the two chief customer types in La Junta (i.e., residential and commercial which combine to constitute more than 95% of the City’s total annual water demand) versus ET. Note that ET in 2011 was less than for either 2010 or 2012; however mean average temperature in July and August of 2011 was the second warmest during this period of time (i.e., 2009 through 2014). Customer water use therefore appears to be significantly influenced by summertime temperatures in July and August, as well as overall seasonal ET.

Year	Estimated ET ¹ (inches)	Per Capita Water Use ² (gpcd)
2005		123
2006		118
2007		111
2008		116
2009	41.90	107
2010	44.74	110
2011	43.94	122
2012	45.43	124
2013	43.85	111
2014	43.47	104

¹based on estimates of ET for the months April through October of each year using the Blaney-Criddle method devised by the State Climatologists Office
²calculated as estimated residential water use divided by population served (see Table 3) with residential water use being approximately 48% of total water sold.

³ The coefficient of variation (i.e., the ratio of standard deviation to mean) for annual population from 2005 to 2014 is about 1%, whereas the coefficient of variation was 5 to 6 times greater for water production, water pumped to distribution and water sold.



Customer Water Use Characteristics

The City tracks water sold based on the following customer categories – residential, commercial/municipal and industrial⁴. The amount of water sold within each of these customer categories along with the number of active meters for each category are presented in Table 5. Based on water sold from 2010-2014, residential sales constituted about 49% of water demand, with commercial/municipal making up about 48%. Noteworthy is that commercial use, as a percentage of total water demand has been increasing in recent years, whereas the percentages of industrial and residential water use have dropped.

	Customer Water Demand (1000 gallons)			Number of Customer Connections ⁵		
	Residential	Commercial	Industrial	Residential	Commercial	Industrial
2010	300,237	262,441	22,313	2408	772	26
2011	323,374	301,095	25,464	2471	781	24
2012	325,745	321,258	25,913	2470	819	24
2013	282,034	298,282	17,640	2451	853	27
2014	271,081	285,771	18,525	2447	866	29

Another aspect of customer water demand worth characterizing is the average monthly use per connection for each customer category, as presented in Table 6. This table illustrates what is of course expected, that per connection water use peaks in July and August, when temperatures are at their peak. What is also important is that the size of the variation (as represented by standard deviation) in water use also peaks in July, indicative of the variability of water demand imposed by changing weather conditions. Although, residential water use is most variable in the transition months of March and October, when irrigation may or may not occur dependent on weather, the sheer magnitude of water demand variations are largest in the heat of the summer.

Interestingly, industrial water use per connection demonstrates the greatest variability of the three customer categories, with summertime standard deviations of nearly 70 million gallons per month per connection. Residential per connection water use increases by a factor of about 3.5 from January to July, whereas industrial use per connection increases by a factor of over 5. In that only 29 industrial customers are connected to the City’s distribution system, it may be valuable for the City to more thoroughly characterize water use by these customers and evaluate methods to partner, if water use reductions can be identified.

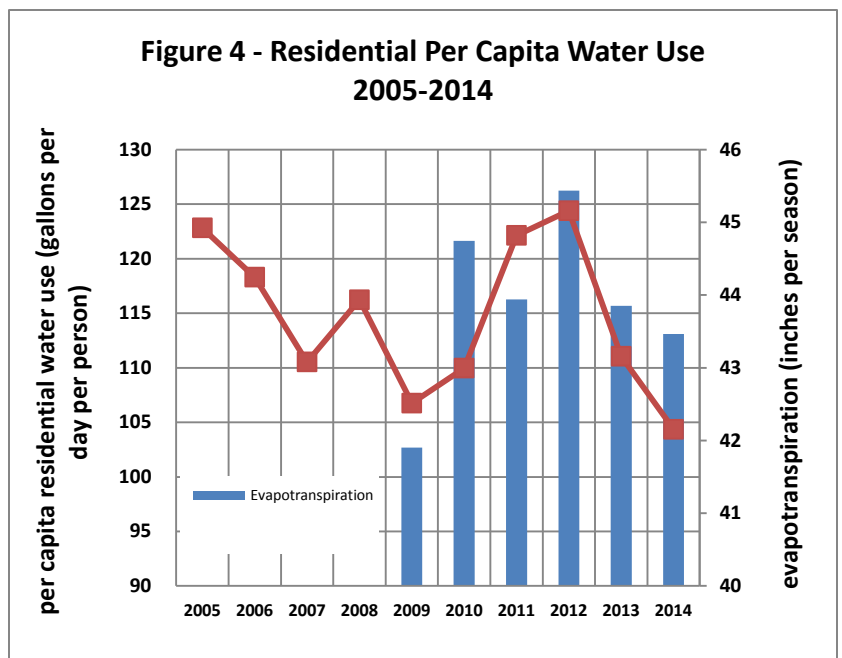
⁴ The City billing department differentiates commercial from industrial customers based on electrical load.

⁵ As determined in December of each year.

Table 6 Summary of Monthly Customer Water Use 2010-2014												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average 2010-2014 (1000 gallons)												
Residential	4,711	4,224	6,447	9,271	13,968	16,957	16,999	18,150	12,884	8,535	5,002	4,841
Commercial	12,182	10,911	17,261	26,051	40,928	49,542	49,976	54,350	38,206	31,092	15,172	11,855
Industrial	28,976	32,686	38,241	69,917	92,855	104,283	150,919	122,110	92,359	57,241	35,194	33,808
Standard Deviation 2010-2014 (1000 gallons)												
Residential	411	244	1,468	1,306	1,726	1,416	2,765	3,271	2,081	1,695	572	453
Commercial	2,647	1,067	3,343	5,586	4,651	2,764	11,264	10,030	3,637	3,431	2,983	751
Industrial	5,346	8,943	7,543	32,437	28,904	42,714	69,097	47,772	28,338	9,292	7,550	11,645
Coefficient of Variation (standard deviation/average)												
Residential	0.09	0.06	0.23	0.14	0.12	0.08	0.16	0.18	0.16	0.20	0.11	0.09
Commercial	0.22	0.10	0.19	0.21	0.11	0.06	0.23	0.18	0.10	0.11	0.20	0.06
Industrial	0.18	0.27	0.20	0.46	0.31	0.41	0.46	0.39	0.31	0.16	0.21	0.34

Another important characteristic of residential per connection water use is the change in wintertime use, which relates to passive water conservation⁶. In La Junta, wintertime residential water use has decreased from 2010 to 2014 from about 4,450 gallons per month per connection to about 4,280, which represents a reduction of about 4%. This amount of passive savings is in line with the range of 300 to 600 thousand gallons of monthly wintertime demand reduction (or about 120 to 240 gallons per connection per month) estimated based on the SWSI Conservation Levels study conducted by the CWCB (2010). Future passive water savings should be expected through 2050 totaling in the range of 10 to 12 gallons per person per day (or about 30 million gallons of demand per year at the current population); however the vast majority of these demand reductions should occur in the La Junta service area by 2025.

Finally, it is valuable to review per capita water use in La Junta over the past 10



⁶ Passive water conservation, as defined by the State of Colorado, is that customer demand reduction that occurs naturally (or passively) as water using fixtures and appliances are replaced with more efficient fixtures and appliance, especially as it relates to toilets, faucet aerators, showerheads, clothes washing machines and dish washing machines.

years. As shown in Figure 4, residential per capita water use tracks with changes to ET in a manner similar to total residential demand as shown in Figure 3. Per capita residential water use may become a valuable parameter to track the effectiveness of future water conservation programs that the City selects to implement if those programs address outdoor watering habits of residential customers. If other water conservation and water use efficiency programs are selected for implementation, then per capita water use will be less valuable as a characteristic parameter tracking water use behaviors; although it will always be one that the City measures and uses for comparative assessment over time.

Forecast Demand

Total water use demand for La Junta within the planning period of seven (7) years has been developed estimating a population growth of 0.22% per year from 2015 to 2020, which is a fraction of the growth predicted in SWSI (CWCB, 2010) but may closer align with recent trends in population change⁷. Additionally, La Junta may choose to increase the size of its service area as it provides reliable potable water to small local water companies and municipalities in the future⁸. To this end, La Junta may grow by perhaps 125 persons plus another 1,200 or so for the wholesale connections. However, the future demand estimate for the City has been developed only for the retail water use customers not including these wholesale customers.

Also it is important to note that the numbers of industrial and commercial customers have been increasing in recent year, even though water use per connection for each of these customer types has been fluctuating based on weather impacts. For this reason, the estimated future water demand for La Junta has been based chiefly on expected changes in the number of customer connections assuming that future water use behaviors of the City’s customers will not change substantially between 2015 and 2022.

Table 7 Average Number of Customer Connections per Year⁹			
	Residential ¹⁰	Commercial ¹¹	Industrial
2014	2,454	863	27
2015	2,472	860	27
2020	2,499	890	29
2022	2,510	899	30

Predicted number of customers per category is provided in Table 7. Based on these numbers of connections and the average monthly water use per connection presented in Table 6, annual water

Table 8 Estimated Future Water Demands for La Junta (in millions of gallons per year)						
	Water Production		Water to Distribution		Customer Water Demand	
	Average Conditions	Dry Conditions	Average Conditions	Dry Conditions	Average Conditions	Dry Conditions
2015	1,089	1,302	728	870	628	751
2020	1,094	1,312	731	877	631	757
2022	1,098	1,318	733	881	633	760

⁷ From 2008 to 2014, population grew from 6,989 to 7,100 or by about 0.022% per year.

⁸ La Junta currently provides wholesale water via connections to Homestead (62 persons), Bent’s Fort (900), Hillside Water Company (90) and the Town of Swink (665). Note that the Town of Swink connection is for approximately 25% of their demands.

⁹ Do not use these values to estimate future taps; only to estimate potential future demands.

¹⁰ Residential customer connections were increased based on the expected increase in population and the average number of persons per connection from 2010 through 2014.

¹¹ Commercial connections were increased based on a best fit natural logarithm to the number of connections from 2010 to 2014.

demands were estimated for average conditions and for dry year conditions¹². Additionally, water placed into distribution was estimated based on the average non-revenue water of 13.6% (see Table 3) and water production was estimated based on the average amount of RO reject as 33.2% (see Table 3). Table 8 presents the results of these calculations.

Note that peak daily demand will be higher during future dry years assuming that watering restrictions are not developed and implemented. Historic data indicates that peak daily demand was highest in 2012 when overall customer demand peaked at 672 million gallons. Projected 2022 dry year demand may be in the range of 760 million gallons, or 13 percent greater than 2012 demands. Peak daily demand would also be expected to increase by a similar range above that which occurred in July 2012. To this point, peak daily demand may range to within 15% of current water treatment plant daily capacity within the planning horizon if seasonal outdoor watering restrictions are not established and enforced.

Note that future demands were reduced to account for estimated passive conservation savings expected to occur as a result of new, more efficient fixtures and appliances being installed by the City of La Junta customer base over the coming years. Passive savings were assumed to be 1.5, 6.5 and 7.5 gallons per person per day for 2015, 2020 and 2022, respectively. Both the calculated average and dry year demands based on the per connection data were adjusted in Table 7 to account for passive savings that may occur within the planning period.

