Loveland Water and Power

Colorado Water Conservation Board
Attn: Kevin Reidy
1313 Sherman Street, Room 721
Denver, CO 80203

June 3, 2020

Re: City of Loveland, 2020 Water Efficiency Plan

Dear Mr. Reidy:

The City of Loveland has completed the final draft of its Water Efficiency Plan (WEP). This letter includes the Cover Letter Submittal Requirements for Colorado Water Conservation Board (CWCB) review and approval of our Water Efficiency Plan.

Name and Contact Information for the City of Loveland:

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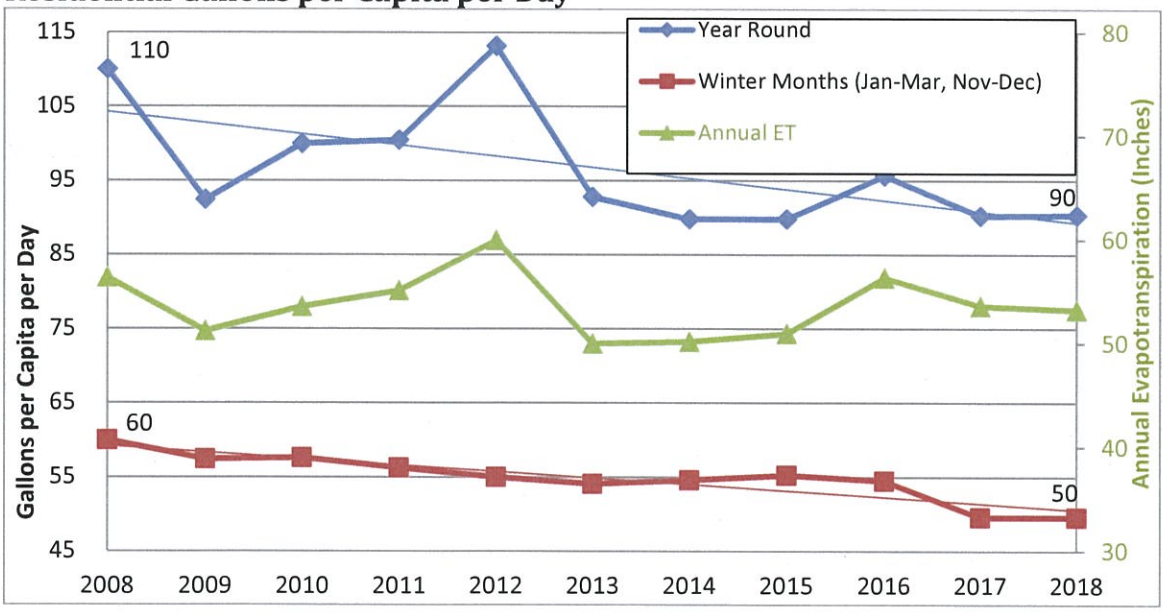
Organizations and Individuals that Assisted in Plan Development:

Loveland's WEP incorporates information provided by various areas of the City of Loveland including the Water & Power Department, Planning Department, Parks and Recreation Department, Utility Billing, and Facilities. The WEP also includes demand management programs available to our customers through Northern Water. Projections on future raw water yields was taken from the 2019 Raw Water Supply Yield Analysis compiled by Spronk Engineering. The update to the plan was compiled in-house by Michelle Erickson, Technical Specialist for the Water Division.

Summary of Water by Customer Category (1000s Gallons):

Year	Single Family	Commercial	Irrigation	Multi-Family	City Use	Hydrant Meter	Wholesale Water	Ranch Water	Non-Revenue Water	Total Treated Water Demand
2008	2,245,938	612,128	504,801	357,794	69,194	78,957	5	4,033	575,580	**4,448,430**
2009	1,894,127	530,661	406,265	335,915	56,127	41,004	0	3,166	575,934	**3,843,200**
2010	2,102,641	554,884	478,398	368,909	68,156	32,669	1,295	3,707	545,341	**4,156,000**
2011	2,106,343	589,363	488,724	414,311	71,316	27,905	1,221	3,584	614,733	**4,317,500**
2012	2,414,488	655,596	585,345	456,881	76,258	19,464	1,710	4,112	663,727	**4,877,581**
2013	1,958,089	576,564	389,629	425,036	71,908	14,499	3,072	3,313	780,414	**4,222,524**
2014	1,903,445	603,642	453,914	424,295	69,790	18,684	7,906	2,665	705,436	**4,189,777**
2015	1,971,128	611,242	458,055	435,684	74,669	10,574	87,113	2,702	695,826	**4,346,993**
2016	2,140,216	642,975	515,925	463,473	81,958	14,062	21,420	4,334	724,133	**4,608,496**
2017	2,040,792	632,067	462,651	457,006	74,877	11,850	24,014	4,999	999,623	**4,707,878**
2018	2,085,928	673,394	510,925	460,737	78,066	21,866	72,176	4,943	755,648	**4,663,683**

Residential Gallons per Capita per Day



The updated WEP underwent review by City staff, City management and the public during the past months. After staff review and editing, the draft WEP was made available to the public for comments for a 60-day period from January 13, 2020 through March 12, 2020. After the public comment period closed, staff presented the Final WEP to the Loveland Utilities Commission (LUC) on May 20, 2020, and

they unanimously adopted a motion recommending that City Council adopt the 2020 Water Efficiency Plan Update. City Council reviewed the WEP and provided unanimous approval at the June 2, 2020 City Council meeting.

We look forward to the CWCB's review and further implementation of wise water use of water as outlined in this WEP.

Sincerely,

Joseph J. Bernosky
Director of Loveland Water and Power

Attachment: City of Loveland, Updated Water Efficiency Plan Dated June 2020.

City of Loveland

WATER EFFICIENCY PLAN

Draft Plan
Updated December 2019

Table of Contents

Foreword **1**

1 – Profile of Existing Water Supply System **2**

1.1 Overview of Loveland's Water System 3

1.2 Water Supply Reliability 5

1.3 Water Supply Limitations 9

2 – Profile of Water Demands and Historical Demand **15**

2.1 Demographics and Key Characteristics of the Service Area 15

2.2 Historical Water Demands 18

2.3 Past & Current Water Efficiency Programs with Estimated Water Savings 34

Changes in Overall Water Demand 47

2.4 Demand Forecasts 52

3 – Integrated Planning and Water Efficiency Benefits and Goals **54**

3.1 Water Efficiency and Water Supply Planning: 54

3.2 Water Efficiency Goals 57

3.3 Integrated Land Use Planning and Water Efficiency Benefits and Goals 59

4 – Selection of Water Efficiency Activities **66**

4.1 Summary of Selection Process 66

4.2 Demand Management Activities 68

5 – Implementation and Monitoring **95**

5.1 Implementation Plan 95

5.2 Monitoring Plan 95

6 – Policy Adoption, Public Review and Formal Approval **99**

6.1 Adoption of New Policy 99

6.2 Public Review Process 100

6.3 Local Adoption and State Approval Processes 101

6.4 Periodic Review and Update 101

Appendix A - City of Loveland Current Water Rates **102**

Appendix B - City of Loveland Irrigation Plan **155**

Appendix C - Modified Worksheets D-G & J **247**

Appendix D - Public Comment Notices and Public Comments **264**

List of Figures

Figure 1-1: City of Loveland Water Service Area 2
Figure 1-2: City's Total Water Demand Projections vs. Firm Yield Projections 8
Figure 1-3: Water Treatment Plant Peak Day Production 11
Figure 1-4: Water Reclamation Facility Solids BOD Capacity per Day..... 12
Figure 1-5: Age of Waterlines by Decade Installed 13
Figure 1-6: Age of Water Valve by Decade Installed..... 13
Figure 1-7: Age of Water Pump Station by Decade Installed 13
Figure 1-8: Age of Water Storage Tank by Decade Installed 14
Figure 1-9: Historical Average Price per CBT Unit 14
Figure 2-1: Average Treated Water Metered Use by Customer Category (2008-2018) 17
Figure 2-2: Population Served and Total Treated Water Demand (2005 to 2018) 19
Figure 2-3: Annual Treated Water Metered Use by Year & Customer Category..... 20
Figure 2-4: Single Family Residential Average Monthly Water Demand (2008 to 2018)... 20
Figure 2-5: Multi-Family Residential Average Monthly Water Demand (2008 to 2018)..... 21
Figure 2-6: Commercial Average Monthly Water Demand (2008 to 2018)..... 21
Figure 2-7: City Use Average Monthly Water Demand (2008 to 2018) 21
Figure 2-8: Irrigation Customer Class Average Monthly Water Demand (2008 to 2018)... 22
Figure 2-9: Wholesale Water Average Monthly Water Demand (2008 to 2018)..... 22
Figure 2-10: Hydrant Rentals Average Monthly Water Demand (2008 to 2018) 23
Figure 2-11: Ranch Water Average Monthly Water Demand (2008 to 2018)..... 23
Figure 2-12: Treated Water Produced, Billed Consumption and Non-Revenue Water 25
Figure 2-13: Average Monthly Treated Water Produced, Billed Consumption, and Non-Revenue Water (2005 to 2018) 26
Figure 2-14: Total Average Daily water Demand per Connection 29
Figure 2-15: Residential Gallons per Capita per Day 30
Figure 2-16: Average Acre Feet of Water per Acre Per Year on Parks and Public Grounds 33
Figure 2-17: Residential Gallons per Capita per Day 48
Figure 2-18: Average Annual Indoor vs. Outdoor Water Usage per Connection..... 49
Figure 2-19: Single Family Residential – Average Water Use per Connection per Year... 49
Figure 2-20: Multi-Family Residential – Average Water Use per Connection per Year..... 50
Figure 2-21: Irrigation – Average Water Use per Connection per Year..... 50
Figure 2-22: Commercial – Average Water Use per Connection per Year..... 51
Figure 2-23: Demand Projections without Changes to Currently Implemented Demand Management Activities 53
Figure 3-1: Unmodified and Modified Treated Water Demand Projections 56
Figure 4-1: SWSI Levels Framework..... 67
Figure 4-2: Leaks Detected and Repaired by the City and Estimated Water Loss from Reported Leaks (2008 to 2018)..... 80
Figure 6-1: The Heart Improvement Program (HIP) Street Modernization Plan Map 100

List of Tables

Table 1-1: Projected Water Demand Scenarios 7
Table 1-2: 2019 Estimate of Target Water Supply for City Water Utility Service Area 7
Table 2-1: Summary of LWP's Water Customers – August 2018 15
Table 2-2: Summary of Population Served and Treated Water Demand - 2005 to 2011 19
Table 2-3: New Construction Residential Dwellings 2011-2016 24
Table 2-4: Summary of Billed Water by Customer Category 27
Table 2-5: Water Balance Table from AWWA M-36 28
Table 2-6: Shower Head Direct Installs 34
Table 2-7: Bathroom Aerator Direct Installs 34
Table 2-8: Kitchen Aerator Direct Installs 34
Table 2-9: Toilet Tank Bag Direct Installs 35
Table 2-10: Larimer County Conservation Corps 35
Table 2-11: Home Energy Audits 35
Table 2-12: Efficiency Works (Direct Installs & Rebates of Water Efficient Fixtures) 36
Table 2-13: Slow the Flow (Sprinkler Audits) 37
Table 2-14: Garden-In-A-Box (Xeriscape Garden Sales) 37
Table 2-15: Shave the Peak Campaign 38
Table 2-16: Leak Repair Program 38
Table 2-17: Hydrozone Program 39
Table 2-18: Water Line Replacement or Rehabilitation Program 41
Table 2-19: Water Meter Testing Program 41
Table 2-20: Children's Water Festival 41
Table 2-21: Colorado Waterwise (*Live Like You Love It)* 42
Table 2-22: City Update (Utility Bill Insert) 42
Table 2-23: Community Stewardship Lecture Series 42
Table 2-24: Water Wise Seminars 43
Table 2-25: Residential e-Newsletter 43
Table 2-26: Xeriscape Demonstration Gardens 43
Table 2-27: Social Media 43
Table 2-28: Video Views (Youtube and Facebook) 44
Table 2-29: Event Participation 44
Table 2-30: Overall Water Savings for All Programs 47
Table 2-31: Population Estimates & Projections 52
Table 3-1: Unmodified and Modified Treated Water Demand Projections 56
Table 3-2: Water Efficiency Goals 58
Table 4-1: Foundation Activities to Implement 69
Table 4-2: Inventory of Meters Maintained by the City (As of December 2018) 72
Table 4-3: Targeted Technical Assistance and Incentives to Implement 81
Table 4-4: Customers Using More than 10 Million Gallons from 2014 through 2018 85
Table 4-5: Direct Install Water Savings per Fixture Type 87
Table 4-6: Water Efficient Rebates Currently Offered 88
Table 4-7: Toilet and Urinal Rebate Program 89
Table 4-8: Ordinances and Regulations to Implement 89
Table 4-9: Educational Activities to Implement 92
Table 5-1: Summary of City's 5-Year (2020-2024) Detailed Water Project Capital Plan 96
Table 5-2: Monitoring Plan Metrics 97

List of Acronyms

AF	Acre Feet
All	All Customer Classes
BMC	Billed Metered Consumption
BUC	Billed Unmetered Consumption
City	City of Loveland
Com	Commercial Customer Class
CP	Cathodic Protection
CWCB	Colorado Water Conservation Board
ET	Evapotranspiration
FTWD	Finished Treated Water Demand
GPCD	Gallons per Capita per Day
GPD	Gallons per Day
IPC	International Plumbing Code
Irr	Irrigation Customer Class
K	Thousands
LWP	Loveland Water and Power
M	Millions
MG	Million Gallons
NRW	Non-Revenue Water
O&M	Operations and Maintenance
Qty	Quantity
Res	Residential Customer Class
RWSYA	Raw Water Supply Yield Analysis
SF	Square Feet
SWSI	Statewide Water Supply Initiative
UDC	Unified Development Code
UMB	Unbilled Metered Consumption
UUC	Unbilled Unmetered Consumption
WC	Wholesale City Customer Class
WEP	Water Efficiency Plan
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

Foreword

The City of Loveland has a long history of promoting the responsible use of water in the community, since water is a precious resource in this semi-arid region of the Western United States. The City has long utilized multiple tools to ensure that its customers are provided with safe and sufficient water supplies now and for future generations. The City and its customers have long shared an enlightened relationship, whereby they understand and value the importance of a reliable and sustainable water supply. Together the City and the local citizenry work to responsibly manage this precious resource.

The City of Loveland's water utility has been delivering drinking water to customers in and near Loveland since 1887. Today, the water utility is part of the Department of Water and Power and serves water to a population of over 77,262[1] with a service territory of an estimated 33 square miles. From 1990 to 2018, the City has seen an increase of nearly 106% in the population served by the utility, which is consistent with the population boom experienced by much of the north Front Range. However, the City and its customers have been able to work together to limit water restriction practices that many other Front Range communities needed to implement during the 2002 and 2003 drought when water supplies became short. Since this drought, the City has been able to limit water demand increases through messaging with its engaged citizenry.

As with other Colorado Front Range communities, the City expects continued growth and increased water demands over the coming decades. The City recently completed capacity expansion projects at both the water treatment plant and wastewater treatment plant. Although the City maintains a diversified water rights portfolio that will meet the needs of the growing community, the current infrastructure has limits and will eventually require future expansion and improvements to meet the predicted increases in peak day demands and average annual demands at both the water and wastewater treatment plants. In addition, the City is responsible for supplying a reliable and cost-effective water supply to its customers. Therefore, the City has a number of reasons to guide and support water efficiency within the utility and with its customers during the coming years.

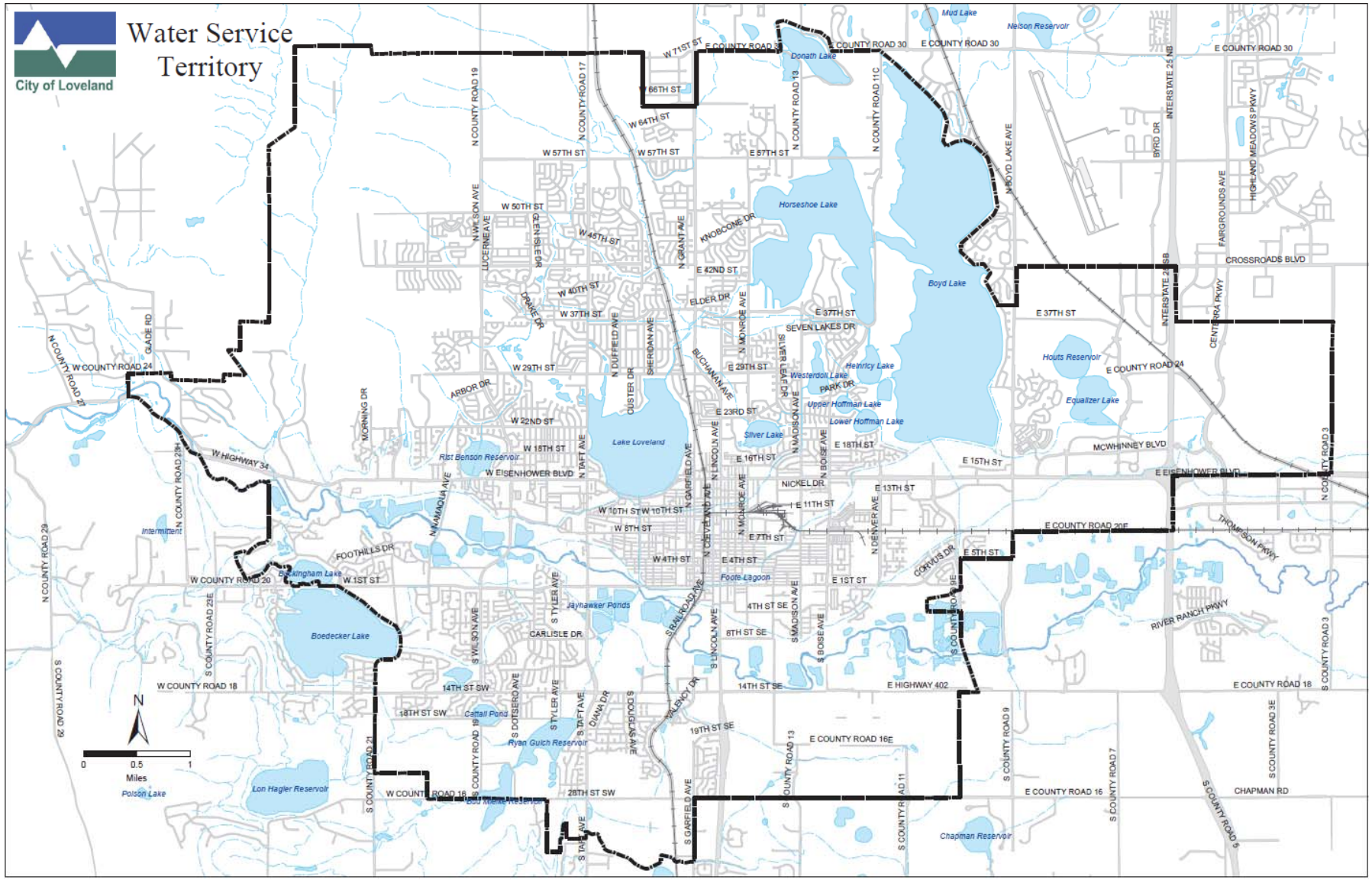
The City's water efficiency planning effort, which is documented in this report, focuses on enhancing future water use efficiency within the utility's service area by managing both indoor and outdoor water use of the City, identifying and implementing measures and programs to reduce overall water usage and summertime peak day water demand, and assisting customers that wish to improve their water use efficiency.

The City recognizes that it is a combination of its actions and the actions and behaviors of its customers that will determine whether the water efficiency measures and programs presented in this Plan are successful. The City is committed to implementing those efforts that will support the long-term sustainability and efficacy of the utility to provide affordable, reliable water to its customers in a manner that customers depends upon. The City has prepared this update to the Water Efficiency Plan in adherence to the prevailing state statutory requirements according to Colorado's Water Conservation Act of 2004 (HB 04-1365).

[1] 2018 population estimate from the Annual Data and Assumptions Report. City of Loveland Community and Strategic Planning. August 2018.

1 – Profile of Existing Water Supply System

FIGURE 1-1: CITY OF LOVELAND WATER SERVICE AREA



1.1 Overview of Loveland's Water System

The City of Loveland was incorporated in the 1880s and has been acquiring and administering water rights ever since. The City began acquiring water rights to use water in the Big Thompson River. Some water rights were purchased outright or filed on the river by the City, while others were dedicated to the City. Early transfers of the No. 1 priority on the Big Thompson River and domestic rights diverted at the Loveland pipeline form the base of the City's water rights. Early plats of the City's annexation show dedication of water rights, which were appurtenant to the land becoming part of the City. In 1960, the City began formally requiring dedication of water rights prior to development. The City has historically accepted native ditch shares/inches, Colorado-Big Thompson Project water and cash-in-lieu of water rights to satisfy raw water requirements for development. The City owns 12,190 units of the CBT Project. The City was also one of the original "Six Cities" to invest in the Windy Gap Project. None of Loveland's water supply comes from groundwater. Its sources are renewed each year with snowmelt and rain.

Currently, the City has a firm yield[2] of approximately 25,720 acre feet (AF) per year, with another 4,730 AF expected as part of the Windy Gap Firming project[3]. In recent years, the greatest annual demand for potable water to the City's customers was 14,969 AF in 2012.

Key Facilities: Following are brief descriptions of the City's key water and wastewater utility facilities.

Reservoirs:

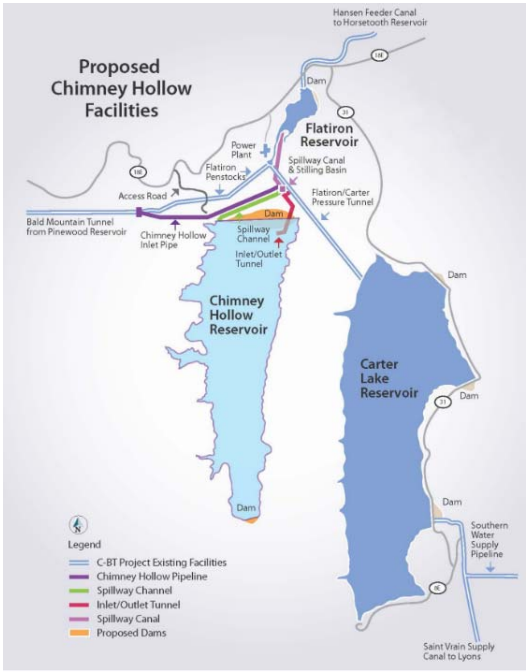
1. **Green Ridge Glade Reservoir** is located about seven miles west of the City, in the valley above the City's Chasteen's Grove Water Treatment Plant and north of the Big Thompson River. When first built, this reservoir had a storage capacity of 600 acre-feet (AF). Following years of planning, design and construction, the City's Green Ridge Glade Reservoir (GRGR) was enlarged from its original 600 acre-feet (AF) capacity to its current storage capacity of approximately 6,835 AF at the normal high water line.

[2] Firm yield is based on the yield of the City's water rights portfolio in conditions equivalent to a 100-year drought.
[3] 2019 Update to the City of Loveland Raw Water Yield Analysis

2. **Great Western Reservoir:** In February 2019, the City purchased approximately 120 acres that included a lined gravel pit. On December 21, 2018, the City filed an application for a conditional water storage right at this site. Additional infrastructure is necessary to make diversions into and out of this reservoir. The project to install that infrastructure is expected to occur approximately eight to ten years in the future (circa 2030). When completed**,** this will provide the City with an estimated 1,300 AF of active storage space resulting in 1,850 AF of additional firm yield**.**

3. **Chimney Hollow Reservoir:** The City is one of the participants in the Windy Gap Firming Project (WGFP). This project will create storage in Chimney Hollow Reservoir (located immediately west of Carter Lake) to make waters from the Windy Gap Project firm. The Chimney Hollow Reservoir site is the most viable and cost effective alternative for firming Windy Gap water.

Loveland owns 40 units of the Windy Gap Project, all of which are available for firming in the WGFP. These units are projected to yield approximately 100 AF per unit when firmed. From 2011 through 2019, the following major milestones have been achieved on the WGFP:



- 2011: **State Officials** approve the Fish and Wildlife Mitigation Plan and Voluntary Enhancement Plan
- 2011: **USBR** publishes the Final Environmental Impact Statement
- 2012: **Grand County** and the **Municipal Subdistrict board** approve agreements to create improvements to the Colorado River
- 2014: **USBR** issues its Record of Decision and signs a carriage contract to transport water to Chimney Hollow Reservoir
- 2016: **State of Colorado** issues a 401 Water Quality Certification
- 2017: **U.S. Army Corps of Engineers** issues its final Record of Decision

The staff of the Northern Colorado Water Conservancy District Municipal Subdistrict (Municipal Subdistrict) anticipate the WGFP construction will begin in 2020, depending upon the resolution of a pending lawsuit filed by a consortium of environmental interests

against the federal agencies permitting the project. Construction is expected to take three to four years depending on conditions.

As part of the National Environmental Policy Act (NEPA) process, the City was required by the Municipal Subdistrict to subscribe to a specific storage amount in the WGFP. The City has subscribed to 9,587 AF of storage in an East Slope reservoir. Currently the Preferred Alternative in the Windy Gap Firming Project is the Chimney Hollow site. City Council has directed City staff to continue to pursue acquisition of additional storage in the WGFP up to a total of 10,000 AF. That additional 413 AF of storage, if it becomes available, would increase the City's firm yield from WGFP by approximately 120 AF.

Water Treatment Plant: Loveland has one filtered water treatment plant located in Chasteen's Grove, about seven miles west of town at elevation 5,220 feet, with a treatment capacity of 38 million gallons per day. It treats water diverted directly off the Big Thompson River or from the City's Green Ridge Glade Reservoir located north of the plant. The plant treats water from native flows out of the Big Thompson River and transbasin water supplies from the Colorado River Basin.

Water Distribution System: As of the end of 2018, the water distribution system consisted of 463.4 miles of water lines, 3,171 hydrants, 8 pump stations and 20.3 million gallons of treated water storage. Due to the water treatment plant being located at a higher elevation than the service area, approximately 70% of the water distribution system is gravity fed. There are six pressure zones providing water to the remaining 30% of the distribution system.

Wastewater Collection System: As of the end of 2018, the wastewater collection system consisted of 453 miles of wastewater lines, 8,917 manholes, and 18 lift stations.

Water Reclamation Facility: Loveland's Water Reclamation Facility (wastewater treatment plant) is located adjacent to the Big Thompson River, about 12.1 miles downstream from the water treatment plant at elevation 4,910'. The plant recently underwent an expansion project that increased the treatment capacity from 10 million gallons per day to 12 million gallons per day.

1.2 Water Supply Reliability

The City of Loveland is located in the South Platte River Basin where the 2010 Statewide Water Supply Initiative (SWSI) identified a 58 percent gap between water needs and water supplies in the basin by 2050. Loveland's participation in the following projects is in-line with the following ways the SWSI report identified to help close the gap:

- **Water Conservation and Efficiency:** Efficiency measures outlined in this Water Efficiency Plan
- **Firming Transbasin Water Rights:** Participation in the Windy Gap Firming Project (Chimney Hollow Reservoir)
- **Firming In-Basin Water Rights:** Completion of the Great Western Reservoir downstream storage project, possible raising of the spillway at Green Ridge Glade Reservoir by 3 feet, and completing Lawn Irrigation Return Flows water court case.

Drought Planning: The City's first effort at long-range resource planning was an August 1986 drought study performed by Camp, Dresser & McKee, Inc.. On October 7, 1986 the Loveland City Council accepted the report and gave direction to staff to prepare the City to meet its full demands during a drought event with a recurrence of 1 in 100 years without curtailment. A 1-in-100 year drought is a drought having a one percent chance of occurring in any given period. This level of drought protection has remained the consistent goal for the City since approval of the recommendations in Phase I of the August 1986 Drought Study.

Raw Water Supply Model: The City contracted with Spronk Water Engineering (SWE) to create and update a raw water supply yield model. The model, which was last updated in 2019, simulates daily water supply and demand from 1951 through 2015 using historical records and assists the City in its current and future water supply planning efforts. This period covers several wet and dry years and includes both the recent droughts of 2002 to 2003 and 2012. Other dry years included 1954 and 1977. Recent wet years include 2009 and 2015. The analysis determined that the extreme conditions experienced in 2002 reasonably represent 1-in-100 year drought conditions.

As part of the 2019 model update, SWE simulated conditions in the Big Thompson River basin throughout the study period. Using the model, the City's firm yield supply of raw water was determined based upon the historic flow conditions over that period. SWE recommends that the City should continue its policy of maintaining a water supply capable of withstanding a 100-year drought.

Firm Yield: The firm yield is defined as the maximum annual demand that can be dependably supplied through the 1951 through 2015 simulated study period without shortage.

- **Current Loveland Supply:** The City's current estimated firm yield is approximately 24,870 AF/yr.

- **Addition of Windy Gap Firming Project:** The raw water supply model shows that Loveland's firm yield will increase to 28,600 AF per year once the Windy Gap Firming Project (Chimney Hollow Reservoir) is online.

- **Addition of Great Western Reservoir:** The raw water supply model shows that Loveland's firm yield will increase to 30,740 AF once both the Windy Gap Firming Project (Chimney Hollow Reservoir) and Great Western Reservoir projects are online. It is estimated that both these projects will be completed by approximately 2031.

The City ran the two scenarios as a cross-check to determine if approximately 40 years into the future, a firm yield of 30,740 AF would still meet the projected water demand. Based on these scenarios, the City's demands are met out to 2060 and slightly beyond. The projected population in 2060 is 137,366 with an average projected water demand of 26,179 AF. A basic summary of the two cross-check scenarios is presented below.

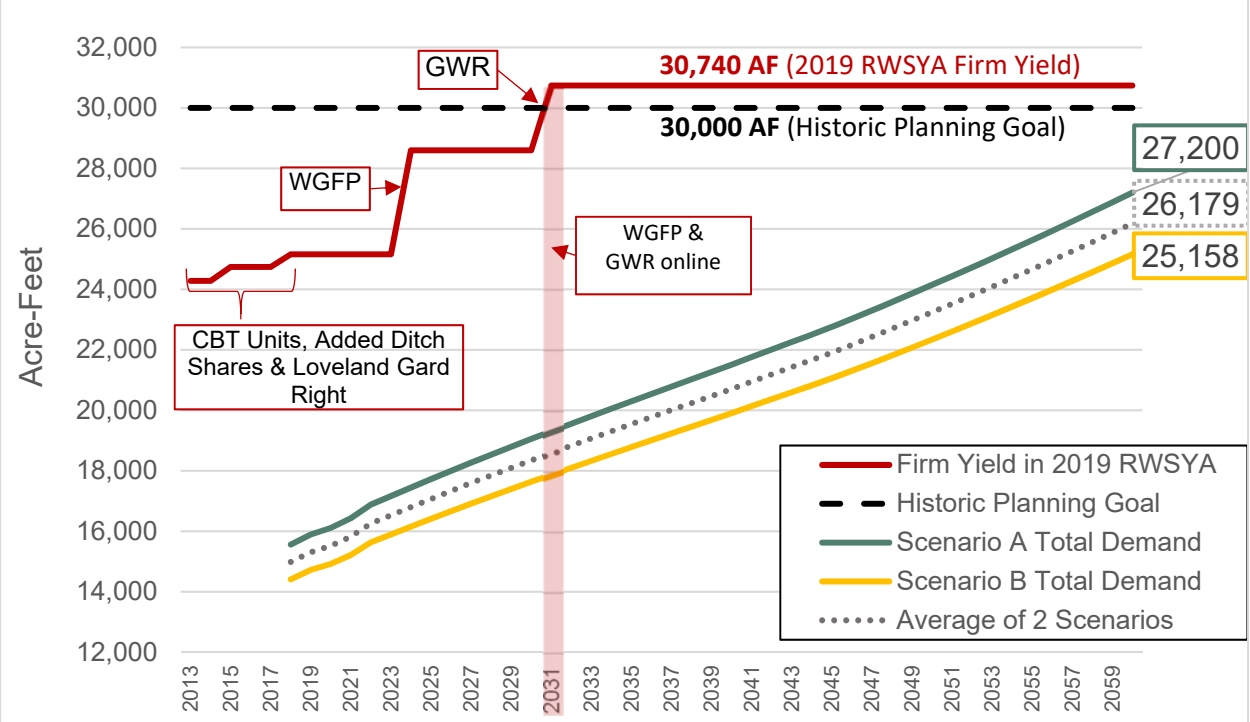
TABLE 1-1: PROJECTED WATER DEMAND SCENARIOS

	Scenario A	Scenario B
Start Demand of Scenario Projections	Largest historical annual treated water produced from the Loveland WTP plus 590 AF for augmentation and irrigation demands *(15,559 AF from 2012)*	5-year average *(2014 to 2018)* treated water produced from the Loveland WTP plus 590 AF for augmentation and irrigation demands *(14,410 AF)*
Beginning Year of Scenarios	Prior Year *(2018)*	
Beginning Population	Last year's population estimate for Loveland* *(77,262 from 2018)*	
Demand Growth Rate	Through the year 2045, increased demands were based on estimated population growth rates*. For projections beyond 2045, the average of the last 15 years *(2031-2045)* of estimated growth rates* was applied.	
End Year of Projections	Approximately 40 years into the future *(2060)*	
*Notes: Based on the population estimates and estimated growth rates through the year 2045 from the *Annual Data and Assumptions Report* published in August 2018 by the City of Loveland Community and Strategic Planning Department.		

TABLE 1-2: 2019 ESTIMATE OF TARGET WATER SUPPLY FOR CITY WATER UTILITY SERVICE AREA

	Scenario A	Scenario B	Scenario Averages	Historic Planning Goal	2031 Firm Yield from 2019 RWSYA
Municipal Demand	26,610 AF	24,568 AF	**25,589 AF**		
Augmentation Demand	590 AF	590 AF	**590 AF**		
Total City Demand	**27,200 AF**	**25,158 AF**	**26,179 AF**	**30,000 AF**	**30,740 AF**

FIGURE 1-2: CITY'S TOTAL WATER DEMAND PROJECTIONS VS. FIRM YIELD PROJECTIONS



Based on these scenarios, the City's demands are met out to 2060 and slightly beyond, which demonstrates that the City's water portfolio is resilient and capable of providing water to meet demands even if senior exchanges on the river are operated more extensively in the future or if agricultural deliveries of CBT water in the Big Thompson River basin continue to decline. For additional information, please see the City's *2019 Raw Water Master Plan Update*.

Safety Factors: The guiding principles of the City's *Raw Water Master Plan* include measures to increase the safety and reliability of Loveland's water supplies and are as follows:

- Acquire and maintain a raw water supply sufficient to meet the demands of the City at a level of a 100-year drought without curtailment as the City expands into the Growth Management Area.
- Develop a diversified water supply portfolio consisting of water rights from both the South Platte River basin (specifically from the Big Thompson River) and from the Colorado River basin.

> *Note: Hydrologic and climatic conditions are usually not the same or of the same degree in the Colorado River basin and the Big Thompson River basin simultaneously. Having water from both basins provides the City with an additional increment of drought protection. If conditions are dry in the Colorado River basin and supplies are limited, less severe conditions may exist in the Big Thompson River basin and vice versa.*

- Develop flexible raw water strategies that enable the City to respond to changes in supply and demand conditions.

- Formulate and apply City policies, taking into consideration the overall impacts on all parties.

Climate Variability: The variability of climate conditions have been analyzed with the potential impacts on the City's water portfolio yield from both native water and transbasin water sources. Climate variability may impact the availability of water sources as well as the form and timing of those source with the possibility of any of the following occurring:

- Future streamflow may increase because of increased precipitation offsetting the impact of increased temperatures.
- Future streamflow may decrease because of increased evapotranspiration due to increased temperatures and decreases in precipitation.
- Declines in snowpack may occur.
- Runoff is expected to occur earlier during the season.

Excess Water Supplies: When Loveland has excess supplies after meeting its municipal demands, the excess water is used in the following ways:

- Filling Green Ridge Glade Reservoir by the end of the water year
- Augmentation leases
- Applied toward Northern Water's CBT Carry Over program
- Placed into Northern Water's regional pool in exchange for reimbursement
- Offered at discounted rates to the City's Parks and Recreation Department for either CBT leases or to top off their irrigation reservoirs.

1.3 Water Supply Limitations

In September 2013, the Front Range, including the City of Loveland, experienced some of the largest rainfall amounts recorded for this area in the last 100 years. Floods can often cause unforeseen damages and water providers can incur expenses beyond the normal anticipated capital improvement and operational budgets.

For long-term shortages and emergencies, the City is continually expanding its water rights portfolio with projects like Chimney Hollow Reservoir, Great Western Reservoir and Lawn Irrigation Return Flows.

For short-term deficiencies and emergencies (*e.g.,* natural disasters, human error, or aging infrastructure), the City maintains interconnections with Little Thompson Water District, Fort Collins-Loveland Water District, and the City of Greeley.

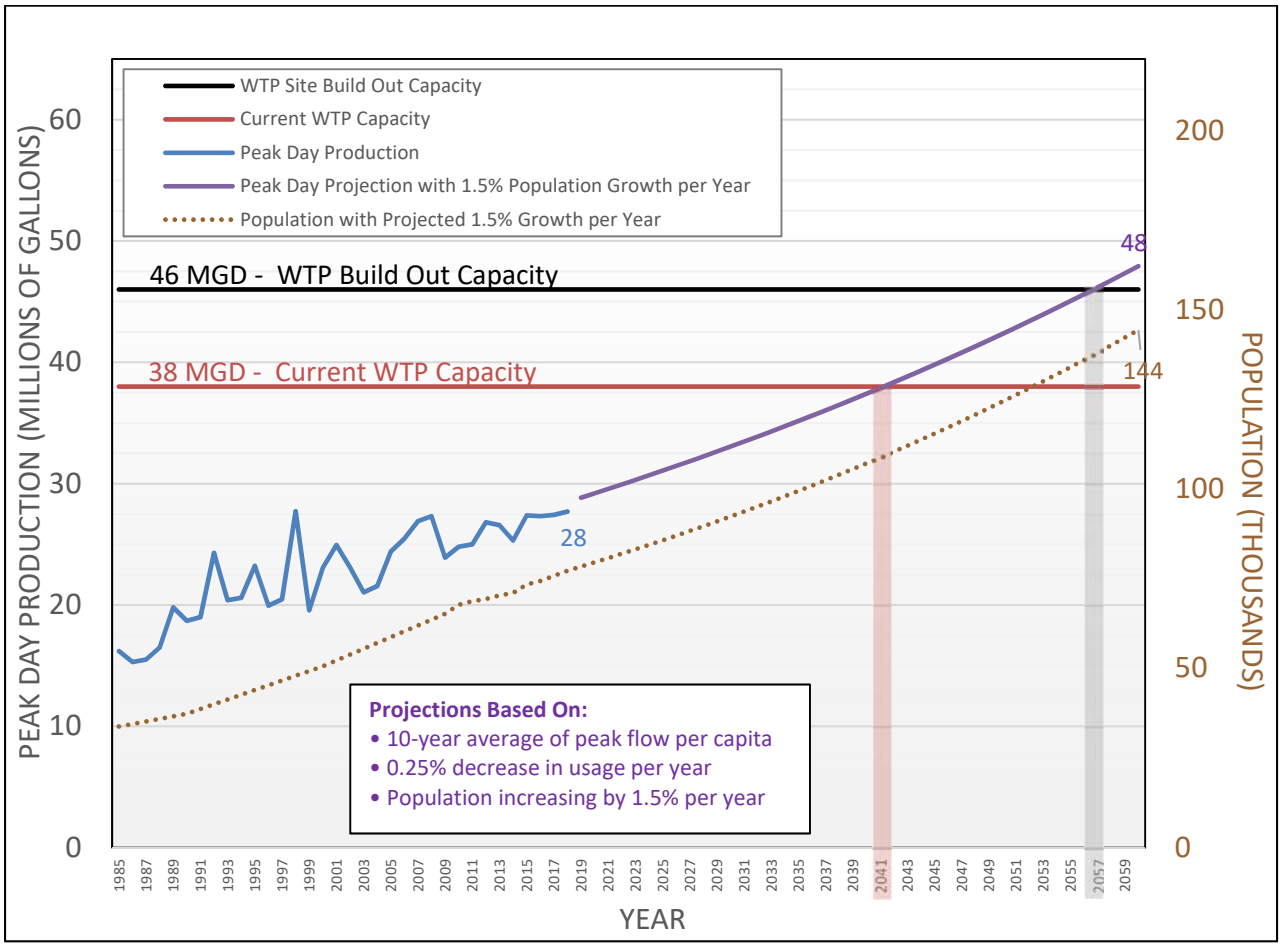
As previously indicated, the City has a robust water rights portfolio that has been developed over the past 130 plus years. The firm yield that exists as a result of the City's diligence is adequate to provide for current demands even within a 100-year drought.

Between 1986 and 1988 the City initiated work on a two-phase drought study using the services of the engineering firm of Camp, Dresser & McKee, Inc. Phase I of the study contained a recommendation that the City prepare to meet its full demands during a drought event with an average recurrence of 1-in-100 years, which translates into a 1% chance that in any year the City could not meet demands without curtailment. Council accepted Phase I of the report on October 7, 1986. The 1-in-100 year level of drought protection remains the goal for the City's raw water supply planning.

This planning policy requires developing sufficient supplies to meet the City's full water demand during a 1-in-100 year drought without water use restrictions. The Loveland Utilities Commission (LUC) and City Council reaffirmed this policy as part of the approval process for the original Raw Water Master Plan in 2005 and again in the 2012 and 2018 updates.

Water Treatment Plant Capacity: The City completed a water treatment plant expansion project in 2016 that raised the treatment plant capacity from 30 million gallons per day to 38 million gallons per day. Based on 2018 projections, the City anticipates needing an additional water treatment plant expansion project to meet summer peak day demands around the year 2041. Higher than anticipated population growth could increase the summer peak day demands and require the next expansion project to be needed sooner than currently anticipated. Improved water efficiencies focused at lowering summer peak demand could delay the need for the next expansion project. See Figure 1-3 for the historical peak day water production and future peak day water projections.

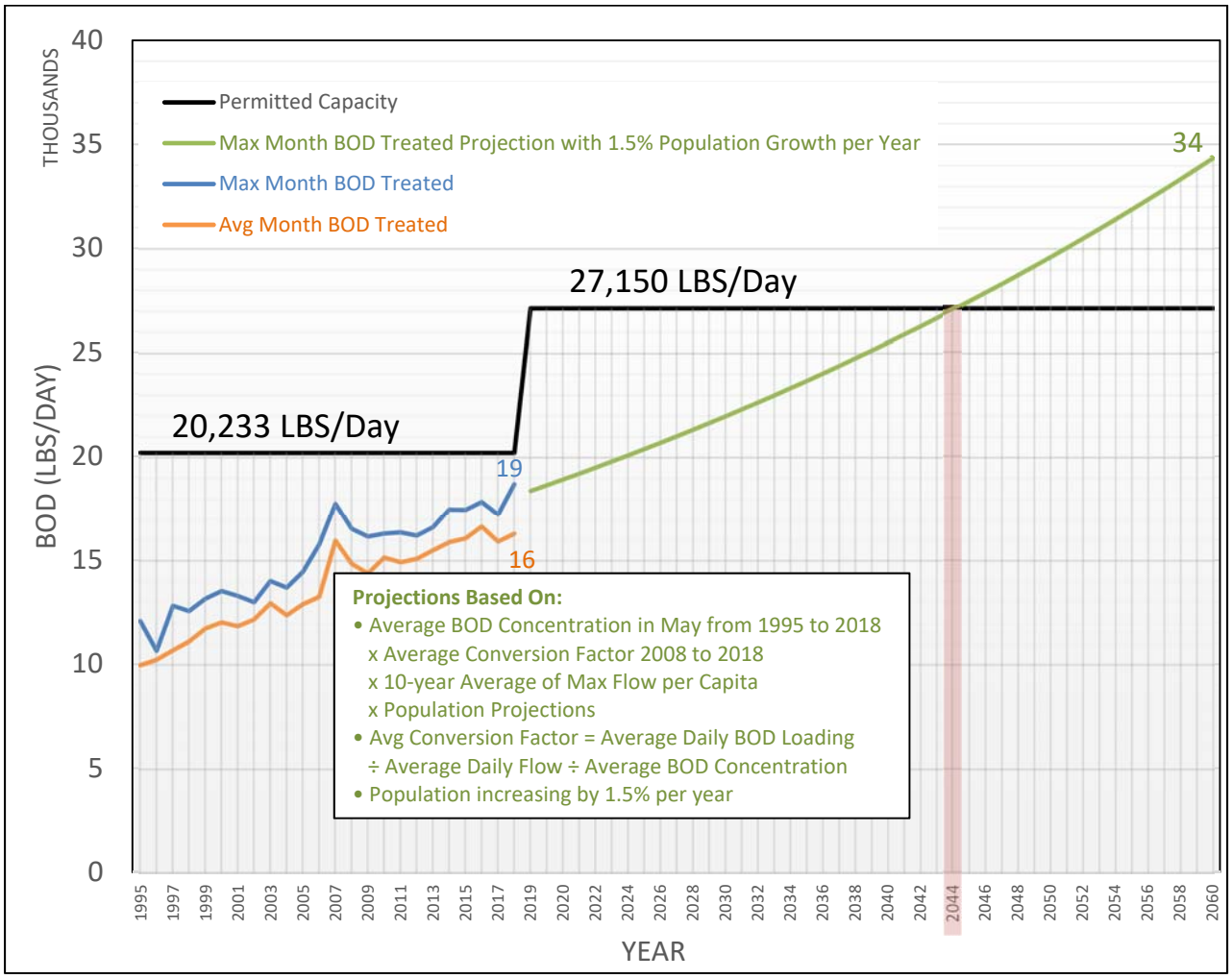
FIGURE 1-3: WATER TREATMENT PLANT PEAK DAY PRODUCTION



Noteworthy is that the City maintains interconnections with the Little Thompson Water District, the Fort Collins-Loveland Water District and the City of Greeley which allows treated water to pass between the service areas of these entities on an as-needed basis. These interconnects may support peak daily water demands if the City's current treatment capacity were exceeded.

Water Reclamation Facility Capacity: The City completed a Water Reclamation Facility (wastewater treatment plant) capacity project in 2019 that increased the hydraulic capacity from 10 mgd to 12 mgd and the solids capacity from 20,233 pounds per day to 27,150 pounds per day. Based on 2018 projections, the City anticipates needing an additional solids treatment plant expansion project around the year 2044. See Figure 1-4 for the historical wastewater treated with future treatment projections.

FIGURE 1-4: WATER RECLAMATION FACILITY SOLIDS BOD CAPACITY PER DAY



The City's wastewater treatment plant capacity limit could eventually limit current treated water deliveries or future developments, since indoor water use requires wastewater treatment to capture grey and black water for cleansing before it is returned to local receiving waters.

Windy Gap Firming Project: In order to firm approximately 120 AF of water, the Windy Gap Firming Project (WGFP) will need to be completed. The City owns 40 units of the Windy Gap Project. These units are anticipated to yield an average of 100 AF per unit. All of the 40 units are available for firming in the WGFP. Although this water supply project had completed the permitting process, construction has been stalled because of litigation. The staff of the Municipal Subdistrict of Northern Water (Municipal Subdistrict) indicates the WGFP construction is expected to start in 2019, with water being stored in the new reservoir by 2023.

Aging Infrastructure: Many parts of the City's water distribution system are reaching the end of their expected useful life and require continued investment through rehabilitation or replacement projects. The City has been focusing its efforts on addressing the worst performing water lines in the distribution system. The City has also invested in leak detection technology and hired

additional operations staff to perform leak detection work. From 2015 to 2018, estimated annual water losses have dropped from an estimated 580 MG per year to 436 MG per year. Over $17 million is budgeted in the Water Utility's 10-year capital improvement plan for water line replacement and rehabilitation projects. Below are charts demonstrating the age of the various water distribution assets by decade installed.

FIGURE 1-5: AGE OF WATERLINES BY DECADE INSTALLED

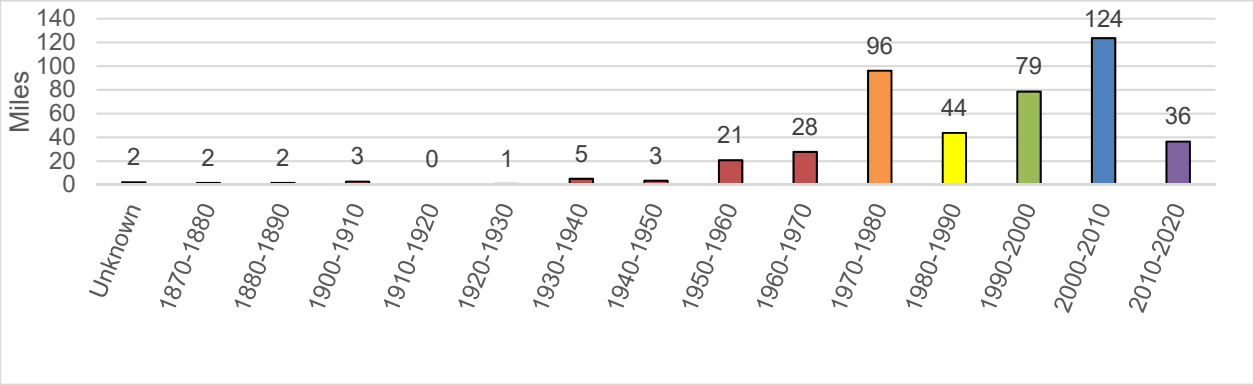


FIGURE 1-6: AGE OF WATER VALVE BY DECADE INSTALLED

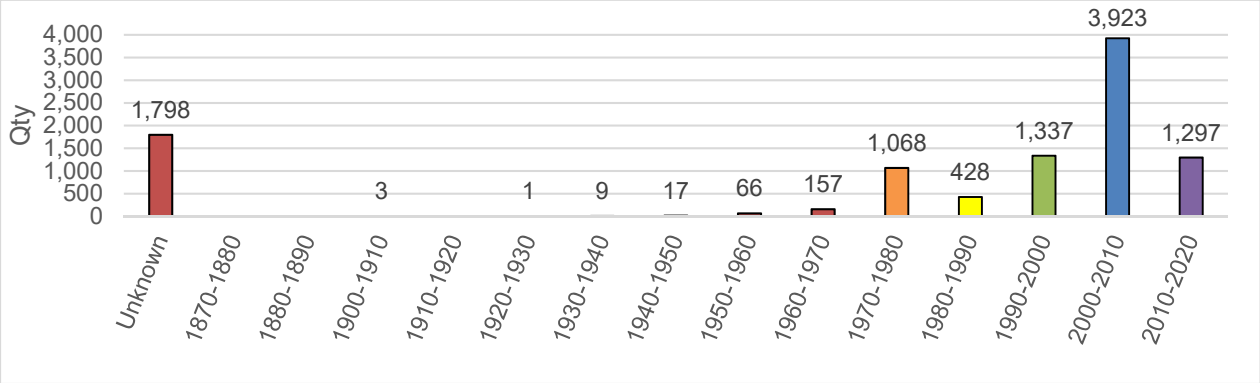


FIGURE 1-7: AGE OF WATER PUMP STATION BY DECADE INSTALLED

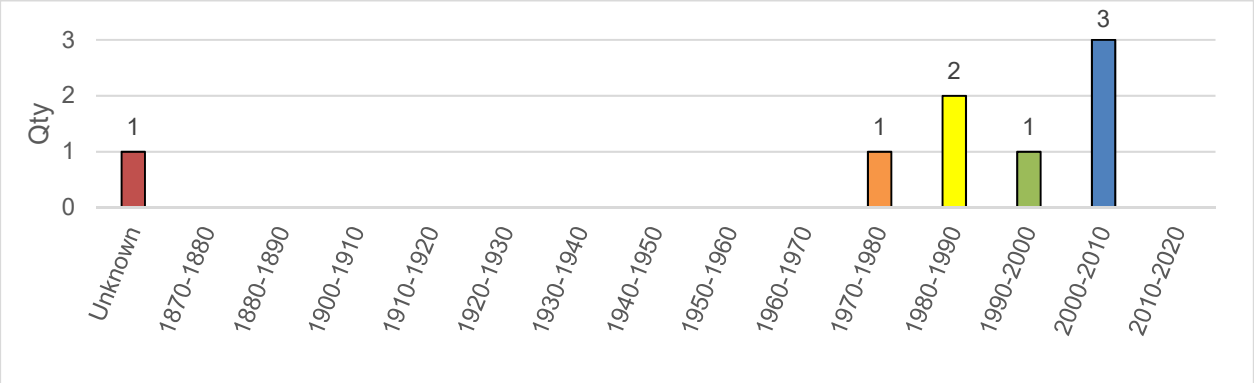
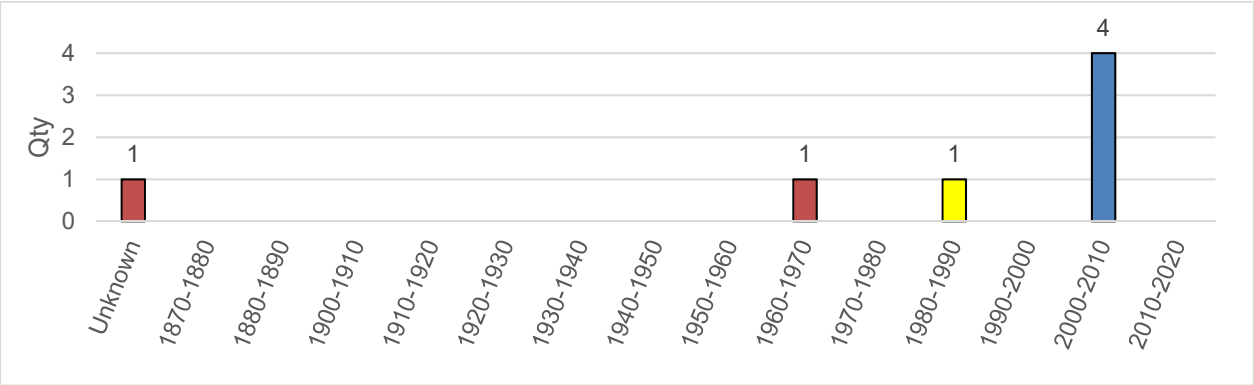
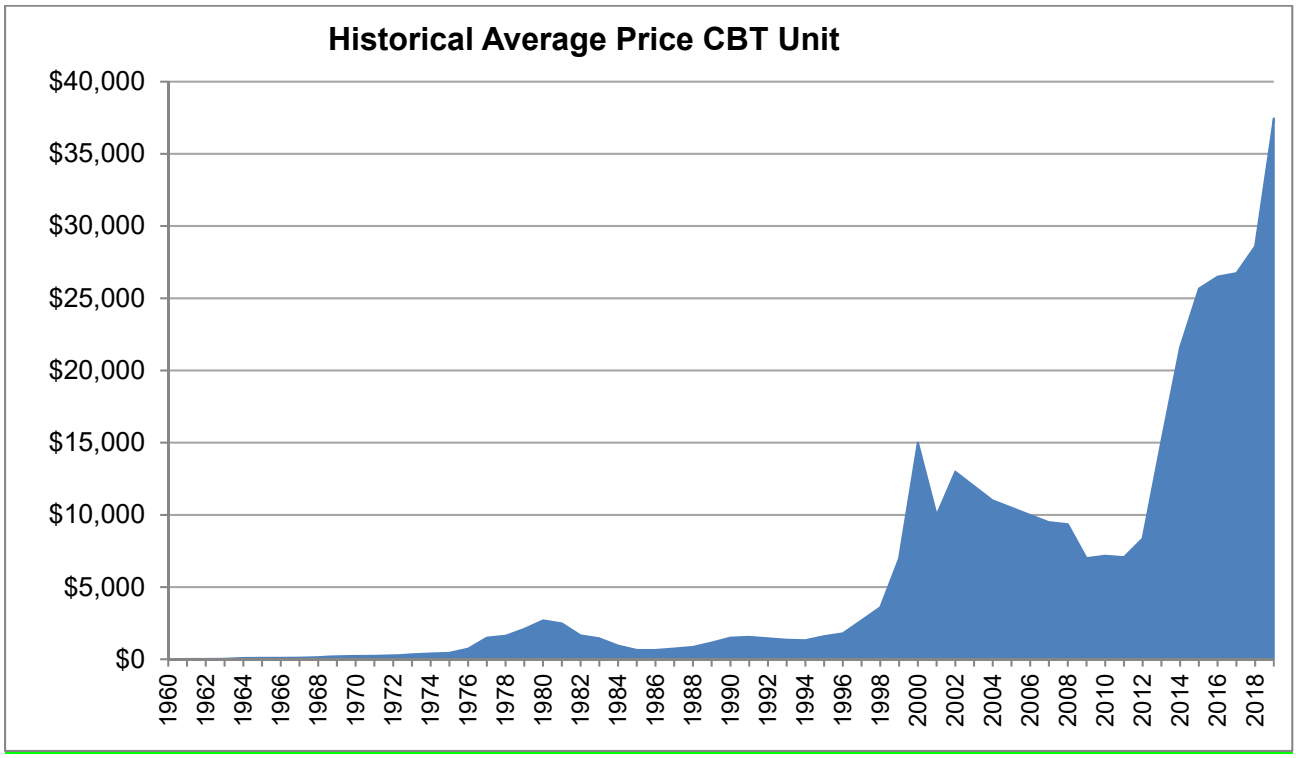


FIGURE 1-8: AGE OF WATER STORAGE TANK BY DECADE INSTALLED



Escalating Cost of Water Rights: Adding water supplies to the City's portfolio may become increasingly challenging in the future. Due to the population growth and subsequent demand along the Front Range, the price for raw water has risen significantly. One of the primary sources of water for Loveland is from the Colorado-Big Thompson (CBT) project. Figure 1-9 demonstrates the significant price increase in CBT units over the last eight years.

FIGURE 1-9: HISTORICAL AVERAGE PRICE PER CBT UNIT



Loveland's other primary raw water source is from native water rights from the Big Thompson River. Even if water rights are available to transfer to the City, they usually must be taken to water court to change their use from agricultural to municipal use, and the accounting requirements and stipulations on new change cases becomes increasingly labor intensive for the utilities.

2 – Profile of Water Demands and Historical Demand

2.1 Demographics and Key Characteristics of the Service Area

The City provides treated water to approximately 27,000 connections, including connections for customers both inside and outside of the city limits. Approximately 96.2% of the City's water customers live within the city limits. Table 2-1 presents a summary of the type and number of water customers receiving water service.

TABLE 2-1: SUMMARY OF LWP'S WATER CUSTOMERS[4] – AUGUST 2018

Customer Type	Number of Connections	% of Total Connections
Single Family Residential	**23,914**	**88.7%**
Inside City Limits	23,027	85.4%
Outside City Limits	843	3.1%
Special Base	44	0.2%
Multi-Family Residential	**1,383**	**5.1%**
Inside City Limits	1,339	5.0%
Outside City Limits	44	0.2%
Irrigation Only	**397**	**1.5%**
Inside City Limits	391	1.4%
Outside City Limits	6	0.0%
Commercial	**1,200**	**4.4%**
Inside City Limits	1,107	4.1%
Outside City Limits	92	0.3%
Special Base	1	0.0%
City Uses	**74**	**0.3%**
Inside City Limits	73	0.3%
Outside City Limits	1	0.0%
Totals	**26,968**	**100.0%**

Figure 2-1, Figure 2-3 and Table 2-4 provide a summary of billed water demand for each of the City's water customer categories for the period from 2008 to 2018. The table below provides an explanation of the customer categories used:

> **Single Family Residential*** – These three categories (inside city limits, outside city limits, and special base) includes all water provided to single family dwellings where there is a separate water tap to each dwelling unit. The Special Base category are for single family

[4] The City also has water use tracked related to hydrant use (for construction), construction water use, and through interconnects with the Little Thompson Water District and the Fort Collins-Loveland Water District. These customers are tracked separately from those summarized in Table 2. We selected a summer month for the connection counts due to irrigation accounts being deactivated during the non-irrigation season.

residences located in the Hidden Valley area west of town that have a higher base rate than other outside city customers.

Multi-Family Residential* – These two categories (inside and outside city limits) includes all water provided to multi-family dwellings in which one water meter provides water to multiple dwelling units.

Irrigation* – These two categories (inside and outside city limits) includes all water provided to dedicated irrigation water meters that do not provide any indoor water use.

> **Note: Prior to 2008 all residential and irrigation use was combined into one residential category. After 2008, LWP maintained different customer categories for single family and multifamily uses, as well as irrigation only taps.*

Commercial – These two categories (inside city limits, outside city limits, and special base) include all commercial uses, including special base customers that pay a higher base charge in the Hidden Valley area. Prior to 2007, there was a separate industrial water use. The City has not had customers tracked within the industrial customer category since 2008 when the water rate structure provided incentives for these customers to change to the commercial customer category. Institutional customer usage is grouped with commercial usage until 2010 when that customer category was eliminated.

City Uses – This category includes all General Fund City facilities that are currently metered – both for indoor and outdoor use. Enterprise Fund customers are included in either the commercial category or the irrigation category if the water is for a dedicated irrigation meter.

Wholesale Water – This customer category tracks the water transferred to neighboring water districts where the two distribution systems meet at interconnections. It includes wholesale water sales to the Little Thompson Water District, the Fort Collins-Loveland Water District, and the City of Greeley.

Ranch Water – The City maintains a standpipe at its Service Center that can be used by any customer via pre-paid cards at rate of $1.67 per 300 gallons in 2019. Water obtained from the standpipe has been used for watering livestock, dust suppression, and other local uses. All water delivered through the standpipe is metered and billed.

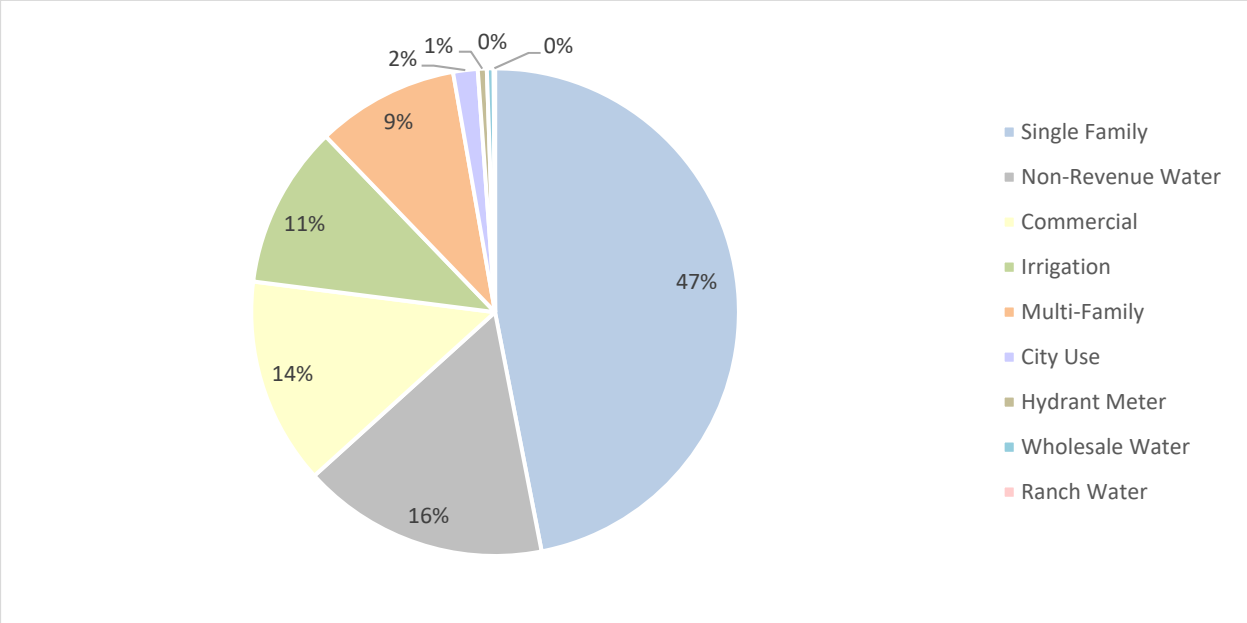
Hydrant Meters – The City also maintains a hydrant water use system, which is also a "pay-as-you-go" program typically used to support construction contractors. The permit to use hydrants for construction water includes hydrant meter rental and a security deposit on the meter, as well as billed water use at a rate of $1.67 per 300 gallons in 2019. The majority of the water delivered through this program is billed[5].

[5] Each instance of unbilled hydrant meter water usage requires prior authorization from the Director of Loveland Water and Power and is accounted for in our annual M36 Water Loss Audit. Generally, these are for large community event instances.

Non-Revenue Water – This category of water use tracks the difference between treated water produced by the City and total water sold. The difference between these two accountings of water is considered as non-revenue water based on standards set forth by the American Water Works Association[6]. Non-revenue water includes unbilled authorized uses, apparent losses and real water losses and is described in more detail later on in this document.

- *Unbilled authorized uses* are primarily for the water used to maintain the water distribution system or for fire suppression related activities. Most of the City's unbilled authorized water use is unmetered.
- *Real losses* are water that is lost due to leaks or overflows.
- *Apparent losses* are from water reaching an end customer, but not being billed or fully billed and are split out into unauthorized uses (water theft), metering inaccuracies, and systematic data handling errors.

FIGURE 2-1: AVERAGE TREATED WATER METERED USE BY CUSTOMER CATEGORY (2008-2018)



[6] AWWA Manual M-36 defines standard practices for water loss control and management for water utilities.

2.2 Historical Water Demands

Historical water demand for the City (based upon available records) is summarized below. When there are inaccuracies in the original data, those inaccuracies are carried through to the overall demand estimates. The following are a few of the areas of uncertainty in the original data that went into compiling the historical water demands.

- **Master Meter:** In 2018, the City began yearly volume draw down tests of the adjacent water storage tank to the master meter measuring the water entering the water distribution system from the Water Treatment Plant that have shown the meter to be over registering the water by approximately 4 percent, which would artificially inflate non-revenue water.

- **Unmetered and/or Unbilled Water:** Although the City has made great strides over the last four years as part of the water audit process to meter and bill locations that previously had gone unbilled and/or unmetered, and to estimate the water usage where unmetered, there is some known water usage that was not included in the earlier years of the demand estimates, because it had not been tracked in our customer information system.

- **Customer Overlap:** There is some customer overlap with neighboring water providers in which one entity provides the water to a customer, but for which the customer is billed by the other water provider. Any water that was billed by the City is included in the historical demands and any water that was not billed by the City is not included in the demand, regardless of which entity provided the water. The City is in the process of working through some agreements to correct the majority of these instances.

- **Billing Delay:** There is a delay from the time that water is produced, to when it is consumed, and then finally billed. The majority of Loveland's water meters are read once a month, but depending on the timing of the read, the majority of the consumption could have occurred in a prior month. The demand estimates do not correct for this billing delay.

- **Metering Inaccuracies:** Water meters in the field tend to slow down over time and occasionally fail completely resulting in an overall under-registration of the actual water consumed by customers.

- **Systematic Data Handling Errors:** Errors can occur in the processes that transmit, archive and report consumption totals from the time when a meter is read to the time when the consumption is billed. These errors are difficult to estimate and correct in demand estimates.

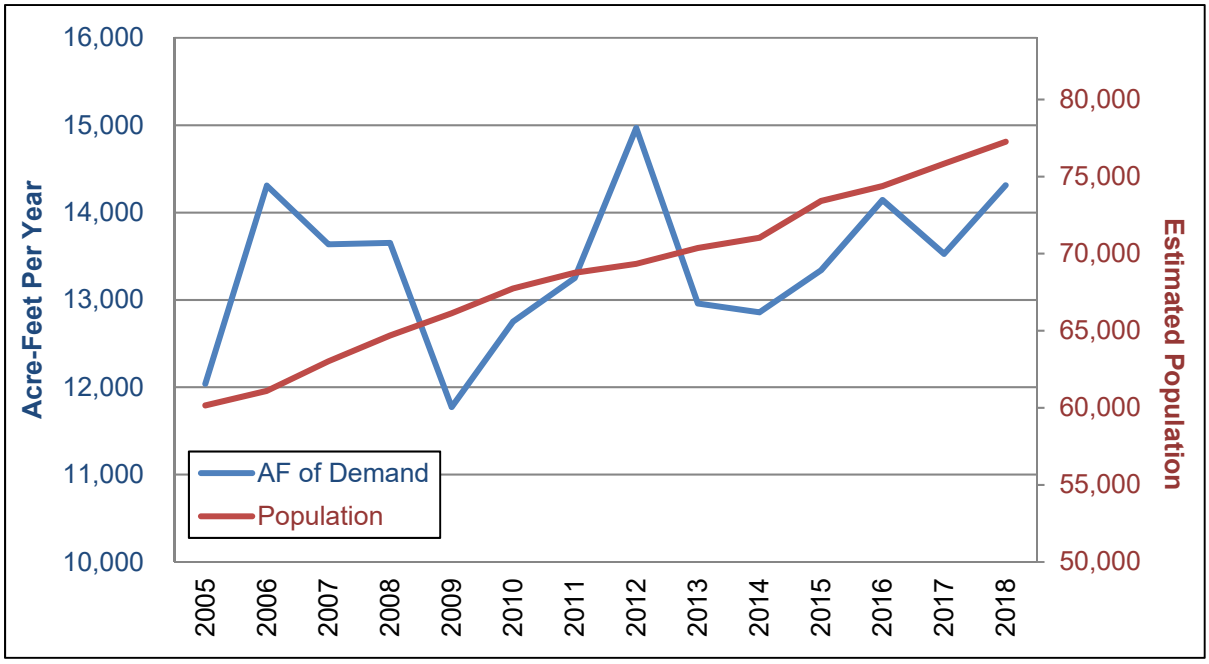
Table 2-2 summarizes the water demand and approximate population served in recent years within the LWP's service area (which is shown in Figure 1-1).

TABLE 2-2: SUMMARY OF POPULATION SERVED AND TREATED WATER DEMAND - 2005 TO 2011

Year	Approximate Population Served[7]	Treated Water Demand (AF)
2005	60,157	12,040
2006	61,098	14,309
2007	63,025	13,636
2008	64,690	13,652
2009	66,132	11,773
2010	67,742	12,752
2011	68,761	13,284
2012	69,341	14,969
2013	70,370	12,958
2014	71,027	12,858
2015	73,420	13,340
2016	74,385	14,143
2017	75,840	13,527
2018	77,262	14,312

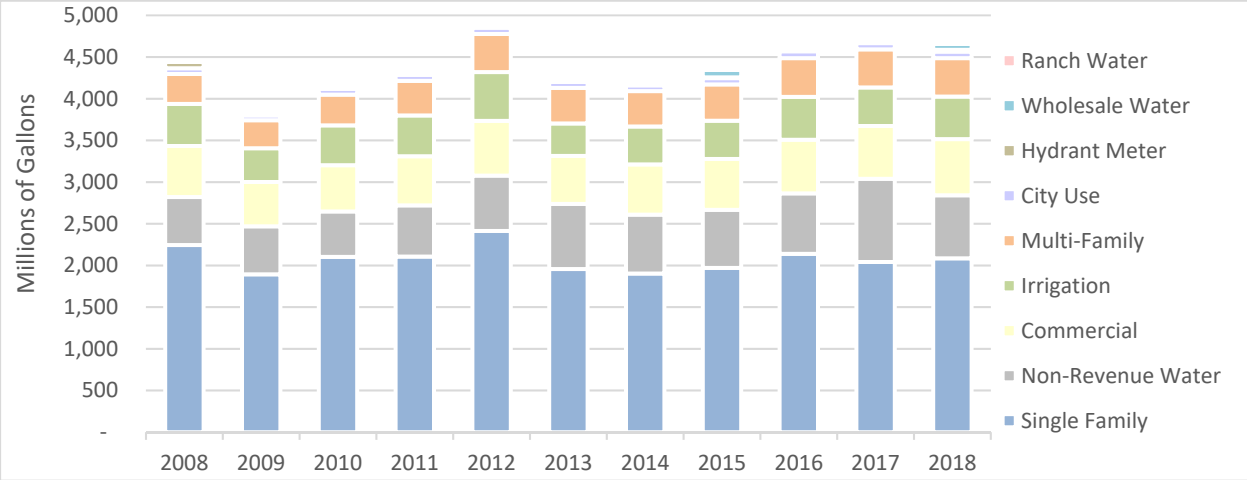
Note that the City's population has increased each year since 2005; however, water demand peaked during the hot dry year of 2012 and quickly dropped back down the following year and has since continued at an overall slight upward trend since that time. Figure 2-2 further illustrates this observation.

FIGURE 2-2: POPULATION SERVED AND TOTAL TREATED WATER DEMAND (2005 TO 2018)



[7] From the "Annual Data and Assumptions Report" – January 1, 2011 and August 2018 by City of Loveland Community and Strategic Planning.

FIGURE 2-3: ANNUAL TREATED WATER METERED USE BY YEAR & CUSTOMER CATEGORY



Monthly Treated Metered Water Use by Customer Category

The figures below outline the average monthly metered water use by customer category.

- **Indoor & Outdoor Demand:** For the residential, commercial, and city use customer classes, water demand is segregated into indoor and outdoor treated water demand by customer category. Indoor water usage was estimated based on the assumption that water usage for the months of January, February, March, November and December would all be for indoor usage. All other months would have a portion of exterior usage. For the months of January, February, March, November and December, the indoor water demand was estimated as the monthly average usage per customer class from 2008 through 2018. For the months of April through October, the estimated average indoor water usage from January through March and November through December was averaged. The outdoor usage was calculated as any remaining water demand.