¹² Dry year conditions are defined as those conditions that may exist 1.28 standard deviations above the mean, which is equivalent to the driest 1 year out of 10, or 10 years out of 100, assuming no watering restrictions are put into place.

Ongoing Water Conservation

The City of La Junta does not currently have any formal water conservation programs in place. That is not to say that the City does not currently practice principles consistent with water conservation. The City's citizens, for example, have a per capita water use that tends toward the low end of the range for Colorado municipalities. In addition, the City has long supported water education for its citizens funding school programs and water forums that engage and enlighten area citizens regarding local and regional water issues. The City has also been an active participant in the State water planning activities related to the Interbasin compact commission (IBCC) and the Arkansas Basin Roundtable.

Another important component of the City's past and ongoing water conservation efforts relates to the ongoing investments that it makes into its water infrastructure. The City spends approximately \$70,000 per year maintaining its meters and water mains, including outside services, materials, and equipment. In addition, the City has made an investment of about \$64,000 in 2014 to install AMR technology converting about 10% of the City's customer meters to radio read technology. This conversion, which will continue in future years, will help to decrease the cost of meter reading and improve the accuracy of the data collection effort.

La Junta does not currently monitor and verify the value and impact of its water conservation programs on customer water use behaviors or overall water demand, per se, although it does track water production, water placed into distribution, water sold and non-revenue water. In addition, La Junta has conducted a formal system-wide water audit through the regional program established and conducted by the Southeastern District. The City has improved its water loss tracking efforts as a result of the initial audit, and has continued to enhance its use of technology to improve meter reading and data handling efforts.

There may be other best management practices related to water production and treatment, water distribution, customer water delivery, customer water use and overall water system management that could provide cost effective and support meaningful water conservation from the City's perspective. For this reason, La Junta will embrace formal water conservation planning with an eye toward improving local water use efficiency and reducing non-revenue water. The City will also consider supporting and/or initiating regional efforts that would address improved source water quality.

Capital Budget and Operating Expenses

The City incurs costs for electricity and chemicals to operate the water treatment facility and deliver water to its customers. These expenses total about \$500,000 per year, on average. Costs associated with upkeep and maintenance of the water system are budgeted to be about \$90,000 per year. This includes meter repair and replacement, leak repair, and other expenses not including staff time. No substantial capital improvement projects are budgeted for 2014 or 2015 beyond those costs related to the continued installation of AMR transponders on existing customer meters.

Water Conservation Goals

Updating the City's water conservation plan will hinge on continued improvements to its data collection and organization efforts, improvements to its water loss control and leak mitigation programs, and its management of water resources within the constraints and practicalities of the lower Arkansas River Basin. As with other local water conservation planning efforts being conducted in the lower basin area, one important component of updating the water conservation plan for the City will be to integrate regional water resources programs into the City's water use efficiency efforts. For example, the new Master Contract with the District will allow the storage of the City's non-project water in Pueblo Reservoir. This new option to create and maintain carryover storage changes some of the opportunities and benefits of local water conservation within the City's service area, including creating options for the City to lease and exchange water. Given that the City must manage transit losses in deliveries of water down the Arkansas River from the Pueblo Reservoir, regional water exchanges facilitated by the District or some of its partners (e.g., Lower Arkansas Valley Water Conservancy District) may be an important outcome of improvements in water use efficiency that the City evaluates within the process of updating its water conservation plan.

Another important component of the City's water conservation efforts will involve the manner in which its source water is managed and treated, in light of changing water quality regulations, since there is the potential for some of the City's return flows related to its treatment processes to be eliminated, which in turn may require the City to find and/or use other sources for augmentation. Therefore, management of source waters may be evaluated as an improvement to local water use efficiency by the City.

Finally, the City is interested in managing summertime peak daily water use. As previously discussed, summertime water use is linked directly to temperatures in July and August, when evapotranspiration is at its peak. The City is therefore interested in improving the efficiency of outdoor irrigation practices – especially for its largest commercial and industrial customers that have sizable irrigation practices.

All of these potential water conservation programs may have cost implications for the City. The potential that drought may impact water sales revenue also exists. Therefore, the City will look to conduct a water rate study in the near-term to address the development of more rigorous water rate structure that allows for drought pricing, as well as pricing for the various customer types that the City supports.

Specific water conservation goals, developed to adhere to the requirements of the State are as follows:

- Reduce non-revenue water by approximately 10% by 2022, which would create a reduction in water pumped to distribution of about 40 AF.

- Reduce summer time peak daily demand by about 10% by 2022, which would create a reduction in customer water demand by about 14 million gallons per season, or about 45 AF. This translates into a reduction of water pumped to distribution of about 50 AF (accounting for the impact of non-revenue water).

If both of these goals are achieved, that would have the effect of reducing groundwater production by about 120 AF accounting for brine water related losses. Revenue impacts of these reductions would be on the order of \$33,000 in lost water sales revenues per year. Operating costs would be reduced on the order of \$40,000 per year if programs were implemented to achieve the stated goals.

Source water protection needs to be mentioned as a goal of the City, although projects and programs associated with improvements to the City's source water quality are beyond to direct control of the City. For example, the City will be one of the recipients of Fry-Ark project water associated with the proposed construction of the Arkansas Valley Conduit (AVC). The quality of the water to be delivered by the AVC is of such quality that it will significantly reduce the brine water production by the City's RO plant, measured as a percentage of the water production. For this reason, the AVC is a project that improves local water use efficiency. Reduced RO treatment also has the regional benefit of reducing power consumption by the City, which in turn reduces coal power plant water consumption.

However, in periods of drought or reduced Fry-Ark Project water deliveries, the City will be dependent on its alluvial wells, and the surface water supplies that feed those wells. It is the quality of the surface water that infiltrates to the City's alluvial wells that brings about the need for RO. Improvements to watershed wide water quality through large scale watershed management programs could potentially reduce the need for RO and improve treatment efficiencies for the City (as well as other cities that utilize shallow alluvial wells in the Lower Arkansas River valley).

The commitment of City resources to source water protection programs may be considered to be premature, given the limited jurisdiction of the City to assessment and implement watershed scale management programs. Nonetheless, the City will maintain its usual commitment to collaborative projects in the region that would provide benefits to the City and the larger geography as a whole with an eye toward future programming that may help to improve source water quality for the City and its regional municipal water providing partners.

Identification and Evaluation of Water Conservation and Efficiency Measures and Programs

Identification

Identifying candidate water conservation and efficiency measures and programs has its roots in two key resource areas. First is the State of Colorado Revised Statute 37-60-126 (4)(a) which addresses water conservation planning for municipal water providers (see Appendix B). This statute is directly applicable to the City¹³ and as such it requires that “at a minimum, [the planning entities should] consider” a list of water-saving measures and program types that may be used by a water provider for water conservation and improved water use efficiency. The second is the Southeastern Colorado Water Conservancy District’s (Southeastern’s) Best Management Practices (BMP) Tool Box, which is a web-based water conservation planning tool that contains a wide variety of relevant information regarding BMPs that water utilities can use to improve water use efficiency and support smart water use. The Tool Box contains categories of measures and programs that address the five different operational areas that all water utilities conduct - system wide management, water production and treatment, water distribution, delivery of water to customers and customer demand management.

Table 9 presents a discussion of how each of the State’s “to be considered” water conservation measures and programs were considered and incorporated into the City’s evaluation of candidate water conservation and water use efficiency programs. In general, La Junta has determined that customer demand management techniques may provide some benefit in terms of outdoor water use; otherwise the City is looking to improve its overall water management programs that will improve its ability to track use, maintain appropriate levels of water sales revenue, and reduce water loss.

For these reasons, La Junta will choose to focus its resources on maintaining and upgrading the water system infrastructure – managing data collection, water loss, and revenue generation – over providing incentives and financial support for customer demand management. The City will also evaluate those programs that will address seasonal water use by the City itself (e.g., in parks and on the golf course) and by its customers (e.g., residential, commercial, etc.). The City will also look to strengthen its customer education and engagement programs recognizing the importance of reaching and engaging the City’s residential and commercial customers and improving their understanding of water supply, wise water use, and the cost of providing reliable, potable water.

Note that a broader range of customer demand management programs such as those listed by the State for consideration under CRS 37-60-126 (4)(a) may become more applicable to the needs of the City and its customer base in the future. However, for the current planning period, there is limited utility of some of those measures and programs contained in Table 9, as noted.

¹³ The City of La Junta is a covered entity under the definition provided by statute (see Appendix A), for the City has once since 2005 exceeded 2,000 acre-feet of water for municipal and industrial uses (2012). As a covered entity, the City is required to create and maintain an approved water conservation on file with the CWCB.

Table 9 Review of State Required Measures and Programs for Consideration Under CRS 30-67-126 (4)(a)			
Measure or Program	Relevance to La Junta	Applicability	Status for Further Evaluation
Water-efficient fixtures and appliances, including toilets, urinals, clothes washers, showerheads, and faucet aerators	Customer Indoor Water Use (chiefly residential, but can be for some commercial (e.g., hotels and bars) and industrial customers)	Customer efforts to replace aging water using fixtures and appliances will create water demand reductions over the planning period. The District could benefit from expanding its Rules and Regulations to address new construction indoor plumbing fixtures (including retrofits) however the State is currently moving forward with this effort. More customer education related to indoor water efficiency will be considered (see below).	No further evaluation necessary
Low water use landscapes, drought-resistant vegetation, removal of phreatophytes, and efficient irrigation	Customer Outdoor Water Use	The City will consider efforts to improve the planting of low water use landscapes in its parks, golf course and open spaces, and will promote Xeriscape and native plant materials with its educational programs/materials	Include for further evaluation
Water-efficient industrial and commercial water-using processes	Customer Commercial and Industrial Process Water Use (including laundries, cooling systems, etc.)	The City has commercial customers which are chiefly bars and restaurants, but includes some industry and commercial laundries. These facilities may benefit from improved water use efficiency; however the cost for new commercial equipment is beyond the scope of this planning effort at this time.	No further evaluation necessary
Water reuse systems	Potential Reuse of Return Flows	The City does not have any reusable water supplies in its portfolio. The City will however, look into storage of unused non-project water supplies in Pueblo Reservoir through the Master Services Contract with SECWCD as a means to expand its augmentation water portfolio.	No further evaluation necessary
Distribution system leak identification and repair	Distribution System Water Loss Management (and System Wide BMPs to collect and manage data to support decision-making)	The City has a number of opportunities to improve the accuracy of its measurements and allow for more focused future programs. Potential areas of improvement include: <ul style="list-style-type: none"> • Metering • Customer Water Use Tracking • System Wide Water Audits 	Include for further evaluation
Dissemination of information regarding water use efficiency measures, including by public education, customer water use audits, and water-saving demonstrations	Customer and Elected Official Education	The City will continue its efforts to educate and to disseminate water education information through local and regional programs, through means such as: <ul style="list-style-type: none"> • Customer Water Audits • Educational Forums and Workshops • Participation in Regional Collaborations 	Include for further evaluation
Water rate structures and billing systems designed to encourage water use efficiency in a fiscally responsible manner	Customer Billing and Utility Finances	The City has tiered water rates associated with excessive water use. New water rates may be needed to keep up with increased cost of energy, chemicals and system maintenance requirements, and to allow for appropriate price in the case of drought or future watering restrictions.	Include for further evaluation
Regulatory measures designed to encourage water conservation	City Ordinances to Improve Customer Water Use Efficiency	The City will consider a water waste ordinance.	Include for further evaluation