FIGURE 2-4: SINGLE FAMILY RESIDENTIAL AVERAGE MONTHLY WATER DEMAND (2008 TO 2018)

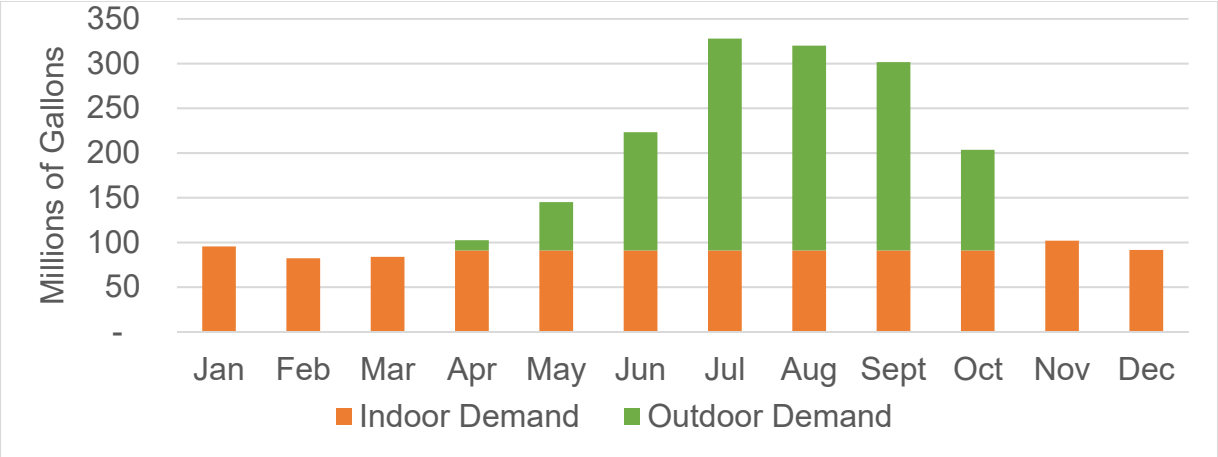


FIGURE 2-5: MULTI-FAMILY RESIDENTIAL AVERAGE MONTHLY WATER DEMAND (2008 TO 2018)

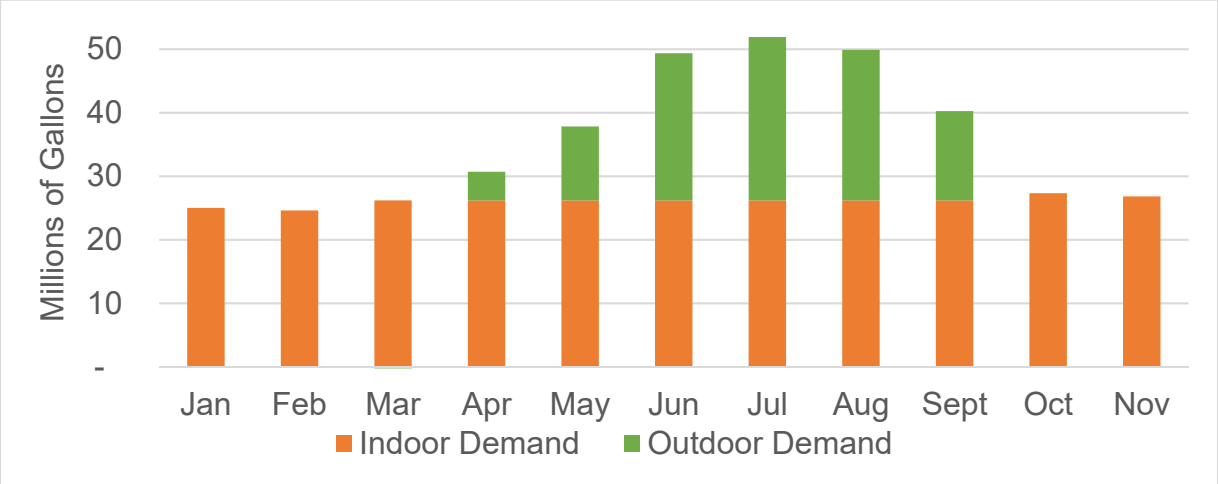


FIGURE 2-6: COMMERCIAL AVERAGE MONTHLY WATER DEMAND (2008 TO 2018)

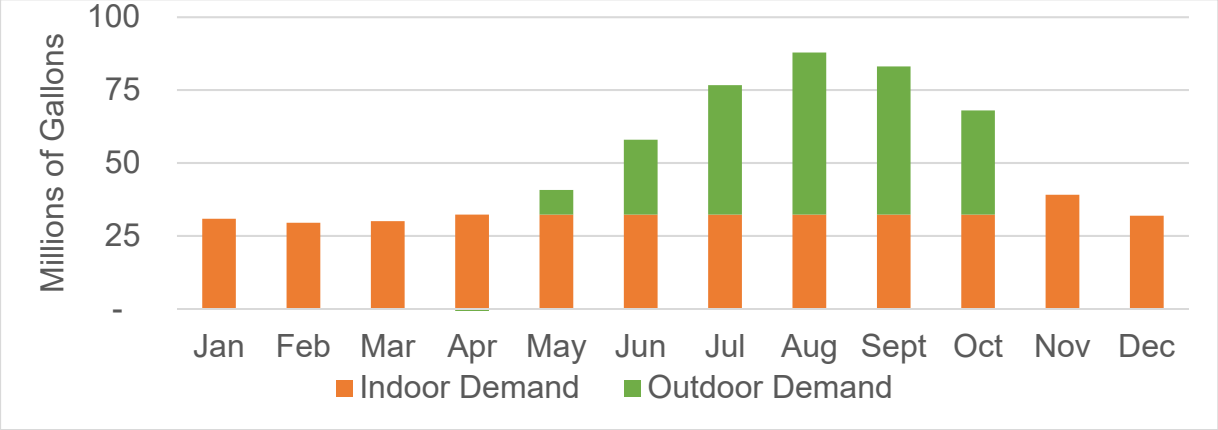
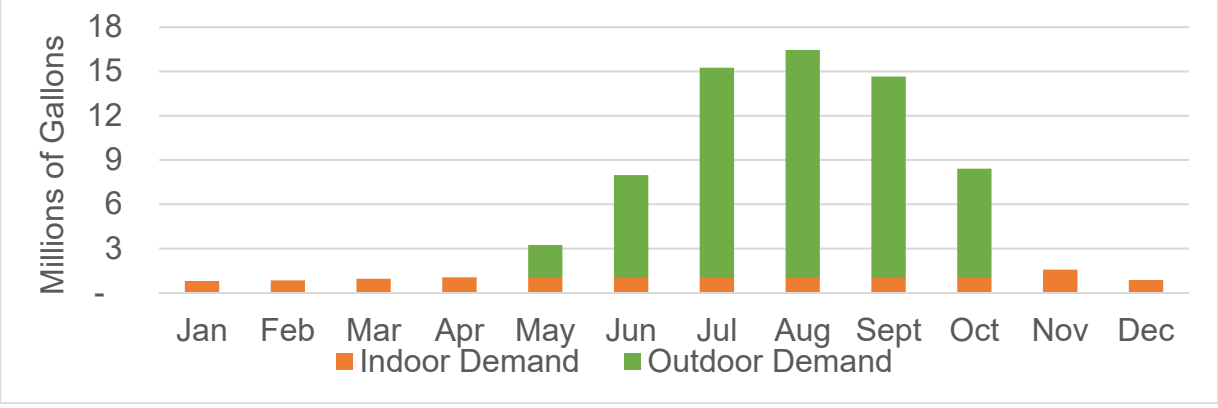
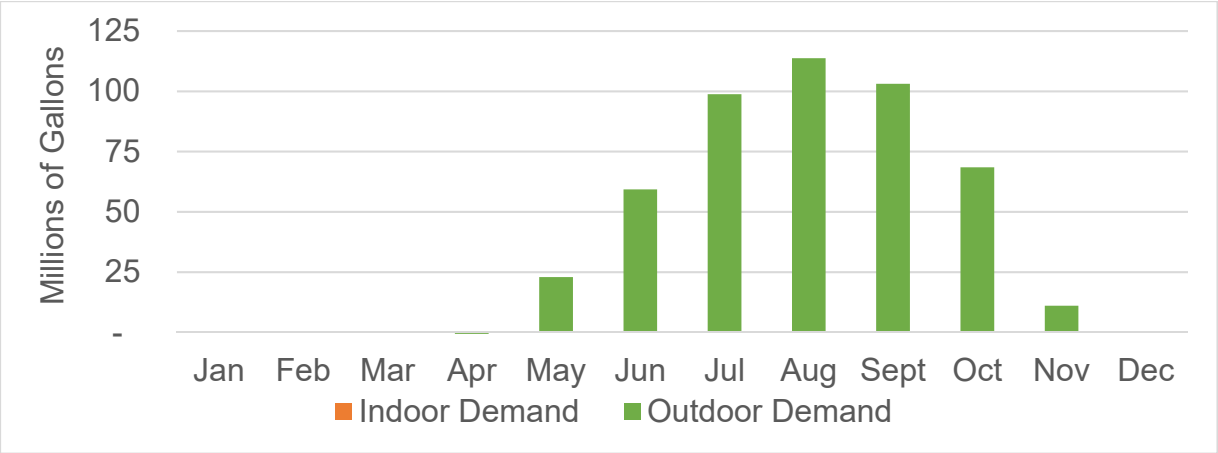


FIGURE 2-7: CITY USE AVERAGE MONTHLY WATER DEMAND (2008 TO 2018)



- **Outdoor Demand Only:** For the irrigation customer class, all water demand was allocated to outdoor usage by averaging the monthly demands from 2008 through 2018.

FIGURE 2-8: IRRIGATION CUSTOMER CLASS AVERAGE MONTHLY WATER DEMAND (2008 TO 2018)



- **Combined Indoor & Outdoor Demand:** Due to the variability of usage, for wholesale, ranch water and hydrant rentals, the water demand was not broken out by indoor and outdoor usage, but rather shows the total average monthly water demand from 2008 through 2018.

FIGURE 2-9: WHOLESALE WATER AVERAGE MONTHLY WATER DEMAND (2008 TO 2018)

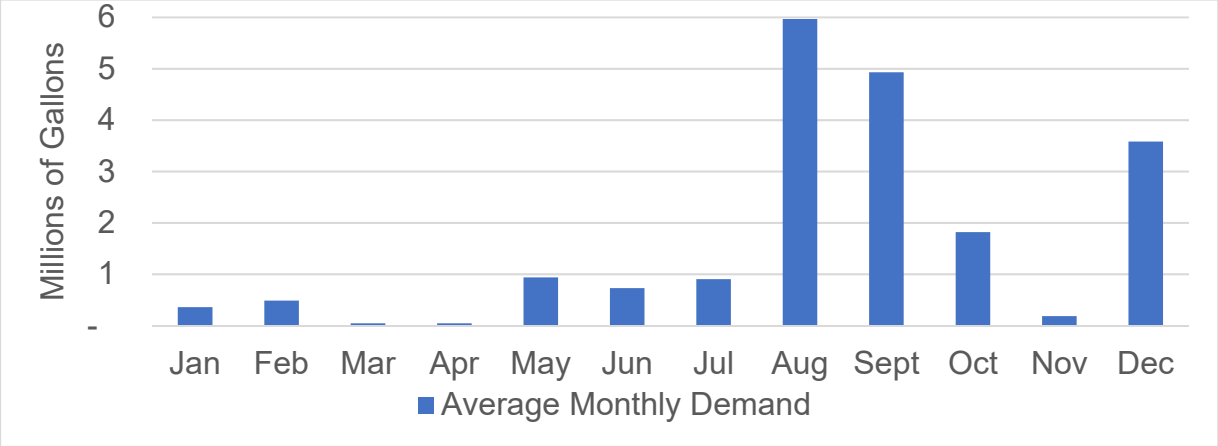


FIGURE 2-10: HYDRANT RENTALS AVERAGE MONTHLY WATER DEMAND (2008 TO 2018)

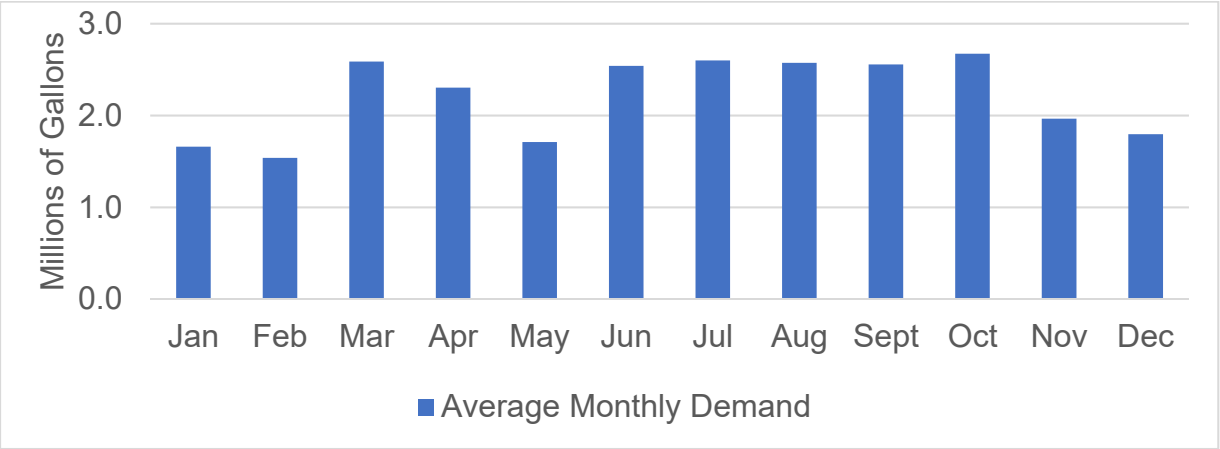
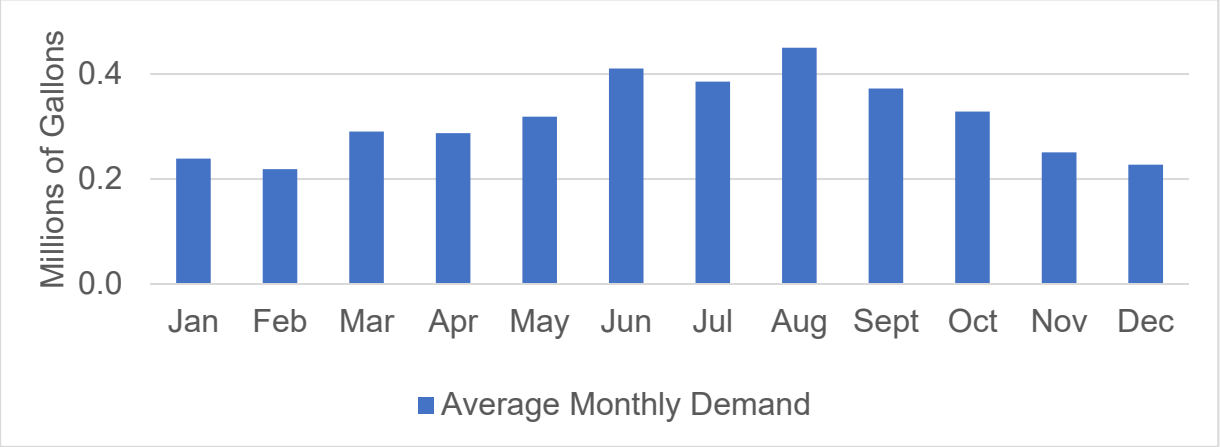


FIGURE 2-11: RANCH WATER AVERAGE MONTHLY WATER DEMAND (2008 TO 2018)



Housing Stock:

The following information is from the 2018 Data and Assumptions Report, published by Loveland's Community and Strategic Planning Department.

- **Owners vs. Renters:** Loveland has more homeowners and fewer renters than nearby peer communities, but since 2000, the percentage of renters in Loveland has increased from 28.6% to 37.5%, while the percentage of owners has decreased from 71.4% to 62.5%.

Renter Occupied Housing

2000	2016
28.6%	37.5%

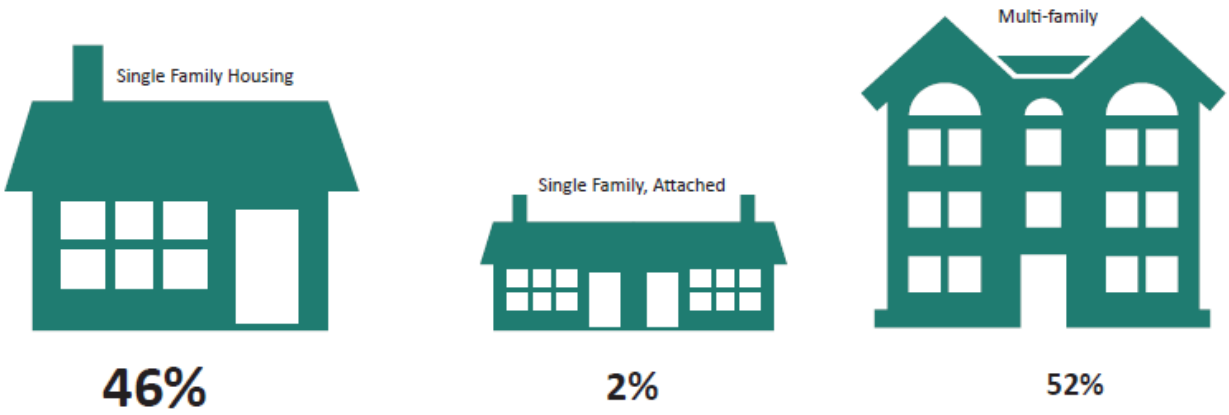
Owner Occupied Housing

2000	2016
71.4%	62.5%

- **Dwelling Units by Type:** According to the 2012-2016 American Communities Survey 5-year Estimates that as of 2016, 66% of the dwellings in Loveland were single family detached units, 9% single family attached units and 24% multi-family units. However, reviewing new home construction starts since 1995, due to high construction costs and labor shortages, the number of new single family detached homes is declining while the number of new multi-family units is increasing.

TABLE 2-3: NEW CONSTRUCTION RESIDENTIAL DWELLINGS 2011-2016

New Construction Residential Dwellings by Housing Type				
Dwelling Type	**1995-2000**	**2001-2005**	**2006-2010**	**2011-2016**
Single Family Detached	71%	63%	40%	46%
Single Family Attached	10%	16%	9%	2%
Multi-family	20%	21%	51%	52%



In designing water efficiency programs, the changes in housing can be taken into consideration. Single family detached homes dominated the older stock of homes and fixture replacement programs targeted at these customers could improve the passive savings from upgrading to newer fixtures. LWP may look at increasing the programs geared toward new multi-family developments such as the hydrozone program, encouraging more dedicated irrigation meters and working with the land use authority to encourage more xeriscape landscaping around such developments.

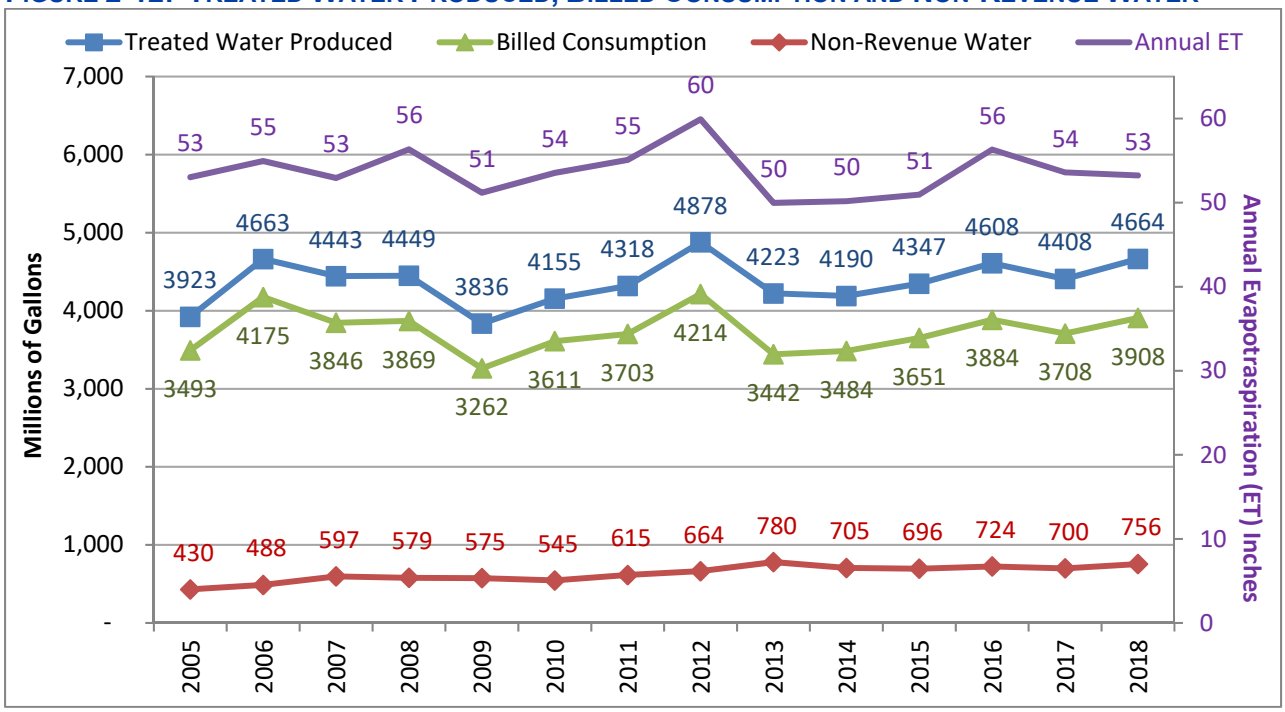
Water Reuse

Portions of LWP's water portfolio includes reusable supplies originating under specific terms and conditions described in its decrees. In addition, the City's Windy Gap water is reusable. Reusing these water sources increases overall firm yield, making reuse an important component in its current and future raw water supplies.

Non-Revenue Water

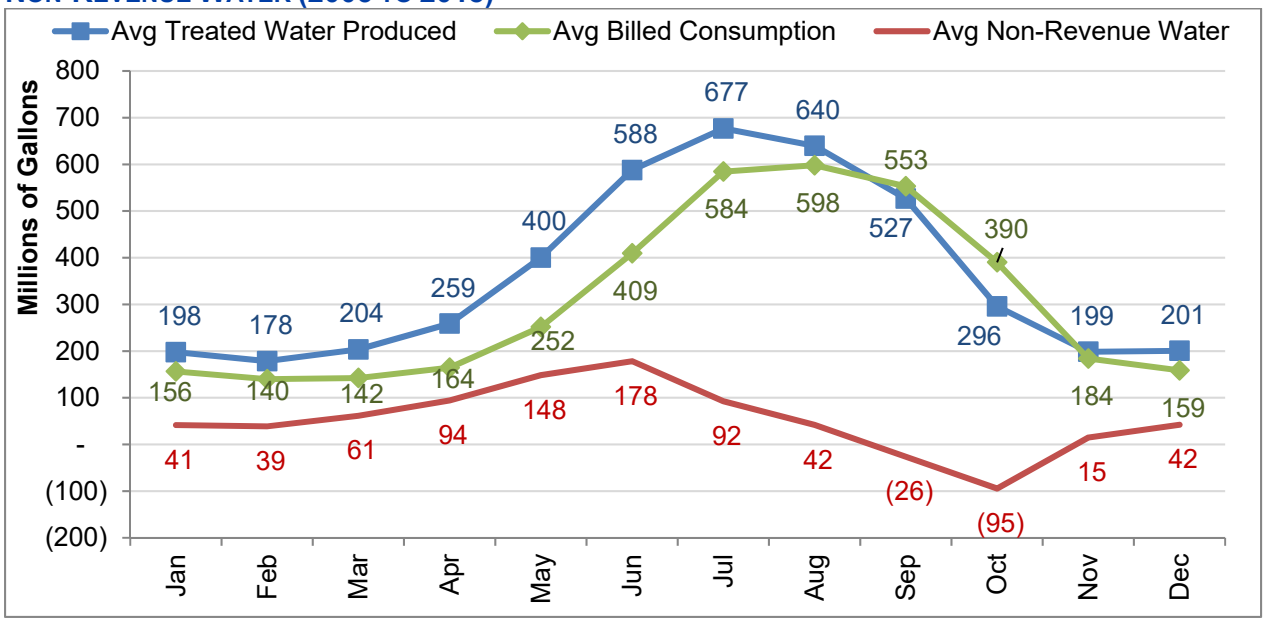
Based on the data presented in Table 2-4, the City's 5-year average of non-revenue water is 716 MG. See Figure 2-12 for the annual treated water produced from the Water Treatment Plant records, billed consumption from Utility Billing records, non-revenue water as the difference between water produced and billed consumption, and annual evapotranspiration rates from Northern Water's Loveland weather station data. During hot dry years, the City produces more water to meet the increased irrigation demands of its customer base and during cold wet years, the City produces less water to be in line with decreased irrigation demands as can be seen by the trending of the blue treated water produced and green billed consumption lines rising and falling in direct correlation to Loveland's yearly evapotranspiration rates (purple line).

FIGURE 2-12: TREATED WATER PRODUCED, BILLED CONSUMPTION AND NON-REVENUE WATER



Non-revenue water changes monthly and varies seasonally. There is a delay from the time water is treated to when the water is billed as can be seen in the green average billed consumption curve lagging behind the blue average treated water produced in Figure 2-13. Customer meters are read monthly and billed afterwards resulting in some water usage being billed over a month after the water consumption occurred. The City has close to 20 MG water storage tank capacity. At times, treated water is stored in tanks rather than for direct customer consumption and at times the water provided for customer consumption is from tank storage rather than being newly treated water from the water treatment plant. Hydrant flushing is generally performed in the springtime before the irrigation season picks up. More water is used during peak construction times to sanitize new water lines and drops off during winter months. These seasonal authorized unbilled activities, the billing delay, and the fluctuations in tank storage levels cause variability of the non-revenue water and create an overall seasonal pattern as seen by the rise and fall of the red non-revenue line in Figure 2-13.

FIGURE 2-13: AVERAGE MONTHLY TREATED WATER PRODUCED, BILLED CONSUMPTION, AND NON-REVENUE WATER (2005 TO 2018)



See Table 2-5 for the Water Balance Table, which shows the different categories of where water enters and exits the water system. Each column of the Water Balance Table adds up to the same amount and thus "balances," but is divided out into different categories – like taking the same amount of water, but dividing it out into different buckets. From this table, please note that non-revenue water consists of the following main categories:

1. **Unbilled Authorized Consumption** – Most of the City's unbilled authorized water use is unmetered and is used to maintain the water distribution system (hydrant flushing, tank cleaning, sanitizing new lines, etc.) or for fire suppression related activities (firefighting, fire training, fire sprinkler system and fire pump installation and testing, fire hydrant flow tests, etc.). There is a small amount of metered and unbilled water use per year. Unbilled metered activities require prior approval from the Director of Loveland Water and Power and have generally only been authorized for a few prominent community events per year.

2. **Apparent Losses** – Nonphysical losses that occur when water is successfully delivered to the customer, but is not measured or recorded accurately. These losses include unauthorized consumption (water theft), metering inaccuracies, and systematic data handling errors.

3. **Real Losses** – Physical water losses of treated, energized water from the water distribution system from breaks, leaks and overflows. Service line leaks on the supply side of customer meters are included in non-revenue water; however, leaks on the demand side of customer meters are not included.

TABLE 2-4: SUMMARY OF BILLED WATER BY CUSTOMER CATEGORY

	BILLED WATER (1000s Gallons)												TOTAL BILLED WATER	NON-REVENUE WATER	TREATED WATER DEMAND
	Single Family		Multi-Family		Irrigation		Commercial[2]		City Use[3]	Whole-sale Water	Hydrant Meter	Ranch Water			
Year	Inside City	Outside City[1]	Inside City	Outside City	Inside City	Outside City	Inside City	Outside City[1]					1000s gallons	1000s gallons	1000s gallons
2008	2,116,125	129,813	353,683	4,111	497,894	6,907	590,721	21,407	69,194	5	78,957	4,033	**3,872,850**	**646,750**	**4,519,600**
2009	1,781,175	112,952	332,686	3,229	402,146	4,119	511,211	19,450	56,127	0	41,004	3,166	**3,267,266**	**1,259,834**	**4,527,100**
2010	1,987,934	114,708	353,843	15,066	474,529	3,869	538,455	16,429	68,156	1,295	32,669	3,707	**3,610,659**	**336,241**	**3,946,900**
2011	2,009,999	96,345	379,661	34,650	485,495	3,229	572,683	16,680	71,316	1,221	27,905	3,584	**3,702,767**	**156,633**	**3,859,400**
2012	2,307,542	106,947	415,181	41,699	579,840	5,505	639,078	16,518	76,258	1,710	19,464	4,112	**4,213,854**	**90,746**	**4,304,600**
2013	1,880,215	77,874	381,633	43,403	386,370	3,259	561,841	14,723	71,908	3,072	14,499	3,313	**3,442,110**	**1,446,940**	**4,889,050**
2014	1,829,277	74,168	380,671	43,624	449,293	4,621	588,039	15,604	69,790	7,906	18,684	2,665	**3,484,341**	**927,034**	**4,411,375**
2015	1,897,561	73,567	388,895	46,789	453,912	4,143	596,322	14,920	74,669	87,113	10,574	2,702	**3,651,167**	**573,663**	**4,224,830**
2016	2,063,765	76,450	412,464	51,009	509,678	6,247	626,392	16,583	81,958	21,420	14,062	4,334	**3,884,363**	**724,133**	**4,608,496**
2017	1,970,092	70,700	406,275	50,731	458,532	4,119	605,181	26,887	74,877	24,014	11,850	4,999	**3,708,255**	**1,022,719**	**4,730,974**
2018	2,013,879	72,049	412,022	48,716	506,872	4,053	619,119	54,275	78,066	72,176	21,866	4,943	**3,908,035**	**779,082**	**4,687,117**

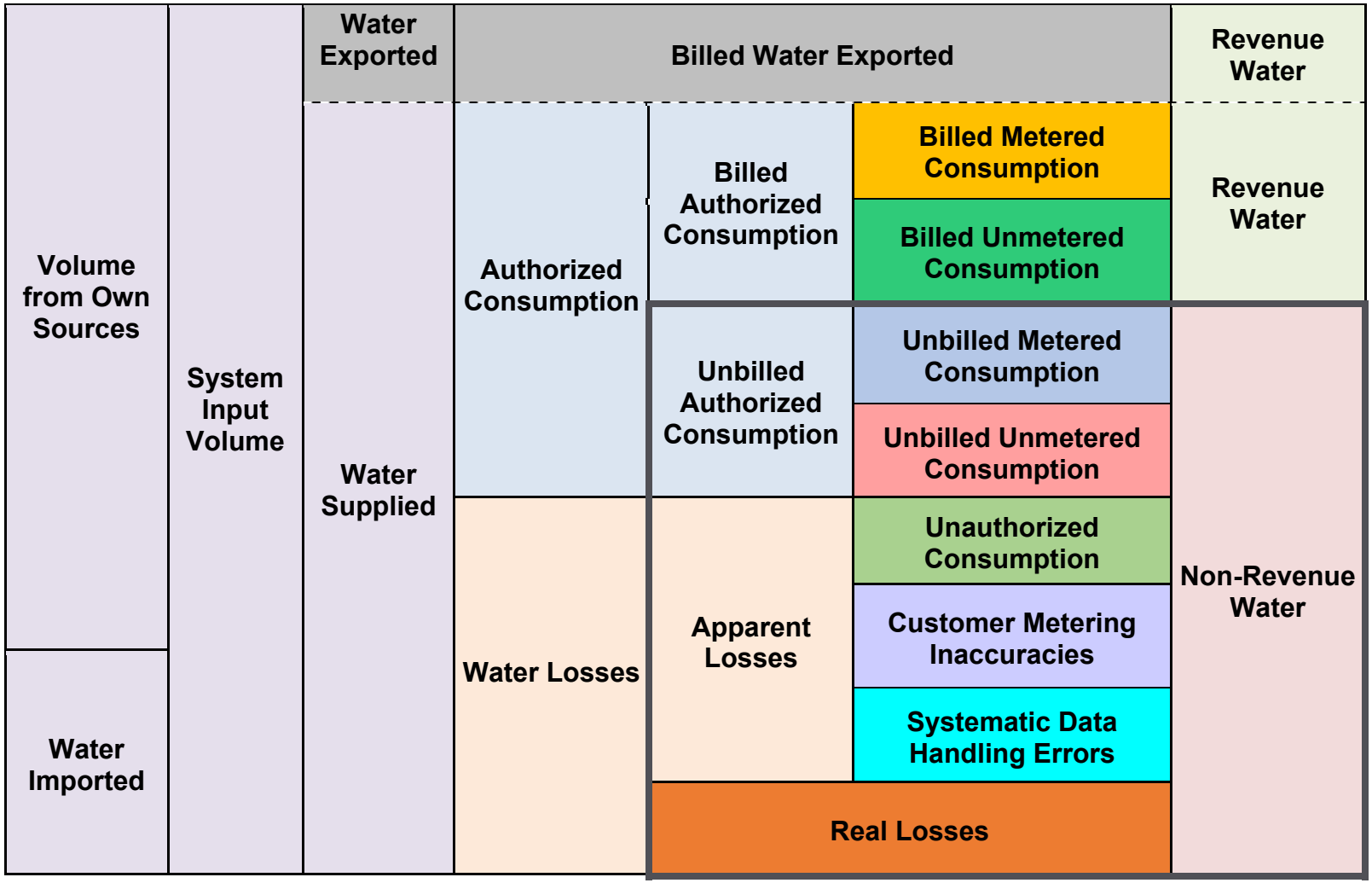
Notes:

1 - Includes special base customers in the Hidden Valley area that pay higher base charges than other outside city limits customers.

2 - The commercial category includes institutional uses prior to 2011 and industrial uses prior to 2008.

3 - The City Use category includes water use for general fund accounts. The City's enterprise fund accounts are billed as either commercial or irrigation accounts.

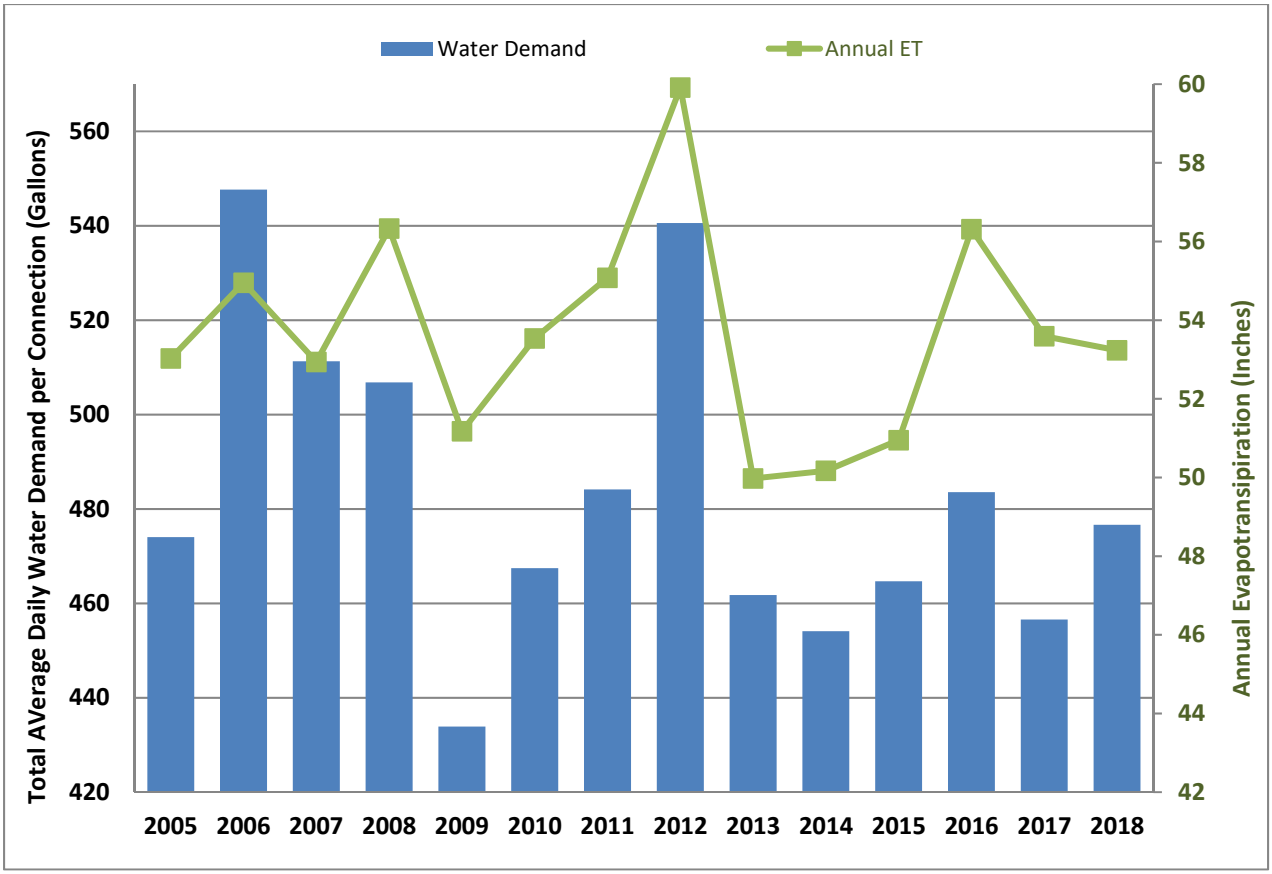
TABLE 2-5: WATER BALANCE TABLE (ADAPTED FROM AWWA MANUAL M-36)



Historical Water Demand per Connection

Figure 2-14 presents the change in per connection water use and evapotranspiration from 2005 through 2018[8]. As can be seen in Figure 2-14, total water demand per connection represented by the blue bars correlates well to Loveland's annual evapotranspiration (ET) in the green line – meaning that total water demand is substantially influenced by the outdoor irrigation needs of the community based on prevailing weather conditions (i.e. precipitation, wind speed and direction, temperature, relative humidity, vapor pressure, and solar radiation).

FIGURE 2-14: TOTAL AVERAGE DAILY WATER DEMAND PER CONNECTION



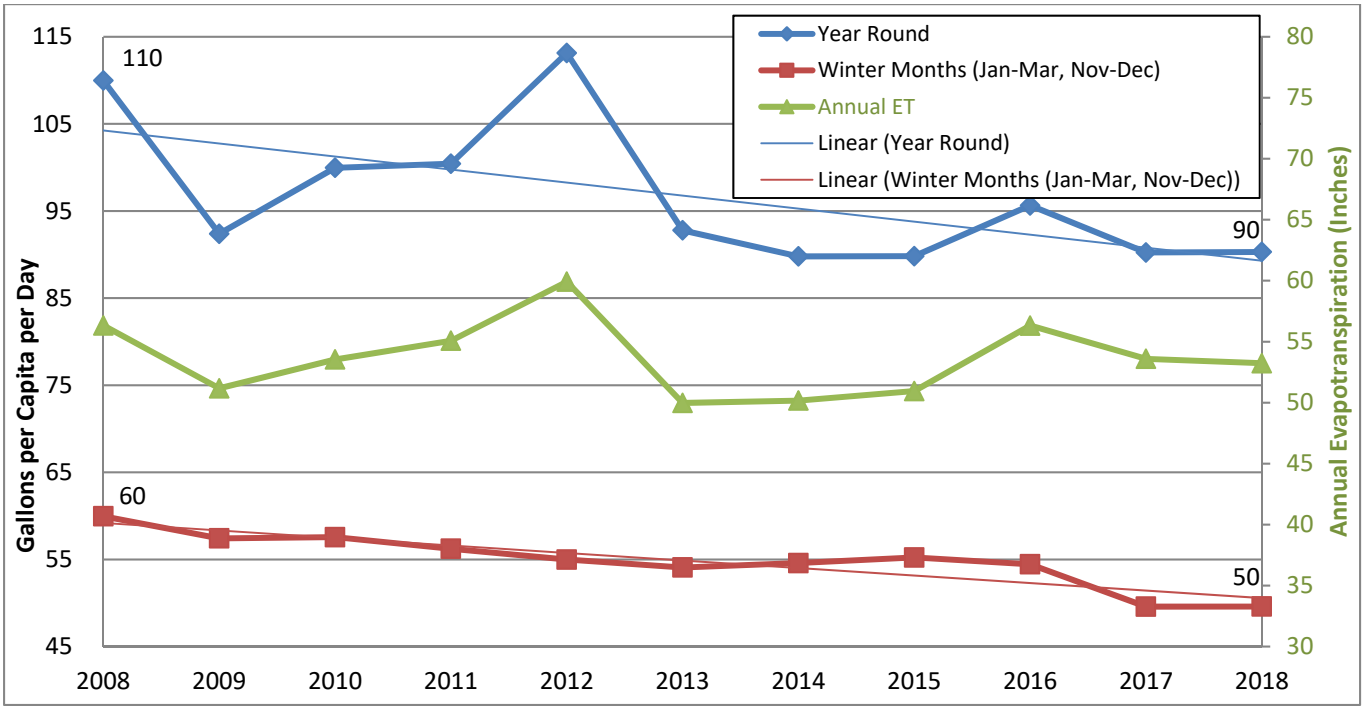
Historical Residential Gallons per Capita per Day

Figure 2-15 demonstrates the observed average water use per person of Loveland's residential customer base since 2008. Total residential water demand per connection represented by the blue line correlates well to Loveland's annual evapotranspiration (ET), the green line, – meaning that total residential water demand is substantially influenced by the outdoor irrigation needs of the community based on prevailing

[8] ET for Alfalfa is based on weather data maintained by Northern Water for the Loveland station at http://www.northernwater.org/WaterConservation/WeatherandETData.aspx.

weather conditions (i.e. precipitation, wind speed and direction, temperature, relative humidity, vapor pressure, and solar radiation). While year round use varies from year to year, overall gallons per capita per day demonstrates a downward trend as indicated by the blue "Linear (Year Round)" trend line. From 2008 to 2018, the overall gallons per capita per day has dropped by 18%. This downward trend can further be demonstrated in indoor water use within the City, which is illustrated as the red "Winter Months" line in Figure 2-15 when it is assumed no outdoor irrigation is occurring. This figure indicates that from 2008 to 2018 the average indoor water use dropped by 17%.

FIGURE 2-15: RESIDENTIAL GALLONS PER CAPITA PER DAY



The 17% drop in residential wintertime per capita use correlates well to expected passive savings that were reported by the Colorado Water Conservation Board in 2010[9]. Specifically, passive savings are those water demand reductions that have occurred, and will continue to occur, as a result of new technology in appliances and fixtures improving customer water use efficiency independent of local water conservation programs conducted by water providers. Residential customer toilets, dishwashers, and clothes washing machines have become substantially more water efficient, and as customers replace aging and broken appliances and fixtures, passive savings have, and will continue to occur organically within the water utility's service area. The City has seen and expects to continue to see average indoor residential demand decrease into the future as more customers replace and upgrade toilets, dishwashers and clothes washing machines.

[9] Colorado Water Conservation Board, Statewide Water Supply Initiate Update, Section 3 – Municipal and Industrial Water Conservation Strategies, 2010.
https://www.waterdm.com/sites/default/files/CWCB%20%282010%29%20Water%20Conservation%20Strategies%20of%20Colorado%20State%20Water%20Supply%20Initiative.pdf

City Water Use

The City uses treated water from 107 water meters[10] for indoor and outdoor use at public buildings, public grounds and parks (excludes water usage at treatment plants and water used to maintain the water distribution and wastewater collection systems). The City also uses raw water to irrigate the grounds at eight of the City's parks. The City strives to employ best management practices that employ water efficient fixtures and systems at new facilities and as appropriate and economically feasible in retrofitting older City facilities.

- **Faucets:** All new City facilities and upgraded areas use automated high-efficiency faucets, which reduce the flow rate and automatically shut off to help reduce overall water usage.

- **Toilets & Urinals:** All new City facilities and upgraded areas use water saving valves at toilets and urinals to reduce overall water usage. New facilities use high-efficiency toilet and urinal fixtures. When upgrading older facilities, if the plumbing was not designed for low-flow wastewater, lower-flow fixtures are installed instead of the newer high-efficiency fixtures to still save water while also allowing enough flow to help prevent undesirable wastewater backups.

- **Car Wash:** The City's car wash recycles a portion of the water from each car wash. Hundreds of gallons from each car wash is collected, filtered and reused in the car wash system.

- **Hydronic Heating and Cooling Equipment:** The City employs industry best practices on hydronic heating and cooling equipment with alarms set to trigger if system leaks occur.

- **Point Source Water Heat:** When using water heaters, some of the heat in hot water is lost between the central hot water heater and the faucet resulting in higher water usage as people run the water to wait for it to warm up. As water heaters fail in the City's facilities, the City replaces them with point source water heat located near where the hot water is needed, such as installing an instahot below a kitchen or bathroom sink. Point source water heat helps eliminates excess water and gas used to heat, store and deliver hot water to where it is needed.

- **Irrigation Plan for Parks and Public Grounds:** Of the outdoor irrigated areas maintained by the City, 19 public grounds areas and 19 of the 27 parks use treated water for irrigation. The remaining 8 parks irrigate with non-potable raw water[11]. The majority of the irrigation water is raw water and is applied through a centralized irrigation controller system that monitors real time ET and rainfall updates, to support human judgment in the management of individual sprinkler zones which can be remotely operated using SCADA. Only a very small number of grounds are without centralized irrigation controllers[12].

[10] This number excludes water used by the water and wastewater utilities at treatment plants and the water used to maintain the water distribution and wastewater collection systems.
[11] There are 19 parks and 19 public grounds on treated water. There are 8 parks and 3 golf courses on raw water. The large parks in Loveland (Loveland Sports Park, North Lake, Centennial, Fairgrounds/Barnes, Mehaffey, Kroh, and Benson) are all irrigated with raw water.
[12] Two detention ponds (total of 2.3 acres) and two small planter beds in the Old Town area are not on central irrigation control.

The City of Loveland Parks and Recreation Department developed a detailed Irrigation Conservation Plan for most of the properties that the City irrigates in 2008 and updated the plan in 2019. The plan (see Appendix B) provides details on each park and public space, including size, and average annual irrigation volumes. The plan also presents a four-tiered irrigation program that may be implemented in case of drought and water shortages.

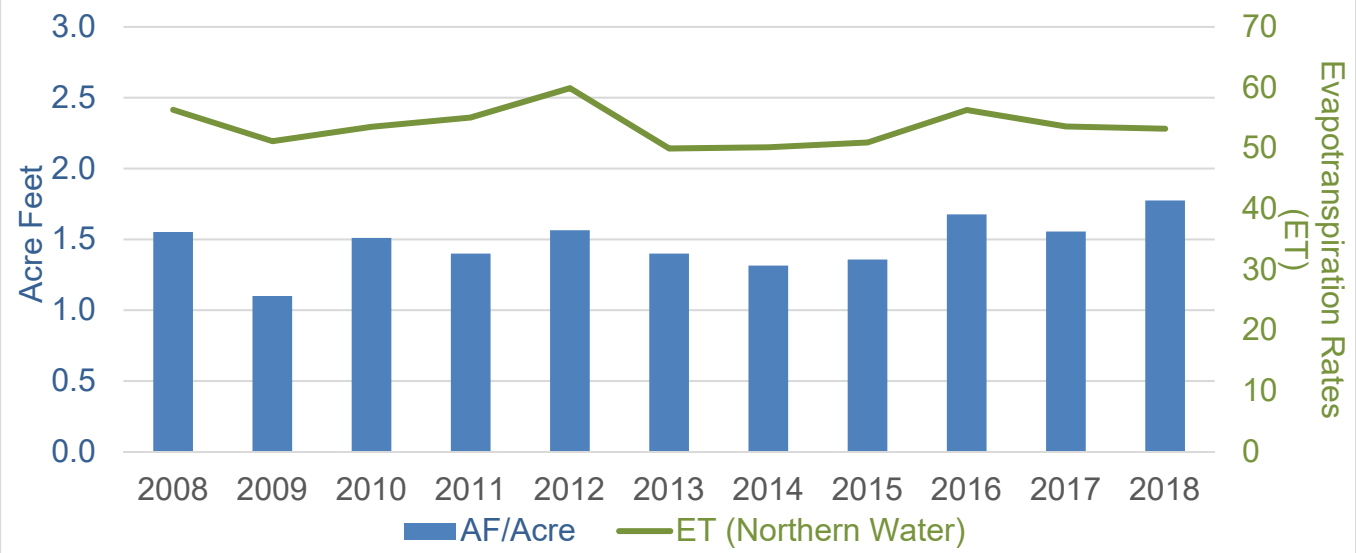
Integral to the City's Irrigation Plan is the understanding that application of irrigation water to the City's properties is not a one-size-fits-all program. As the Irrigation Plan states:

Several factors need to be applied when calculating actual turf watering requirements:

- ***Types of Grasses*** *being irrigated (Blue Grass, Buffalo Grass, Turf Type Fescue, etc.);*
- ***Site Conditions*** *(shady, sunny, hillside, low area, soil type, soil compaction, etc.); site impacts (low use, high use, sports turf, green belts, etc.);*
- ***Safety Concerns*** *regarding recreation activities (hard playing surfaces, large cracks in the soil, bare ground, etc.);*
- ***Current Weather Conditions*** *(evapotranspiration rates, temperatures, soil moisture levels, wind, sunshine, weekly rain totals);*
- ***Aesthetics*** *(public buildings, sculpture parks, planned public events, etc.).*

Overall, the irrigation water used by the Parks Department is efficiently managed at all times leveraging the benefits of centralized controllers with human judgment, as conditions warrant, since Parks staff can remotely operate the irrigation systems at 98% of the park and public spaces for which the City is responsible. Noteworthy is that based on the four-tiered irrigation program, park irrigation has been used effectively by the City in the past as a drought buffer. To irrigate Kentucky Blue Grass in this region, it requires on average about 3 AF of water per acre. The average water used per acre on the City's Parks and Public Grounds from 2008 through 2018 has been considerably lower than the standard 3 AF per acre (See Figure 2-16.)

FIGURE 2-16: AVERAGE ACRE FEET OF WATER PER ACRE PER YEAR ON PARKS AND PUBLIC GROUNDS



Below are two efforts the City plans to either investigate efficiency improvements or correct for known inefficiencies at City facilities:

1. **Pilot Program:** The City will be piloting efficient fixtures and systems at the new Northern Colorado Law Enforcement Training Center to be located at the Northern Colorado Regional Airport. As part of this pilot program, the City will install hybrid waterless urinals that may be programed to flush cycle either once a day, every other day or every three days depending on the urinal usage. The City will also be piloting an evaporative cooling system at this facility that will employ best management practices. Although evaporative cooling uses water in the process to cool air, it will be much more efficient at cooling high-volumes of air than standard air conditioning systems. Although the City does not provide water to this facility, if the results of this pilot program are favorable, the City will look to install hybrid waterless urinals and evaporative cooling systems in other City facilities.

2. **Lagoon Repairs:** The City is aware that the lagoon at the City's Civic Center has a leaky rubber bottom, the City plans to seal the bottom of the lagoon with concrete to reduce future water loss.

2.3 Past & Current Water Efficiency Programs with Estimated Water Savings

The City supports and promotes local water efficiency and conservation using various internal and external programs. Each of the City's programs and efforts are briefly described below along with additional information on the programs to evaluate their effectiveness, such as the number of participants, the period of implementation, estimated water savings, cost per 1,000 gallons saved or other applicable statistics and/or information. Some programs, such as public outreach endeavors, do not show specific water savings, but they are listed because they help to contribute to the overall promotion of water efficiency in the City of Loveland. Following the outline of the existing program are graphs of overall water demand changes, which help demonstrate the combined effect of these water efficiency programs as well as passive savings.

1. **Larimer County Conservation Corps** and **Home Energy Assessment Program**

The City supports and offers energy and water programs, which provide home assessments to residents. The water efficiency measures of these assessments include replacing faucet aerators and showerheads, installing toilet dams, and providing dye tablets to test for leaking toilets. They also educate customers about water and energy efficiency practices and services.

TABLE 2-6: SHOWER HEAD DIRECT INSTALLS

Period of Implementation	2011 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Estimated Accumulated Annual Water Savings (AF)		10.20	12.74	14.19	16.33	17.81	**71.28 AF**	**14.26 AF**
Qty Installed per Year		314	251	144	211	147	**1067**	**213**
Assumptions: Fixture life of 10 years, water savings of 3,292 gallons per year per fixture.								

TABLE 2-7: BATHROOM AERATOR DIRECT INSTALLS

Period of Implementation	2011 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Estimated Accumulated Annual Water Savings (AF)		3.00	3.80	4.66	5.51	6.03	**23.01 AF**	**4.6 AF**
Qty Installed per Year		542	402	430	425	265	**2064**	**413**
Assumptions: Fixture life of 10 years, water savings of 649 gallons per year per fixture.								

TABLE 2-8: KITCHEN AERATOR DIRECT INSTALLS

Period of Implementation	2011 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Estimated Accumulated Annual Water Savings (AF)		0.85	1.04	1.25	1.35	1.46	**5.94 AF**	**1.19 AF**
Qty Installed per Year		146	131	183	272	168	**900**	**180**
Assumptions: Fixture life of 10 years, water savings of 378 gallons per year per fixture.								

TABLE 2-9: TOILET TANK BAG DIRECT INSTALLS

Period of Implementation	2011 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Estimated Accumulated Annual Water Savings (AF)		1.95	1.80	1.49	1.34	1.08	**7.66 AF**	**1.53 AF**
Qty Installed per Year		84	119	62	35	24	**324**	**65**
Assumptions: Measured life of 4 years, water savings of 1460 gallons per year.								

TABLE 2-10: LARIMER COUNTY CONSERVATION CORPS

Period of Implementation	2011 to Present	2014	2015	2016	2017	2018
Fixture		**Quantity Installed**				
Showerhead		276	211	131	205	145
Bathroom Aerator		485	382	416	421	263
Kitchen Aerator		241	143	172	87	88
Tank Bags		54	93	59	35	24
Water Savings		**Estimated Water Savings (Gallons)**				
1st Year of Direct Install		1,393,295	1,132,364	852,392	1,032,075	716,331
Accumulated Savings Based on Fixture Life		13,459,910	10,508,960	8,007,080	10,014,150	6,953,070
ROI		**Dollars Spent per 1,000 Gallons Saved**				
1st Year of Fixture Installation		$8.79	$18.02	$24.64	$20.83	$33.50
Accumulated Savings based on Fixture Life		$0.91	$1.94	$2.62	$2.15	$3.45

TABLE 2-11: HOME ENERGY AUDITS

Period of Implementation	2011 to Present	2014	2015	2016	2017	2018
Fixture		**Quantity Installed**				
Showerhead		38	40	13	6	2
Bathroom Aerator		57	20	14	4	2
Kitchen Aerator		31	25	3	0	5
Tank Bags		30	26	3	0	0
Water Savings		**Estimated Water Savings (Gallons)**				
1st Year of Direct Install		217,607	192,070	57,396	22,348	9,772
Accumulated Savings Based on Fixture Life		1,913,270	1,692,940	547,680	223,480	97,720
ROI		**Dollars Spent per 1,000 Gallons Saved**				
1st Year of Fixture Installation		$5.51	$6.25	$17.42	$24.95	$136.07
Accumulated Savings based on Fixture Life		$0.63	$0.71	$1.83	$2.49	$13.61

2. Efficiency Works

The initial focus of the Efficiency Works program was to implement energy-efficient improvements for the City's commercial and residential customers. Water efficiency improvements were added as part of the building-tune-up program in 2011, during which time 157 ultra-low-flow faucet aerators and 5 low-flow pre-rinse spray valve nozzles were installed. In 2019, the City updated the intergovernmental agreement with Platte River Power Authority, who administers the Efficiency Works demand-side management program, to provide additional non-energy related programs when directly funded by the owner cities. In 2020, the City is planning to roll out a toilet and urinal rebate program through Efficiency Works for both commercial and residential customers.

TABLE 2-12: EFFICIENCY WORKS (DIRECT INSTALLS & REBATES OF WATER EFFICIENT FIXTURES)

Period of Implementation: 2011 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Fixture	**Quantity**						
Showerhead - 1.5 GPM HH	0	0	0	0	186	**186**	**37.2**
Bath Aerator - 1.0 GPM	0	0	0	0	159	**159**	**31.8**
Kitchen Aerator - 1.5 GPM	0	0	0	0	47	**47**	**9.4**
Ultra Low-flow Faucet Aerator	0	0	0	0	0	**0**	**0**
Low-flow Pre-rinse Spray Valve Nozzle	0	0	0	0	0	**0**	**0**
Self-Contained Ice Machine	0	0	0	1	0	**1**	**0.2**
Water Savings	**Estimated Water Savings (Gallons)**					**5-Year Total**	**Average per Year**
1st Year of Direct Install	0.00	0.00	0.00	0.00	2.35	**2.36 AF**	**0.47 AF**
Accumulated Savings Based on Fixture Life	6.03	7.53	9.04	10.55	14.42	**47.57 AF**	**9.51 AF**
Type of ROI	**Dollars Spent per 1,000 Gallons Saved**						
1st Year of Fixture Installation	$0	$0	$0	$100	$3,675	**$3,775**	**$755**
Accumulated Savings based on Fixture Life	$0.34	$0.28	$0.23	$0.23	$0.95	**$2.02**	**$0.40**

Assumptions: Measured life of 10 years for showerheads and aerators, 5 years for ice machines, water savings per year of 2,365 gallons per 1.5 GPM showerhead, 2,482 gallons for 0.5 GPM aerators, 1,752 gallons for 1.0 GPM aerators, 1,022 gallons for 1.5 GPM aerators, 3,000 gallons per ultra low-flow faucet, 4,000 gallons for low-flow pre-rinse spray valve nozzle, and1,380 gallons for self-contained ice machines.

3. Slow the Flow (Sprinkler Audits)

The City supports Resource Central's *Slow the Flow* irrigation audits. These 90-minute audits include a visual inspection to pinpoint sprinkler system problems, testing to measure the precipitation rate of the sprinkler system, measuring how evenly the water covers the intended areas, and soil sampling to determine root depth and soil type. Customers receive one-on-one education on how to program and set up their automatic sprinkler system to conserve water while still providing adequate water for their plants as well as learning about their specific soil types and ways to improve their soil conditions and irrigation systems.

TABLE 2-13: SLOW THE FLOW (SPRINKLER AUDITS)

Period of Implementation: 2012 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Estimated Accumulated Annual Water Savings (AF)	4.61	4.61	0.73	4.80	TBD	**14.76 AF**	**3.69 AF**
Qty Performed per Year	119	101	77	206	115	**618**	**124**
Water Savings	**Estimated Water Savings (Gallons)**					*Assumptions: Water savings calculated per participant for 3-years based on actual consumption.*	
1st Year of Audit	238,000	-	-	1,565,600	TBD		
Accumulated Savings (3-years from Audit)	1,503,000	1,503,000	238,000	1,565,600	1,565,600		
ROI	**Dollars Spent per 1,000 Gallons Saved**						
1st Year of Audit	$20.56	$10.55	$67.72	$20.08	$10.24		
Accumulated Savings (3-years from Audit)	$32.30	$42.85	$338.32	$71.51	$81.75		

4. Garden-in-a-Box Residential Xeriscape Program

The City provides discounted Garden-in-a-Box kits to local residential customers through this Resource Central program. The Garden-in-a-Box kits include a professionally designed planting design of low water xeric plants tailored to grow in Colorado soils. The kits can help conserve around 1,000 gallons of water compared to a traditional grass lawn.

TABLE 2-14: GARDEN-IN-A-BOX (XERISCAPE GARDEN SALES)

Period of Implementation: 2007 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Estimated Accumulated Annual Water Savings (AF)	0.38	0.38	0.40	0.40	0.50	**2.07 AF**	**0.41 AF**
Qty Purchased per Year in Loveland	125	123	131	130	164	**673**	**135**
Water Savings	**Estimated Water Savings (Gallons)**					*Assumptions: Water savings of 1,000 gallons per garden for 1 year.*	
1st Year of Installation	125,000	123,000	131,000	130,000	164,000		
Accumulated Savings	125,000	123,000	131,000	130,000	164,000		
ROI	**Dollars Spent per 1,000 Gallons Saved**						
1st Year of Installation	$47.76	$52.79	$35.48	$43.17	$35.83		
Accumulated Savings	$47.76	$52.79	$35.48	$43.17	$35.83		

5. Shave the Peak Campaign

As the Water Treatment Plant began approaching its peak capacity, the "Shave the Peak" campaign was used starting in 2010 to temporarily reduce the peak day water production at the Water Treatment Plant. Instead of putting an $8.1 million dollar project into the proposed 2011 budget, City Council approved the campaign with alternatives to reduce peak water demand and still meet the customers' water needs. The program proposed promoting enhanced community involvement through implementation of a voluntary every other day outdoor watering schedule and activation of an interconnect from the Little Thompson Water District to the City's distribution system. This interconnect would add treated water to the City's supplies when necessary, and the watering schedule balanced the community's water demand. The program started in 2010 and successfully delayed the costly water treatment capacity expansion project until 2014. The plant expansion project concluded in 2016 and increased the capacity from 30 MGD to

38 MGD. Over the last five years, the City's peak day flows per year have ranged from 25.3 MGD on the low end to 27.7 MGD on the high end. We expect to employ a similar strategy when future peak day flows begin to approach the current 38 MGD capacity to delay the next expansion project to a time when the customer base has the need to use the additional capacity that the improvements would provide.

TABLE 2-15: SHAVE THE PEAK CAMPAIGN

Period of Implementation	2010 to 2016	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Summer Peak Day Flows (MGD)		25.3	27.4	27.3	N/A	N/A	**80.0**	**26.7**
Summer Peak Flow per Capita (Gallons)		357	373	367	N/A	N/A	**1097**	**366**

6. Leak Repair Program

As part of the City's water loss control program, the Water Operations staff proactively employs leak detection equipment to find and repair leaks before they surface. They also repair any reported water main leaks. They estimate the water that had been leaking by size of the leak, the pressure of the water and the run times. By fixing these leaks, the plants can produce less treated water to meet customer demands.

TABLE 2-16: LEAK REPAIR PROGRAM

Period of Implementation	2008 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Estimated Accumulated Annual Water Savings (AF)		311.18	358.19	449.27	505.59	575.56	**2199.78 AF**	**439.96 AF**
Leaks Repaired per Year		75	64	82	44	59	**324**	**65**
Assumptions: Water savings estimated based on size of leak, pressure, and run times.								

7. Hydrozone Program

The City supports water-efficiency for developments that design, install, and maintain water efficient landscapes. This allows for a reduced water rights payment on the associated dedicated irrigation meter(s) and potentially reduced system impact fees if the tap size(s) can be reduced. Participants must submit a hydrozone plan that includes irrigation and planting designs that clusters plants with similar water requirements together to help conserve water. A water budget is calculated to the specific plants under the hydrozone plan. The landscape design must demonstrate at least a 25% reduction from the three acre feet of water per acre required to irrigate typical Kentucky bluegrass. Participants have three years to establish plants in which the water budget does not apply. Going forward, if the water budget is exceeded, an annual surcharge is assessed, which can be very costly and serves as an added incentive to keep irrigation water usage down.

TABLE 2-17: HYDROZONE PROGRAM

Period of Implementation	2009 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Estimated Accumulated Annual Water Savings (AF)		114.45	120.66	120.66	146.53	155.15	**657.45 AF**	**131.49 AF**
Number of Water Meters on Program		25	33	34	34	35	**N/A**	**32**
Number of Acres on a Water Budget		101	107	107	98	98	**N/A**	**102**
Assumptions: Water savings based on the amount of the reduction in water rights paid verses the full water rights payment of 3 AF per acre. Three AF per acre is the average amount of water needed annually to irrigate Kentucky bluegrass in this region. Water savings begin after the initial 3-year grace period, to provide time to establish plants before the water budget goes into effect.								

8. Northern Water's – Water-Efficiency Program

The City receives a substantial amount of water through the Colorado-Big Thompson project, which is administered by Northern Water. Northern Water offers programs to encourage efficient water use. These programs are available to all their customers in the region including the City of Loveland. Following are brief descriptions of the water efficiency offerings of Northern Water available to the City of Loveland's customer base:

- **Landscape Demonstrations** – Northern Water leads by example through showcasing cutting edge designs in integrated landscapes which are water efficient, drought resilient, carbon sequestering and soil building, while still providing utility and property value. They are renovating and expanding their demonstration areas from their backyard to include the rest of the property's landscape features. As part of their demonstration gardens, they offer information about native and alternative grasses, irrigation technologies (smart controls using weather or soil moisture data), plant water use by turf grass variety, comparative irrigation techniques (subsurface drip irrigation vs. spray irrigation), xeric garden irrigation comparison, soil preparations based on type of existing soil, gradient irrigation of turn grasses, the use of a weather station to track water demand for turn and plants in the garden, water-conserving turf grasses using up to 30% less water than standard Kentucky bluegrass, gradient subsurface drip irrigation, review of sixteen Kentucky bluegrass varieties, and a xeriscape plaza featuring eight miniature landscapes with Colorado-friendly landscaping themes and a variety of water-wise plants and mulches.
- **Industry Training** – To enhance the green industry's water efficiency capabilities, Northern Water provides landscape, design, property management and service industries with new irrigation and landscape management certifications including Watershed Wise Landscape Professional Training with the Green Gardens Group and Irrigation Association certification classes.
- **Consultations** – Offers free, objective, third-party, on-site landscape evaluations, which may include water-use benchmarking for HOAs, businesses, municipalities, sanitation districts and property managers.

- **Water-Efficient Landscape Grant Program** – Northern offers grants from $5,000 to $15,000 with a 50 percent match to promote water-efficient, Colorado climate-friendly landscapes. The grants are available to public facilities or open spaces, businesses, schools, multi-family complexes, and HOA-management landscapes. The landscapes must be at least 500 square feet in 2019 and at least 1,000 square feet starting in 2020, designed to use substantially less water than traditional landscapes and include at least 50 percent plant coverage when the plants are mature.

  Below are brief descriptions of the four projects that participated in this new grant program in 2019 and for which the City expects to begin seeing water savings with the 2020 irrigation season.

  1. **Seven Lakes Master HOA:** This 0.4 acre project was located on a steep slope, making irrigating and maintaining turf difficult. The project consisted of converting an area that was 86% turf and 14% rock beds and to all terraced rock beds that will have approximately 50% vegetation/canopy coverage once the new plants are established. The existing trees remained, but many of the plantings were replaced with Colorado Plant Select choices. The converted landscape is now easier to maintain and will require less water going forward. In addition, the project enhanced the beauty of a main gateway to a highly visible neighborhood located directly off Boise Avenue.
  2. **Mariana Cove Owners Association:** This project consisted of updating the plantings and irrigation system of approximately 0.3 acres of islands and roadside areas to make them more water-efficient and reduce maintenance and operational costs while also improving the overall appearance of the subdivision.
  3. **Kendall Brook HOA:** This neighborhood in Northwest Loveland had difficulty in establishing native grasses adjacent to the City's recreation trail back in 2015. These areas were overrun with weeds, some of them invasive, and management consisted of herbicide applications and mowing. This project involved eradicating the existing weeds and establishing native grasses that comply with Kendall Brook's master plan and the City of Loveland's guidelines. This area will require temporary irrigation through the first full growing season to establish the grasses. Ones the native grasses are established, the irrigation system will be removed and these areas will become non-irrigated areas. The project also implemented recommendations from a water audit which determined where water savings could be maximized by replacing irrigation controls with smart controllers.
  4. **Fairway Ridge HOA:** Conversion of approximately 5,000 sf of turf to primarily low-water use native plants with a minimum of 50% plant coverage in four areas and modification of the irrigation system as needed.

9. Water Line Replacement/Rehabilitation Program

As part of the City's water loss control program, the City's water engineering staff have focused efforts on rehabilitating or replacing the worst performing waterlines in the water distribution system. Between 2015 and 2018, the total annual estimated water loss from the water distribution system (real losses and apparent losses) dropped by 210 million gallons.

TABLE 2-18: WATER LINE REPLACEMENT OR REHABILITATION PROGRAM

Period of Implementation	2013 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Dollars Spent per year		$1,814,726	$124,900	$657,802	$1,277,222	$133,000	**$4,007,650**	**$801,530**
Feet Repaired/Rehabbed		8,843	8,762	2,869	6,070	1,255	**27,799**	**5,560**
Costs		**Dollars Spent per Foot Repaired/Rehabbed**						
Dollars per Foot Repaired/Rehabbed		$205.22	$14.25	$229.28	$210.42	$105.98	**$765.14**	**$153.03**

10. Meter Testing Program

The City currently employs the following meter testing procedures:

- **Small Meters (0.75" and 1.0"):** Tested each time they are flagged for a problem. Starting in 2017, the City began testing a yearly sampling of these meters proportionate to each make, model and size in the field.
- **Medium Meters (1.5" and 2.0"):** Tested each time they are flagged for a problem. Tested every 5 years, where not impeded due to issues in access, area disturbance or other difficulties.
- **Large Meters (3.0", 4.0" and 6.0"):** Tested each time they are flagged for a problem. Tested yearly, where not impeded due to issues in access, area disturbance or other difficulties.

If meters test outside of parameters, they are either rebuilt or replaced.

TABLE 2-19: WATER METER TESTING PROGRAM

Period of Implementation	2011 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Meters Tested per Year		718	671	754	926	542	**3,611**	**722**

11. Children's Water Festival

The Loveland Children's Water Festival is an annual collaboration with Loveland Storm Water Utility and Northern Water. This yearly festival is a daylong activity in which 5th graders in the Thompson School District are brought through a variety of education stations. Each station involves a 25-minute interactive learning session. Topics such as water quality, pretreatment, and water sources are the most common. The City often hosts a learning session on water conservation. This activity usually involves teaching students how they can be "water savers" followed by an interactive lesson in how quickly water waste can add up.

TABLE 2-20: CHILDREN'S WATER FESTIVAL

Period of Implementation	2013 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Number of Attendees		800	850	850	900	900	**4,300**	**860**
Cost per Attendee		$2.56	$3.64	$2.81	$3.09	$0.56	**$12.66**	**$2.53**

12. Colorado Waterwise (*Live Like You Love It* campaign)

The City is a member of the Colorado Waterwise "Live Like you Love It" campaign. The City is granted access to the campaign materials, which it utilizes in a variety of ways. The one-pagers on water efficiency landscaping and indoor water use are always on-hand and distributed frequently at events. The social media materials are used commonly, and the campaign is featured frequently on our promotional items and educational efforts.

TABLE 2-21: COLORADO WATERWISE (*LIVE LIKE YOU LOVE IT*)

Period of Implementation	2015 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Cost per Year		N/A	$3,000	$4,743	$7,915	$6,500	**$22,158**	**$5,539**

13. City Update (Utility Bill Insert)

Eleven months of the year, Loveland Water and Power composes two of the six-page bill insert newsletter titled "City Update". The City Update is the only outreach effort delivered to every rate-payer in Loveland. Loveland Water and Power dedicates roughly 50% of the written material to water related topics. Water features may include program promotion for Slow the Flow, Garden in the Box or other water programs and initiatives. It can also include educational pieces on water quality or water conservation topics such as irrigating with the cycle and soak method.

TABLE 2-22: CITY UPDATE (UTILITY BILL INSERT)

Period of Implementation	2002 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Number of Recipients		Unknown	Unknown	Unknown	36,696	38,299	**74,995**	**37,498**
Cost per Recipient		Unknown	Unknown	Unknown	$0.33	$0.31	**$0.64**	**$0.32**

14. Community Stewardship Lecture Series

Starting in 2016, the City began partnering with the High Plains Environmental Center to facilitate lectures for the Loveland community. Topics included water-efficient landscaping, rain barrels, and a screening of "The Great Divide" documentary film that focused on water resources.

TABLE 2-23: COMMUNITY STEWARDSHIP LECTURE SERIES

Period of Implementation	2016 to 2018	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Number Offered per Year		N/A	N/A	7	5	3	**15**	**5**
Number of Attendees		N/A	N/A	105	122	129	**356**	**119**
Cost per Attendee		N/A	N/A	$8.85	$1.56	$1.24	**$11.65**	**$3.88**

15. Water Wise Seminars

In 2019, the City partnered with Resource Central to provide two "Water-Wise" Seminars at the Loveland Public Library. These two and a half hour sessions included presentations from xeriscaping experts (one focused on general xeriscaping, the other on xeriscaping with an intent to attract pollinators), a question and answer session, and an opportunity to discuss water saving programs and habits with City staff.

TABLE 2-24: WATER WISE SEMINARS

Period of Implementation	2019	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Number Offered per Year		N/A	N/A	N/A	N/A	N/A	**N/A**	**N/A**
Number of Attendees		N/A	N/A	N/A	N/A	N/A	**N/A**	**N/A**
Cost per Attendee		N/A	N/A	N/A	N/A	N/A	**N/A**	**N/A**

16. Residential e-Newsletter

The Residential e-Newsletter is the utility's largest online publication. Similar to City Update, the Residential e-newsletter has content split between water and power topics.

TABLE 2-25: RESIDENTIAL E-NEWSLETTER

Period of Implementation	2017 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Number of Recipients		N/A	N/A	N/A	2,617	2,732	**5,349**	**2,675**
Cost per Recipient		N/A	N/A	N/A	$0.41	$0.44	**$0.85**	**$0.43**

Note: The costs include the full subscription rate to Constant Contact Service, which is also used for the business newsletter, outage notifications, and broadband notifications.

17. Xeriscape Demonstration Gardens

The Parks Department maintains two demonstration xeriscape gardens, one at the downtown Civic Center and another at the City Service Center. The one at the Civic Center (Jeff Peterson Xeriscape Demonstration Garden) was originally installed in 1996. In 2014, the Loveland Water and Power partnered with the High Plains Environmental Center to update the garden and give it a new look, including the installation of more than 130 plants. Each installation is accompanied by educational materials for Loveland citizens, including xeriscaping principles and plant identification signs.

TABLE 2-26: XERISCAPE DEMONSTRATION GARDENS

Period of Implementation	1996 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Costs		$3,230	$53	$0	$0	$0	**$3,283.45**	**$656.69**

18. Social Media

Loveland Water and Power dedicates approximately half of its social media posts and efforts to water, including promoting water education, water programs, and water conservation. The City tracks All Likes/Follows on Facebook, Twitter and Instagram. The cost data only includes paid posts. Graphic design elements reused across multiple platforms are not included in the costs (physical handouts, mailers, rack cards, City Update, etc.).

TABLE 2-27: SOCIAL MEDIA

Period of Implementation	2014 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Contacts		1,489	1,894	2,411	2,780	3,173	**11,747**	**2,349**
Contacts per Dollar Spent		41	206	94	40	264	**645**	**129**

19. Video Views (YouTube and Facebook)

Loveland Water and Power posts videos on YouTube and Facebook. Most of these videos are professionally produced by an outside media company. *Note: The cost data includes budget dollars in both water and power.*

TABLE 2-28: VIDEO VIEWS (YOUTUBE AND FACEBOOK)

Period of Implementation	2017 to Present	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Views		N/A	N/A	N/A	2,708	16,986	**19,694**	**9,847**
Cost per View		N/A	N/A	N/A	$3.54	$0.46	**$4.00**	**$2.00**

20. Loveland Water & Power Website

The website has a host of materials for visitors, including educational materials on water efficiency and promotion of Loveland's water programs. In 2019, Loveland Water and Power began to track website analytics for specific parts of the website.

21. Events Participation (General)

Loveland Water and Power promotes water and power programs at various events with varying audiences. This is a summary by year of the number of events that Loveland Water and Power participated in since 2014.

TABLE 2-29: EVENT PARTICIPATION

Period of Implementation	All Years	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Number of Events		32	38	33	25	24	**152**	**30**
Approximate Attendance		8,634	14,719	10,895	7,529	4,753	**46,530**	**9,306**

22. 2017 Water Quality Campaign

In 2017, the City conducted a 4-month water quality campaign that included social media, direct mail, and video outreach. One of the three components of the campaign focused on water conservation.

23. Water Efficiency Give A-Ways

The City provides customers with dye tablets free of charge to self-test their toilets for leaks. At various events, the City has given away hourglass shower timers to promote taking shorter showers and toilet tank bags to reduce water usage per flush on high water use toilets.