Table 9 (continued)			
Review of State Required Measures and Programs for Consideration Under CRS 30-67-126 (4)(a)			
Measure or Program	Relevance to La Junta	Applicability	Status for Further Evaluation
Incentives to implement water conservation techniques, including rebates to customers to encourage the installation of water conservation measures	Customer Indoor and Outdoor Water Use	The City's customer base is currently replacing older fixtures and appliances as retrofits occur and aging fixtures and appliances are replaced. Incentives are not considered to be as high a priority as water loss management and improved data collection at this time.	No further evaluation necessary

Water conservation and/or efficiency measures and programs that the City may choose to implement have been identified using the template presented in Southeastern’s BMP Tool Box discussed above. The results are listed in Table 10. To this point, Table 10 is organized by each of the five areas that define water utilities operations and the time frame during which implementation of the candidate measures and programs may occur. The table has been segregated into the three key time periods as follows:

- Short-term (1 to 2 years)
- Mid-term (2 to 3 years)
- Long-term (3 to 5 years)

Table 10 Summary of Water Conservation and Efficiency Measures and Programs Under Consideration				
System Wide Management	Process and Treatment	Distribution System	Customer Water Delivery	Customer Demand Management
Short-Term (1-2 years)				
Continue data management for water loss assessment, water utility management, and SECWCD and CWCB Reporting	Join Lower Ark Working Group dealing with radionuclides and other water quality issues	Continue water line repair and replacement, as needed	Continue meter repair and replacement, as needed, including AMR installations	Continue current customer education supporting local and regional programs
Initiate annual system-wide water audits (based on AWWA M-36 methodology)		Evaluate District Metered Areas (DMAs)	Continue service line repair and replacement, as needed (on Utility side of connection)	
Update and improve water waste controls for customers and drought response planning		Initiate improved water loss control program including improved data tracking and assessment	Improve/revise current “red-flag” monitoring of billing data to help identify customer-side leaks and abnormal water use conditions	
			Develop improved customer water use tracking esp. for wholesale water sales ¹⁴ and to differentiate commercial from industrial uses.	
Mid-Term (3 – 5 years)				
Same as above	Same as above	Same as above	Same as above	Same as above
Evaluate changes to water rates and customer billing structure to include more rigorous conservation pricing and to prepare for drought-related pricing when needed			Develop customer meter testing and/or replacement program including prioritized replacement of older and larger meters (as AMR meter program is completed)	Evaluate water use training and/or audit program for selected customers (e.g., large irrigators)
Long-Term (>5 years)				
Same as above	Same as above	Same as above	Same as above	Same as above
Evaluate changes/updates to water waste ordinance/drought response			Initiate planning for AMR device upgrades/battery replacement program	

¹⁴ Includes treated water sales to those entities that maintain separate customer billing – e.g., Bents Fort, Hillside Water, Homestead, and Town of Swink (see footnote 7).

These time frames have been developed to differentiate those activities that the utility will initiate shortly after plan acceptance and approval from those activities that will occur in future years, still within the 7-year planning horizon, depending on:

- The results of the short-term implementation activities;
- The applicability and relevance of the mid-term and long-term measures and programs; and
- The changing needs of the City and its customers.

Overall, the City will look to select programs that will do the following throughout the planning horizon:

- Improve overall water loss management;
- Reduce seasonal customer demands; and
- Support improved educational and outreach programs

Components of each of these programmatic areas that the City will consider for implementation are described in more detail below.

Improved Overall Water Loss Management

Although the City has a good track record regarding tracking and managing system wide water loss, there are some improvements that can be made that will help the City better characterize non-revenue water and real and apparent losses, which in turn support more rigorous economic assessments of future capital expenditures and operating expenses. The improvements, which consist of various BMPs, will also help to support more accurate tracking of customer water use behaviors, which in turn may support decisions regarding customer demand management program investments in the future.

The BMPs related to improved overall water loss management include those that:

- Improve customer water use data collection;
- Improve data use and management; and
- Continue real loss management.

Improved Customer Water Use Data

The City may consider developing financial tools that will support more accurate differentiation of commercial and industrial customers. This is an important component of tracking customer water use behavior since commercial and industrial customers are some of the City's largest water user, and current methods related to customer classification does not consistently differentiate institutional uses such as schools from commercial uses. In addition, industrial users are identified based on electrical demand, instead of facility use. Improvements in customer categorization will help the City to better understand customer water use patterns. In addition, the City will benefit from reviewing commercial, industrial and institutional accounts as a means to identify authorized, unbilled water uses that may help to better characterize apparent and real water loss. Recharacterization of

customer categorization may also support future water rate studies – including setting tap fees and customer use rates.

The City may also consider creating wholesale water customer categories to track deliveries to those entities with separate retail billing systems such as the Town of Swink, Homestead, etc. Placing these organizations into a separate customer category will help to better characterize these types of deliveries and may help to support future program developments and assessments. For example, water loss related to wholesale deliveries tends to be less than retail customers since real losses associated with service connections are limited. Understanding wholesale deliveries more explicitly will also help to assess meter replacement programs for these customers, since large meters tend to require replacement more often than small meters. More accurate meters helps to reduce non-revenue water by reducing apparent water losses.

Finally, the City should consider continuing its meter replacement and upgrade program, which includes installing AMR transmitters on all customer meters enabling radio-read based data collection. More accurate customer meters will help to reduce apparent water losses, and use of AMR radio-read based data collection can help to reduce systematic data handling errors, as well as free up staff time to allow for more distribution system preventive maintenance programs (e.g., valve exercising, hydrant flushing, leak detection). Increased preventive maintenance has been shown to reduce real losses and improve the quality of water deliveries.

Improved Data Management and Assessment

The City should consider implementing annual system wide water audits, continuing to perform audits in a manner consistent with the audit performed for the City by the Southeastern Colorado Water Conservancy District in 2013. The water audit is based on the American Water Works Association (AWWA) M-36 Manual on Water Loss Control and Management. Conducting the water audit using this methodology will help to maintain a consistency in data collection and use, and will support benchmarking and comparative analyses with other similar utilities that the City may wish to perform in the future. Given that the M-36 methodology is focused on supporting economic decision-making by utilities related to water loss management, it fits nicely with the current and expected future needs of the City.

As part of implementing annual water audits, the City may wish to consider creating district metered areas (DMAs) within the City's distribution system. DMAs are created by placing meters at selected locations on the main trunk line of the City's distribution system in such a way that a specific section of the City's distribution system can be monitored for water loss by applying the M-36 methodology on the isolation segment – linking water placed into the DMAs distribution with water sales to customers within that DMA. DMAs can be created to isolate older sections of infrastructure, areas of varying high and low pressure, and/or any area of specific interest. Based on the configuration of the City's distribution system, perhaps 5 or 6 DMAs would make sense to better characterize water loss and non-revenue water.

Continued Real Loss Management

The City has various programs that address real water loss including leak identification and repair, replacement of aging water lines and service lines, and various preventive maintenance routines. The City should continue these programs and look for ways to enhance those preventive maintenance programs that improve distribution system water quality and reduce water loss.

Reduce Seasonal Demands

Although the City has always had more than adequate water treatment capacity to deliver potable water during peak summertime demands, current and future peak summertime demand nonetheless taxes the water system, as flows are high and operating water pressure fluctuates. In addition, future increases in peak summertime water demand could approach current treatment capacity, with the potential to require treatment plant capacity upgrades which would be costly. Therefore, the City will consider implementing water conservation programs that will reduce summertime peak demand, since water conservation programs related to this kind of effort are typically far less costly than treatment plant expansions or upgrades.

To address the improved management of seasonal demands, the City may consider a number of programs that will work to reduce customer demands, which may occur continuously and/or just during peak demand periods¹⁵. The list which that City may consider includes:

- Improving the development and use of “red-flags” that utilize the City’s customer water use data collected using the new AMR system to identify unusually high customer water use.
- Developing more prescriptive and in some cases (e.g., during drought) restrictive water waste ordinances that allow for time of day and day of the week watering restrictions; overspray restrictions; and water waste enforcement.
- Establishing more pronounced drought triggers and drought response programs for control of seasonal water use in times of water shortage.
- Continuing and enhancing customer water education programs to create more awareness and engagement as it relates to seasonal water use and water waste.

Note that customer education can include customer water audits that allows for data sharing and technology transfer to occur between the utility and its customers.

Other Educational and Engagement Programs

The City has long invested in student education programs supporting water fairs and providing classroom content. The City also is active in educational programs that relate to its position and standing in the local and regional water community. By keeping involved with regional and state wide water programs and initiatives, the City can be prepared for and understand new and upcoming

¹⁵ Note that improvements in system wide water loss management will also work to reduce seasonal peak water demand; however these programs are discussed elsewhere in this Plan.

changes in water availability, regulations and funding programs. The City can also influence processes that run counter to the City's interests.

The City will continue its efforts in this area, adding one new program initiative to its list of key programs to track and support – the Lower Arkansas Valley Water Quality Working Group. This group has been established as a result of unmet compliance orders from the State Health Department to local private water companies that operate in close proximity to the City. The Working Group's objectives include identifying and developing solutions to allow local private water companies to come into compliance with state and federal regulations, in collaboration with local and regional water utilities and water providers, as well as county, state and federal governmental entities. The City has a clear role in monitoring these proceeding and potentially lending support in those areas that coincide with City interests and benefits.

As indicated in Table 10, the various components of future water conservation measures and programs that the City will consider for implementation have different time frames within which each are considered to be appropriate. For example, most improvements to data collection and management are considered important and appropriate in the short-term (1-2 years). This is due to the fact that improved data collection and management BMPS are the basis for future program selection and development. In the mid-term (i.e., the next 2 to 5 years), the City will continue to implement BMPs that enhance its current water conservation and efficiency programs leveraging better and more accurate data collection, improved data assessment and evaluation programs. In addition, the City is proposing to consider conducting a water rate study based, in part, on the improved customer data collection efforts conducted in the years prior.

In particular, the City should evaluate the need for conducting a water rates study to support changes to rates in response to increasing chemical and energy costs, the increasing need for reserves, and the need for capital outlays related to water loss control, system maintenance and system upgrades. La Junta should also consider decoupling its base fee from water provided such that water bills are more aligned with water use.

In addition, the City should consider expanding its testing and/or replacing of its oldest customer meters and the meters of its largest water customers.

Another mid-term program that the City will consider implementing relates to the training and/or auditing it's largest outdoor water users – its irrigation only customers (which includes the City parks and golf course) and its largest commercial and industrial water users (which includes schools). This may involve holding meetings to discuss irrigation practices, or it may involve conducting onsite visits to review past water use and current irrigation methods and practices.

In the long-term, the City may plan to utilize improved water loss management data collection and tracking methods to reduce both apparent and real losses – by directing capital improvements and focusing day-to-day operational activities. Other long-term conservation programs may include updating and revising the City's Rules and Regulations as needed, updating and replacing customer

meter reading device batteries and equipment, and considering updating the City's web site to include more water conservation and water education content.