24. Site Development Performance Standards and Guidelines

The following are excerpts related to water efficiency from the *City of Loveland Site Development Performance Standards and Guidelines*[13] used for development and redevelopment of land within the City of Loveland. The document is maintained by the City's Planning, Engineering, and Building Department.

[13] City of Loveland Site Development Performance Standards and Guidelines. http://www.cityofloveland.org/home/showdocument?id=5007

a. **Conserve Water Resources:** Purposefully locate landscaping materials where they will help conserve energy and water resources. (Section 4.01.01E)

b. **Plants Compatible to Climate and Water Supply:** All landscape materials planted pursuant to the provisions of these Site Development Standards and Guidelines shall be healthy and be compatible with the local climate and the site soil characteristics, drainage and water supply. (Section 4.02.01A)

c. **Mulch:** The use of quality mulch is encouraged. Mulch can reduce weed growth and slow erosion. Mulch all planting beds. Keep mulch cover at least 3 inches deep to retain water around roots. Avoid the use of crushed aggregate, gravel, lava rock, and plastic. (Section 4.020.02C)

d. **Encourage Low Water Use Plants:** The use of very low and low water use plant materials is encouraged. Water conservation is achieved through one or more of the following: 1. The use of plant materials suited for drought tolerance or reduced water demand, as listed under 'Moisture" in Appendix A, Guideline Plant List; 2. The use of appropriately designed irrigation and/or the redirection of natural moisture; 3. The limited use of conventional bluegrass turf to only those areas of high use. Use drought tolerant blue grass, buffalo grass, blue gamma, and/or brome/fescue combinations in other areas of turf. (Section 4.02.02D)

e. **Soil Amendment Requirements:** (All new commercial developments, multi-family developments, common areas in subdivision and hydrozones require soil amendments. Hydrozone program participants are required to have notarized soil amendment affidavits. Amending soils with compost increases the soil's capacity to hold moisture, which allows for watering to be reduced.) Soil amendments (ie. organic matter and fertilizers) appropriate for site conditions and landscape design shall be provided. The landscape installer must certify that soil amendments have been installed in accordance with the requirements of this Chapter and in accordance with submitted plans. (Sections 4.02.05D)

   Soil amendments (including organic matter and fertilizers) that are appropriate for the intended plant materials, design of the site and soil conditions should be selected and used. Soil should be tilled and amendments incorporated to a minimum depth of 6 inches. The following schedule specifies the minimum soil amendment requirements per 1000 square feet of landscape area:

   i. Bluegrass and High-Water Plantings: 3 cubic yards
   ii. Shrubs, Perennials and Moderate to Low-Water Plantings: 2 cubic yards
   iii. Xeric and Very Low-Water Plantings: 1 cubic yard or comparable treatment
   iv. Dryland and native grassland re-establishment areas: no required treatment (Section 4.02.06.F)

f. **Temporary Irrigation to Establish Native Plants:** If there are areas on site which require watering only to establish plantings, such as areas planted with native seed mixes, an irrigation system which is temporary in nature and available for the establishment period is permitted. (Section 4.02.06B3)

g. **Avoid Irrigation Overspray:** Design of irrigation systems should avoid overspray onto non-planted and impervious surfaces. 1. To the extent possible, avoid the use of planting areas less than 10 feet wide that are irrigated with overhead sprinkler systems; 2. Subsurface and/or drip irrigation systems should be used for shrub bed areas. (Section 4.02.06C)

h. **Optional Water Efficient Landscape Plan:** See an abbreviated description under the "7. Hydrozone Program" above. (Section 4.10.01)

i. **Guideline Plant List Specifications:** This document lists plants suitable for the east slope or Front Range conditions with approximate annual irrigation requirements. The list was developed by Green Industries of Colorado (GreenCo), which is an alliance of eight trade associations representing diverse aspects of plant and landscape industry from nurseries, greenhouses, sod growers, plant care professionals, retail garden centers, golf course management, arborists, and landscape professionals and was developed in cooperation with Colorado State University.

25. Water Waste Ordinance:

The City has the following ordinances in place to encourage water efficiency:

> **City of Loveland Municipal Code 13.04.170 Wasting Water:** Consumers shall prevent unnecessary waste of water and keep all water outlets closed when not in actual use. Hydrants, urinals, water closets, and other fixtures, must be kept in repair so that they will not cause unnecessary waste of water. The supplying of water may be discontinued for any violation of this section. (Ord. 997 § 6, 1968; prior code § 13.13).

26. Sprinkler Use Limitation Ordinance:

The City also has sprinkler use limitation ordinance in place to reduce the quantity of water dispensed on a given area at one time.

> **City of Loveland Municipal Code 13.04.210 Sprinkling – Use Limits:** Consumers shall not use a larger hose than three-fourths of an inch in diameter, and sprinkling without a nozzle or with a nozzle opening larger than one-fourth inch is strictly forbidden. Maximum use at one time shall be limited by the following gallons per minute: Lot areas up to 10,000 square feet, 10 gallons per minute; For each additional 10,000 square feet, 5 gallons per minute. (Ord. 997 § 8, 1968; prior code § 13.16)

27. Water Provider Review of New and Proposed Developments:

The Water and Power Department plays an integral part in the development review process within the City of Loveland. City staff members from Planning, Building, Fire, Transportation, Stormwater, Parks, Power, and Water/Wastewater participate in the review of new and proposed developments. The City's development review process has several steps addressing a development project from concept to building permit and a water utility staff member tracks each project through the following steps.

Step 1 – Concept Review: The City offers three Concept Review meeting openings weekly on Thursday afternoons to allow an applicant with a proposed development project to sit face to face with all of the City's development review staff members and receive feedback on their project at no cost to the applicant. Following the meeting, City staff compile a comprehensive packet with written comments from each department regarding the proposed project. The comments provided by the water and wastewater staff review the existing conditions on the site, including meters, services, or mains, and what is required to develop the site. Comments are also provided regarding any existing water rights credits and what is due.

Step 2 – Planning/Zoning Approval: During the Planning and Zoning Review, water department staff review the construction plans for the development as well as verify the proposed water meter size. The Water Department requires that the applicant provide a water meter size justification letter to ensure the water meter is not under or oversized. At this point, there may be a final residential plat, and the residential water rights are invoiced.

Step 3 – Building Permit Approval: Water Department staff review building permit plans and confirm water meter sizing. Fees are collected based on meter size and development type. Commercial water rights are invoiced and collected at this time.

The Water Department staff member dedicated to Development Review answers all phone calls, emails and walk-in customer questions regarding water development, construction, and fees.

On Mondays, the Water Department staff meet internally with representatives from water resources, operations, pre-treatment, engineering, and water metering to collectively review and provide comments on all development projects at any of the steps of the development process outlined above. On Wednesdays, a Water Utility staff member meets with the other Development Review Team members from other City departments to coordinate comments prior to providing them to applicants.

Overall Water Savings for Programs

For the programs in which we estimated a specific amount of water savings per year, below is a summary of their combined impact on reducing water demand per year.

TABLE 2-30: OVERALL WATER SAVINGS FOR ALL PROGRAMS

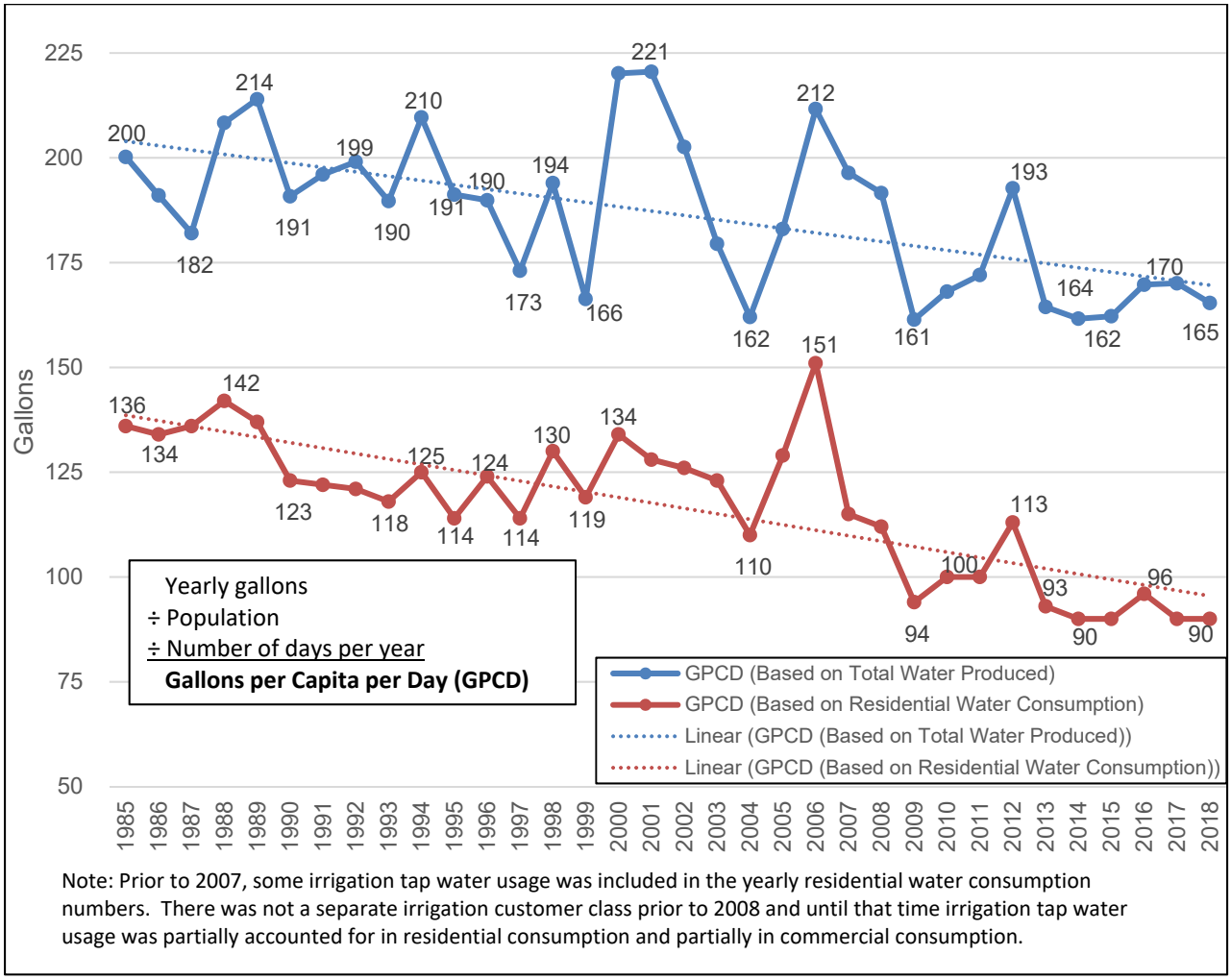
	2014	2015	2016	2017	2018	5-Year Total	Average per Year
Total Estimated Accumulated Annual Water Savings (AF)	452.66	510.76	601.69	692.40	772.01	**3,030**	**606**

Changes in Overall Water Demand

Some efficiency programs are more difficult than others to estimate their individual impact on overall water demand. For instance, we know that efforts to repair and replace water transmission and distribution assets (meters, water lines, water values, etc.), efforts to educate the public on water efficiency, land development requirements (soil amendments, etc.), and water saving giveaways (shower timers, toilet leak dye tablets, toilet tank bags, etc.) make some type of impact on water demand. Figure 2-17

demonstrates a downward trend in per capita water demand from 1985 to 2018 from the combined impact of all the water efficiencies occurring in the City's water system.

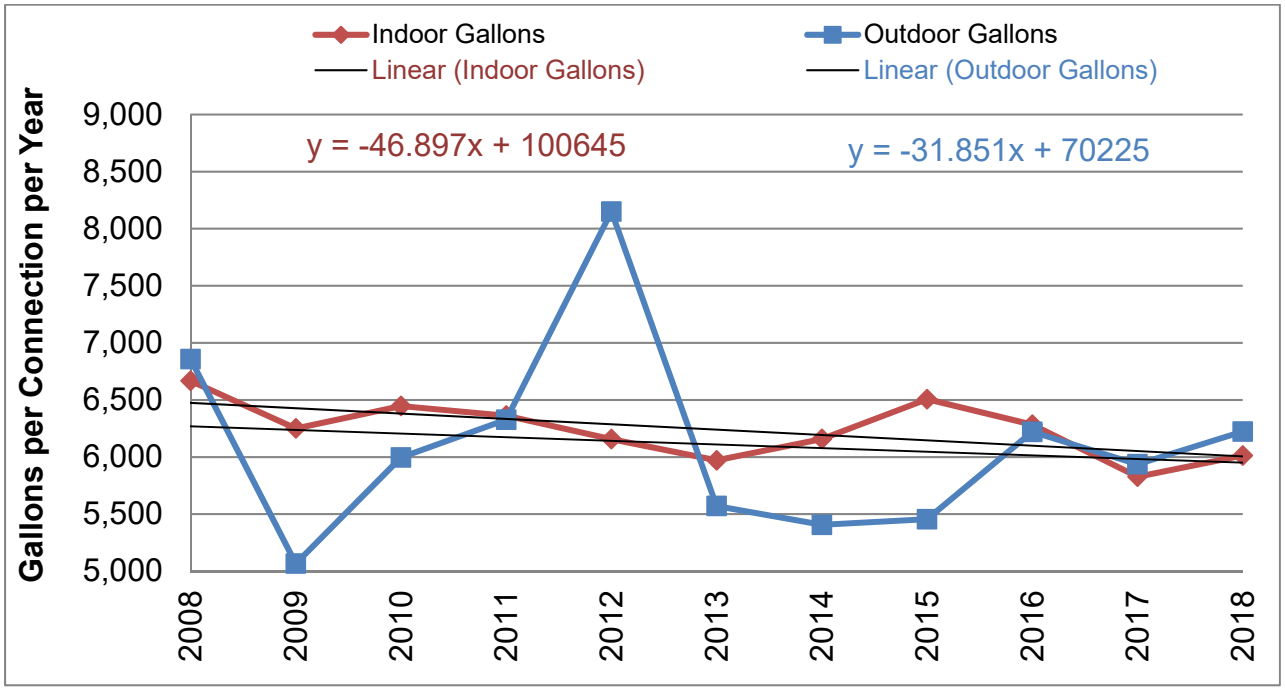
FIGURE 2-17: RESIDENTIAL GALLONS PER CAPITA PER DAY



Note: Prior to 2007, some irrigation tap water usage was included in the yearly residential water consumption numbers. There was not a separate irrigation customer class prior to 2008 and until that time irrigation tap water usage was partially accounted for in residential consumption and partially in commercial consumption.

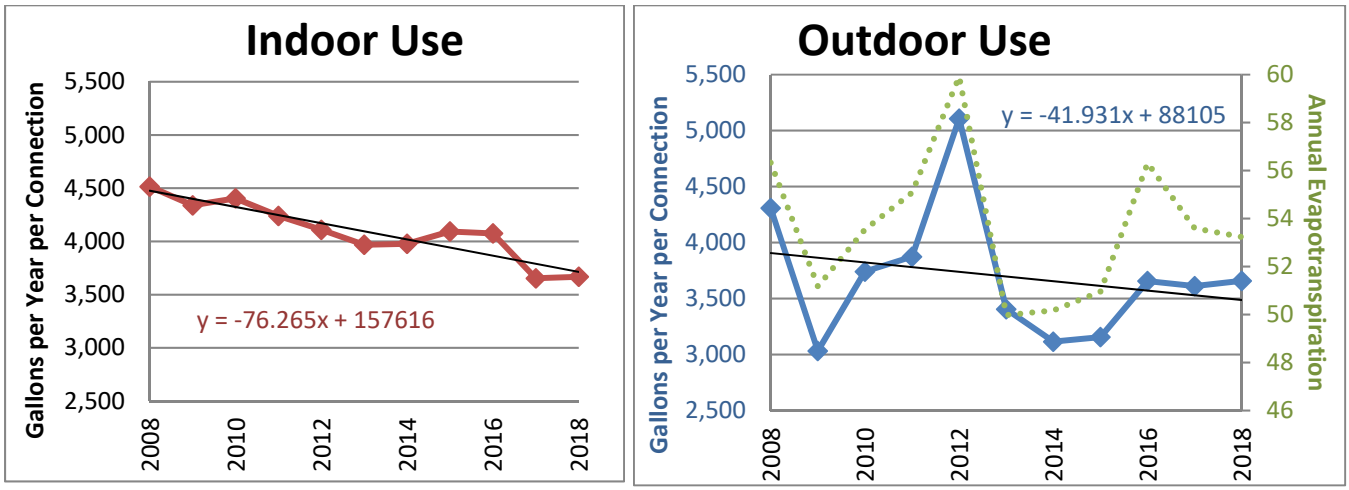
By looking at the water usage during the winter months of January through March and November through December, when it is unlikely that the water usage would be for outdoor uses, we can extrapolate the average indoor water usage verses outdoor water usage per year. Using this methodology helps distinguish whether overall decreases in water usage are due to indoor or outdoor water efficiencies. Based on this methodology, Figure 2-18 demonstrates that from 2008 to 2018 Loveland's average indoor water usage per connection decreased by approximately 47 gallons per year, which could be attributed to factors that affect indoor water usage such as replacing indoor plumbing fixtures and appliances with higher efficiency fixtures and appliances. During that same period, Loveland's average outdoor water usage per connection decreased by approximately 31 gallons per year, which could be attributed to factors that affect outdoor irrigation use such as increased xeriscape, increased soil amendments, decreases in the portions of lots being irrigated, installation of more efficient sprinkler systems and watering schedules.

FIGURE 2-18: AVERAGE ANNUAL INDOOR VS. OUTDOOR WATER USAGE PER CONNECTION



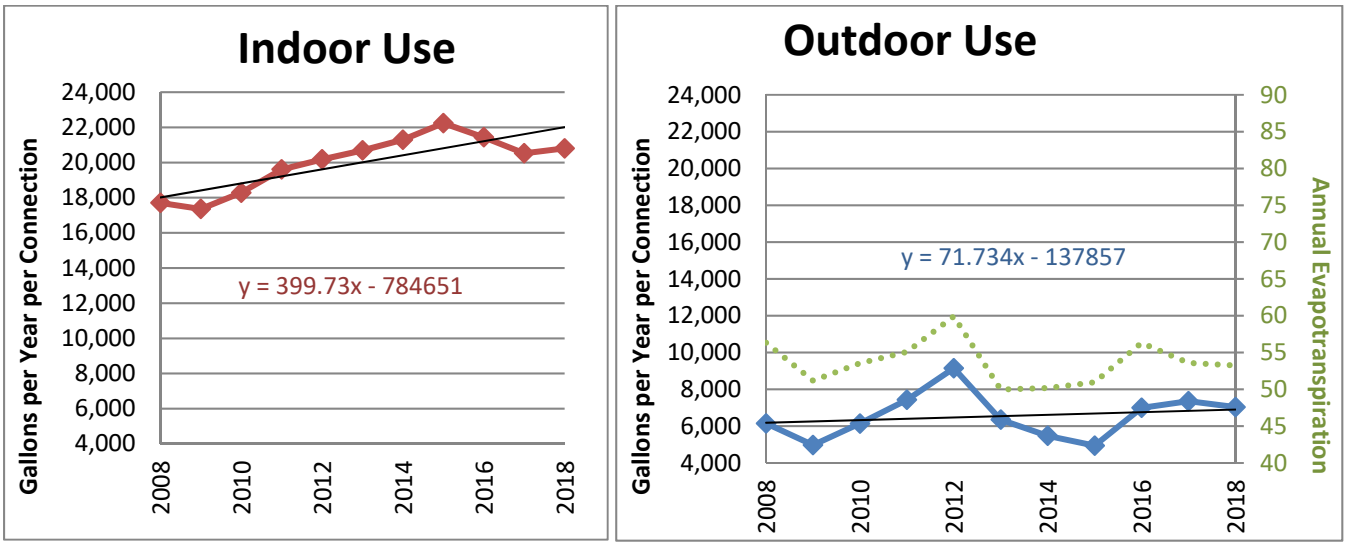
The following figures, separate the estimated indoor and outdoor water usage by customer class from 2008 to 2018. The indoor water usage is calculated as the average monthly usage from January through March and November through December and multiplies by twelve months per year. The outdoor usage is calculated by deducting the estimated indoor usage from the total yearly usage.

FIGURE 2-19: SINGLE FAMILY RESIDENTIAL – AVERAGE WATER USE PER CONNECTION PER YEAR



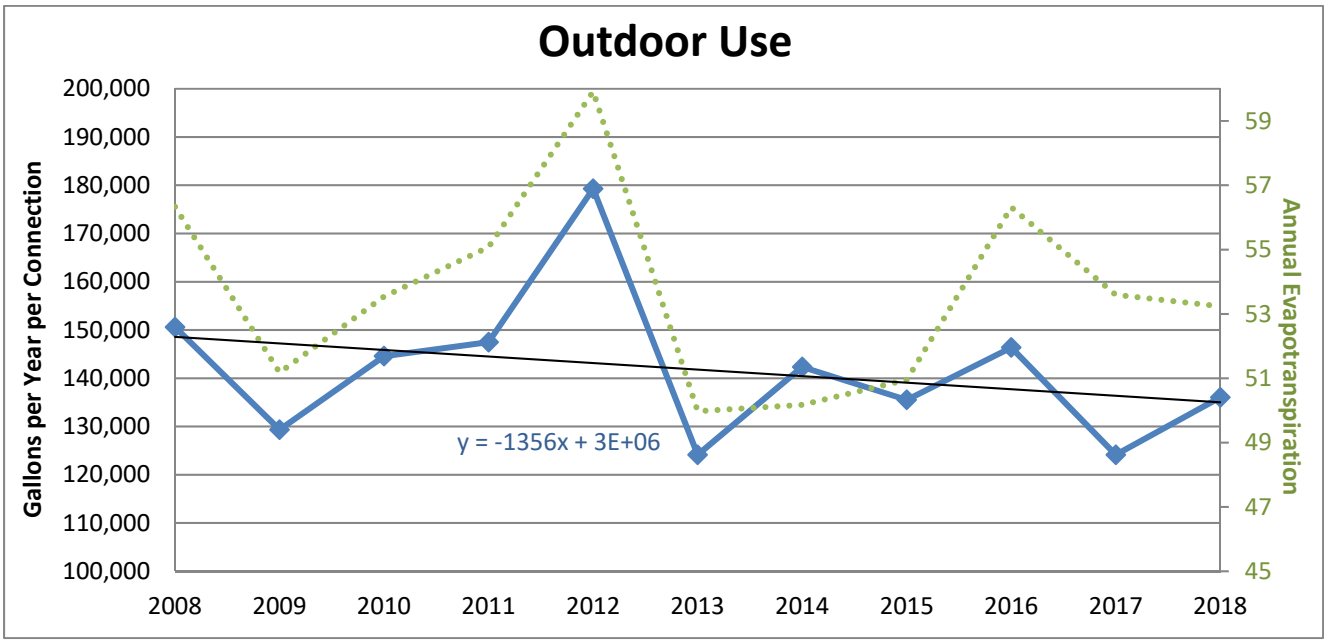
From 2008 to 2018, the water usage for single family connections decreased by approximately 76 gallons per year for indoor usage and approximately 41 gallons per year for outdoor usage.

FIGURE 2-20: MULTI-FAMILY RESIDENTIAL – AVERAGE WATER USE PER CONNECTION PER YEAR



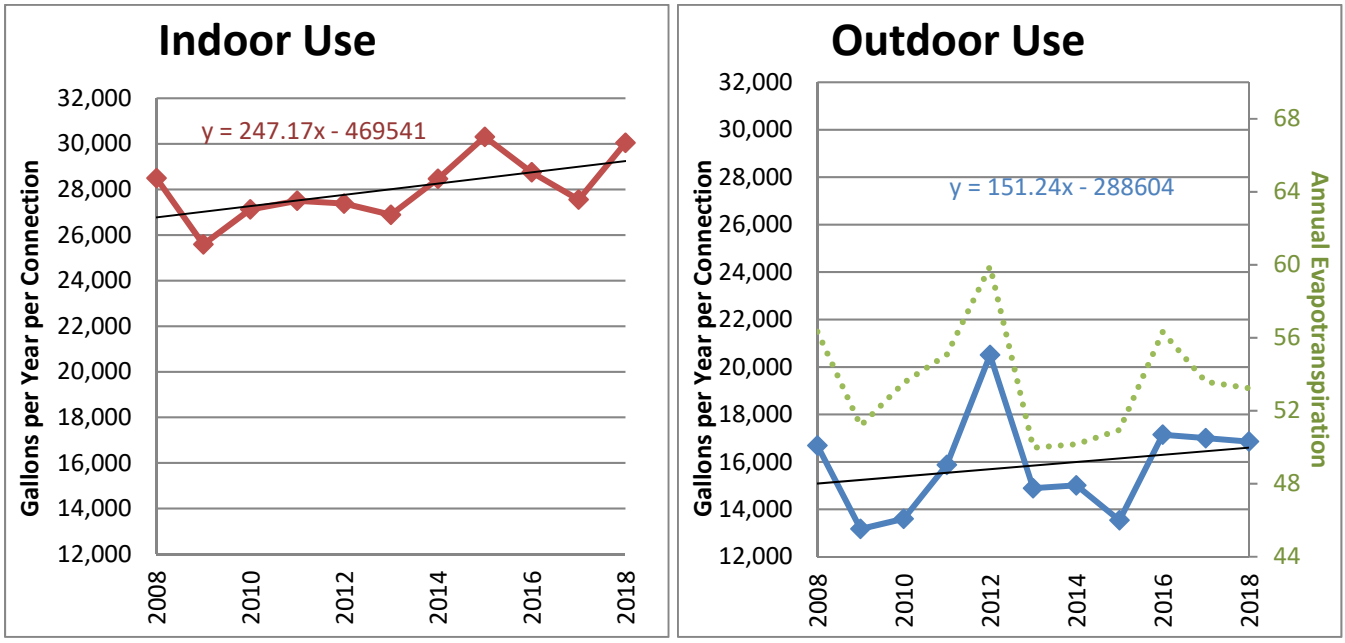
From 2008 to 2018, the water usage for multi-family connections increased by approximately 400 gallons per year for indoor usage and approximately 72 gallons per year for outdoor usage. Further investigation is needed to determine the water usage per dwelling unit. If the average dwelling units served per connection has increased, the actual water usage per dwelling unit may be decreasing over time.

FIGURE 2-21: IRRIGATION – AVERAGE WATER USE PER CONNECTION PER YEAR



It is assumed that all water usage from dedicated irrigation meters are for outdoor usage. From 2008 to 2018, the water usage for irrigation connections decreased by approximately 1,356 gallons per year. The decrease in usage can partly be attributed to the increased participation in the hydrozone program that includes water budgets and penalties for budget exceedances.

FIGURE 2-22: COMMERCIAL – AVERAGE WATER USE PER CONNECTION PER YEAR



From 2008 to 2018, the water usage for commercial connections increased by approximately 247 gallons per year for indoor usage and approximately 151 gallons per year for outdoor usage.

Progress on Prior Water Savings Goals:

Loveland's 2013 Water Conservation Plan had an overarching water savings goal to reduce per connection water usage by approximately 11% between 2012 and 2020, for an estimated demand reduction of about 1750 AF. From 2012 through 2018, average water usage per connection (excluding ranch water and hydrant meter rentals) reduced by 15% going from the average usage per connection per year of 14,227 gallons in 2012 down to 12,153 gallons in 2018. If all the customers in 2018 were to have used the same average amount of water usage per connection per year as was used in 2012, the water usage in 2018 would have been 2,033 AF higher than the actual 2018 water usage. Unless there are large increases in water usage per connection during 2019 and 2020, the 2013 Water Conservation Plan goals to reduce per connection water usage by 11% and an estimated demand reduction of 1,750 AF have already been achieved.

2.4 Demand Forecasts

The potential effects of future water demand programs that the City chooses to implement have not been included in the demand forecast prepared during this step. Demand forecasting at this point in the planning process only incorporates trends in future customer water demand based on a continuation of the current water usage trends and ongoing water efficiency efforts and "passive conservation" as older fixtures and appliances wear out and are replaced with models that meet current efficiency standards. A revision to the demand forecast based on implementing the efficiency measures selected by the City is made later during the planning process, and is presented in Section 4.

TABLE 2-31: POPULATION ESTIMATES & PROJECTIONS

Year	Population Estimate/ Projection	Percent Change from Previous Year
2009	66,132	--
2010	67,742	2.43%
2011	68,761	1.5%
2012	69,341	0.84%
2013	70,370	1.48%
2014	71,027	0.93%
2015	73,420	3.37%
2016	74,385	1.31%
2017	75,840	1.96%
2018	77,262	1.88%
2019	78,980	2.22%
2020	80,106	1.43%
2021	81,765	2.07%
2022	84,090	2.84%
2023	85,545	1.73%
2024	86,993	1.69%
2025	88,434	1.66%
2026	89,869	1.62%
2027	91,280	1.57%
2028	92,620	1.47%
2029	93,953	1.44%

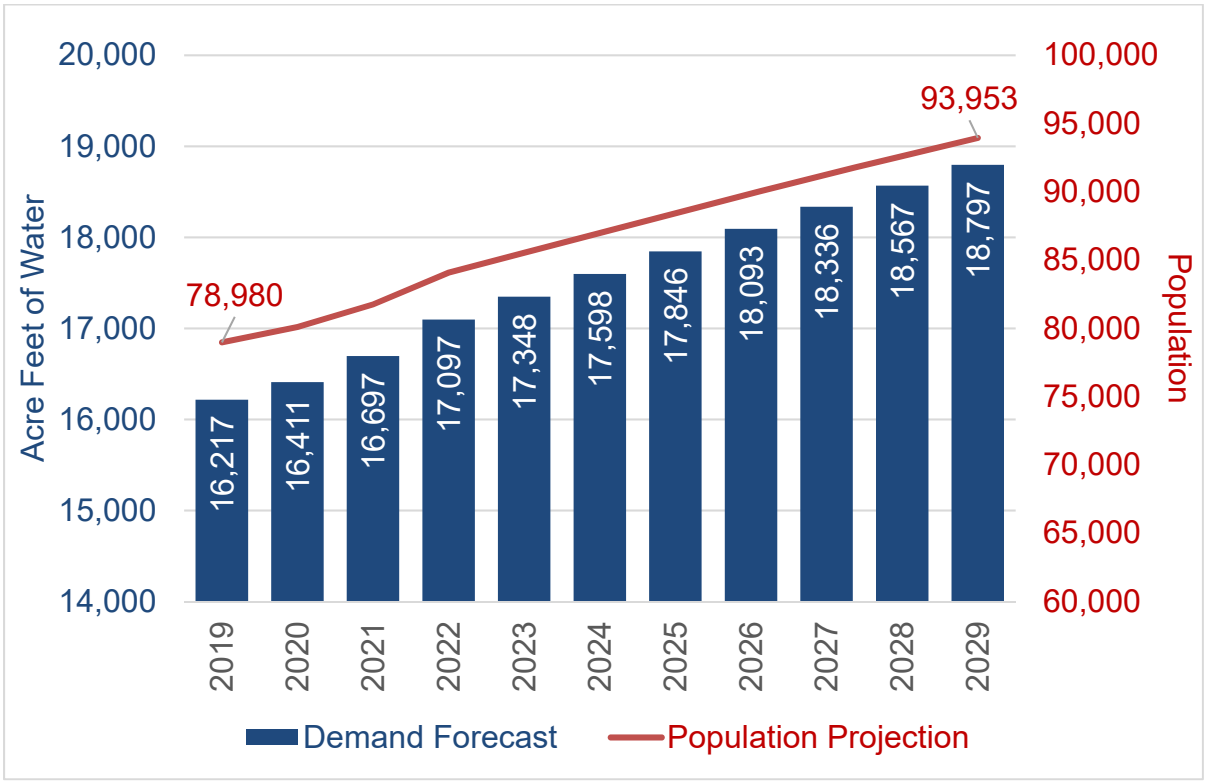
For the demand forecasts, average condition water demands are projected through 2029, which coincides with the last year included in the City's current 10-year capital improvement plan. Actual demands over the 10-year period from 2009 through 2018 were used to project forward the usage from 2019 through 2029. This period of time takes into account the current demand management programs and water demand trends for dry, wet and average years.

As the population increases or decreases for the residential, irrigation, commercial, and ranch water customer classes, the overall demand for each of these customer classes increases or decreases as well. For these categories, the projections were based on the 10-year average water use per capita per customer class and multiplied by the expected population per year. For the remaining customer classes (city use, hydrant rentals, and wholesale sales) that do not correlate well to population growth, future projected water demand was based on the most recent 5-year water demand average (2014-2018).

Population Estimates and Projections were taken from the *Annual Data and Assumptions Reports* published by Loveland's Community and Strategic Planning Department. These reports generated population estimates as follows:

- ***2009*** - Based on projections by the State Demographer's Office and Loveland's historical share of Larimer County Population.
- ***2010 through 2019*** - Based on the number of dwelling units derived from Building Division records and forecasts multiplied by 2.37, which is the estimated number of persons per dwelling unit in Loveland.
- ***2018 and Beyond*** - Based on growth rates developed by the State Demographer's Office for the Loveland sub-area.

FIGURE 2-23: DEMAND PROJECTIONS WITHOUT CHANGES TO CURRENTLY IMPLEMENTED DEMAND MANAGEMENT ACTIVITIES



3 – Integrated Planning & Water Efficiency Benefits and Goals

The anticipated benefits of improved water efficiency and water efficiency goals play a role in the City's planning efforts to ensure sufficient water supplies as well as the timing and nature of future capital improvement projects.

3.1 Water Efficiency and Water Supply Planning:

It can be a challenge for a utility to have adequate water supplies, treatment capacities, and well maintained water distribution systems while striving to keep costs low for its ratepayers. One of the ways to help keep costs low is to time projects for when they are needed rather than ahead of time. Water efficiency improvements can help delay, eliminate, or reduce the size of future capital improvement projects and water acquisition and firming projects.

Treatment Plant Capacity: The capacity of a water treatment plant is sized to meet peak day summer demands – a very short period of the year. Loveland's water treatment plant is rated to treat 38 million gallons per day. Based on the peak day water usage projections with unmodified demands, the City anticipates needing additional capacity in place by approximately 2041, which would necessitate the design and construction to be completed prior to that time. Water efficiency measures that help reduce summer peak demands, such as those focused on reducing outdoor irrigation needs, can help delay the need for the next expensive treatment plant capacity project.

Water Storage Tanks: An $8M 3.5 MG water storage tank is scheduled to be designed and constructed between 2024 and 2025 in the capital improvement plan to help meet anticipated future water demands. Water efficiency improvements could delay the need for this water storage tank.

Downstream Storage: Between December 2018 and February 2019, the City filed an application for a conditional water storage right on a property purchase for a downstream lined gravel pit. In about eight to ten years, the City has slated a project costing approximately $6M to install infrastructure at this site that would allow diversions into and out of this reservoir. When completed, this downstream storage would provide the City with an estimated 1,300 AF of active storage space and 1,850 AF of additional firm yield. Water efficiency improvements could delay the need for this water storage reservoir.

Water Rights Requirements: In September 2019, the City updated its residential water rights requirements based on observed water efficiency improvements. The City performed a 10-year indoor and outdoor residential water use study based on housing type (single family detached, single family attached and multi-family) from 2008 through 2017 on structures built after low-flow plumbing fixtures were mandated to determine if the residential water rights requirements should be adjusted on future developments. The findings from the study indicated that indoor water use per dwelling had decreased, outdoor water usage per lot had decreased, and single family detached units on average used substantially more water for both indoor and outdoor use than the other residential dwelling types. In September 2019, the City updated the water rights requirements for new residential developments to be in line with the 99% confidence interval of the sample data, observed water usage, system loss factors, and vacancy rates.

Indoor residential water rights per dwelling decreased from 0.23 AF per unit to:

- 0.22 AF for single family detached units greater than 800 sf
- 0.16 AF for single family detached units less than or equal to 800 sf, single family attached units, and multi-family units

Outdoor residential water rights decreased on the first 15,000 sf per lot from 1.6 AF per net lot acre to:

- 1.4 AF for single family detached units greater than 800 sf
- 1.3 AF for single family detached units less than or equal to 800 sf, single family attached units, and multi-family units

Reduced residential water rights requirements is an example of how the City has incorporated water efficiency improvements into its long-term water acquisition policies and water supply planning process.

Yearly Projections: Each year, the City updates its future projections based on the historical water usage patterns. As part of this process, the City looks at changes in gallons per capita per day, changes in peak day water production, changes in annual water production, and changes in the proportion of revenue verses non-revenue water. Any water efficiency improvements made are captured in these yearly projection updates, which result in delaying the projected time line for future water acquisitions and firming projects and capacity related water capital improvement projects.

Modified Forecasted Water Demand Projections: Below is the modified demand forecast that includes the impacts of the proposed efficiency activities in Section 4 of this WEP. By continuing existing water-efficiency activities and implementing the newly proposed water-efficiency activities, the City estimates that the total demands in 2029 will be about 1,231 AF less than without these programs. The City estimates the accumulated water savings from existing and future water-efficiency activities during the planning period of 2019 through 2029 to be 11,201 AF. The City plans to accomplish this level of water efficiency by continuing successful activities already in place and implementing the newly proposed programs outlined in Section 4. The projected water savings are expected to be demonstrated by continued reductions in per capita use over the planning period; however, overall treated water demand is expected to increase as the population increases.