Other water conservation measures and programs may be included in the implementation of this Plan in support of achieving the specified goals, since the City may choose alternative actions in response to changing conditions and customer needs. However, the basis for changing direction and making revisions to planned water conservation and water use efficiency measures and programs will be those data that are collected as a result of the early phases of Plan implementation.

Evaluations

In general, the water conservation measures and programs that the City will implement align with those activities that the City has been and continues to do on a regular basis. This includes those activities that are budgeted for and conducted on an annual basis such as:

- Meter instrumentation upgrades (i.e., adding AMR transponders);
- Meter repair and replacement, as needed;
- Service line repair and replacement, as needed; and
- Water line repair and replacement, as needed.

The City also collects data on a daily and monthly basis to monitor and characterize water production rates, treatment efficiencies, and customer water demand. Implementation of this Plan will therefore, at the very least, redefine how funds are spent on a typical year and adjust how data are collected and managed with an eye toward improved organizational efficiencies. Overall, improvements in standard operating procedures will allow the City to more accurately characterize customer water use patterns, including City uses, and more accurately track non-revenue water such that overall water loss management in La Junta can be more effectively monitored and quantified.

Improved data collection and management efforts that the City chooses to implement as a result of this planning effort are focused on improving the quality of the information that the City collects such that more rigorous economic decision-making related to infrastructure investments and water rate setting may occur. For example, real water loss occurs daily within the distribution system of all water utilities. The key question for the utility is therefore, what are the costs of repairing infrastructure and reducing water loss as compared to the costs of allow water loss to continue. Only with rigorous and orderly data collection and management can these questions be answered. Given that the City has about \$250,000 of lost water sales due to non-revenue water, it will be of value to the City to improve its characterization of non-revenue water, authorized unbilled water use and real and apparent water losses, for the purposes to improving the efficiency of the water distribution and delivery system. Since the City budgets about \$90,000 per year on water system maintenance and repair, and has reserves that may be used for larger expenditures as needed, improved data collection and assessment will help the City to better manage water loss, reduce non-revenue water and more accurately characterize customer water use behaviors.

The specific measures and programs that have been selected to support **improved water loss management** begins with improved data collection and management. The City will focus improvements in data collection and management on:

- Characterizing authorized unbilled water use including tracking metered and unmetered uses (e.g., street cleaning, fire fighting and training, hydrant flushing, etc.).
- Refining billing customer categories, especially with regard to those customers that are currently categorized as either commercial or industrial, such that schools and institutions are separated from commercial and industrial users, and there is consistency in how commercial accounts are differentiated from industrial accounts.
- Adding a customer category for wholesale water sales.
- Explicitly tracking water leak repairs with formal work order logs that identify the type and location of the leak, the nature of the leak repair, the time of the leak reporting and the time of the leak repair (to help estimate water loss), the materials involved, etc.

The next component of improved data collection and management by the City is the initiation of system-wide water audits on an annual basis by the City. Using the AWWA M-36 methodology, water production and sales are tracked on a monthly basis to characterize non-revenue water and water loss. Having this procedure in place will help to support more rigorous economic decision making related to future capital budgeting, and will support data reporting required by the State and the Southeastern District.

The cost to the City to implement these enhancements to those best management practices currently being conducted by the City is not considered significant. It is more a matter of changing the habits and underlying processes of a select few practices currently conducted by utility staff. For this reason, there is little cost to implement, with substantial return expected.

In general, water loss management BMPs and the benefits related to improved data collection and management processes are not costly; they just require that some changes occur to allow the utility to operate more efficiently. These improvements in efficiency are in part related to changing and improving technology, and in part due to improvements in the sophistication of utility operations being discovered as a result of joint industry research being conducted by AWWA. To wit, the City is not behind where utilities are across the nation, but rather is moving forward at a pace consistent with those other utilities that realize change and improvement is a continuous process that requires vigilance and vision.

One somewhat costly BMP that the City will look to implement as part of a second stage of water loss management, depending in part on the results of improved data collection and management as described above, are District Metered Areas (DMAs). If the City's efforts to better characterize non-revenue water and real and apparent water loss indicate that real water loss is substantial enough to warrant additional infrastructure investment, the City may install DMAs in key locations within the City's distribution system. At a cost of \$15,000 to \$30,000 per installation of a SCADA reporting magnetic flow meter on the discharge side of each of the City's storage tanks would help the City to pinpoint more accurately the location of real and apparent water losses, if the need arose.

Seasonal water use demand management is also a goal of the City's; however, it is more challenging to manage since it involves developing and utilizing BMPs that influence and control customer water use behavior. To begin with, the City can enhance its water waste ordinance. Currently, the City has the following language:

13.04.180 - Wasting water.

No person shall use or permit to be used leaking water connections, lines or other facilities nor irrigate without a sprinkling device or through and by an open hose nor use water for irrigation in such manner as to cause water to flow down streets and gutters, nor use or permit to be used water for irrigation at times forbidden by resolution of the Board of Public Utilities Commissioners of the City, nor otherwise waste water from the water supply and system of the City.

Although this language prohibits certain water wasting activities, it is unclear what penalties may be assessed to those in violation. In addition, the City has ordinances (see Appendix C) that allow City Council to set various stages of water restrictions which limit outdoor irrigation and effect water rates. However, financial penalties related to violating the specified restrictions are not stated. The City should expand and enhance its ordinances to include language regarding penalties for violating these requirements and restrictions.

It may also be of value to the City to provide a more explicit tie between how stages of watering restrictions are determined, as a means to eliminate subjectivity – tying water supply availability to restrictions and increasing water rates.

Seasonal water demands can be reduced by increasing water rates as well. The City will consider water rate increases, and creating conservation rates¹⁶ as a part of Plan implementation, once the City has developed better categorization of customer water use, and has created a category for wholesale water sales.

City water use is another focus for future water conservation programs. In particular, City park, cemetery, and golf course water use which are the three biggest water accounts in the City (see Table 11) and 8 of the top thirteen. Based on a preliminary assessment of water use per square foot of irrigated turf, it is not clear that irrigation rates within the City's properties are inconsistent with prudent irrigation practices. In fact, all those facilities evaluated (e.g., Town Park Lake, La Junta Golf Course, City Cemetery) had irrigation rates of less than 25-inch of water application per season.

Although these rates appear to indicate that turf is effectively managed at each of the City's facilities, there may be options for improved water use efficiency at each location through managed pant materials, irrigation zones and/or application rates. To this point, the City will conduct audits at each of its large irrigation facilities to evaluate options for increase water use efficiency and to reduce seasonal peak demand.

The City will also conduct audits for purposes of helping its largest commercial, industrial and residential identify options for improved water use efficiency¹⁷.

¹⁶ Conservation rates in the context of this Plan are those that include increased per thousand gallon costs for water use above selected thresholds of monthly water use.

¹⁷ There are three single family residential customers that are in the City's top 50 water users; with each averaging over 1.1 million gallons of use per year (or about 100,000 gallons per month). For 3 persons living in a home, this would translate to over 1,000 gallons per person per day of water use.

Table 11 City of La Junta Largest Water Accounts in 2014 (in order of use)	
Customer	Location
City of La Junta	Golf Course
City of La Junta	Cemetery
City of La Junta	Wastewater Treatment Plant
Ark Valley Reg Med Center	
Wal-Mart	
City of La Junta	4908 San Juan Ave.
East Otero School District	6 th and Topeka
City of La Junta	10 th and Santa Fe
Goal Academy	
City of La Junta	22 nd and Bradish
City of La Junta	14 th and Santa Fe
Morningside Heights	
City of La Junta	Pool
East Otero School District	900 Smithland
East Otero School District	1817 Smithland
Otero Junior College	
Lewis Bolt and Nut	
City of La Junta	521 Adams
Debourgh Manufacturing	
Family Restaurants Inc.	
Lewis Bolt and Nut	
Winter Livestock	
Colorado East	
La Junta LTC Investors	
Otero Junior College	

One other program that the City will find cost effective, will be to develop data assessment tools using the benefits of its new AMR equipment installations. Other utilities have been able to leverage the increased data collection and storage capabilities of the AMR transponders to monitor customer usage more closely, which can include daily and even hourly water use for any specific customer. These data can help the City to identify customers with leaks and other unusual water use. The City can develop “red-flag” queries of billing data to identify unusual water use, as well as can access the AMR data in situations where customers are in disagreement with water billings. In either case, the City can utilize these data to identify customer side leaks and improve customer water use efficiency.

These same methods can also be used to support water audits of the City’s largest customers.

Note that the City will need to continue budgeting for infrastructure improvements related to the AMR system; both in terms of installing new equipment in the next two or three years, and in terms of doing the requisite maintenance associated with testing and replacing meters and replacing the AMR batteries on a 7 to 10 year rotating schedule.

Implementation Plan

Implementation Tasks

Based on the needs of the City and its customers, La Junta will implement those selected water conservation and water use efficiency programs listed in Table 12, with the intention of achieving the water conservation goals listed previously. Implementation will occur over a number of years as ongoing programs are continued and new programs are phased in. Funding levels are always a consideration, as operating expenses and water sales income change seasonally and from year to year. However, the programs that have been selected for implementation are those that the City believes are best for the organization in the short-term and mid-term; helping to improve processes, enhance business practices, and support customer needs.

The focus of the implementation plan is on the 1 to 2 year planning horizon, for during the short-term it is possible to identify expenditures that can be used to implement those selected measures and programs without the substantial uncertainty that occurs when planning for 3 to 5 years into the future. To this point, the implementation plan provides a detailed accounting of planned expenditures for those programs selected for implementation in the short-term; and less detailed accounting of those that have been selected for implementation 3-years and further out.

Programs related to the implementation of improved processes such as tracking water use and water loss, enhanced customer education, etc. will be conducted as appropriate during the normal course of business once the proper infrastructure is in place. Once initiated, it is anticipated that these practices will be conducted on a regular and consistent basis into the future.

Other long-term water conservation and water use efficiency measures and programs that have been identified for consideration in Table 10 presented in the previous section will be evaluated and characterized further for implementation based on the outcome of the short-term and mid-term implementation efforts.

Table 12
Summary of Selected Water Conservation and Water Use Efficiency Measures and Programs for Short-Term (1-2 years) and Mid-Term (3-5 years) Implementation By the City of La Junta

Selected Measure/Program	BMP Category(ies)	Key Attributes	Description	Estimated Cost
Customer Water Use Tracking				
Improve customer water use tracking including wholesale water sales and differentiating commercial and industrial water use	Customer Water Delivery	Supports more accurate characterization of water use and water loss	Requires re-evaluating the categorization of each commercial and industrial customer and developing new customer categories for institutional uses (e.g., schools). Also includes developing wholesale water use categories.	City Utility Labor Only
Water Loss Management				
Continue Best Management Practice (BMP) related to data collection and management in support of water loss management	System Wide Management	Supports more accurate characterization of water loss through distribution to customers	City will strive to develop and link BMPs based on a more rigorous accounting of non-revenue water, authorized unbilled water, and estimates of real and apparent water loss in accordance with AWWA standards (i.e., M-36). BMPs will include improving the collection and tracking of water placed in distribution, unbilled water uses, and customer water use.	City Utility Labor Only
Enhance current "red flag" system for identifying (and correcting, if possible) high water use by customers (or false readings in the billing database)	Customer Water Delivery	Supports the identification of customer side leaks and over water use; and errors in data collection	Requires making selected adjustments to billing software and/or billing data processing to allow for comparisons of water use to previous months and tracking back into historical use to be able to differentiate high use from differences between normal seasonal increases.	City Utility Labor Only
Conduct annual system wide water audits	System Wide Management	Supports more accurate characterization of water loss through both water treatment and distribution to customers	Utilize City resources to conducted annual system-wide water audits using the AWWA M-36 methodology (see Appendix D). City will consider conducting third party audit every 3 to 5 years to support data checking and to evaluate BMPs and/or coordinating tri-annual audits with the Southeastern District.	City Utility Labor Only (except for 3 rd party audit which will be provided by the Southeastern District triannually)
Continue water line repair and placement projects then update based on results of improved water loss management BMPs	Distribution System/Customer Water Delivery	Supports reduced water loss through installation of improved distribution piping and new valves and appurtenances	Utilizes resources which are budgeted and expensed annually, then makes adjustments based on the audit results and improved data collection efforts, such that funding can be funneled to those areas of greatest benefit (e.g., more aggressive replacement of cast iron pipe)	\$25-50,000/yr
Continue service line repair and replacement	Distribution System/Customer Water Delivery	Supports reduced water loss through installation of improved service line/metering couplings	Utilizes resources which are budgeted and expensed annually to replace service lines when water mains are replaced.	(included in water line replacement and repair)
Continue meter repair and replacement, then update based on results of improved water loss management BMPs	Customer Water Delivery	Supports improved accuracy of tracking customer water use which improves organization's water sales revenues and reduces water loss	Utilizes resources which are budgeted and expensed annually to replace existing under-performing customer meters. Revise program to be more aggressive in the future based on results of the audits and improved data collection efforts.	\$2-5,000/yr

Table 12 (continued)
Summary of Selected Water Conservation and Water Use Efficiency Measures and Programs for Short-Term (1-2 year) and Mid-term (3-5years) Implementation

Selected Measure/Program	BMP Category(ies)	Key Attributes	Description	Estimated Cost
Water Loss Management (continued)				
Install District Meter Areas (DMAs)	Distribution System	Supports tracking of real and apparent water loss within selected portions of the City's distribution system.	Requires installing meters in selected locations within the City's distribution system piping and tracking those customer meters within the section of distribution system associated with the DMA.	\$15,000 to \$30,000 per DMA (depending on the meter size)
Seasonal Demand Management				
Revise and Update City's Rules and Regulations related to water waste, outdoor irrigation restrictions, enforcement options, and drought triggers.	System Wide Management/Customer Demand Management	Defines requirements for operation of irrigation systems and how drought will influence different actions by the City to limit and improve the efficiency of seasonal water use.	Updating the Rules and Regulations involves reviewing and revising components of the existing ordinances and codes to incorporate new technology, and make more direction connections between water waste and improved seasonal water use efficiency.	City Utility and Manager Labor Only
Initiate customer education and training for largest water users/outdoor irrigators	Customer Demand Management	Supports reducing customer demand through focused educational efforts and awareness-generating audits	Utilize City resources to reach customers through web-based content, and develop messaging program that engages and educates some of the City's biggest outdoor water users (irrigation only customers, and commercial and institutional customers)	\$200/yr plus \$20,000 one time grant (with \$5,000 from City)
Evaluate changes to water rates and fee structures (may need to occur every 3-5 year depending on water sales revenues)	System Wide Management	Supports improving revenue generation to support more aggressive leak detection and water loss management through capital projects, improved metering; and enhanced BMPs	Develop water rates based on changing customer demand characteristics, need for conservation rate structures, and increasing operational costs. Include connection between drought planning and rate structures.	\$15,000 (one time cost)
Other Educational Efforts				
Continue Customer Educational Efforts	Customer Demand Management	Supports customer engagement and understanding of changing water rates, policies and programs		
Join Lower Arkansas Water Quality Working Group	System Wide Management/Water Production and Treatment	Allows the City to remain abreast of regulations and policies that may impact utility operations and future water use efficiencies	(see Page 17 for a explanation of this program)	City Utility Labor Only

Plan Monitoring and Assessment

Many of the measures and programs that have been selected for implementation have imbedded within them data collection and evaluation BMPs that constitute plan monitoring and assessment practices. For example, the goal associated with reductions in system wide water loss will be assessed through the deliberate use of the AWWA M-36 water accounting methodology described in Appendix D. Similarly, the goal associated with reduced summertime water demand will be characterized and tracked as customer water use and total distribution system demanded are measured. A summary of the data collection and assessment that will occur to monitor and assess the benefits of the various selected measures and programs is presented in Table 13.

Table 13
Summary of Monitoring and Assessment Data Collection

Type of Data	Timing			Uses		
	Hourly	Daily	Monthly	Distribution System Water Loss Metrics ¹	System Wide Water Use Metrics ²	Customer Demand Management
Water to Distribution		X	X	X	X	
Metered Unbilled Water Use			X	X	X	
Metered Customer Water Use			X	X	X	
Unmetered Authorized Water Use (bulk water sales, construction water, etc.)			X	X		
Estimates of Other Authorized or Known Uses (e.g., losses due to leaks, line flushing, etc.)			X	X		
Individual and Categorized Water Customer Water Use (through tracking of financial data)			X	X	X	X
Number of Leaks Found/Repaired			X	X		
Number of Customer High Use Accounts Identified			X			X
¹ Includes: (all are monthly) water to distribution, water sold, non-revenue water, authorized unbilled consumption, estimated apparent losses, estimated current monthly water loss (see Appendix D)						
² Includes: (all are monthly) water sold per single residential connection, water sold per multi-tap residential connection, water sold per commercial connection, number of connections, highest water use connections (top 50)						

Updating the Plan

The City’s Water Conservation and Efficiency Plan will be reviewed and updated informally throughout the planning period (i.e., until the end of 2022). The City may choose to formally update the Plan whenever it is valuable to the organization dependant on financial needs, and/or substantial changes to its current operating conditions. At the very least, the Plan will be updated in 7 years, or by the end of 2022.

Plan Public Review and Comment

La Junta's Water Conservation and Efficiency Plan Update has undergone public review in accordance with the requirements of the State regulations for a period of 60 days – from June 11, 2015 to August 17, 2015. A notice of the public review was printed in the local newspaper (see Appendix E). A copy of the draft Plan was made available to the public at the City's offices and online. Public comments are provided in Appendix E, as well as the responses that were developed for each comment.

Appendix A – Current Water Rates



APPENDIX A

WATER FEES ESTABLISHED JANUARY 1, 2015

SECTION 1:

1.1 CUSTOMER CHARGE: The monthly customer charge is determined by LINE SIZE. Irrigation meters will be charged for actual usage only and no customer charge shall be assessed.

<u>Line Size</u>	<u>Monthly Fee</u>	<u>Line Size</u>	<u>Monthly Fee</u>
¾ Inch	\$ 9.22	3 Inch	\$ 147.52
1 Inch	\$16.32	4 Inch	\$ 261.85
1 ½ Inch	\$36.88	6 Inch	\$ 590.09
2 Inch	\$65.46	8 Inch	\$1,049.24

1.2 COMMODITY CHARGE: The charge for water used that does not exceed the Water Conservation Limits shall be \$2.36 per each 1,000 gallons for all customers. The charge for water used in excess of the Water Conservation Limits shall be \$2.81 per 1,000 gallons.

WATER CONSERVATION LIMITS

Residential (any size meter)	35,000 gallons
Commercial	
¾" meter	35,000 gallons
1" meter	62,000 gallons
1 ½" meter	140,000 gallons
2" meter	250,000 gallons
3" meter	560,000 gallons
4" meter	1,000,000 gallons
Larger than 4" meter	2,250,000 gallons



Draft for Discussion Purposes Only

- 1.3 DROUGHT CHARGE:** The commodity charge for residential accounts will increase to \$2.81 after 15,000 gallons whenever Stage 2 or Stage 3 water restrictions are in force.
- 1.4 IRRIGATION METERS:** New irrigation taps will not be provided after January 1, 2002. Whenever the ownership of an account with an existing irrigation meter changes ownership, the irrigation meter on that account will be eliminated. All new accounts and taps will be assessed rates as a regular meter account.
- 1.5 FACILITY INVESTMENT FEES:** The following flat monthly charge will be assessed in addition to the regular use fees as listed above, except that all residential accounts will be charged the ¾ inch monthly fee. Outside City limits doubling of fees shall not apply to this fee, but remains in effect for all other charges.

<u>Line Size</u>	<u>Monthly Fee</u>	<u>Line Size</u>	<u>Monthly Fee</u>
¾ Inch	\$ 17.00	3 Inch	\$ 272.00
1 Inch	\$ 30.09	4 Inch	\$ 482.80
1 ½ Inch	\$ 68.00	Over 4 Inch	\$1,088.00
2 Inch	\$120.70		

- 1.6 OUTSIDE CITY RATES:** The above charges and fees shall be doubled for outside the City limits, except for Sales to a Public Water System which are defined in Part I, Section 9.

1.7 WATER TAPPING FEES:	<u>Size of Line</u>	<u>Tap Fee</u>
	¾ Inch	\$ 1,500.00
	1 Inch	\$ 2,655.00
	1 ½ Inch	\$ 6,000.00
	2 Inch	\$10,650.00
	3 Inch	\$24,000.00
	4 Inch	\$42,600.00
	Over 4 Inch	\$96,000.00

These charges are for tap fees only. Time and materials will also be charged, with time being charged for man and equipment hours plus the materials used in the hookup.



SECTION 9 – SALE OF CITY WATER TO A PUBLIC WATER SYSTEM

9.3 Fees: The fees to be charged to a Consecutive System or Community Water System shall be as follows:

Tap Size	Tap Fee	Monthly Facility Fee	Monthly Customer Charge	Rate per 1000 gallons	Maximum water use before increase	Charge per 1000 over maximum
Less than 2"	Not available					
2"	\$ 21,300.00	\$ 120.70	\$ 130.92	\$2.36	250,000	\$2.81
3"	\$ 48,000.00	\$ 272.00	\$ 295.04	\$2.36	560,000	\$2.81
4"	\$ 85,200.00	\$ 482.80	\$ 523.70	\$2.36	1,000,000	\$2.81
6"	\$192,000.00	\$1,088.00	\$1,180.16	\$2.36	2,250,000	\$2.81

9.3.1 Whenever the City of La Junta implements Stage 2 or Stage 3 water restrictions the "Charge per 1000 over maximum" shall be \$4.22.

9.3.2 Other fees may also be assessed as provided in these policies for replacement surcharges as set forth below.

9.4 Replacement Water: Consecutive System or Community Water System customers must supply well-pumping replacement water at a ratio of 1:1 for every gallon of water consumed. If a Consecutive System or Community Water System customer cannot provide replacement water the City will apply a surcharge of \$.50 per 1000 gallons as set forth in the Fees Sections of this policy. This surcharge shall apply to that portion of any deficit of replacement water that should have been provided to the City by the Consecutive System or Community Water System.