The impact of the proposed water efficiency program will be apparent with regard to both total water demand and water sales in the City. The design of the water efficiency program focuses on reducing real and apparent water loss, reducing summertime peak demand, reducing treated water demands at the water and wastewater treatment plants, and improving overall customer water use efficiency, all of which can help postpone capital improvement projects and reduce long-term water supply development requirements. The City will need to continue its practices related to the integration of storage and efficient water use to meet the needs of its customers – since the nature of a future water supply that is reliable, secure, and sustainable will change in response to a growing service population, evolving commercial and business uses, and changing climatic and regulatory conditions. It is also vital to note that overall water demand reductions are estimates based on experience, literature assessments and expected trends in the City's municipal water use. Actual water savings may vary widely depending on customer behaviors, weather conditions, City messaging efforts, and any number of other external factors.

FIGURE 3-1: UNMODIFIED AND MODIFIED TREATED WATER DEMAND PROJECTIONS

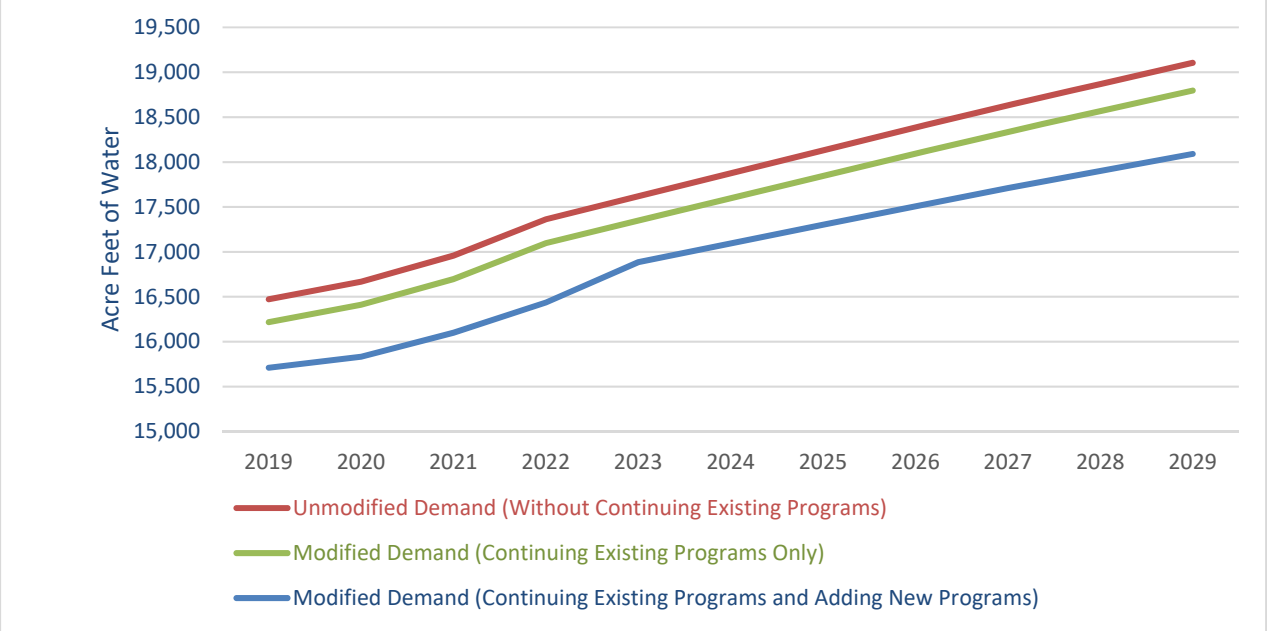


TABLE 3-1: UNMODIFIED AND MODIFIED TREATED WATER DEMAND PROJECTIONS

Treated Water Demands			
Year	**Unmodified (AF)**	**Continuing Existing Programs (AF)**	**Continuing Existing & Adding New Programs (AF)**
2019	16,532	16,217	15,707
2020	16,666	16,411	15,766
2021	16,956	16,697	16,035
2022	17,361	17,097	16,399
2023	17,618	17,348	16,866
2024	17,874	17,598	16,832
2025	18,128	17,846	17,052
2026	18,382	18,093	17,252
2027	18,632	18,336	17,467
2028	18,868	18,567	17,670
2029	19,104	18,797	17,872
Increase Use from 2019 Unmodified	**2,572**	**2,265**	**1,341**
Difference from 2029 Unmodified		**307**	**1,231**

3.2 Water Efficiency Goals

A preliminary set of goals was developed prior to the selection of the water efficiency activities to provide a means to screen and evaluate the selected activities. An initial meeting was held with utility staff to discuss water efficiency goals appropriate for the City. The following preliminary goals were established:
Implement water efficiency programs that are:

- Already existing or that have low start-up costs with significant water savings
- Able to be administered within the City's staffing and administration constraints
- Compatible with community and governing board philosophies and values
- Beneficial to the community
- Applicable to Loveland

The efforts selected by the City to implement also meet at least some of the following water-efficiency objectives through:

- Reducing summertime peak daily demands by focusing on reducing outdoor irrigation
- Reducing utility and municipal water use
- Reducing system wide water loss
- Reducing per capita water usage
- Developing water rates that accurately reflect the cost of service for providing reliable, secure and sustainable water supplies, including infrastructure management and maintenance, and the impact of changing customer water use behavior patterns in the future
- Developing technical assistance and educational programs that will support improved water use efficiency

After selecting the water efficiency efforts that the City desired to implement, estimated costs and water savings were calculated for each program during the planning period. The following water savings goals are based on the combined impact of the yearly projected water savings of each Water Efficiency Plan measure during the planning period from 2019 through 2029.

TABLE 3-2: WATER EFFICIENCY GOALS

Goal Category	Goal	Measurement of Success
Overall Targeted Water Savings	Reduce Total GPCD from the 5-year average (2014-2018) of 163 GPCD by 8 gallons to 155 GPCD by 2029. (Excludes hydrant rental sales, ranch water and wholesale water sold to neighboring water districts.)	Monitor GPCD based on the amount of water for commercial, irrigation, residential, wholesale city, and non-revenue water divided by Loveland's population.
Irrigation Customer Class	Reduce water consumption by 4,300 AF between 2019 to 2029.	Monitor irrigation billing data (water demands) and acres irrigated through dedicated irrigation meters.
Residential Customer Class	Reduce water consumption by 4,300 AF between 2019 to 2029.	Monitor residential billing data (water demands) and population estimates.
Commercial Customer Class	Reduce water consumption by 900 AF between 2019 to 2029.	Monitor commercial billing data (water demands) and customer counts. Monitor decrease in water usage at Wastewater Treatment Plant. Monitor whether non-potable water fill station is implemented for sanitary sewer jetting and estimated yearly gallons used.
City Use	Reduce water consumption by 400 AF between 2019 to 2029.	Monitor city wholesale billing data (water demands) and customer counts.
Water Loss Control Program	Reduce non-revenue water by 2,400 AF between 2019 to 2029.	Monitor non-revenue water, apparent and real water loss levels on the annual M36 Water Loss Audit.
Water Rate Structure	Maintain a fair and equitable water structure that promotes efficient use while maintaining sufficient revenue.	Monitor actual rate increases verses per capita demands. Perform cost of service studies at least every 3-years to adjust rates based on the actual costs of services by rate class and that meet the 10-year capital improvement plan revenue requirements.

3.3 Integrated Land Use Planning and Water Efficiency Benefits and Goals

Below is a summary of all the water and land use integration efforts that the City currently employs or anticipates employing, along with the expected benefits and goals of these efforts. Many of these measures are described in more detail in other sections of this WEP.

1. **Committee for Water Efficiency Through Integrated Land Use Planning:** In fall 2019, the City of Loveland began a committee that will meet at least semi-annually with representatives from the Water Utility and the Planning Department to identify existing and potential water efficiencies that can be or have been incorporated into land use planning. At the initial kickoff meeting, several possible activities were identified that could be investigated that would help incorporate water efficiencies into the land use planning, particularly for new developments. The committee will seek to gain direction from City Council during the WEP approval process on which areas to prioritize.
2. **Integrate Long-Term Land Use and Water Planning**
    a. **Raw Water Master Plans:** For many years, the Water Utility has incorporated the Planning Department's population projections into their Raw Water Master Plans to ensure the City has adequate water supplies to meet the long-term needs of the City. The Water Utility looks at the changes in average gallons per capita per day of the City's customer base to help project future demands. Gallons per capita per day has decreased as more of the customer base has incorporated water-efficiencies into indoor and outdoor water uses.
    b. **Water Model:** The Water Utility incorporates the Planning Department's population projections and types and locations of new developments into the water model to determine if the existing pipes and infrastructure of the water distribution system will be adequate to meet future water needs. The water model takes a comprehensive look at the existing system and future growth projections and plans improvements to the existing system along with sizes and locations of future pipes, pump stations, and tanks to meet future demand. Results of this model form the framework for the capital improvement plan and budgets in upcoming years.
    c. **Comprehensive Plan –** The City's "Create Loveland Comprehensive Plan" last updated in 2015, serves as the umbrella plan for all City functions and services. The Comprehensive Plan refers the readers for more specifics on water related items to reference the 2012 Raw Water Master Plan, 2009 Water Master Plan, and 2013 Water Conservation Plan. Following, are a few excerpts from the Comprehensive Plan that encourage the wise use of water and improving water efficiencies:
        - **Create Loveland and Water:** "… *seeks to help Loveland become a more water efficient community by considering the impact of land use decisions on water use while anticipating how water supply will have an impact on future land use options. Currently, the water supply is not seen as placing*

immediate limits on Loveland's growth. However, it will need to be continually monitored through the Raw Water Master Plan."

- **Protect and Maintain Environmental Resources Policy 4.5:** "*Actively promoting landscape practices that conserve water…*"
- **Support Energy Choices for Loveland's Residents and Businesses that Include Clean Sources Policy 5.1:** "*Support enhanced home efficiency and performance measures to reduce energy costs and conserve resources (e.g., energy/water efficiency, rooftop solar, etc.).*"
- **Growth Management Area:** "*…predicating new development on water, sewer and infrastructure capacities*" is a method identified to make more efficient use of land and infrastructure and help to focus Loveland's resources.
- **Residential Water Use:** "*Water use is largely influenced by City policies governing land use and development patterns. Planning for increasing density though redevelopment and infill; higher density housing (smaller yards); unirrigated native landscapes; more efficient irrigation and water-wise landscaping for all uses; and encouraging installation of high efficiency water fixtures helps mitigate the growing pressures on Colorado's limited rivers and water resources – and reduces costs for acquiring water rights. The State's Water Plan, as authorized by Governor Hickenlooper, requires communities to include efficient land use planning. Efforts to reduce the required irrigated landscaping (buffer yards, open spaces, common areas, and detention ponds) in new development should be considered.*"

3. **Adjusting Residential Water Rights Based on Observed Usage Patterns:** The City performed a 10-year indoor and outdoor residential water use study based on housing type on residences built after the low-flow plumbing fixtures were mandated. The findings from the study indicated that indoor water use per dwelling had decreased, outdoor water usage per lot had decreased, and single family detached units on average used substantially more water for both indoor and outdoor use than the other residential dwelling types.

   As a result of the study, in September 2019, the City updated its residential water rights requirements based on observed water efficiency improvements. Indoor residential water rights per dwelling decreased from 0.23 AF per unit down to 0.22 AF for single family detached units greater than 800 sf and 0.16 AF for single family detached units less than or equal to 800 sf, single family attached units, and multi-family units. Outdoor residential water rights decreased on the first 15,000 sf per lot from 1.6 AF per net lot acre down to 1.4 AF for single family detached units greater than 800 sf and 1.3 AF for single family detached units less than or equal to 800 sf, single family attached units, and multi-family units.

   Reduced residential water rights requirements is an example of how the City has incorporated water efficiency improvements into its long-term water acquisition policies and water supply planning process.

4. **Integration of Water Considerations into the Development Approval Process:** The Water and Power Department plays an integral part in the review of developments within the City of Loveland. The City requires staff members from Planning, Building, Fire, Transportation, Stormwater, Parks, Power, and Water/Wastewater to participate in the review of new and proposed developments. The City's development review process has several steps and many people involved to get a project from concept to building permit, and a water utility staff member tracks each project through the following primary steps.

   Step 1 – Concept Review: The City offers three Concept Review meeting openings weekly on Thursday afternoons to allow an applicant with a proposed development project to sit face to face with all of the City's development review staff members and receive feedback on their project at no cost to the applicant. Following the meeting, City staff compile a comprehensive packet with written comments from each department regarding the proposed project. The comments provided by the water and wastewater staff review the existing conditions on the site, including meters, services, or mains, and what is required to develop the site. Comments are also provided regarding any existing water rights credits and what is due.

   Step 2 – Planning/Zoning Approval: During the Planning and Zoning Review, water department staff review the construction plans for the development as well as verify the proposed water meter size. The Water Department requires that the applicant provide a water meter size justification letter to ensure the water meter is not under or oversized. At this point, there may be a final residential plat, and the residential water rights are invoiced.

   Step 3 – Building Permit Approval: Water Department staff review building permit plans and confirm water meter sizing. Fees are collected based on meter size and development type. Commercial water rights are invoiced and collected at this time.

   The Water Department staff member dedicated to Development Review answers all phone calls, emails and walk-in customer questions regarding water development, construction and fees. On Mondays, Water Department staff meet internally with representatives from water resources, operations, pre-treatment, engineering, and water metering to collectively review and provide comments on all development projects at any of the steps of the development process outlined above. On Wednesdays, a Water Utility staff member meets with the other Development Review Team members from other City departments to coordinate comments prior to providing them to applicants.

5. **Cottage & Micro Homes:** Single family detached homes less than or equal to 800 square feet are charged lower system impact fees and water rights equivalent to the amount paid for single family attached homes. This encourages development of smaller homes and smaller sized lots which tend to use less water than the typical single family detached developments.
6. **Hydrozone Program:** The City supports water-efficiency for developments that design, install and maintain water efficient landscapes. This allows for a reduced water rights

payment on the associated dedicated irrigation meter(s) and potentially reduced system impact fees if the tap size(s) can be reduced. Participants must submit a hydrozone plan that includes irrigation and planting designs that clusters plants with similar water requirements together to help conserve water. A water budget is calculated to the specific plants under the hydrozone plan. The landscape design must show at least a 25% reduction from the 3 AF of water per acre required to irrigate typical Kentucky bluegrass in this area. Participants have 3 years to establish plants in which the water budget does not apply. Going forward, if the water budget is exceeded, an annual surcharge is assessed, which can be very costly and serves as an added incentive to keep irrigation water usage down.

7. **Separate Irrigation Taps:** When a developer chooses to have a separate irrigated tap to irrigate all outdoor areas, water rights are paid on only the irrigated areas rather than on the net lot acres which can help the utility and the customers more closely monitor outdoor irrigation usage.

8. **Meter Justification Letter:** For all commercial, irrigation and multi-family (≥ 3 dwelling units) water meters, the City requires the developer to submit a meter justification letter signed and sealed by a Licensed Engineer with fixture counts, equivalent gallons per minute demand flows from International Plumbing Code (IPC) manuals, and the type and size of water meter chosen. This helps to prevent over sizing of meters, which not only costs more to install, maintain and replace, but also results in higher base charges on all future utility bills.

9. **Northern Water's Water Efficiency Program:** The City receives a substantial amount of water through the Colorado-Big Thompson project, which is administered by Northern Water. Northern Water offers water conservation solutions for wise water use. These programs are available to all their customers in the region including the City of Loveland. Following are brief descriptions of the water efficiency offerings of Northern Water available to the City's customer base:

    - **Landscape Demonstrations** – Northern Water leads by example through showcasing cutting edge designs in integrated landscapes which are water efficient, drought resilient, carbon holding and soil building, while still providing utility and property value. They are renovating and expanding their demonstration areas from their backyard to include the rest of the property's landscape features. As part of their demonstration gardens, they offer information about native and alternative grasses, irrigation technologies (smart controls using weather or soil moisture data), plant water use by turf grass variety, comparative irrigation techniques (subsurface drip irrigation vs. spray irrigation), xeric garden irrigation comparison, soil preparations based on type of existing soil, gradient irrigation of turn grasses, the use of a weather station to track water demand for turf and plants in the garden, water-conserving turf grasses using up to 30% less water than standard Kentucky bluegrass, gradient subsurface drip irrigation, review of sixteen Kentucky bluegrass varieties, and a xeriscape plaza featuring eight miniature landscapes with Colorado-friendly landscaping themes and a variety of water-wise plants and mulches.

- **Industry Training** – To enhance the green industry's water efficiency capabilities, Northern Water offers landscape, design, property management and service industries with new irrigation and landscape management certifications including Watershed Wise Landscape Professional Training with the Green Gardens Group and Irrigation Association certification classes.
- **Water-Efficient Landscape Grant Program** – Grants between $5,000 up to $15,000 with a 50 percent match are offered to promote water-efficient, Colorado climate-friendly landscapes. The grants are available to public facilities or open spaces, businesses, schools, multi-family complexes, and HOA-managed landscapes. The landscapes must be at least 500 square feet, designed to use substantially less water than traditional landscapes and include at least 50 percent plant coverage when the plants are mature.
- **Consultations** – Offer free, objective, third-party, on-site landscape evaluations, which may include water-use benchmarking for HOAs, businesses, municipalities, sanitation districts and property managers.

10. **Site Development Performance Standards and Guidelines:** The City publishes *The City of Loveland Performance Standards and Guidelines*[14], a document that specifies standards and guidelines applicable to all new developments and redevelopments. The following water-efficiency measures are included in this document:
    a. Locate landscaping materials to help conserve water resources
    b. Choose plants compatible to the local climate and water supply
    c. Encouraging the use of mulch to retain water around plant roots
    d. Encourage planting low water use plants
    e. Soil amendment requirements
    f. Temporary irrigation to establish native plants
    g. Avoiding irrigation overspray
    h. Optional participation in the Hydrozone Program
    i. List of plants suitable for this climate with the approximate annual irrigation requirements.

    For more detailed information on site development standards and guidelines, please see program number 24 in Section 2.3 of this document.

11. **Unified Development Code (UDC):** The City recently updated the unified development code, which allowed provisions for smaller homes on smaller lots that use less water than the typical single family detached homes.

    a. **Complete Neighborhoods Density Bonus** – Developments that meet certain criteria (walkability, connectivity, etc.) may have higher density developments, which tend to be comprised of smaller homes and smaller lots that on average use less water than typical single family detached home developments.

    b. **Clustering** – Allows for clustering of smaller sized homes that increase densities.

[14] [14] City of Loveland Site Development and Performance Standards and Guidelines. http://www.cityofloveland.org/home/showdocument?id=5007

c. **Variety in Housing Pallet** – Allows for more varieties in multi-family and attached housing that decrease water use per capita.

12. **Encourage Infill & Redevelopment:** Flexible development standards apply on commercial and multi-family projects on redevelopment and infill projects. They may be able to qualify for higher maximum building heights, higher density limitations and more flexibility on the perimeter setbacks or build-to lines requirements that can help to have more compact water infrastructure and reduced irrigated acres per capita – all of which contribute toward increased water efficiency.
13. **Excess Water Use Surcharges on Commercial Accounts:** Commercial customers are required to furnish adequate raw water to meet the customer's demand for treated water. If a commercial customer exceeds the amount furnished to the City, they are charged an excess water use surcharge in addition to the regular water rates. Commercial customers have the option to provide the City with additional water rights to increase the amount of gallons that may be used prior to incurring excess water use surcharges. This fee is assessed to support water use efficiency and to aid in recovering the cost of replacement water for large commercial water users.

Possible future modifications to integrated planning and water efficiency efforts.

1. **Excess Water Use Surcharge Extension:** Extend to either all new irrigation meters or to all new developments based on the water rights paid.
2. **Hydrozone Program Expansion and Changes:** Require all new dedicated irrigation accounts that irrigate an area above a certain threshold to be on the Hydrozone Program with a water budget. Modify the existing Hydrozone Program to not remove participants if they exceed their water budgets by more than 5% for 3 consecutive years to allow for time to educate and implement successful landscape changes where needed. Showcase successful Hydrozone participants.
3. **Irrigation Audits:** Offer/require auditing of irrigation systems and programming, particularly on large irrigated areas.
4. **Requirements for Percent of Area to be Landscaped for HOA's & Commercial Developments:** Limit the amount of grass and/or add more requirements for xeric landscaping
5. **Large Commercial Lots:** Adjust the requirements to have xericape at the frontage of the business behind the green areas and to the rear of the lots.
6. **Regional Meeting & Planning:** Meet with the neighboring water districts to develop common requirements for the overlapping areas that are part of the City of Loveland, but served water by others.
7. **Water Rights on Redevelopment:** Work to incrementally bring the water rights requirements of redevelopments to match the requirements of equivalent new developments, while providing credit for existing water rights (Possibly waive this requirement on downtown redevelopments).
8. **City of Loveland Plant List:** Update and implement revised planting lists.

9. **Modify the Turf Along Sidewalk Requirement:** Currently the City requires trees and turf between sidewalks and the streets on some of the larger roads. Investigate whether to pursue modifications to encourage the use of low-use seed mixes along roadways or changing the requirements to have areas of low-water use plants.
10. **Adopt or Strengthen Water-Related Ordinances or Regulations:** Research water efficiency related ordinances and regulations of other Colorado municipalities for ideas on how to either improve existing ordinances and regulations or to implement new ones in the City.
11. **Water Efficiency Education Materials for Planning:** Have the Water Utility develop and provide water efficiency documents for Planning to handout (brochures, fliers, etc.).
12. **Irrigation and Grounds Maintenance with Water Efficiency Focus:** Jointly engage with the development community and HOAs through an education campaign of how to design, install and maintain water efficient grounds.

4 – Selection of Water Efficiency Activities

4.1 Summary of Selection Process

The City used the following four-step process to select and evaluate water efficiency activities: 1-Assessment, 2-Identification, 3-Qualitative screening, 4-Evaluation and selection.

Assessment, Identification and Qualitative Screening
The City discussed with each of the water division work groups and with a new committee formed with representatives from the water utility and planning department on where water efficiencies could be improved and projects that could be implemented or studied. In addition, the City used Modified Worksheets D-G (Included in Appendix C) from the Addendum to 2012 Municipal Water Efficiency Plan Guidance Document that includes land use planning efforts to help identify additional water efficiency activities that met at least the first qualitative screening criteria listed below and preferably met at least one of the other screening criteria two through four listed below:

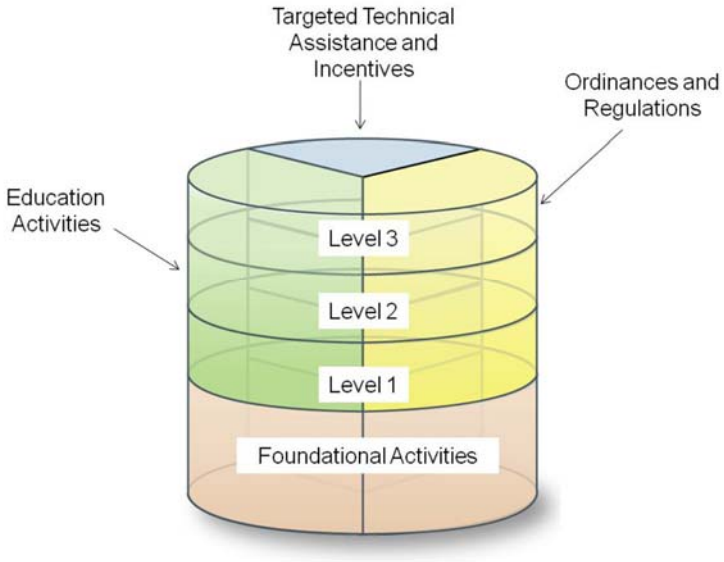
1. Within LWP's ability to implement
2. Low cost with significant water savings
3. Beneficial to the community
4. Reduce summer time peak demand

Activities that did not meet the basic screening criteria were eliminated. The remaining activities were further evaluated by asking:

- Was it was appropriate to expand a current program or should new program be created?
- Would there would be sufficient resources in place to support such a program?
- Would there be public support of such a program politically and from the customer base?
- What should be the timing to implement the programs?
- Which programs should we evaluate with future planning efforts?

The list of activities evaluated are organized according the SWSI Levels Framework, which assists water providers in prioritizing and selecting activities. The following cylindrical depiction shows this framework. The highest priority should be given to activities starting at the bottom of the cylinder and then working upward.

FIGURE 4-1: SWSI LEVELS FRAMEWORK



Below is a brief description of each of the SWSI Levels Framework categories:

- **Foundational Activities:** Activities focused on system operations and water efficiencies within the direct control of the utility. (*e.g. metering, data collection – monitoring and verification, water use efficiency oriented rates and tap fees, system water loss management and control, planning, staff, etc.)*

- **Targeted Technical Assistance and Incentives:** Activities that rely on indoor water efficient technologies and water-wise outdoor practices. *(e.g. water efficient fixtures and appliance installs, low water use landscapes, water efficient industrial and commercial water-using processes, rebates, water budgets, give-aways, etc.)*

  These activities are further broken down into the following three levels based on the targeted customers:

  Level 1 - Utility/municipality facility water efficiency
  Level 2 - Customers with the largest water use
  Level 3 - Management of remaining customer demands

- **Ordinances and Regulations:** Regulatory activities designed to encourage water efficiency. *(e.g. general water use regulations, landscape design/installation rules and regulations, indoor and commercial regulations.)*

  These activities are further broken down into the following three levels based on the targeted groups:

  Level 1 - Existing service area
  Level 2 - New construction
  Level 3 - Point of sale of existing building stock

- **Educational Activities:** Activities and efforts to educate the public on the benefits of water efficiency, how the utilities are promoting water efficiency and how customers can reduce their water usage. *(e.g. Customer education and technical assistance programs.)*

These activities are further broken down into the following three levels based on the type of communication:

Level 1 – One-way education
Level 2 – One-way education with feedback
Level 3 – Two-way education

Following the initial screening, water efficiency activities were selected for further evaluation. Some of the activities have been combined to assist in evaluation and avoid double counting of savings.

4.2 Demand Management Activities

State regulations (CRS 37-60-126 – see Appendix C) require that covered entities that develop water efficiency plans for review and approval by the CWCB consider a broad range of potential measures and programs for the plan to be complete. Tables 4-1, 4-2, 4-5 and 4-6 present summaries of the water efficiency measures and programs evaluated and selected by the City for implementation during the period 2019 to 2029 broken down into the following categories.

- Foundational activities (Table 4-1)
- Targeted technical assistance and incentives (Table 4-2)
- Ordinances and regulations (Table 4-5)
- Educational Activities (Table 4-6)

The summary tables for each category lists each program to implement along with additional information including the expected implementation period, estimated costs over the planning period, estimated water savings, accounts or customer classes affected by the program, and program specific notes. Following the tables in each of the categories is a more detailed description of the activities that have been performed and that the City plans to implement during the planning period through 2029.

4.2.1 Foundational Activities

Foundational activities focus on system operations and water efficiencies within the direct control of the utility. (*e.g.,* metering, data collection – monitoring and verification, water use efficiency oriented rates and tap fees, system water loss management and control, planning, staff, etc.) Below is a summary table of the foundational activities chosen to implement, followed by a brief description of what the City has done on foundational activities and description of planned changes and expansions of their foundational activities.

TABLE 4-1: FOUNDATION ACTIVITIES TO IMPLEMENT

Foundational Activities					
Metering	**Implementation Period**	**Estimated Costs (2019 to 2029)**	**Estimated Accumulated Water Savings by 2029 (AF)**	**Customer Classes/ Accounts Affected**	**Notes**
Meter Testing, Rehabbing & Replacement Program	2011 to 2029	$2.3M	1,273 AF	↓NRW ↑BMC	No change to total treated demand.
Metering Unmetered Unbilled Locations Irrigation at Water Utility Sites	2020 to 2029	$1K	7 AF	↓UUC ↑UMC	No change to non-revenue water or treated water demands. Irrigation at 29th St Pump Station & Namaqua Hills Tank.
Cost/Benefit Analysis to Install Meters at the Fire Training Grounds	2021 to 2029	$100K	13 AF	↓UUC ↑UMC	If implemented, no change to non-revenue water or treated water demands.
Metering Unmetered Billed Locations	2020 to 2029	$200	1 AF	↓BUC ↑BMC	Reduction in billed unmetered offset by increase in billed metered consumption. No change to treated water demands. Install meter on Public Works Vehicle
Graphing Usage at Difficult Testing Sites	2020 to 2029	$47K	3 AF	↓NRW ↑BMC	No change to total treated demand.
Demand Data Collection and Billing Systems	**Implementation Period**	**Estimated Costs (2019 to 2029)**	**Estimated Accumulated Water Savings by 2029 (AF)**	**Customer Classes/ Accounts Affected**	**Notes**
Upgraded Customer Information System with On-line Water Use Portal and Access to Improved Reports for Staff	2020-2029	$1.2M	Unknown	↓All	
Water Efficiency Oriented Rates and Tap Fees	**Implementation Period**	**Estimated Costs (2019 to 2029)**	**Estimated Accumulated Water Savings by 2029 (AF)**	**Customer Classes/ Accounts Affected**	**Notes**
Scheduled Rate Increases & Cost of Service Rate Studies	2019 to 2029	$135K	3,632 AF	↓All	Water Cost-of-Service Rate Studies scheduled for 2021, 2024, and 2027

Foundational Activities					
Excess water use surcharge – expand to all irrigation accounts (existing and new)	2024 to 2029	$18.5K	1,627 AF	↓Com ↓Irr	Costs include community outreach and educational efforts.
Tap Fees with Water Use Efficiency Incentives for Single Family Attached, Multi-Family, Micro, and Cottage homes.	2019 to 2029	$20K	Unknown	↓Res	Based on a 10-year study, we estimate the average annual water savings at 22K gallons per year per dwelling unit from the average usage of an average sized single family detached home, but it is difficult to trace whether the tap fees is the determining factor in choosing to do other types of housing.
System Water Loss Management and Control	**Implementation Period**	**Estimated Costs (2019 to 2029)**	**Estimated Accumulated Water Savings by 2029 (AF)**	**Customer Classes/ Accounts Affected**	**Notes**
Water Loss Control Program:		**$53.7M Total**	1,120 AF	↓NRW	Water savings based on estimated water loss gallons from the M36 water loss audit from 2015 less 2018 divided by 4 years.
• M36 Annual Water Loss Audit	2015 to 2029	$0.26M			
• Leak Detection and Repair	2012 to 2029	$4.01M			
• Water Line Replacement & Rehabilitation Program	2014 to 2029	$48.95M			
• Cathodic Protection	2020-2021	$0.48M			

Abbreviations:

All	=	*All Customer Classes*
BMC	=	*Billed Metered Consumption*
BUC	=	*Billed Unmetered Consumption*
Irr	=	*Irrigation Customer Class*
NRW	=	*Non-Revenue Water*
Res	=	*Residential Customer Class*
UMC	=	*Unbilled Metered Consumption*
UUC	=	*Unbilled Unmetered Consumption*

METERING

Meter Testing and Replacement Policies and Procedures: In July 1979, the Loveland City Council approved an ordinance requiring water meters for all new construction and for existing homes when ownership changed hands. Before that time, the City only required meters for commercial accounts within the City and for all accounts served outside the City limits. Less than a year later in June 1980, the City Council passed another ordinance requiring meters for all water customers.

By 1981, the City was the first municipality in the state to be completely metered, at a cost of over $3 million. Before metering, the water treatment plant's peak day demand was 22 million gallons per day. After metering, the peak day demand dropped to 16.7 million gallons per day (City of Loveland, 1989). After metering, the average annual water usage declined by 20 percent. On a per capita basis, these reductions remain reflective in today's uses along with additional decreases per capita, attributed to our customer base using more water-efficient fixtures and practices.

Since being fully metered in 1981, the City has maintained an aggressive meter testing and replacement program. This program currently involves testing any sized meter flagged for possible problems (i.e. high read, no read, observed meter damage, observed losses in meter accuracy detected by meter readers and/or utility billing services, etc.) as well as periodic testing of meters on the following schedule:

- **Large Sized Meters:** Annually test 3 inch or larger water meters in service, except at locations where not feasible due to access, area disturbance or other issues.
- **Medium Sized Meters:** Test 1.5 inch and 2 inch size meters every 5 years except at locations where not feasible due to access, area disturbance or other issues.
- **Small Sized Meters:** Annually test a sampling of meters smaller than 1.5 inch.

Meters that are tested are evaluated for accuracy and either replaced or repaired as needed to restore meter accuracy and maintain the accuracy of City water billings. The City follows AWWA's guidance that a meter must be at least 95% accurate in the low flow range, and at least be 98.5% accurate in the mid and high flow ranges to remain in service. Most meters that test below the acceptable levels are replaced rather than rebuilt due to the unavailability of replacement parts and due to regulations that limit reinstalling meters with lead components. The City currently budgets $115,000 annually for water meter replacements.

Metered and Unmetered Water Use: See Table 4-2 for a summary of water meters by size currently maintained by the City in the water distribution system and the portion of the billed water that went through each size meter during 2018. As part of the M36 Annual Water Loss Audits from 2015-2018, the City has made great strides in metering and billing locations that previously had gone unbilled and/or unmetered. The only remaining unmetered sites are as follows:

1. **Irrigation at Water Utility Sites:** The irrigation of the grounds around one water pump station and one small water tank use unmetered treated water.
2. **Fire Training Grounds:** Nine fire hydrants at the fire training grounds are unmetered. The Fire Authority submits an annual log of estimated usage.
3. **Public Works Vehicles:** There are a few vehicles with unmetered water tanks. The water usage is estimated and billed based on volume of tank capacity per vehicle and load counts.
4. **Utility Facilities:** Several of the water pump stations and wastewater lift stations have internal hose bibs used occasionally to wash down the floor or equipment. These are used so infrequently that the City does not plan to install meters at these locations.

Unmetered water is used in various activities listed below – all of which annual logs are kept to help estimate actual usage.

- **Maintaining the Water Distribution System**: fire hydrant flushing, transmission line flushing, water storage tank cleaning and draining
- **Maintaining the Wastewater Collection System:** sanitary sewer jetting
- **Disinfection of Lines and for Non-Emergency Dewatering of Lines**: primarily occurs for construction projects and new developments
- **Firefighting, Fire Training, and Fire Suppression Systems:** fire training at the fire training grounds and off site, firefighting, fire hydrant flow tests, new fire sprinkler systems, testing of fire pumps

TABLE 4-2: INVENTORY OF METERS MAINTAINED BY THE CITY (AS OF DECEMBER 2018)

Meter Size (inches)	Meter Count	2018 Consumption (Millions of Gallons)	% of Total Metered Consumption
0.75	25,752	2,312	61%
1	783	305	8%
1.5	412	384	10%
2	332	453	12%
3	63	218	6%
4	22	92	2%
6	4	47	1%
Totals	**27,368**	**3,811**	**100%**

Automated Meter Reading: Approximately 110 meters for either large water use customers or at locations with difficult readout access have automated meter reading (AMR) technology to allow for remote data collection (e.g., drive by) of water use. The rest of the meters in the City are currently read manually by meter readers on a monthly basis.

Modifications and/or New Meter Programs: The City plans to consider or implement the following changes to their meter program:

- **Metering the Irrigation Water at Utility Sites:** The City plans to install meters to track the irrigation water used at the 29th Street Pump Station and at the Namaqua Hills Tank by the end of 2020.
- **Metering Fire Training Grounds:** The City will do a cost/benefit analysis to determine whether to proceed with metering the fire training grounds. In order to not restrict flows during fire training at the hydrants and based on preliminary designs, metering this site would require a 6" meter and meter pit on one end of the campus and an 8" meter and meter pit at the other end of the campus and subtracting out any metered usage at the administration building that is already metered on this site.
- **Public Works Vehicles:** The water metering staff will work with Public Works to see whether it would be feasible and economical to install meters on the remaining vehicles with unmetered water tanks.
- **Graphing Usage at Difficult Testing Sites:** For sites with medium and large size meters (1.5" and greater) with large volumes of water usage that have not been tested, due to access, area disturbance or other issues, the City will look into graphing the monthly historical usage. Graphs that show a downward trend from year to year may indicate where a water meter is failing and under registering usage.
- **Estimating Water Loss from Metering Inaccuracies:** Previously, the City estimated water loss due to metering inaccuracies based on a straight average of the low, medium, and high flow meter test results. Based on 2019 Colorado Water Loss Initiative training, most meters 2" in size or smaller are used primarily in the medium flow rate range and a more accurate way to estimate of water loss due to meter inaccuracy would be to use a weighted average of test results (15% low flow, 70% medium flow, 15% high flow). Starting with the 2019 calendar year water loss audit, the City will use this new approach in estimating metering inaccuracy apparent water loss.

WATER RATES AND BILLING SYSTEMS

History: In 1887, the Water Utility established a flat annual billing rate, based on the type of dwelling and the number of fixtures. Customers paid the yearly fee in advance. Until 1968, water rates were based on a flat fee determined by fixture counts. Keeping track of the number of bathrooms and toilet fixtures in homes as the City grew became increasingly difficult, and in July 1968, the City developed a flat rate charge per family based upon average water usage. Since the installation of meters in 1981, the monthly billing has reflected actual water use and uses a uniform rate for residential customers.

In 1989, City Council approved a series of rate increases that specified water rates from 1990 to 1997. A portion of the revenues from these rate increases allowed Loveland to purchase additional CBT units, cash fund the Green Ridge Glade Reservoir expansion, and set aside money to pay off the City's obligation in the original Windy Gap Project. In 2001, once the specific needs for the rate increases were met, the City lowered rates by 33 percent.

The City conducts water rate studies to correctly and fairly price its water services on a three-year cycle. The last water rate study was completed in 2018, with the next one scheduled for 2021. Rates are set periodically using a cost-of-service methodology, meaning that the rates are designed to reflect as closely as possible the real cost of providing water service to customers. For instance, because the irrigation customer class uses water during the peak water production times of year, they pay a higher usage fee, because their water usage contributes more toward costly plant expansion projects required to meet peak demands.

The City maintains a comprehensive water use billing program that provides different rates for each of its different customer classes. The rates include a base fee and a water use fee. Overall, the City maintains a water rate structure that is designed to create revenue to cover both its fixed and variable expenses – with the base fee covering a portion of the fixed expenses and the use fee covering the remaining portion of the fixed expenses as well as all the variable expenses. The base fees help the City to have more predicable revenue generation from year to year. The variable use fee acts as an incentive to encourage customers to conserve water (See Appendix A for the entire 2020 Utility Rates, Charges and Fee Schedule).

The City bills its customers for water monthly, except for those water users that utilize "ranch water," which is provided on a "pay-as-you-go" basis using pre-paid cards and use fees.

The City maintains a couple of noteworthy incentive programs within its rate structure to support water use efficiency. The first is the City's excess water use surcharge that it assesses to commercial accounts that exceed a specific individual base amount of annual water use. This fee is assessed to aid in recovering the cost of replacement water for large commercial water users.

The second is the City's hydrozone program that lowers raw water rights requirements for irrigation only taps that take advantage of native plantings and other outdoor water use efficiency practices to reduce the tap size required to serve the property and to reduce the amount of on-going irrigation requirements. See the Hydrozone section for additional details on this program.

Modifications to Data Collection, Billing System and Water Rates: Below outlines a few areas the City plans to improve or investigate changes in the way it tracks, bills, and charges for water.

- **Updated Customer Information System:** The City of Loveland is in the process of designing a new Customer Information System that will allow more flexibility in the data that is tracked and allow reports and queries of the water consumption data to be pulled by a larger group of employees.

  Part of this new system will allow customers to log into a self-serve portal where they can view current verses previous bills, it will have efficiency tips and information and have interactive graphs to compare their monthly consumption to the prior year's consumption while overlaying graphs of humidity and precipitation to see how changes in the climate impact their water consumption. The new Customer Information System is set to roll out before the end of 2020.

- **Rate Increases & Water Cost of Service Studies:** Beginning in 2014, City Council began approving 10-year utility rate tracks with yearly water rate increases. In November of 2018, City Council approved the following 10-year water utility rate track with a 7% rate increase for 2020, followed by three consecutive years with rate increases of 7% per year, capped off by six consecutive years with rate increases of 3.5% per year. These rate increases will be used to raise revenue for capital projects, as well as to assist in achieving specified water efficiency goals. Insomuch as the rate increases will be happening, WEP implementation will include tracking the impacts of the rate increases on customer demand and water use.

  We can expect to have a decrease in demand due to these scheduled rate increases. Based on various studies, the price elasticity of annual residential water use is likely between 0.35 to 0.45, which means that a 10% rate increase would produce between a 3.5% to 4.5% reduction in demand over time with the outdoor demand being more elastic than indoor demand[15]. Even with these large expected demand reductions, the City should plan to integrate the water rate fee changes with its messaging on wise water use and water conservation to help educate and engage its customer base regarding the justification for increased water rates and to manage customer expectations regarding further water rate increases.

  The City has a policy of conducting water rate studies once every three years to maintain appropriate customer water rates based on the cost of service. The last rate study the City completed was in 2018 to assess current and projected future costs, we anticipate completing future rate studies during the Water Efficiency Planning horizon in 2021, 2024, and 2027. A water rate study can examine the impacts of alternative tap fee incentives for new and existing customers that install water efficient landscapes and appropriately designed irrigation systems for those landscapes.

  The water rate study is important to the water efficiency planning efforts for three reasons. First, the water rates will need to be developed in a manner consistent with the projected future demands – based on the impacts of both passive and active savings and expected peak day demand reductions.

  Second, the development of new and/or expanded water rate categories (e.g., for different customer classes, to account for seasonal variability in fixed and/or variable costs, etc.) should support water use tracking as new water efficiency measures and programs are implemented. This will help to ensure that water demand reductions can be attributed to active programs conducted and funded by the City.

  Third, the water rates should include the costs of the water efficiency measures and programs selected for implementation, such that the true cost of services can be included in the base and rate fee structure. In addition, the City should ensure that costs for emergencies, capital

[15] Griffin, Ronald C. Water Resource Economics: The Analysis of Scarcity, Policies, and Projects. The MIT Press, Cambridge, MA. 2006. http://www.allianceforwaterefficiency.org/uploadedFiles/Resource_Center/Library/rates/White-Paper-Rate-Structures-and-Conservation-March-13-2009.pdf

projects, leak detection and prevention, improved metering and data management, and overall system wide loss control are included in water rates and fees. Finally, the City will evaluate options and efficacy of including additional tiers of water rates in its pricing for residential and commercial customers.

Currently, the City has identified substantial water rate increases that it will put into practice over the next 10 years.

- **Excess Water Use Surcharge on Irrigation Accounts:** The City will investigate whether to expand the excess water use surcharge from just commercial accounts to all irrigation meters based upon the water rights paid or assumed to be credited on grandfathered properties. The surcharge amount would be set as part of the utility's annual rates, charges and fee schedule. This would essentially act as a 2-tier billing system, in which consumption above a certain level would incur a financial penalty.

- **Residential Water Rights Requirements:** In September 2019, the City updated its residential water rights requirements based on observed water efficiency improvements over a 10-year period. The water rights requirements for new residential developments are in line with the 99% confidence interval of the sample data, observed water usage, system loss factors, and vacancy rates. Indoor residential water rights per dwelling decreased from 0.23 AF per unit down to:
  - 0.22 AF for single family detached units greater than 800 sf
  - 0.16 AF for single family detached units less than or equal to 800 sf, single family attached units, and multi-family units

  Outdoor residential water rights decreased on the first 15,000 sf per lot from 1.6 AF per net lot acre down to:

  - 1.4 AF for single family detached units greater than 800 sf
  - 1.3 AF for single family detached units less than or equal to 800 sf, single family attached units, and multi-family units

  The reductions in water rights requirements for single family attached homes, single family detached homes less than 800 sf and multi-family may contribute toward developers choosing to build more of these units than the higher water use of single family detached homes.

SYSTEM WATER LOSS MANAGEMENT AND CONTROL

Annual Water Loss Audit: The City supports the accountable and efficient management of its water supplies by making efforts to understand its system inefficiencies and focusing efforts on continual improvement in tracking and billing the water that goes through the water distribution system. To support these efforts, the City has conducted internal annual audits of the water distribution system since 2000.

Between 2000 and 2014, the City performed an "Unaccounted for Water Loss Report" – a high-level audit that does a basic calculation to deduct known water uses from the total water produced in a given year to determine the remaining "unaccounted for water" portion.

Beginning with the 2015 calendar year audit, the City began using AWWA's water loss audit methodology from the Water Audits and Loss Control Programs, Manual of Water Supply Practices M36. These water loss audits are a much more thorough and in-depth approach that require gathering information from existing records, procedures, and databases and estimating other uses to categorize and quantify where water enters and exits the LWP distribution system each calendar year with a focus to not only reduce water loss, but to also improve the validity of each number entered into the audit.

During the course of compiling the M36 audits, several problem areas, inefficiencies, and improvements have been discovered and corrected. Following are some of the key improvements made to increase revenue water, improve water efficiency, and better account for water:

- **Volume from Own Sources:** Through draw down tests, City staff discovered the master source meter was over registering the amount of water entering Loveland's water distribution system by approximately 3.85%. This difference had previously been attributed as real water loss.

- **Billed Metered:** When determining the boundaries of what to include and exclude from the audit, staff discovered some customer overlap with neighboring water providers in which one water provider supplied the water to a customer, but the customer was billed by another water provider. For this audit, staff excluded water provided by other water providers billed to the City's customers, and included water the City provides to customers that are billed by other water providers.

  During the 2018 audit, some data entry errors in the consumption records when meters were replaced or customers changed were found and staff is working with Utility Billing to prevent these errors from occurring in the future.

  As a result of these audits, the City metered and billed an additional 32 MG between 2015 to 2018 from the following corrections and improvements:

  1. **Wastewater Utility:** Pays for all water used at the Wastewater Treatment Plant. New meters were installed to measure previously unmetered usage and all water meters are read and billed on a monthly basis.

  2. **Stormwater Utility:** Pays for the irrigation of two drainage ponds and at one ditch siphon that previously had been metered, but not billed.

  3. **Local HOA:** Pays for the irrigation water of the grounds around a neighborhood sewer lift station per the specifications in the final development plan. Previously this water use was metered, but unbilled.

  4. **Parks Department:**
     a. Pays for all downtown watering with metered water usage. Previously they had hooked up to some unmetered water sources.
     b. The City installed a meter for the water usage at the train depot at North Lake Park, which had previously been unmetered unbilled usage.

5. **Public Works Department:** Installed two more meters on their vehicles with water storage tanks rather than estimating usage by load counts.

Starting with the 2018 audit, the City began including construction water in the audit, which had inadvertently been excluded from prior years due to not being included on the consumption reports from the Utility Billing Department. Construction water is the initial water furnished to a premises during construction of improvements when no water meter had previously been installed. The Building Department charges a flat fee based on the tap size for an allotted number of gallons. We had 530,815 gallons of construction water in 2018 that had not been accounted for elsewhere.

The City removed the 1.25" water meter rate, which upon field investigation of the one meter listed at that size, was found to actually be a 1.5" meter and the 1.25" was simply a data entry error in our billing system.

- **Billed Unmetered:** From 2015 to 2018, the billed unmetered usage dropped from 193K gallons per year to less than 30K gallons per year. The only use remaining in this category is for the few remaining Public Works vehicles with unmetered water storage tanks, which the usage is estimated and billed based on the volume of tank capacity per vehicle and load counts.

- **Unbilled Metered:** Since 2015, this number has dropped from over 12 million gallons per year to less than 15,000 gallons per year as the Water Utility now bills other departments, other City utilities, and a neighborhood HOA for water usage that previously had not been billed. See Billed Metered section above for more details.

- **Unbilled Unmetered:** Beginning in 2019, the Wastewater Utility began reimbursing the Water Utility for the water used for sanitary sewer jetting on a quarterly basis. Between 2015 to 2018, the estimated amount of water used for sanitary sewer jetting ranged from 3 MG up to 12 MG per year.

  The City has dramatically improved the way that it tracks and estimates unbilled unmetered water usage. Logs with estimated water usage are submitted annually for the following unbilled unmetered activities:
  - Fire hydrant flushing
  - Transmission line flushing
  - Water storage tank cleaning and draining
  - Disinfection and construction projects
  - Fire training grounds fire hydrant usage
  - Off-site fire training
  - Firefighting
  - Fire hydrant flow tests
  - New fire sprinkler systems
  - Annual fire pump tests

- **Water Losses:** Between 2015 to 2018, the total annual estimated water loss from the water distribution system (real losses and apparent losses) dropped by 210 million gallons. The City underwent a thorough external audit by Water Company of America of the utility billing system that included field investigations. During their audit, they found and corrected a few instances that impacted water revenue in which the wrong number of units in multi-unit buildings was being billed and when a customer was listed in the wrong customer class. The City's water

engineering staff have focused efforts on rehabbing and replacing the worst performing waterlines in the water distribution system. Both these efforts combined have lowered our estimated water loss.

- **Water Metering Inaccuracies:** Water meters act as the cash register for water utilities and it is important that they accurately record water usage, so that each customer pays their fair share of the cost of the utility. Meters that test outside of the acceptable specifications are either replaced or rebuilt. The Water Metering department carries out a rigorous meter testing program to test any meter flagged for problems and to test where feasible the largest meters yearly, the medium sized meters every 5 years and to test a sample of the small meters every year. Based on the meter accuracy results, the water audit calculated the estimated lost water and revenue due to meter inaccuracies.

The Water Utility plans to continue conducting these detailed annual M36 Water Loss Audits with the objective of understanding our system better to be able to better track and bill water usage, reduce non-revenue water and reduce water losses.

Leak Detection and Repair: The water utility continues to refine its leak detection program to identify and address water distribution leaks that are not surfacing. The City has maintained a proactive leak detection program for many years utilizing Sound Sense acoustic emission correlators to help pinpoint the location of leaks in real time.

In 2017, the City spent $20,088 on Gutermann Leak Detection Equipment with 20 logging sensors, which allows a whole area to be checked for leaks. The loggers are placed on water valves or fire hydrants and are left out for a period of 24-hours. The loggers correlate the location of leaks based on sound. Once a leak is identified, crews use the Sound Sense correlators to more accurately pinpoint the leak locations. The City has found and fixed various leaks with this equipment, even leaks as small as hydrants that were not completely shut off with water slowly leaking out the weep holes at the base.

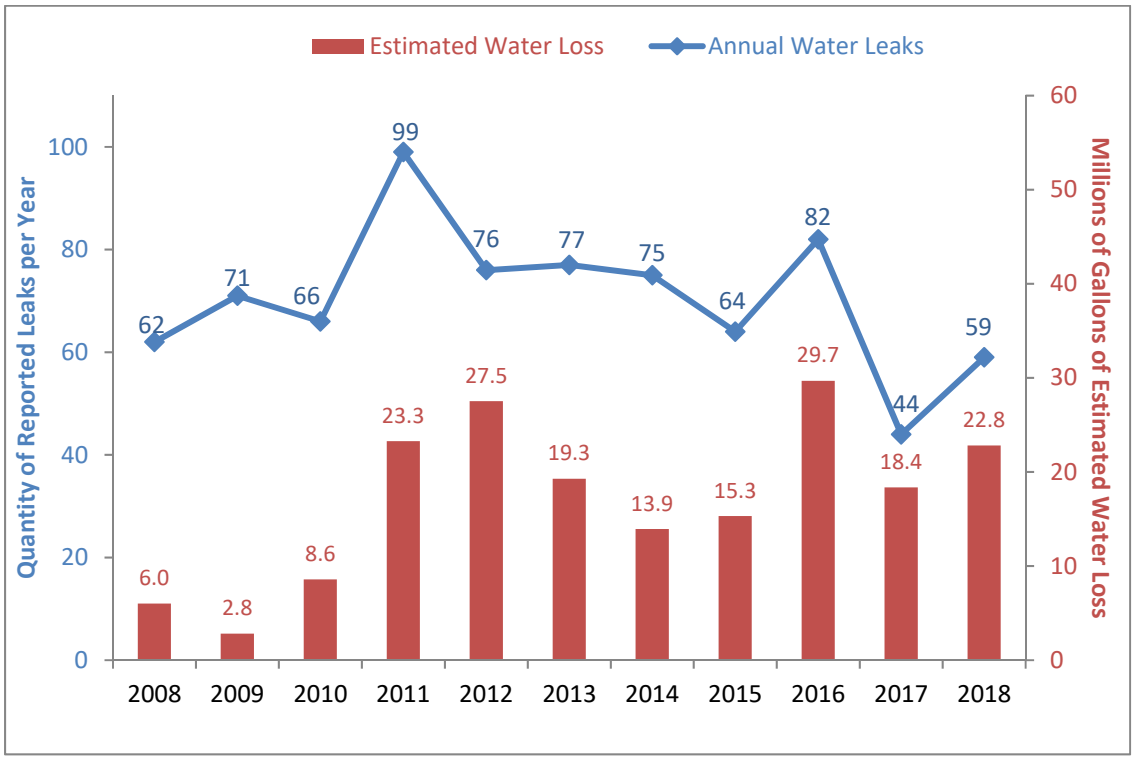
The Water Operations staff has separated the City into 69 basins, and they work to complete leak detection on a whole basin before moving onto the next basin. Their goal is to perform leak detection on each basin approximately every 2-years – dependent on time availability outside of their normal workload in maintaining the water distribution and wastewater collection systems and depending on time availability outside of fixing reported leaks.

In 2011, the City detected 6 leaks that had not surfaced, saving an estimated 310,000 gallons per day (gpd) in water losses (and another 2 leaks in 2012 saving an additional 130,000 gpd). The new leak detection equipment purchased in 2017 helped find 3 leaks in 2018 and 1 leak in 2019 that had not surfaced that had leaked approximately 374 thousand gallons.

In 2016, the City contracted with Pure Technologies to conduct an investigation into leaks and pipe wall assessment on a 36” and 34” steel water transmission main through the insertion of a new technology called Smartball. The approximate 3” diameter watertight Smartball housed sensors and was encapsulated in an approximate 8” diameter foam ball that rolled through the pipe using the existing flow. The ball’s location was tracked with sensors attached to the exterior of the pipe roughly every 2,500’. It took approximately seven and a half hours for the

ball to traverse the five mile pipe segment. The City received a report that outlined the location of leaks and the condition of the pipe along these transmission lines. Two leaks were detected that were estimated to be the source of approximately 30,000 gallons per day of water loss.

FIGURE 4-2: LEAKS DETECTED AND REPAIRED BY THE CITY AND ESTIMATED WATER LOSS FROM REPORTED LEAKS (2008 TO 2018)



Water Line Replacement and Rehabilitation Program: In an effort to reduce system water losses, the water engineering and operations staff have focused efforts on rehabilitation or replacing the worst performing waterlines in the water distribution system. Annually, the engineering and operations groups meet to review a report identifying waterline pipe segments with a history of more than 5 leaks per 1,000 feet of pipe and assess the risks of pipe failure on each of those segments. They update the waterline rehabilitation and replacement project plans for the next few years based on the updated leak report data, pipe failure risk analysis, and available yearly budget. See the table below for the yearly breakout of over $47 million budgeted in the 10-year Capital Improvement Plan (2020-2029) for replacing and rehabilitating waterlines. One of the major projects identified in this plan is to reline a 4-mile stretch of a major 36" water transmission line for close to $6M between 2026 and 2027.

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Budget	$2.2M	$1.8M	$3.1M	$3.4M	$3.8M	$4.4M	$5.3M	$11.2M	$6.3M	$6.1M

Cathodic Protection: Corrosion on metal waterlines can eventually eat through pipes and cause waterline leaks. Cathodic Protection (CP) is a technique the City uses to control the corrosion of the surface of the City's metal waterlines by one of the following methods:

1. **Sacrificial Anode Cathodic Protection:** Connect a more easily corroded metal (sacrificial anode) to the pipe that corrodes first before the metal pipeline would be corroded.
2. **Impressed Current Cathodic Protection:** Use external DC power supply to apply electrical current flow, which allows for significantly higher current output with fewer, longer lasting anodes than the sacrificial anode system.

For nearly 30 years, during leak repairs the City's Operations Crews weld a magnesium anode to metal pipes undergoing repair to help protect against future corrosion and leaks on the connecting segments of metal pipe.

The City tests annually the pipeline potentials on the large diameter metal waterlines to determine where CP is low or extinguished. The City uses this information to develop plans for where and when to renew CP. The City has budgeted close to $0.5M between 2020 and 2021 for CP design and installation projects.

Year	2020	2021
Budget	$32,000	$450,360

4.2.2 Targeted Technical Assistance and Incentives

Activities that rely on indoor water efficient technologies and water-wise outdoor practices. *(e.g. water efficient fixtures and appliance installs, low water use landscapes, water efficient industrial and commercial water-using processes, rebates, water budgets, give-aways, etc.)* Following is a description of what the City has done on targeted technical assistance and incentives broken down by the following three levels based on the targeted customers:

Level 1 - Utility/municipality facility water efficiency
Level 2 - Customers with the largest water use
Level 3 - Management of remaining customer demands

TABLE 4-3: TARGETED TECHNICAL ASSISTANCE AND INCENTIVES TO IMPLEMENT

Targeted Technical Assistance and Incentives					
Level 1: Utility/ Municipal Facility Water Efficiency	**Implementation Period**	**Estimated Costs (2019 to 2029)**	**Estimated Accumulated Water Savings by 2029 (AF)**	**Customer Classes/ Accounts Affected**	**Notes**
Optimize Water Used to Backwash Filters at the Water Treatment Plant	October 2019 to 2029	$3K	613 AF	↓FTWD	Reduces finished treated water demand from the chlorine contact basin located before the water distribution master meter.
Conversion to non-pot water in the rotary drum thickeners at the Wastewater Treatment Plant	2020 to 2029	$15K	98 AF	↓Com	

Level 1: Utility/ Municipal Facility Water Efficiency	Implementation Period	Estimated Costs (2019 to 2029)	Estimated Accumulated Water Savings by 2029 (AF)	Customer Classes/ Accounts Affected	Notes
Conversion to non-pot water in headworks step screens at the Wastewater Treatment Plant	2020 to 2029	$1K	49 AF	↓Com	
Repair the leaky bottom of the lagoon at the Civic Center grounds	2020 to 2029	$250K	3 AF	↓Irr	
Hybrid Waterless Urinals and Evaporative Cooling System Pilot Program	2020 to 2022	<$100K>	Unknown	↓WC	Although the City does not provide water to the pilot project facility, if the results are favorable, the City will look to install hybrid waterless urinals and evaporative cooling systems in other City facilities.
Feasibility Study to Use Non-Potable Water for Sanitary Sewer Jetting	2026 to 2029	$30K	80 AF	↓Com	If implemented, decrease in commercial class consumption. Savings based on average estimated yearly usage from 2015 to 2018.
Level 2: Management of Largest Customer Demands	**Implementation Period**	**Estimated Costs (2019 to 2029)**	**Estimated Accumulated Water Savings by 2029 (AF)**	**Customer Classes/ Accounts Affected**	**Notes**
Hydrozone Program	2019-2029	$117K	1,833 AF	↓Irr	
Northern Water Grants for Landscape Conversions	2019-2029	$3.3K	55 AF	↓Irr	

Level 3: Management of Remaining Customer Demands	Implementation Period	Estimated Costs (2019 to 2029)	Estimated Accumulated Water Savings by 2029 (AF)	Customer Classes/ Accounts Affected	Notes
Direct Installs of Efficient Plumbing Fixtures (shower heads, bathroom aerators, kitchen aerators, toilet tank bags, toilets, etc.) through Larimer County Conservation Corps and Resource Central	2011 to 2029	$230K	506 AF	↓Res	
Slow-the-Flow (Sprinkler Audits)	2019 to 2029	$243K	47 AF	↓Res	
Garden-in-a-Box (Discounted xeric landscaping plants)	2007 to 2029	$63K	5 AF	↓Res	
Efficiency Works (Rebates on water-efficient fixtures and appliances)	2011 to 2029	$350K	464 AF	↓Res ↓Com	Added toilet and urinal rebate program beginning in 2020.

Abbreviations:

All	=	*All Customer Classes*
Com	=	*Commercial Customer Class*
FTWD	=	*Finished Treated Water Demand*
Irr	=	*Irrigation Customer Class*
Res	=	*Residential Customer Class*
WC	=	*Wholesale City Customer Class*

LEVEL 1 - UTILITY/MUNICIPAL FACILITY WATER EFFICIENCY

Non-Potable Water at Wastewater Treatment Plant: In order to help reduce the amount of treated water required in the wastewater treatment process, the City uses non-potable water to irrigate the 23 acre grounds of Loveland's Wastewater Treatment Plant. In addition, approximately 60,000 gallons of non-potable water is sprayed on the primary and secondary clarifiers annually to help with defoaming. This reduces the amount of treated water demand by an estimated 20.1 MG per year.

Drought Management Plan: In 2013, the City published a Drought Management Plan to handle droughts more severe than a 1-in-100 year drought. The Drought Management Plan includes four increasingly restrictive drought response levels linked to the severity of the projected water supply shortage to reduce customer water usage and lower the overall demand on Loveland's water system. The degree of restriction in each level is meant to coincide with the drought severity and decrease the demand on the system by an estimated 10 percent. This plan will help Loveland manage their water efficiently during times of severe drought.

Projects in Progress/Being Studies to Reduce Utility Water Use:

- **Water Treatment Plant Backwash Study:** In 2019, the Water Treatment Plant began a study to see if there could be a reduction in backwash run times in water treatment plant filter beds. This study was designed to reduce the amount of water required to backwash filters while still maintaining adequate water quality.

  The City has normally used about 70,000 gallons of chlorinated finished water for each filter backwash. After this treated water is used to backwash filters, the chlorine is removed and then the water is sent to ponds, which are decanted before the water is returned to the river. Generally, filters are backwashed for one of the following reasons:

  1. **Loss of Head** occurs as the rate that water goes through the filter media decreases compared to the rate the water enters the filter media.
  2. **Timing with Other Backwashes** - Only one of the twenty filters can be backwashed at a time. In order to keep up with the on-going need to backwash filters, particularly during peak plant production times, backwashing filters are scheduled one after another. If a filter exceeds 120 hours of runtime, it is backwashed.
  3. **Turbidity** is a measure of the relative cloudiness or haziness caused by individual particles in water. If any given filter begins letting increased turbidity through the media, it is backwashed.

  Based on water quality tests performed in 2019 at each minute of backwash, the City is able to reduce backwash run times down to approximately 12 minutes while still maintaining water quality, which will save up to 21,000 gallons per backwash. The City plans to use these new optimized filter backwash times to save approximately 19.5 million gallons per year in treated water demands.

- **Wastewater Treatment Plant Rotary Drum Thickeners:** Currently, the Wastewater Treatment Plant uses treated water in two Return Activated Sludge (RAS) pumps in the Rotary Drum Thickeners at a rate of 3 gallons per minute per pump. Beginning in late 2019, the City is in the process of changing the majority of the water to non-potable water, which would reduce the treated water demand by an estimated 3.2 MG per year.

- **Wastewater Treatment Plant Headworks Step Screens:** Based on manufacturer information, the headworks step-screens at the Wastewater Treatment Plant use approximately 45,000 gallons per day for each headworks screen. The City has two headworks screens with one screen running all the time and occasional times when both screens run concurrently. In 2019, the City began the process to change from using treated water to a non-potable water system at the headwords screens, which would save up to an estimated 16 MG per year per screen in operation.

- **Lagoon Repairs:** The City is aware that the lagoon at the City's Civic Center has a leaky rubber bottom, the City plans to seal the bottom of the lagoon with concrete to reduce future

water loss. The lagoon holds approximately 1 million gallons. The water meter that fills the lagoon is also used to irrigate the surrounding public grounds so it is not known how much water is leaking. After the repairs are made, the City could compare consumption records before and after the bottom is sealed to determine the approximate yearly water savings.

- **Hybrid Waterless Urinals & Evaporative Cooling System Pilot Program:** The City will be piloting efficient fixtures and systems at the new Northern Colorado Law Enforcement Training Center to be located at the Northern Colorado Regional Airport. As part of this pilot program, the City will install hybrid waterless urinals that may be programed to flush cycle either once a day, every other day or every three days depending on the urinal usage. The City will also be piloting an evaporative cooling system at this facility that will employ best management practices. Although evaporative cooling uses water in the process to cool air, it will be much more efficient at cooling high-volumes of air than standard air conditioning systems. Although the City does not provide water to this facility, if the results of this pilot program are favorable, the City will look to install hybrid waterless urinals and evaporative cooling systems in other City facilities.

- **Sanitary Sewer Jetting:** The City plans to do a feasibility study on switching to non-potable water to perform sanitary sewer jetting. Between 3 MG to 12 MG have been used annually for sanitary sewer jetting from 2015 to 2018. Switching to non-potable water would require the installation of a non-potable fill station at the wastewater treatment plant and increase fuel costs. The vacon trucks are also used for other applications such as spraying down streets that drain to the storm water system. Meeting regulatory requirements, water rights requirements and environmental impacts would need to be taken into account in this feasibility study. We estimate this feasibility study would cost approximately $30,000 to complete.

LEVEL 2 - MANAGEMENT OF LARGEST CUSTOMER DEMANDS

Identification of Largest Water Users: In order to identify the largest water users, the City compiled a list of customers that used more than 10 million gallons between 2014 through 2018. They were then categorized based on the type of customer to better understand the nature of their water use and what type of programs would be beneficial.

TABLE 4-4: CUSTOMERS USING MORE THAN 10 MILLION GALLONS FROM 2014 THROUGH 2018

Type of Customer	Number of Water Meters	Average Annual Gallon Consumption per Water Meter
1. Outdoor Irrigation (HOA's, commercial properties, parks, public grounds, schools, etc.)	89	3,435,658
2. Big Box Stores, Strip Malls, and Commercial Condos	18	3,349,005
3. Apartment Complexes	15	2,909,267

Type of Customer	Number of Water Meters	Average Annual Gallon Consumption per Water Meter
4. Schools/School District	13	3,424,602
5. Trailer/RV Parks	9	6,336,584
6. Industrial and Manufacturing Businesses	9	7,503,647
7. Senior Living, Assisted Living and Nursing Home Facilities	8	3,699,546
8. Restaurants	7	2,460,104
9. Hospitals and Medical Facilities	6	6,221,948
10. Car Washes	5	3,793,759
11. Hotels	4	3,027,992
12. Other (gyms, pools, church, laundry facilities, single family residences, etc.)	10	3,614,328

Of the large water users in the City, dedicated outdoor irrigation meters are by far the most frequent large water user category. This water usage also contributes substantially toward summer peak demand. The City will focus its efforts on reducing outdoor irrigation by promoting the following programs:

Hydrozone Program: The City will focus its efforts on reducing the outdoor irrigation demands by promoting its Hydrozone Program to new and existing irrigation meter customers. Through the Hydrozone Program, the City supports water-efficiency for developments that design, install and maintain water efficient landscapes. This allows for reduced water rights payments or credits on existing accounts on the associated dedicated irrigation meter(s) and potentially reduced system impact fees if the tap size(s) can be reduced. Participants must submit a hydrozone plan that includes irrigation and planting designs that clusters plants with similar water requirements together to help conserve water. A water budget is calculated to the specific plants under the Hydrozone plan. The landscape design must show at least 25% reduction from the 3 acre-feet of water per acre required to irrigate Kentucky bluegrass. Participants have 3 years to establish plants in which the water budget does not apply. Going forward, if the water budget is exceeded, an annual surcharge is assessed.

Water-Efficient Landscape Grant Program: For existing irrigation meter customers, the City will also promote Northern Water's Water-Efficient Landscape Grant Program, which offers grants between $5,000 up to $15,000 with a 50 percent match available to public facilities or open spaces, businesses, schools, multi-family complexes, HOA-management landscapes. The landscapes must be at least 1,000 square feet, designed to use substantially less water than traditional landscapes and include at least 50 percent plant coverage when the plants are mature.

LEVEL 3 - MANAGEMENT OF REMAINING CUSTOMER DEMANDS

Larimer County Conservation Corps and Home Energy Audit Program: The City will continue to offers home assessments, audits and retrofits to residents through the Larimer County Conservation Corps (LCCC) program and Resource Central's Home Energy Audit Program (HEAP). The water efficiency measures of these assessments and audits include replacing faucet aerators and showerheads, installing toilet dams, toilet replacements and providing dye tablets to test for leaking toilets. Although, the focus of these programs is toward low-income households, any residential customer may apply to participate in these programs. They also educate customers about water and energy efficiency practices and services. We based future participation levels and water savings upon the 5-year average of each type of direct install performed between 2014 and 2018.

The estimated water savings per fixture type and annual participation levels are listed in the table below:

TABLE 4-5: DIRECT INSTALL WATER SAVINGS PER FIXTURE TYPE

Fixture Type	Gallons Saved per Fixture per Year	Annual Participation Level
Shower Heads	3,292	213
Bathroom Aerator	649	413
Kitchen Aerator	378	159
Toilet Tank Bag	1,460	65
Toilets	3,416	13

Slow the Flow (Sprinkler Audits): The City plans to continue to support Resource Central's *Slow the Flow* irrigation audits based upon 5-year average participation levels with approximately 124 audits performed per year at a total cost of $22,069 per year. These 90-minute audits include a visual inspection to pinpoint sprinkler system problems, testing to measure the precipitation rate of the sprinkler system, measuring how evenly the water covers the intended areas, and soil sampling to determine root depth and soil type. Customers receive one-on-one education on how to program and set up their automatic sprinkler system to conserve water while still providing adequate water for their plants as well as learning about their soil types and ways to improve the soil conditions and ways to improve their irrigation systems. Gallon savings were based upon the average of gallons saved between 2013 through 2017.

Garden-in-a-Box Residential Xeriscape Program: The City plans to continue to provide discounted Garden-in-a-Box kits to local residential customers through this Resource Central program. The Garden-in-a-Box kits include a professionally designed planting design of low water xeric plants tailored to grow in Colorado soils. The kits can help conserve around 1,000 gallons of water compared to a traditional grass lawn. The modified projections were based on offering 124 discounted gardens per year through 2029. (The 5-year average of gardens sold from 2014-2018 was 124.)

Efficiency Works: The initial focus of the Efficiency Works program was to implement energy-efficient improvements for the City's commercial and multi-family customers. Water efficiency improvements were added as part of the building-tune-up program in 2011, during which time 157 ultra-low-flow faucet aerators and 5 low-flow pre-rinse spray valve nozzles were installed. In 2019, the City updated the intergovernmental agreement with Platte River Power Authority, who administers the Efficiency Works demand-side management program, to provide additional non-energy related programs when directly funded by the owner cities. Below is a listing of the 2019 water related instant rebates offered through this program.

TABLE 4-6: WATER EFFICIENT REBATES CURRENTLY OFFERED

Efficiency Works Instant Rebates Offered	Models	Rebate Amount	Location
Smart Irrigation Systems			
Orbit B-Hyve Smart Watering Irrigation Timer	57950	$100	Lowes
Orbit White Rain Sensor	57071	$30	Lowes
Rachio 16-Station Wi-Fi Compatible Irrigation Timer	16ZulW-B	$100	Lowes
Rachio 8-Station Wi-Fi Compatibility Indoor Only Irrigation Timer	8ZulW-B	$100	Lowes
High Efficiency Showerheads			
American Standard FloWise Shower Head	1660.710.002	$10	Lowes
High Efficiency Toilets			
American Standard WaterSense Dual Flush Toilet	2889218.02	$50	Lowes
American Standard WaterSense Toilet	288CA114.020 288DA114.020	$50	Lowes
Niagara Stealth Elongated Toilet	77001WHCO1	$50	Lowes
TOTO Drake II WaterSense Toilet	CST453CUF-01	$50	Lowes
Energy Star Washing Machines			
GE High Efficiency Top-Load Washer	GTW680BSJWS GTW485ASJWS	$30	Lowes
Samsung 5-cu ft High Efficiency Top-Load Washer (White) ENERGY STAR	WA50R5200AW	$30	Lowes

In 2020, the City is planning to roll out a toilet and urinal rebate program through Efficiency Works for both commercial and residential customers. One of the benefits of a toilet rebate program for high-water efficiency toilets is that once they are installed, water savings are not dependent upon changes in customer behaviors to be achieved. Customers continue to use their toilets or urinals in the same fashion that they did before and water is saved with each flush. Once the older high water use toilets are removed from service, generally only high-efficiency toilets would be used in these locations going forward, allowing for the water savings to accumulate from year to year going forward. The City hopes to apply for some grant funding through CWCB to help with the implementation of this program. Below outlines the water saving assumptions and approximate yearly participation levels.

TABLE 4-7: TOILET AND URINAL REBATE PROGRAM

Rebate Type:	**Toilet Rebates** ($50 to $100)	**Urinal Rebates** ($75 to $100)
Assumptions:	Average Rebate Amount: $75 Average Annual Water Savings 6,300 Gallons per Fixture	Average Rebate Amount: $87.50 Average Annual Water Savings: 6,000 Gallons per Fixture
Year	**Rebates per Year**	**Rebates per Year**
2020	360	34
2021	373	36
2022	387	37
2023	400	38
2024	413	39
2025	427	41
2026	440	42
2027	453	43
2028	467	44
2029	480	46

4.2.3 Ordinances and Regulations

Several City regulations are designed to encourage water efficiency *(e.g., general water use regulations, landscape design/installation rules and regulations, indoor and commercial regulations.).* The following table describes those City ordinances and regulations based on the targeted groups:

Level 1 - Existing service area
Level 2 - New construction
Level 3 - Point of sale of existing building stock (Please note that there are no existing or planned new level 3 ordinances or regulations during the planning period.)

TABLE 4-8: ORDINANCES AND REGULATIONS TO IMPLEMENT

Ordinance and Regulations					
Level 1: Existing Service Area	**Implementation Period**	**Estimated Costs (2019 to 2029)**	**Estimated Accumulated Water Savings by 2029 (AF)**	**Customer Classes/ Accounts Affected**	**Notes**
Water Waste Ordinance Expansion	Approximately 2021 to 2029	$4K	Unknown	↓All	Includes increasing nature of ordinance to possibly include time of day irrigation restrictions and penalties for water wasters.
Excess Water Use Surcharge on All Irrigation Meters (Existing & New)	Approximately 2024 to 2029	$19K	1,627 AF	↓Irr	Includes public outreach to existing customers that would be impacted.

Level 2: New Construction Regulations	Implementation Period	Estimated Costs (2019 to 2029)	Estimated Accumulated Water Savings by 2029 (AF)	Customer Classes/ Accounts Affected	Notes
Require 25% Reduction in Irrigation Requirements & Water Rights on all New Irrigation Accounts	2022 to 2029	$24K	382 AF	↓Irr	Includes public outreach to developers and builders.
Abbreviations: *All* = *All Customer Classes* *Irr* = *Irrigation Customer Class*					

LEVEL 1 - EXISTING SERVICE AREA

Water Waste Ordinance: The City has the following ordinances in place to encourage water efficiency:

> **City of Loveland Municipal Code 13.04.170 Wasting Water.**
> Consumers shall prevent unnecessary waste of water and keep all water outlets closed when not in actual use. Hydrants, urinals, water closets, and other fixtures, must be kept in repair so that they will not cause unnecessary waste of water. The supplying of water may be discontinued for any violation of this section. (Ord. 997 § 6, 1968; prior code § 13.13)[16].