Appendix B – CRS 37-60-126



Draft for Discussion Purposes Only

C.R.S. 37-60-126

COLORADO REVISED STATUTES

*** This document reflects changes current through all laws passed at the First Regular Session of the Sixty-Ninth General Assembly of the State of Colorado (2013) ***

TITLE 37. WATER AND IRRIGATION
WATER CONSERVATION BOARD AND COMPACTS
ARTICLE 60. COLORADO WATER CONSERVATION BOARD
PART 1. GENERAL PROVISIONS

C.R.S. 37-60-126 (2013)

37-60-126. Water conservation and drought mitigation planning - programs - relationship to state assistance for water facilities - guidelines - water efficiency grant program - repeal

(1) As used in this section and [section 37-60-126.5](#), unless the context otherwise requires:

(a) "Agency" means a public or private entity whose primary purpose includes the promotion of water resource conservation.

(b) "Covered entity" means each municipality, agency, utility, including any privately owned utility, or other publicly owned entity with a legal obligation to supply, distribute, or otherwise provide water at retail to domestic, commercial, industrial, or public facility customers, and that has a total demand for such customers of two thousand acre-feet or more.

(c) "Grant program" means the water efficiency grant program established pursuant to subsection (12) of this section.

(d) "Office" means the office of water conservation and drought planning created in [section 37-60-124](#).

(e) "Plan elements" means those components of water conservation plans that address water-saving measures and programs, implementation review, water-saving goals, and the actions a covered entity shall take to develop, implement, monitor, review, and revise its water conservation plan.

(f) "Public facility" means any facility operated by an instrument of government for the benefit of the public, including, but not limited to, a government building; park or other recreational facility; school, college, university, or other educational institution; highway; hospital; or stadium.

(g) "Water conservation" means water use efficiency, wise water use, water transmission and

Draft for Discussion Purposes Only

distribution system efficiency, and supply substitution. The objective of water conservation is a long-term increase in the productive use of water supply in order to satisfy water supply needs without compromising desired water services.

(h) "Water conservation plan", "water use efficiency plan", or "plan" means a plan adopted in accordance with this section.

(i) "Water-saving measures and programs" includes a device, a practice, hardware, or equipment that reduces water demands and a program that uses a combination of measures and incentives that allow for an increase in the productive use of a local water supply.

(2) (a) Each covered entity shall, subject to [section 37-60-127](#), develop, adopt, make publicly available, and implement a plan pursuant to which such covered entity shall encourage its domestic, commercial, industrial, and public facility customers to use water more efficiently. Any state or local governmental entity that is not a covered entity may develop, adopt, make publicly available, and implement such a plan.

(b) The office shall review previously submitted conservation plans to evaluate their consistency with the provisions of this section and the guidelines established pursuant to paragraph (a) of subsection (7) of this section.

(c) On and after July 1, 2006, a covered entity that seeks financial assistance from either the board or the Colorado water resources and power development authority shall submit to the board a new or revised plan to meet water conservation goals adopted by the covered entity, in accordance with this section, for the board's approval prior to the release of new loan proceeds.

(3) The manner in which the covered entity develops, adopts, makes publicly available, and implements a plan established pursuant to subsection (2) of this section shall be determined by the covered entity in accordance with this section. The plan shall be accompanied by a schedule for its implementation. The plans and schedules shall be provided to the office within ninety days after their adoption. For those entities seeking financial assistance, the office shall then notify the covered entity and the appropriate financing authority that the plan has been reviewed and whether the plan has been approved in accordance with this section.

(4) A plan developed by a covered entity pursuant to subsection (2) of this section shall, at a minimum, include a full evaluation of the following plan elements:

(a) The water-saving measures and programs to be used by the covered entity for water conservation. In developing these measures and programs, each covered entity shall, at a minimum, consider the following:

(I) Water-efficient fixtures and appliances, including toilets, urinals, clothes washers, showerheads, and faucet aerators;

(II) Low water use landscapes, drought-resistant vegetation, removal of phreatophytes, and

Draft for Discussion Purposes Only

efficient irrigation;

(III) Water-efficient industrial and commercial water-using processes;

(IV) Water reuse systems;

(V) Distribution system leak identification and repair;

(VI) Dissemination of information regarding water use efficiency measures, including by public education, customer water use audits, and water-saving demonstrations;

(VII) (A) Water rate structures and billing systems designed to encourage water use efficiency in a fiscally responsible manner.

(B) The department of local affairs may provide technical assistance to covered entities that are local governments to implement water billing systems that show customer water usage and that implement tiered billing systems.

(VIII) Regulatory measures designed to encourage water conservation;

(IX) Incentives to implement water conservation techniques, including rebates to customers to encourage the installation of water conservation measures;

(b) A section stating the covered entity's best judgment of the role of water conservation plans in the covered entity's water supply planning;

(c) The steps the covered entity used to develop, and will use to implement, monitor, review, and revise, its water conservation plan;

(d) The time period, not to exceed seven years, after which the covered entity will review and update its adopted plan; and

(e) Either as a percentage or in acre-foot increments, an estimate of the amount of water that has been saved through a previously implemented conservation plan and an estimate of the amount of water that will be saved through conservation when the plan is implemented.

(4.5) (a) On an annual basis starting no later than June 30, 2014, covered entities shall report water use and conservation data, to be used for statewide water supply planning, following board guidelines pursuant to paragraph (b) of this subsection (4.5), to the board by the end of the second quarter of each year for the previous calendar year.

(b) No later than February 1, 2012, the board shall adopt guidelines regarding the reporting of water use and conservation data by covered entities and shall provide a report to the senate agriculture and natural resources committee and the house of representatives agriculture, livestock, and natural resources committee, or their successor committees, regarding the guidelines. These guidelines shall:

Draft for Discussion Purposes Only

(I) Be adopted pursuant to the board's public participation process and shall include outreach to stakeholders from water providers with geographic and demographic diversity, nongovernmental organizations, and water conservation professionals; and

(II) Include clear descriptions of: Categories of customers, uses, and measurements; how guidelines will be implemented; and how data will be reported to the board.

(c) (I) No later than February 1, 2019, the board shall report to the senate agriculture and natural resources committee and the house of representatives agriculture, livestock, and natural resources committee, or their successor committees, on the guidelines and data collected by the board under the guidelines.

(II) This paragraph (c) is repealed, effective July 1, 2020.

(5) Each covered entity and other state or local governmental entity that adopts a plan shall follow the entity's rules, codes, or ordinances to make the draft plan available for public review and comment. If there are no rules, codes, or ordinances governing the entity's public planning process, then each entity shall publish a draft plan, give public notice of the plan, make such plan publicly available, and solicit comments from the public for a period of not less than sixty days after the date on which the draft plan is made publicly available. Reference shall be made in the public notice to the elements of a plan that have already been implemented.

(6) The board is hereby authorized to recommend the appropriation and expenditure of revenues as are necessary from the unobligated balance of the five percent share of the severance tax operational fund designated for use by the board for the purpose of the office providing assistance to covered entities to develop water conservation plans that meet the provisions of this section.

(7) (a) The board shall adopt guidelines for the office to review water conservation plans submitted by covered entities and other state or local governmental entities. The guidelines shall define the method for submitting plans to the office, the methods for office review and approval of the plans, and the interest rate surcharge provided for in paragraph (a) of subsection (9) of this section.

(b) If no other applicable guidelines exist as of June 1, 2007, the board shall adopt guidelines by July 31, 2007, for the office to use in reviewing applications submitted by covered entities, other state or local governmental entities, and agencies for grants from the grant program and from the grant program established in [section 37-60-126.5 \(3\)](#). The guidelines shall establish deadlines and procedures for covered entities, other state or local governmental entities, and agencies to follow in applying for grants and the criteria to be used by the office and the board in prioritizing and awarding grants.

(8) A covered entity may at any time adopt changes to an approved plan in accordance with this section after notifying and receiving concurrence from the office. If the proposed changes

Draft for Discussion Purposes Only

are major, the covered entity shall give public notice of the changes, make the changes available in draft form, and provide the public an opportunity to comment on such changes before adopting them in accordance with subsection (5) of this section.

(9) (a) Neither the board nor the Colorado water resources and power development authority shall release grant or loan proceeds to a covered entity unless the covered entity provides a copy of the water conservation plan adopted pursuant to this section; except that the board or the authority may release the grant or loan proceeds notwithstanding a covered entity's failure to comply with the reporting requirements of subsection (4.5) of this section or if the board or the authority, as applicable, determines that an unforeseen emergency exists in relation to the covered entity's loan application, in which case the board or the authority, as applicable, may impose a grant or loan surcharge upon the covered entity that may be rebated or reduced if the covered entity submits and adopts a plan in compliance with this section in a timely manner as determined by the board or the authority, as applicable.

(b) The board and the Colorado water resources and power development authority, to which any covered entity has applied for financial assistance for the construction of a water diversion, storage, conveyance, water treatment, or wastewater treatment facility, shall consider any water conservation plan filed pursuant to this section in determining whether to render financial assistance to such entity. Such consideration shall be carried out within the discretion accorded the board and the Colorado water resources and power development authority pursuant to which such board and authority render such financial assistance to such covered entity.

(c) The board and the Colorado water resources and power development authority may enter into a memorandum of understanding with each other for the purposes of avoiding delay in the processing of applications for financial assistance covered by this section and avoiding duplication in the consideration required by this subsection (9).

(10) Repealed.

(11) (a) Any section of a restrictive covenant or of the declaration, bylaws, or rules and regulations of a common interest community, all as defined in [section 38-33.3-103, C.R.S.](#), that prohibits or limits xeriscape, prohibits or limits the installation or use of drought-tolerant vegetative landscapes, or requires cultivated vegetation to consist wholly or partially of turf grass is hereby declared contrary to public policy and, on that basis, is unenforceable. This paragraph (a) does not prohibit common interest communities from adopting and enforcing design or aesthetic guidelines or rules that require drought-tolerant vegetative landscapes or regulate the type, number, and placement of drought-tolerant plantings and hardscapes that may be installed on the unit owner's property or property for which the unit owner is responsible.

(b) As used in this subsection (11):

(I) "Executive board policy or practice" includes any additional procedural step or burden, financial or otherwise, placed on a unit owner who seeks approval for a landscaping change by

Draft for Discussion Purposes Only

the executive board of a unit owners' association, as defined in [section 38-33.3-103, C.R.S.](#), and not included in the existing declaration or bylaws of the association. An "executive board policy or practice" includes, without limitation, the requirement of:

(A) An architect's stamp;

(B) Preapproval by an architect or landscape architect retained by the executive board;

(C) An analysis of water usage under the proposed new landscape plan or a history of water usage under the unit owner's existing landscape plan; and

(D) The adoption of a landscaping change fee.

(II) "Restrictive covenant" means any covenant, restriction, bylaw, executive board policy or practice, or condition applicable to real property for the purpose of controlling land use, but does not include any covenant, restriction, or condition imposed on such real property by any governmental entity.

(II.5) "Turf" means a covering of mowed vegetation, usually turf grass, growing intimately with an upper soil stratum of intermingled roots and stems.

(III) "Turf grass" means continuous plant coverage consisting of nonnative grasses or grasses that have not been hybridized for arid conditions which, when regularly mowed, form a dense growth of leaf blades and roots.

(IV) "Xeriscape" means the application of the principles of landscape planning and design, soil analysis and improvement, appropriate plant selection, limitation of turf area, use of mulches, irrigation efficiency, and appropriate maintenance that results in water use efficiency and water-saving practices.

(c) Nothing in this subsection (11) precludes the executive board of a common interest community from taking enforcement action against a unit owner who allows his or her existing landscaping to die or go dormant; except that:

(I) No enforcement action shall require that a unit owner water in violation of water use restrictions declared by the jurisdiction in which the common interest community is located, in which case the unit owner shall water his or her landscaping appropriately but not in excess of any watering restrictions imposed by the water provider for the common interest community;

(II) Enforcement shall be consistent within the community and not arbitrary or capricious; and

(III) In any enforcement action in which the existing turf grass is dead or dormant due to insufficient watering, the unit owner shall be allowed a reasonable and practical opportunity, as defined by the association's executive board, with consideration of applicable local growing seasons or practical limitations, to reseed and revive turf grass before being required to replace it with new sod.

Draft for Discussion Purposes Only

(d) This subsection (11) does not supersede any subdivision regulation of a county, city and county, or other municipality.

(12) (a) (I) There is hereby created the water efficiency grant program for purposes of providing state funding to aid in the planning and implementation of water conservation plans developed in accordance with the requirements of this section and to promote the benefits of water efficiency. The board is authorized to distribute grants to covered entities, other state or local governmental entities, and agencies in accordance with its guidelines from the moneys transferred to and appropriated from the water efficiency grant program cash fund, which is hereby created in the state treasury.

(II) Moneys in the water efficiency grant program cash fund are hereby continuously appropriated to the board for the purposes of this subsection (12) and shall be available for use until the programs and projects financed using the grants have been completed.

(III) For each fiscal year beginning on or after July 1, 2010, the general assembly shall appropriate from the fund to the board up to five hundred thousand dollars annually for the purpose of providing grants to covered entities, other state and local governmental entities, and agencies in accordance with this subsection (12). Commencing July 1, 2008, the general assembly shall also appropriate from the fund to the board fifty thousand dollars each fiscal year to cover the costs associated with the administration of the grant program and the requirements of [section 37-60-124](#). Moneys appropriated pursuant to this subparagraph (III) shall remain available until expended or until June 30, 2020, whichever occurs first.

(IV) Any moneys remaining in the fund on June 30, 2020, shall be transferred to the severance tax operational fund described in [section 39-29-109 \(2\) \(b\)](#), C.R.S.

(b) Any covered entity or state or local governmental entity that has adopted a water conservation plan and that supplies, distributes, or otherwise provides water at retail to customers may apply for a grant to aid in the implementation of the water efficiency goals of the plan. Any agency may apply for a grant to fund outreach or education programs aimed at demonstrating the benefits of water efficiency. The office shall review the applications and make recommendations to the board regarding the awarding and distribution of grants to applicants who satisfy the criteria outlined in this subsection (12) and the guidelines developed pursuant to subsection (7) of this section.

(c) This subsection (12) is repealed, effective July 1, 2020.

HISTORY: Source: L. 91: Entire section added, p. 2023, § 4, effective June 4. L. 99: (10) repealed, p. 25, § 3, effective March 5. L. 2003: (4)(g) amended and (11) added, p. 1368, § 4, effective April 25. L. 2004: Entire section amended, p. 1779, § 3, effective August 4. L. 2005: (11) amended, p. 1372, § 1, effective June 6; (1), (2)(b), and (7) amended and (12) added, p. 1481, § 1, effective June 7. L. 2007: (1)(a), (2)(a), (5), (7), and (12) amended, p. 1890, § 1, effective June 1. L. 2008: IP(4) amended, p. 1575, § 30, effective May 29; (12)(a) amended, p. 1873, § 14, effective June 2. L. 2009: (12)(a) amended, ([HB 09-1017](#)), [ch. 297](#),

Draft for Discussion Purposes Only

p. 1593, § 1, effective May 21; (9)(a) amended, (SB 09-106), ch. 386, p. 2091, § 3, effective July 1.L. 2010: (4)(a)(I) and (9)(a) amended and (4.5) added, (HB 10-1051), ch. 378, p. 1772, § 1, effective June 7; (12)(a)(III), (12)(a)(IV), and (12)(c) amended, (SB 10-025), ch. 379, p. 1774, § 1, effective June 7.L. 2013: (11)(a), (11)(b)(III), IP(11)(c), (11)(c)(I), and (11)(c)(III) amended and (11)(b)(II.5) and (11)(d) added, (SB 13-183), ch. 187, p. 756, § 1, effective May 10; (6) and (12)(a)(IV) amended, (SB 13-181), ch. 209, p. 873, § 24, effective May 13.

Editor's note: Subsection (12) was originally enacted as subsection (13) in House Bill 05-1254 but was renumbered on revision for ease of location.

Cross references: (1) In 1991, this entire section was added by the "Water Conservation Act of 1991". For the short title and the legislative declaration, see sections 1 and 2 of chapter 328, Session Laws of Colorado 1991.

(2) For the legislative declaration contained in the 2004 act amending this section, see section 1 of chapter 373, Session Laws of Colorado 2004.



Appendix C – Relevant City Water Ordinances



Draft for Discussion Purposes Only

CHAPTER 13.04 - Water

I - Water Regulations

13.04.180 - Wasting water.

No person shall use or permit to be used leaking water connections, lines or other facilities nor irrigate without a sprinkling device or through and by an open hose nor use water for irrigation in such manner as to cause water to flow down streets and gutters, nor use or permit to be used water for irrigation at times forbidden by resolution of the Board of Public Utilities Commissioners of the City, nor otherwise waste water from the water supply and system of the City.

(Prior code §27-18)

II - Water Conservation

13.04.300 - Definitions.

Unless the context specifically indicates otherwise, the following terms, as used in Sections 13.04.300 through 13.04.415 inclusive, shall have the following meanings:

Drip irrigation means low pressure, low volume irrigation applied slowly, near or at ground level, to minimize runoff and loss to evaporation, including the use of a bubbler, drip emitter, in-line tubing and soaker hose, but does not include micro-sprays.

Hand-watering means the use, expenditure, or application of water supplied to a water customer through a hand-held hose connected to a piping system where the water is used for any exterior purposes or is otherwise expended outside any dwelling, building or structure.

Irrigate means to apply or to expend water onto land, whether by channels, by flooding, by sprinkling or by any other means whatsoever, except hand-watering.

Landscape means any combination of living plants, such as trees, shrubs, vines, ground cover, flowers or turf grass.

Pond means an artificially constructed outdoor pond used for decorative or aesthetic purposes.

Projected demand means the expected levels of water demand placed upon the water supply system assuming no additional restrictions. This projected amount is the City's best estimate based on an analysis of historic trends, current and expected weather conditions, snowpack levels, system modeling, engineering judgment, consumption and growth forecasts, as well as other relevant factors.

Turf grass means continuous plant coverage of grasses that, when regularly mowed, form a dense growth of leaf blades and roots.

Water customer means the person designated on the records maintained by the City as the person responsible for payment of charges incurred for the use of the water supply system at the premises being served, or any person of lawful age who uses water at the premises served.

Water feature means any fountain or waterfall used for decorative or aesthetic purposes.

(Ord. 1423 §§1, 2, 2006; Ord. 1348, 2003)

13.04.310 - Waste of water prohibited.

Draft for Discussion Purposes Only

- (a) No water customer shall allow, permit or cause the waste of water, which shall include any use of water in violation of this Chapter.
- (b) During any water shortage declared under this Chapter, no water customer shall be required, whether by public or private agreement, to retain existing turf grass, install new turf grass or to irrigate existing turf grass in a manner inconsistent with this Chapter.

(Ord. 1423 §§1, 2, 2006; Ord. 1348, 2003)

13.04.315 - Procedure for declaring shortages.

- (a) The City Council, sitting in open session, shall declare by resolution the appropriate level of water restriction provided herein as to any water shortage.
- (b) The City Council shall consider, although not be bound by, any recommendations of the Board of Utility Commissioners concerning the appropriate level of water restrictions to be imposed.

(Ord 1423 §§1, 2, 2006)

13.04.320 - Stage I shortage.

A Stage I shortage may be declared when the City Council determines that proactive measures should be taken to avoid or reduce the severity of a shortage. During a Stage I shortage, the City will increase public communication and education efforts aimed at water conservation, will encourage the community to conserve water wherever possible and will evaluate the development of water rates that promote the efficient use of water. In addition, the following restrictions on the use of water by water customers shall be in effect during a Stage I shortage:

- (1) All City facilities will restrict irrigation of turf grass to Monday, Wednesday and Friday. From April 15 through October 15, no outdoor watering shall be allowed between 10:00 a.m. and 6:00 p.m.
- (2) These provisions shall not apply to the City cemetery or City golf course.
- (3) Outdoor watering by all users shall be prohibited from 10:00 a.m. to 6:00 p.m.

(Ord. 1423 §§1, 2, 2006; Ord. 1370, 2004; Ord. 1348, 2003)

13.04.330 - Stage II shortage.

A Stage II shortage may be declared when the City Council determines that proactive measures should be taken to avoid or reduce the severity of a shortage. In addition to the Stage I restrictions set forth above, the following restrictions on the use of water by water customers shall be in effect during a Stage II shortage.

- (1) Level A. Outdoor landscaping:
 - a. Outdoor landscape watering shall only be allowed three (3) days per week on designated days as follows:
 - 1. Residential users with even-numbered addresses may only irrigate on Sunday, Wednesday and Friday;
 - 2. Residential users with odd-numbered addresses may only irrigate on Tuesday, Thursday and Saturday; and
 - 3. Commercial users may only irrigate on Monday, Wednesday and Friday.
 - b. All City facilities less than five (5) acres in size will restrict irrigation of turf grass to Monday and Friday.



Draft for Discussion Purposes Only

(2) Level B. Outdoor landscaping:

- a. Outdoor landscape watering shall only be allowed two (2) days per week on designated days as follows:
 - 1. Residential users with even-numbered addresses may only irrigate on Sunday and Wednesday;
 - 2. Residential users with odd-numbered addresses may only irrigate on Tuesday and Saturday; and
 - 3. Commercial users may only irrigate on Monday and Friday.
- b. All City facilities less than five (5) acres in size will restrict irrigation of turf grass to Friday.

(3) Level C. Outdoor landscaping:

- a. Outdoor landscape watering shall only be allowed one (1) day per week on designated days as follows:
 - 1. Residential users with even-numbered addresses may only irrigate on Sunday;
 - 2. Residential users with odd-numbered addresses may only irrigate on Saturday; and
 - 3. Commercial users may only irrigate on Friday.
- b. All City facilities less than five (5) acres in size will restrict irrigation of turf grass to the second and fourth Friday of the month.

(4) Level D. Outdoor landscaping:

- a. Outdoor landscape watering shall only be allowed two (2) days per month on designated days as follows:
 - 1. Residential users with even-numbered addresses may only irrigate on the second and fourth Sunday of the month;
 - 2. Residential users with odd-numbered addresses may only irrigate on the second and fourth Saturday of the month; and
 - 3. Commercial users may only irrigate on the second and fourth Friday of the month.
- b. All City facilities less than five (5) acres in size will restrict irrigation of turf grass to the fourth Friday of the month.

(5) Level E. Outdoor landscaping:

- a. Outdoor landscape watering shall only be allowed one (1) day per month on designated days as follows:
 - 1. Residential users with even-numbered addresses may only irrigate on the second Sunday of the month;
 - 2. Residential users with odd-numbered addresses may only irrigate on the second Saturday of the month; and
 - 3. Commercial users may only irrigate on the second Friday of the month.
- b. From October 1 to April 30, in the event there is inclement weather and outdoor landscape watering is precluded on a designated watering day, then outdoor landscape watering shall be allowed for the affected water customers as follows:
 - 1. Residential users with even-numbered addresses may only irrigate on the fourth Sunday of the month;
 - 2. Residential users with odd-numbered addresses may only irrigate on the fourth Saturday of the month; and



Draft for Discussion Purposes Only

3. Commercial users may only irrigate on the fourth Friday of the month.

(Ord. 1423 §§1, 2, 2006; Ord. 1348, 2003)

13.04.340 - Miscellaneous provisions for Stage II shortages.

- (a) Notwithstanding the foregoing, during a Stage II shortage, outdoor landscape watering shall not exceed:
- (1) For residential users, three (3) hours each designated watering day; and
 - (2) For commercial users, twenty (20) minutes per zone or area for pop-up fixed spray sprinklers, and forty-five (45) minutes per zone or area for pop-up rotary-type sprinklers (including but not limited to impact or gear drive).
- (b) During a Stage II shortage, from April 15 to October 15, outdoor landscape watering shall only be allowed on designated days as set forth in this Section from midnight to 10:00 a.m. or from 6:00 p.m. to midnight.
- (c) During a Stage II shortage, landscape irrigation with a drip irrigation system or hand-held container is allowed for trees, shrubs and plants (including vegetable and flower gardens, but excluding turf grass) at any time. Landscape irrigation with a hose with attached positive shutoff nozzle is allowed for trees, shrubs and plants (including vegetable and flower gardens, but excluding turf grass) on a water customer's designated watering day from midnight to 10:00 a.m. or from 6:00 p.m. to midnight. Irrigation with a hose means holding in the hand a hose with attached positive shutoff nozzle, and does not include operating a hose with a sprinkler or manually operating an irrigation controller.
- (d) During a Stage II shortage, if there is no street address associated with the premises, such as a parkway or median (private or public), the outdoor landscape watering schedule for commercial users shall be followed.
- (e) During a Stage II shortage, no water customer shall:
- (1) Apply water to any turf grass, sodded or landscape area resulting in the pooling or flowing of water across the ground or into drainage ways, including but not limited to, gutters and storm sewers;
 - (2) Fail to repair any irrigation system that is leaking; or
 - (3) Apply water intended for landscape irrigation to an impervious surface, such as a street, sidewalk, driveway, patio or deck.
- (f) During a Stage II shortage, motor vehicles, trailers, boats and other types of equipment shall be washed only during a water customer's designated watering days as set forth above and only with a hand-held hose equipped with a positive shutoff nozzle for quick rinses or with a bucket; except that washing of vehicles, trailers, boats and equipment may be done by a commercial car wash if the outflows are routed through the City sanitary sewer system.
- (g) During a Stage II shortage, there shall be no hose washing of sidewalks, walkways, patios, driveways, parking areas or other impervious surfaces, except to eliminate conditions that pose a threat to public health or safety or when required as surface preparation for the application of architectural coatings or painting.
- (h) During a Stage II shortage, the use of water in all public and private water features is prohibited except those using recirculating water. The use of recirculating water in all public and private water features shall be limited to no more than twelve (12) hours per day. A sign shall be posted near the water feature stating designated operating hours and that it uses recirculating water. The foregoing shall not apply to the use of water essential to the support of existing exotic fish.
- (i) During a Stage II shortage, ponds and pools shall be filled or refilled only during a water customer's designated watering day as set forth above, and only with a handheld hose equipped with a positive shutoff nozzle. The foregoing shall not apply to the use of water essential to the support of existing exotic fish.
-

Draft for Discussion Purposes Only

(Ord. 1423 §§1, 2, 2006; Ord. 1348, 2003)

13.04.350 - Stage III shortage.

A Stage III shortage may be declared when the City Council determines that proactive measures should be taken to avoid or reduce the severity of a shortage. In addition to the Stage I and Stage II restrictions set forth above, the following restrictions on the use of water by water customers shall be in effect during a Stage III shortage.

- (1) No additional water connections will be allowed.
- (2) Outdoor watering shall be prohibited except for limited irrigation to sustain large trees with trunks of at least six (6) inches in diameter, measured at the base of the tree.
- (3) Washing of motor vehicles, trailers, boats and other types of equipment shall be prohibited, except that washing may be done by a commercial car wash.
- (4) The use of water in all public and private water features shall be prohibited.
- (5) Filling or refilling any pond or swimming pool shall be prohibited except so as to prevent damage to the structure.

(Ord. 1423 §§1, 2, 2006; Ord. 1348, 2003)

13.04.360 - Duration of water use restrictions.

The City Council (in concert with the Board of Utility Commissioners) will regularly evaluate the full supply and projected demand to determine whether it is necessary to continue the water use restrictions of a declared stage. Stages may be declared in accord herewith, and, if water supply conditions warrant, the City Council may either downgrade or withdraw a declaration of a stage.

(Ord. 1423 §§1, 2, 2006; Ord. 1348, 2003)

13.04.370 - Alternative water management plans.

- (a) General. A water customer may request relief from applicable provisions of Sections 13.04.300 through 13.04.415, inclusive, by filing an alternative water management plan with the City Manager for consideration by the City Council. The City intends to provide water customers with the ability to design water management alternatives that give water customers flexibility in meeting the requirements of this Chapter while achieving maximum conservation goals. Additionally, the City intends to acknowledge previously implemented water conservation measures.
 - (b) Alternative Water Management Plan. Alternative water management plans shall contain proposed water reduction measures or otherwise demonstrate optimal use of water. In the event a water customer submits an alternative water management plan for irrigation, the water customer's plan shall be in accord with the City's irrigation criteria. Alternative water management plans for irrigation shall not be allowed during a Stage III shortage.
 - (c) Approval. No alternative water management plan shall be approved unless the water customer affirmatively demonstrates that:
 - (1) Proposed water reduction measures achieve at least the same level of demand reduction as the applicable restrictions of Sections 13.04.300 through 13.04.415, inclusive;
 - (2) Recently implemented water conservation measures achieve at least the same level of demand reduction or efficiency as the applicable restrictions of Sections 13.04.300 through 13.04.415, inclusive (shall not apply to the City, as it is committed to lead by example and has already implemented conservation measures); or
-

Draft for Discussion Purposes Only

- (3) The water customer has a critical need, which may include, but not be limited to, the watering of heavily used athletic or playing fields. Alternative water management plans must be reviewed and approved by the City Council in writing based on the then-current criteria established by the City before a water customer may implement any alternative water management plan. The water customer shall comply with the conditions of the approved alternative water management plan unless good cause exists for changes to the plan and the plan is amended accordingly and approved as set forth in this Section. Any water customer with an approved alternative water management plan shall post a notice of the existence of the plan on the premises so as to be visible from a public street at all times during the term of the plan. The City may withdraw or amend any approved alternative water management plan upon the movement to a different declared stage or outdoor landscape watering level.
- (d) Violations. In the event a water customer violates any condition of an alternative water management plan approved under this Section, then the approval granted under this Section shall be withdrawn, and the City may add a charge to the water customer's bill equal to one hundred dollars (\$100.00) for a residential user and five hundred dollars (\$500.00) for a commercial user.

(Ord. 1423 §§1, 2, 2006; Ord 1348, 2003)

13.04.380 - Exceptions.

- (a) Water customers may use water essential to protect general public health, safety or welfare.
- (b) In a Stage II shortage, a water customer installing turf grass, by sod or seed, may irrigate the affected area at times other than as set forth herein if the water customer obtains a valid turf irrigation permit in accord with this Section. Applications for turf irrigation permits shall be submitted to the City on a form supplied by the City, and shall include all necessary supporting documentation. Applications shall be accompanied by a fifty-dollar permit fee. The applicant shall comply with the conditions of the turf irrigation permit. The turf irrigation permit shall be displayed on the premises so as to be visible from a public street at all times during the term of the turf irrigation permit. Notwithstanding the foregoing, turf irrigation permits shall not be issued during Levels D and E of a Stage II shortage.
- (c) Irrigation systems may be operated at any time for cleaning and maintenance purposes, but this limited operation shall not exceed ten (10) minutes per zone per week. On a residential user's premises, an attendant must be on site and visible throughout the entire maintenance operation. On a commercial user's premises, an attendant must be on site and a sign indicating maintenance is being performed must be posted and visible from a public street throughout the entire maintenance operation.

(Ord. 1423 §§1, 2, 2006; Ord. 1348, 2003)

13.04.390 - Access to premises.

- (a) Whenever necessary for the purpose of investigating any alleged violation of Sections 13.04.300 through 13.04.415, inclusive, the City shall have the power, upon the presentation of proper credentials, to enter and inspect at any reasonable time and in any reasonable manner the exterior of a water customer's premises.
- (b) If entry to or inspection of the premises is denied or not promptly permitted, the City Manager and/or the City Attorney is authorized to make application to the Municipal Court for the issuance of an inspection warrant. The application shall identify the premises upon which entry is sought and the purpose for which entry is desired, and shall state the facts giving rise to the belief that a condition which is dangerous to the public health, safety or welfare exists at the premises. Any warrant issued pursuant to the application shall command the owner or occupant to permit entry by the City Manager or his or her representative for the purpose stated.

(Ord. 1423 §§1, 2, 2006; Ord. 1348, 2003)

Draft for Discussion Purposes Only

13.04.400 - Liability.

Each water customer shall be responsible for compliance with Sections 13.04.300 through 13.04.415, inclusive, with respect to the water customer's premises, and shall be responsible for applicable charges for noncompliance with Sections 13.04.300 through 13.04.415, inclusive. In the event of an alleged violation of Sections 13.04.300 through 13.04.415, inclusive, proof that the condition originated at any water customer's premises shall constitute a rebuttable presumption that the water customer is responsible for the violation.

(Ord. 1423 §§1, 2, 2006; Ord. 1348, 2003)

13.04.415 - Affirmative defenses.

- (a) It shall be an affirmative defense to any person charged under any of Sections 13.04.300 through 13.04.415, inclusive, if all of the factors enumerated below exist at the time of the offense:
- (1) The cited violation is for violation of any provision of Sections 13.04.300 through 13.04.415, inclusive;
 - (2) The person charged is eighty (80) years of age or older;
 - (3) The person charged demonstrates by credible evidence the actual date of birth so charged;
 - (4) The violation is for a time violation wherein the person charged has been charged with a violation of watering from 10:00 a.m. until 11:59 a.m. on the otherwise designated watering day;
 - (5) The person charged with the offense was using a hand-held or lawn sprinkling device other than automated sprinklers as set forth in Subsection (4) above;
 - (6) The violation is solely based upon a violation of allocated time.
- (b) The Court, in making a determination that the affirmative defense applies, shall excuse all court costs associated with the legal action.
- (c) The Court shall dismiss the action with prejudice.

(Ord. 1423 §§1, 2, 2006)



Appendix D – AWWA M-36 Methology



Appendix E – Public Notice and Comments