In practice, the City utilizes this ordinance to support water waste complaints filed by local customers. The City dispatches staff to investigate the complaint, and most often it is against a homeowner who was unaware of their water waste issue. Once the homeowner has been made aware, the problem is fixed and no additional complaint is lodged.

Sprinkler Use Limitation Ordinance: The City has a sprinkler use limitation ordinance in place to reduce the quantity of water dispensed on a given area at one time.

> **City of Loveland Municipal Code 13.04.210 Sprinkling – Use Limits**
> Consumers shall not use a larger hose than three-fourths of an inch in diameter, and sprinkling without a nozzle or with a nozzle opening larger than one-fourth inch is strictly forbidden.
>
> Maximum use at one time shall be limited by the following gallons per minute:
> - Lot areas up to 10,000 square feet, 10 gallons per minute;
> - For each additional 10,000 square feet, 5 gallons per minute. (Ord. 997 § 8, 1968; prior code § 13.16)

[16] City of Loveland Municipal Code. Chapter 13.04 Water Service. 13.04.170 Wasting water. http://online.encodeplus.com/regs/loveland-co/doc-viewer.aspx#secid-3125

Modifications and/or New Level 1 - Ordinances and Regulations:

- **Expanded Water Waste Ordinance:** The City's water waste ordinance provides general guidelines for unacceptable water waste by its customers, and allows for the City to shut off service for offenders. The City will consider developing two key amendments to this section of the municipal code:
  - Time of day watering restrictions that discourage outdoor irrigation between 10 am and 6 pm from May 1st through September 15th.
  - The ability of the City to fine observed water wasters for violations

- **Excess Water Use Surcharge on All Irrigation Meters:** The City will investigate whether to expand the excess water use surcharge from just commercial accounts to all irrigation meters by ordinance that specifies how the allotment would be set per irrigation meter. This ordinance along with the surcharge rate would essentially act as a 2-tier billing system, in which consumption above the allotment would incur a financial penalty. This is also covered in the Foundational Activities section above.

LEVEL 2 - NEW CONSTRUCTION REGULATIONS

Modifications and/or New Level 2 Ordinances and Regulations:

- **25% Water Reduction on New Irrigation Meters –** The City will consider requiring all new dedicated irrigation accounts that irrigate an area above a certain acreage threshold to submit a landscaping plan that demonstrates at least a 25% reduction in water requirements from the standard amount of water of 3 acre feet per acre required to water typical Kentucky Blue Glass in this region. Water rights would be paid based on the water requirements of the landscape plan.

  The implementation of this ordinance in conjunction with expanding the excess water use surcharge to all irrigation accounts would help to reduce future irrigation water needs by at least 25% unless customers pay penalties, which could be applied toward raw water acquisition and firming projects. (See a more detailed outline of the excess water use surcharge in the "Water Efficiency Oriented Rates and Tap Fees" section of the Foundational Activities.)

LEVEL 3 – POINT OF SALES ORDINANCES ON EXISTING BUILDING STOCK

The City did not choose to implement any point of sales ordinances as part of this Water Efficiency Plan Update.

4.2.4 Educational Activities

The City will continue its efforts to support educational activities that teach about the value of water, water management, ways to conserve and use water more efficiently. These activities help to engage the community and instill a general sense of water awareness in its attendees. There is no specific attempt to quantify potential water savings that are attributed to these expenditures;

however, the City believes that the support of water educational activities is a basic responsibility of the utility that will continue to be funded.

TABLE 4-9: EDUCATIONAL ACTIVITIES TO IMPLEMENT

Educational Activities					
Level 1: One-Way Communication	**Implementation Period**	**Estimated Costs (2019 to 2029)**	**Estimated Accumulated Water Savings by 2029 (AF)**	**Customer Classes/ Accounts Affected**	**Notes**
City Update (Utility Bill Insert)	2019-2029	$283K	Unknown	All	
Residential e-Newsletter	2019-2029	$33K		Res	
Colorado Waterwise (Live Like You Love It)	2015-2029	$75K		All	
Xeric Demonstration Gardens	2014-2029	$17K		All	
Level 3: Two-Way Communication	**Implementation Period**	**Estimated Costs (2019 to 2029)**	**Estimated Accumulated Water Savings by 2029 (AF)**	**Customer Classes/ Accounts Affected**	**Notes**
Children's Water Festival	2013-2029	$78K	Unknown	Res	
Seminars & Lectures (Water Wise Seminars & Community Stewardship Lecture Series)	2016-2029	$20K		All	
Social Media	2014-2029	$129K		All	
Video Views (YouTube and Facebook)	2017-2029	$275K		All	

Abbreviations:
All = All Customer Classes
Res = Residential Customer Class

LEVEL 1 - ONE-WAY EDUCATIONAL ACTIVITIES

During the planning horizon out to 2029, the City will continue with the following one-way educational activities at the same levels as it currently participates:

City Update (Utility Bill Insert): Loveland Water and Power plans to continue to compose 2 of the 6-page bill insert newsletter titled "City Update" that goes out eleven months of the year. The City Update is the only outreach effort delivered to every ratepayer in Loveland. Loveland Water and Power dedicates roughly 50% of the written content to water related topics. Water features may include program promotion for Slow the Flow, Garden in the Box or other water programs and initiatives. It can also include educational pieces on water quality or water conservation topics such cycle and soak irrigation methods.

Residential e-Newsletter: The City plans to continue with the residential e-Newsletter, which is the utility's largest online publication. Similar to City Update, the Residential e-newsletter has content split between water and power topics.

Colorado Waterwise (*Live Like You Love It* campaign): The City plans to continue its Colorado Waterwise membership and participate in the – "Live Like You Love It" campaign. The City will continue to access the campaign materials, which it utilizes in a variety of ways. The one-pagers on water efficiency landscaping and indoor water use are always on-hand and distributed frequently at events. The social media materials are used commonly, and the campaign is featured frequently on our promotional items and educational efforts.

Xeriscape Demonstration Gardens: The City plans to continue to maintains two xeriscape demonstration gardens, one at the downtown Civic Center and another at the City Service Center. The one at the Civic Center (Jeff Peterson Xeriscape Demonstration Garden) was originally installed in 1996. Each installation is accompanied by educational materials for Loveland citizens, including xeriscaping principals and plant identification signs.

LEVEL 2 - ONE- WAY EDUCATIONAL ACTIVITIES WITH FEEDBACK

The City did not choose to implement any one-way educational activities with feedback as part of this WEP Update.

LEVEL 3 - TWO-WAY EDUCATION

During the planning horizon out to 2029, the City will continue with the following two-way educational activities at the same levels as it currently participates:

Children's Water Festival: Loveland Children's Water Festival is an annual collaboration with Loveland Storm Water Utility and Northern Water. This yearly festival is a daylong activity in which 5th graders in the Thompson School District are brought through a variety of education stations. Each station involves a 25-minute interactive learning session. Topics such as water quality, pretreatment, and water sources are the most common. The City often hosts a learning session on water conservation. This activity usually involves teaching students how they can be "water savers" followed by an interactive lesson in how quickly water waste can add up. By educating the children, the hope is that they will help implement water efficiency practices into their homes and schools to reduce water usage.

Community Lectures & Seminars: The City plans to continue to offer educational lectures and seminars focusing on water to the community. The City partnered with the High Plains Environmental Center to facilitate lectures for the Loveland community on topics such as water-efficient landscaping, rain barrels, and a screening of "The Great Divide" documentary film focused on water resources. The City also partnered with Resource Central to provide "Water-Wise" Seminars at the Loveland Public Library with question and answer sessions and opportunities to discuss water saving programs and habits with City staff.

Social Media: Loveland Water and Power plans to continue to dedicate approximately half of its social media posts and efforts to water, including promoting water education, water programs,

water conservation and water efficiency. The City tracks All Likes/Follows on Facebook, Twitter and Instagram.

Video Views (YouTube and Facebook): Loveland Water and Power plan to continue to contract out for professional video productions to post on YouTube and Facebook on various utility related topics including water efficiency. These educational videos teach about what is involved in obtaining, treating, transmitting water and cleaning up the water before it returns to the river as well as teach how to use water more wisely. The video viewing platforms allow for viewers to comment on the materials and for staff to answer questions and clarify information to viewers.

5 – Implementation and Monitoring

This section includes the activities and coordination necessary to implement the water efficiency plan and monitor the overall effectiveness of the water efficiency plan.

5.1 Implementation Plan

The implementation plan defines the process necessary to carry out the selected water efficiency activities. A description of the steps the City will use to implement that water efficiency plan is presented in Worksheet J, of Appendix C.

The City has identified those measures and programs that it currently anticipates to implement to improve water efficiency; however, future appropriations of City funding for the various measures and programs contained herein cannot be guaranteed given that the nature of future City priorities may change due to City Council directives or other unforeseeable issues. The City's water use efficiency plans need to maintain flexibility to adapt to the changing needs and requirements of not only the City's resources, but also the water efficiency programs as well. Water efficiency is most effective when there is flexibility to improve the programs on an annual basis while still working to meet water use reduction targets. As portions of the water efficiency programs are implemented and new data and information are acquired, adjustments may be made to future water use efficiency programs that are not predicted at the time of this planning effort. Therefore, this WEP will be implemented in an adaptive management approach, incorporating changing conditions and influences into the year-to-year, and month-to-month, water use efficiency activities planned and executed by the City. Adjustments to this WEP will be made based upon program analysis including the monitoring of expenditures, water savings, local weather data, water losses, regulatory changes, industry advances and stakeholder input.

Because reduced water use can decrease revenues, the City makes annual updates to its 10-year annual capital improvement plans, and sets a budget for all activities that fit within the expected revenue stream. Cost of service rate studies are scheduled to be performed to make additional adjustments to the rates to ensure that the future revenue streams are sufficient to support the planned projects and programs.

5.2 Monitoring Plan

It is important to identify an approach to monitor as many of the measures and programs as possible so the value of each program can be evaluated as it is implemented. In this way, adaptive management of the WEP components can be performed, and resources from the City allocated. Generally, the City has selected water use efficiency measures and programs that can be tracked. However, some measures and programs such as customer education and the effect of increasing water rates cannot be measured directly. For these measures and programs, overall customer water use metrics such as per capita residential water use and total per capita water use will be tracked. Other measures and programs, such as sprinkler audits can be monitored on an individual basis. Monitoring efforts and metrics that the City proposes are summarized in Table 5-2.

5-Year Capital Improvement Plan:

The City maintains a detailed 5-year capital plan that identifies design, consulting and construction costs associated with ongoing and upcoming water related projects, including:

- Transmission and distribution projects (focusing on replacing steel and cast iron pipe with plastic in critical areas)
- Water treatment plant
- Water resources
- Upgrades and extensions (AKA – oversizing and extensions)
- Miscellaneous operations and maintenance (O&M) budgets

The projects that the Water Utility are currently tracking include water line replacements, water storage tank construction, meter upgrades and replacements, treatment plant upgrades and improvements, water resources projects, vehicle purchases, and various O&M projects. A specific breakdown of the City's 5-year detailed capital project list is provided in the table below.

TABLE 5-1: SUMMARY OF CITY'S 5-YEAR (2020-2024) DETAILED WATER PROJECT CAPITAL PLAN[17]

Water Project Category	5-Year Total
Transmission and Distribution	
Water Line Replacements	14,388,680
Water Line Valve Insertions	225,180
Water Line Construction, Extensions, Oversizing & Connections	26,130,380
Water Storage Tanks	9,322,510
Water Pump Stations	1,052,520
Water Meter Replacements	625,990
Water Meters for New Development	451,810
Meter Design & Install for Existing Fire Training Grounds	120,590
Cathodic Protection of Water Lines	482,360
Water Treatment Plant	3,033,310
Water Resources	8,810,860
General Plant	1,249,280
Large One Time Operations and Maintenance Projects	
Transmission and Distribution	78,190
Water Treatment Plant	156,380
Total	**66,128,040**

Capital projects that are considered as a part of the City's water efficiency programs include water line inspections, replacements and upgrades, and cathodic protection (which are all expected to help reduce real water losses); and meter replacements (which are expected to help reduce apparent water losses). The costs of these programs will be included in the overall water efficiency program costs provided later in this WEP.

[17] From the 2020 Capital Improvement Plan for the Water Utility

Utility staff will review the metrics outlined in the following table annually, along with review of updated water demand projections. Budgets and capital improvement plans are updated annually to fit within the anticipated future revenue stream and are presented and approved by City Council. Utility staff provide the Loveland Utilities Commission with overviews of the water loss audit results and levels of service metrics on an annual basis which cover many of the monitored items listed in the following table. More thorough presentations will be made to City governing boards, commissions and councils proceeding each scheduled update to the Water Efficiency Plan, the next of which is scheduled to occur in 2027.

TABLE 5-2: MONITORING PLAN METRICS

General Monitoring Data	Frequency	
Total Water Use	**Annual**	**Monthly**
Raw water deliveries to WTP (river & reservoir)	✓	✓
Process water used to treat water at WTP	✓	
Total treated water produced (metered at WTP Chasteen's Tank at WTP)	✓	✓
Total treated water delivered (sum of customer meters)*	✓	✓
Reduction in treated water used at WWTP	✓	✓
Per capita water use (total treated water/population)	✓	✓
Indoor and outdoor treated water deliveries	✓	✓
Treated water peak day produced	✓	
Treated water peak day flow per capita	✓	
Non-revenue water (From water loss report)*	✓	
Unbilled authorized consumption	✓	
Apparent water loss (From water loss report)	✓	
Real water loss (From water loss report)	✓	
Water Use by Customer Type	**Annual**	**Monthly**
Treated water delivered*	✓	✓
Residential per capita water use (residential water use/population)	✓	
Unit Water use (e.g. AF/account or AF/Irrigated acre)	✓	
Indoor and outdoor treated water deliveries	✓	✓
Large users	✓	✓
Other Demand Related Data	**Annual**	**Monthly**
Irrigated landscape (e.g. AF/acre or number of irrigated acres)	✓	
Precipitation	✓	✓
Temperature		
Evapotranspiration	✓	✓
Drought index information	✓	
Economic conditions	✓	
Population	✓	
New taps	✓	✓
** Note: Required for the Annual HB-1051 reporting requirements to the State of Colorado.*		

Program Specific Monitoring Data	Frequency	
General Programs	**Annual**	**Monthly**
Participation counts per program	✓	
Costs per program	✓	
Measured life of savings	✓	
Implementation period	✓	
New gallons saved per program per year	✓	
Accumulated gallons saved per program per year	✓	
Cost per 1,000 gallons saved	✓	
Per capita water use (total treated water/population)	✓	✓
Meter Testing & Replacement Program	**Annual**	**Monthly**
Quantity of meters tested by size	✓	
Meter test results (low, medium, high, average)	✓	
Total estimated water consumption under-registration	✓	
Water usage at difficult testing sites for medium and large sized meters		✓
Water Rate Increases	**Annual**	**Monthly**
Water rates	✓	
Excess Water Use Surcharge on Irrigation Accounts	**Annual**	**Monthly**
Average water usage per irrigated acre on dedicated irrigation accounts	✓	
Leak Detection Program	**Annual**	**Monthly**
Leaks repaired per year	✓	
Estimated water loss from leaks	✓	
Waterline Rehabilitation and Replacement	**Annual**	**Monthly**
Feet of waterlines rehabbed or replaced	✓	
Optimize Water Used to Backwash Filters at the Water Treatment Plant	**Annual**	**Monthly**
Difference between total raw water delivered to plant and finished water entering distribution system	✓	
Switch to Non-Potable at WWTP Headworks Building and Rotary Drum Thickeners	**Annual**	**Monthly**
Total annual water usage at Wastewater Treatment Plant (WWTP)	✓	
Repair Leaky Bottom of Civic Center Lagoon	**Annual**	**Monthly**
Total annual water usage at Civic Center Grounds	✓	
Hydrozone Program Tracking	**Annual**	**Monthly**
Irrigated acres	✓	
Quantity of water meters	✓	
Water rights paid	✓	
Annual water usage	✓	
Northern Water's – Water Efficient Landscape Grant Program	**Annual**	**Monthly**
Irrigated areas	✓	
Type of conversions	✓	
Water savings	✓	
Waster Waste Ordinance Expansion	**Annual**	**Monthly**
Number of infractions	✓	
25% Reduction in Irrigation Requirements and Water Rights on all New Irrigation Accounts	**Annual**	**Monthly**
Irrigated acres added on new irrigation accounts	✓	
Water rights paid on added new irrigation accounts	✓	

6 – Policy Adoption, Public Review and Formal Approval

6.1 Adoption of New Policy

This WEP proposes considering the adoption of the following new policies within approximately 2 to 5 years:

Expanded Water Waste Ordinance - The City's water waste ordinance provides general guidelines for unacceptable water waste by its customers, and allows for the City to shut off service for offenders. The City will consider developing two key amendments to this section of the municipal code:

i) Time of day watering restrictions that discourage outdoor irrigation between 10 am and 6 pm from May 1st through September 15th.

ii) The ability of the City to fine observed water wasters for violations

Excess Water Use Surcharge on Irrigation Accounts – Currently, the City imposes an excess water use surcharge only on commercial accounts that exceed their annual allotment. This City will consider instituting an excess water use surcharge on all irrigation accounts that exceed an allotment amount determined by either the water rights paid for the tap or an assumption of water rights paid on grandfathered properties.

25% Water Reduction on New Irrigation Meters – The City will consider requiring all new dedicated irrigation accounts that irrigate an area above a certain threshold to submit a landscaping plan that demonstrates at least a 25% reduction in water usage from the standard amount needed to water typical Kentucky Blue Glass. Water Rights would be paid based on the water requirements of the landscape plan.

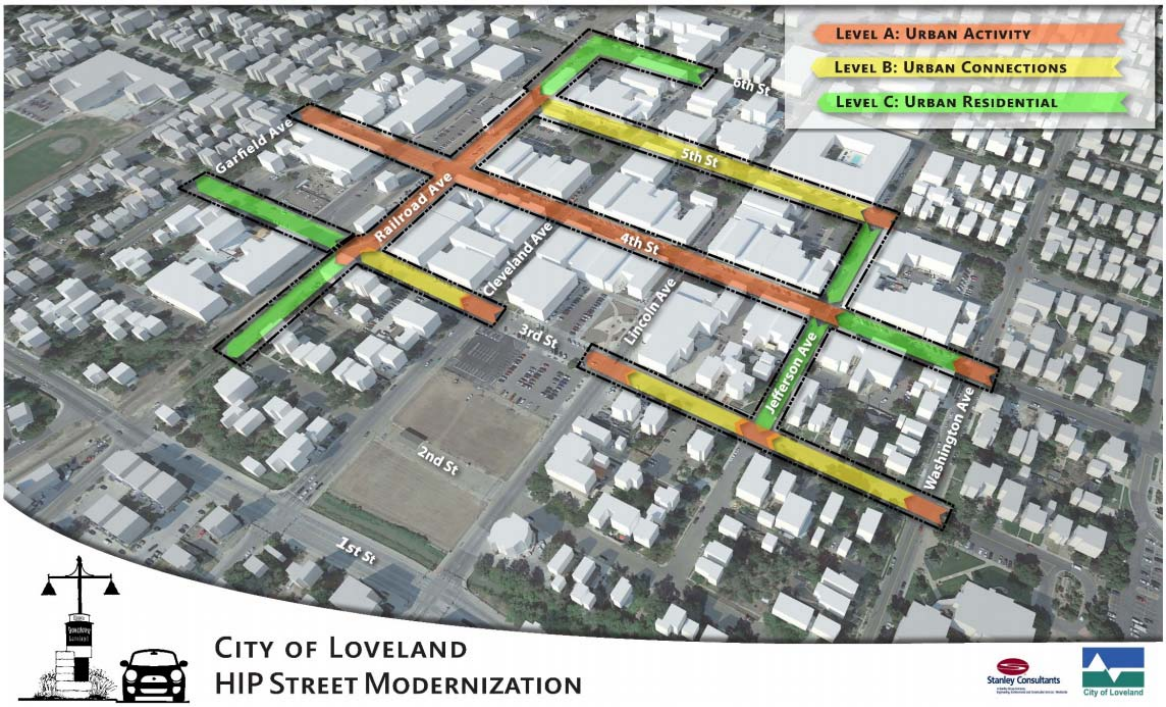
Hydrozone Program Amendment – In order to allow new owners and newly contracted maintenance companies time to adjust watering schedules and landscaping to meet the water budgets set forth in the Hydrozone Plans, the City will consider removing the stipulation that any participant exceeding their annual water budget by at least 5% for 3 consecutive years outside of the grace period or exemption years is no longer eligible to be on the Hydrozone Program and is required to pay the difference between the full water rights that normally would have been charged for the irrigated acres verses what has already been paid.

This WEP proposes considering the adoption of the following new policies within approximately 6 to 10 years:

Modify the Turf Along Sidewalk Requirement: Currently the City requires trees and turf between sidewalks and the streets on some of the major arterial roads. The City will investigate whether to pursue modifications to encourage the use of low-use seed mixes along roadways or changing the requirements to have areas of low-water use plants along these roadways instead.

Water Rights on Redevelopment: The City may work to incrementally bring the water rights requirements of redevelopments outside of the downtown area to match the water rights requirements of equivalent new developments, while providing credit for existing or grandfathered in water rights on the redeveloped properties. The Heart Improvement Program (HIP) Street Modernization plan area displayed in the map below may serve as the definition of which downtown areas would be exempted from these water rights requirements for redevelopments.

FIGURE 6-1: THE HEART IMPROVEMENT PROGRAM (HIP) STREET MODERNIZATION PLAN MAP



6.2 Public Review Process

A public review process is required for all State-approved plans. Since the City developed a Water Conservation Plan in 2013, the public may be familiar with the water efficiency concept and activities. The City's prior public education program may have contributed to this level of awareness. For this water efficiency planning process, the public was notified of the 60-day comment period and how to submit comments. The comment period was from January 13, 2020 through March 12, 2020.

The plan was available on the City's website and in its office for review. Copies of the Final Draft WEP were made available for public review at City Hall, the Loveland Public Library and the Water Utility Offices. Appendix D contains copies of the public notice announcements used by the City to advertise the public comment period. (List either the public comments or state "No public comments were received as a result of the notice.")

6.3 Local Adoption and State Approval Processes

The updated Water Efficiency Plan (WEP) underwent review by the City staff, City management and the public during the past months. After internal staff review and editing, the draft WEP was reviewed by the Colorado Water Conservation Board from December __2019 through January __, 2020. Public review and comment was invited for a 60-day period from January 13, 2020 through March 12, 2020. Once the public comment period closed, staff presented the WEP to City of Loveland Boards, Commissions and Councils as follows:

Water Efficiency Plan Presentations		
Name	**Presentation Dates**	**Location**
Loveland Utilities Commission (LUC)	Wednesday, April 15, 2020	Service Center Willow Room 200 N. Wilson Ave. Loveland, CO 80537
Construction Advisory Board (CAB)	Wednesday, April 22, 2020	Civic Center Council Chambers 500 E. 3rd St. Loveland, CO 80537
Planning Commission	Monday, April 27, 2020	Civic Center Council Chambers 500 E. 3rd St. Loveland, CO 80537
City Council	Tuesday, May 19, 2020	Civic Center Council Chambers 500 E. 3rd St. Loveland, CO 80537

The City Council provided the final approval of the updated WEP by resolution on May 19, 2020.

6.4 Periodic Review and Update

On an annual basis, the City will monitor the metrics proposed in Table 5-2 to help gain understanding on the effectiveness of the efficiency programs implemented and where to make improvements. This periodic review will help prepare the City for the next Water Efficiency Plan update scheduled for 2026 with final approvals in 2027.

(Note: Items highlighted in green are subject to change in the final version of the 2020 WEP based on actual dates, approvals and comments received.)

Appendix A - City of Loveland Current Water Rates

UTILITY RATES, CHARGES, AND FEES

Loveland Water and Power

Effective January 1, 2020

Table of Contents

WATER RATES & FEES **1**

Monthly Water Base Charge by Water Tap Size • Inside City 1
Monthly Water Base Charge by Water Tap Size • Outside City 1
Water Rate per 1,000 Gallons 1
Construction Water Fee 2
Fire Hydrant Flow Test 2
Hidden Valley Rates & Fees 2
Hydrant Meter Rental Fees 3
Raw Water Fees 3
Public Water Fill Station Rate (Ranch Water) 3
Water Meter Fees 3
Water Turn Ons 3
Water Wet Tapping Fees 4

WASTEWATER RATES & FEES **5**

Monthly Wastewater Base Charge • Metered Water Services 5
Wastewater Rate per 1,000 Gallons • Metered Water Services 5
Monthly Wastewater Rates • Flat Rate Services 5
High Strength Wastewater Surcharge 5
Pretreatment Fees 5
Wastewater Wet Tapping Fees 5

ELECTRIC RATES & FEES **6**

Electric Non-Summer Rates • Jan-June & Nov-Dec 6
Electric Summer Rates • July-Oct 6
Renewable Energy Premium 6
Electric Self-Generation Non-Summer Rates • Jan-June & Nov-Dec 7
Electric Self-Generation Summer Rates • July-Oct 8
Area Lighting 9
Charges when Access Denied 9
Distribution Designer Deposits 9
Electric Annexation Surcharges 10
Electric Coincident Peak Demand Service 10
Electric Turn Ons/Offs 10
Electric Vehicle Charging 10
Pole Attachments 11
Residential Service Installation Fees 11
Residential Service Upgrades (larger than 150 amps and no larger than 200 amps) 11
Service Connects, Disconnects & Reconnects 11
Small Equipment Flat Rates 11
Transmission Voltage Service 11

DEVELOPMENT FEES **12**

Raw Water, Water & Wastewater Development Fees • Inside City 12
Raw Water, Water & Wastewater Development Fees • Outside City 13
Fire Tap Plant Investment Fee • Outside City 14
Electric Plant Investment Fees 14

MISCELLANEOUS ACCOUNT FEES & CHARGES **15**

APPENDIX **16**

WATER 17
Capital Recovery Surcharge – Raw Water & Water ***17***
Construction Water Fee ***17***
Excess Water Use Surcharge ***17***

FIRE TAP PLANT INVESTMENT FEE 18
HIDDEN VALLEY ESTATES AREA 18
NATIVE RAW WATER STORAGE FEE 19
RAW WATER DEVELOPMENT FEE 20
SUPPLYING WATER TO OTHERS PROHIBITED 20
SYSTEM IMPACT FEES • WATER 20
WATER RATES 20
WATER METER AND TAPPING FEES 20
WASTEWATER 21
CAPITAL RECOVERY SURCHARGE - WASTEWATER 21
FLAT RATE WASTEWATER SEWER SERVICE 21
HIGH STRENGTH WASTEWATER SURCHARGE 21
PUBLIC NOTIFICATION OF VIOLATION 21
SYSTEM IMPACT FEES • WASTEWATER 21
WASTEWATER CHARGES 22
WASTEWATER WET TAPPING FEE 23
ELECTRIC 24
ANNEXATION SURCHARGE 24
APPLICATIONS FOR ELECTRIC SERVICE 24
CHARGES WHEN ACCESS DENIED 24
DISCONNECT AND RECONNECT SERVICES 24
DISTRIBUTION DESIGNER DEPOSITS 25
ENERGIZE ELECTRIC SERVICE TO SMALL DEVICES QUALIFYING FOR FLAT RATE SERVICE 25
OTHER DEPOSITS 25
PERMANENT DISCONNECT AND REMOVAL OF SERVICE 25
PLANT INVESTMENT FEE 26
RESALE OF ELECTRIC CURRENT PROHIBITED 27
PUBLIC ELECTRIC VEHICLE CHARGING STATION SERVICE USER FEES 27
RENEWABLE ENERGY PREMIUM 27
RESIDENTIAL SERVICE INSTALLATIONS AND UPGRADES FOR SINGLE FAMILY AND DUPLEX DWELLINGS 28
SERVICE TURN-ON FEE AT THE METER 29
TEMPORARY EXTENSIONS 29
SCHEDULE AL • AREA LIGHTING (EXISTING CONTRACTS ONLY) 30
SCHEDULE CP • COINCIDENT PEAK DEMAND SERVICE 30
SCHEDULE FE • FLAT RATE SERVICE 32
SCHEDULE LG • LARGE GENERAL SERVICE 33
SCHEDULE PT • PRIMARY SERVICE WITH TRANSFORMER 34
SCHEDULE R • RESIDENTIAL SERVICE 35
SCHEDULE RD • RESIDENTIAL DEMAND SERVICE 36
SCHEDULE SG • SMALL GENERAL SERVICE 37
SCHEDULE TS • TRANSMISSION VOLTAGE SERVICE 38
SELF-GENERATION RATE 39
MISCELLANEOUS ACCOUNT FEES & INFO 40
ACCESS TO UTILITY METER AND OTHER CITY FACILITIES AND APPURTENANCES 40
AFTER HOURS 40
APPLICATION OF PAYMENT 40
CHARGES DUE – WHEN 41
INTERFERING OR TAMPERING WITH A UTILITY METER 41
LATE PAYMENT PENALTY 41
NEW ACCOUNT OR REACTIVATION FEE AND NEW ACCOUNT METER READING FEE 42

RETURNED CHECK FEE *42*
SERVICE REINSTATED *42*
SUSPENSION OF SERVICE TERMINATION *42*
TERMINATING UTILITY SERVICES *42*
UTILITY SERVICE DEPOSIT *43*
RESOURCE LINKS 44
BROADBAND WEBSITE WWW.LOVELANDPULSE.COM *44*
COINCIDENT PEAK RATE *44*
HELPING A NEIGHBOR IN DISTRESS (HAND) PROGRAM *44*
HYDROZONE *44*
MUNICIPAL CODE *44*
RANCH WATER *44*
RENEWABLE ENERGY PREMIUM (GREENSWITCH) *44*
REQUIREMENTS FOR ELECTRIC SERVICE WEBPAGE *44*
SELF-GENERATION WEBSITE *44*
UNDERSTANDING YOUR UTILITY BILL *44*
UTILITY BILLING WEBSITE *44*
UTILITY BILLING PAYMENT OPTIONS *44*
WATER AND WASTEWATER DEVELOPMENT STANDARDS WEBPAGE *45*

WATER RATES & FEES

	Monthly Water Base Charge by Water Tap Size • Inside City						
	0.75 inch	**1.00 inch**	**1.50 inch**	**2.00 inch**	**3.00 inch**	**4.00 inch**	**6.00 inch**
Single Family	$15.77	$20.32	N/A				
Multi-Family	$26.86	$31.14	$35.42	$47.21	$133.96	$166.10	$241.08
Commercial	$15.77	$20.32	$24.83	$37.32	$129.22	$163.27	$242.70
Irrigation	$15.77	$20.32	$24.83	$37.32	$129.22	$163.27	$242.70
Note: Base charges for taps greater than 6" are set by City Council.							

	Monthly Water Base Charge by Water Tap Size • Outside City						
	0.75 inch	**1.00 inch**	**1.50 inch**	**2.00 inch**	**3.00 inch**	**4.00 inch**	**6.00 inch**
Single Family	$23.66	$30.48	N/A				
Multi-Family	$40.29	$46.71	$53.13	$70.82	$200.94	$249.15	$361.62
Commercial	$23.66	$30.48	$37.25	$55.98	$193.83	$244.91	$364.05
Irrigation	$23.66	$30.48	$37.25	$55.98	$193.83	$244.91	$364.05
Note: Base charges for taps greater than 6" are set by City Council.							

Water Rate per 1,000 Gallons		
	Inside City	**Outside City**
Single Family	$3.22	$4.83
Multi-Family	$3.26	$4.89
Commercial*	$3.83	$5.75
Irrigation	$4.99	$7.49
Additional Non-Residential Charges		
Excess Water Use Surcharge*	$1.37	$1.37
Capital Recovery Surcharge – Raw Water Development Fee**	$0.160	$0.160
Capital Recovery Surcharge – Water System Impact Fee**	$0.852	$1.278
**Note: Applies to all commercial customers.* ***Note: Applies to all non-residential water taps 2" and greater (excludes irrigation water taps).*		

Construction Water Fee

Water Tap Size	Allotment (Thousands of Gallons)	Fee
0.75 inch	16	$61.28
1.00 inch	27	$103.41
1.50 inch	55	$210.65
2.00 inch	87	$333.21
3.00 inch	163	$624.29
4.00 inch	271	$1,037.93
> 4.00 inch	*Negotiated with the Water and Power Department*	

Note: Regular water use fees apply after construction water allotment is surpassed.

Fire Hydrant Flow Test

Charge per Test	$200

Hidden Valley Rates & Fees

Hidden Valley Monthly Base Charge for 0.75 inch tap	$196.53

Hidden Valley Water Availability of Service Fee: This fee applies to all water taps applied for on or after January 1, 2010 to serve lots authorized pursuant to Resolution #R-35-2004 and #R-83-2005. Payment of this fee shall be due upon application for the water tap. The fee shall be calculated as follows:

A Number of Months from Jan 1, 2007 to the Availability of Service Fee due date

xB $67.00 per month

Engineering News Record 20 Cities Construction Cost Index
xC (Used to inflate the construction costs to current dollars)

= **Hidden Valley Water Availability of Service Fee**

Note: Customers in the Hidden Valley area includes Hidden Valley Estates 1, Hidden Valley Estates 2, Hidden Valley Estates 3, Wild Valley North and James A Wild Trust Subdivisions. Customers in the Hidden Valley area are responsible to pay for the replacement cost of their water system and the costs are split evenly between all the water taps. The Hidden Valley Monthly Base Charge has been billed to all lots in the Hidden Valley Estates 1 and 2 Subdivisions monthly since August of 2005. For lots in the Hidden Valley Estates 3, Wild Valley North and James A Wild Trust Subdivisions, the Hidden Valley Water Availability of Service Fee is required to catch up on all the fees the other water tap holders have already paid, and then the Hidden Valley Monthly Base Charge begins and continues to be billed regardless of usage or occupancy of the residence.

Hydrant Meter Rental Fees		
Hydrant Meter Rental Fees	Hydrant meter deposit	$2,000
	Daily rental	$5
	Install fee	$60
	Removal fee	$60
	Moving meter fee	$60
	Water use rate per 1,000 gallons	$5.96

Raw Water Fees		
Cash-in-Lieu Fee per Acre-Foot	Set by Loveland Utilities Commission (Municipal Code 19.04.041)	
Native Raw Water Storage Fee per Acre-Foot	Barnes Ditch	Set by Municipal Code 19.04.045
	Big Thompson Ditch & Manufacturing Co.	
	Buckingham Irrigation Co. (George Rist Ditch)	
	Chubbuck Ditch	
	Louden Irrigating Canal and Reservoir Co.	
	South Side Ditch Company	

Public Water Fill Station Rate (Ranch Water)	
Water Use Rate per 1,000 Gallons	$5.96

Water Meter Fees		
Purchase Water Meter & Readout*	0.75 inch water meter	$195
	1.00 inch water meter	$255
Install Meter		$95
Inspect Meter Pit & Meter Setter		$65
Return Appointment/Trip Fee**	Regular hours	$40
	After regular hours	$110
**Note: For 1.50 inch meters and larger, the contractor provides the meter and readout.* ***Note: Regular business hours are Monday through Friday, 7:00 AM to 4:00 PM, excludes City holidays.*		

Water Turn Ons		
Water Turn-On	7:00 AM to 4:45 PM on regular business days	$40
	4:45 PM to 7:00 AM on regular business days, anytime on weekends or city holidays	$110
Note: Requests to turn-on water services on delinquent accounts will be processed after the account is made current.		

Water Wet Tapping Fees		
Water Wet Tapping Fees	0.75 inch water tap	$365
	1.00 inch water tap	$370
	1.50 inch water tap	$375
	2.00 inch water tap	$385
	> 2.00 inch water tap	$580

WASTEWATER RATES & FEES

Monthly Wastewater Base Charge • Metered Water Services		
	Inside City	**Outside City**
Single Family	$14.46	$21.69
Multi-Family Residential (per Dwelling Unit)	$4.23	$6.35
Commercial	$14.46	$21.69

Wastewater Rate per 1,000 Gallons • Metered Water Services		
	Inside City	**Outside City**
Single Family	$4.79	$7.19
Multi-Family Residential (per Dwelling Unit)	$5.25	$7.88
Commercial	$5.28	$7.92
Additional Non-Residential Rates		
Capital Recovery Surcharge – Wastewater System Impact Fee*	$0.856	$1.284
**Note: Applies to all non-residential water taps 2" and greater (excludes irrigation water taps).*		

Monthly Wastewater Rates • Flat Rate Services		
	Inside City	**Outside City**
Single Family	$32.67	$49.02
Multi-Family Residential (per Dwelling Unit)	$22.08	$33.14
Commercial	$187.46	$281.20
Note: Because these customers receive their water service from another water provider and their wastewater service from the City, their wastewater service is charged on a flat fee basis instead of based on water usage.		

High Strength Wastewater Surcharge	
BOD charge per pound (when discharge is greater than 330 mg/l)	$0.56
TSS charge per pound (when discharge is greater than 199 mg/l)	$0.34

Pretreatment Fees		
Pretreatment Inspection Fee		$85
Significant Industrial User (SIU)	Laboratory Analysis	Actual Cost plus $75
	Public Notification of Violation	Actual Cost plus $75

Wastewater Wet Tapping Fees		
Tapping Fees (Includes Saddle and Stainless Strap)	4 inch	$315
	6 inch	$355

ELECTRIC RATES & FEES

Electric Non-Summer Rates • Jan-June & Nov-Dec						
Customer Class	**Schedule**	**Monthly Base Charge & Monthly Minimum Bill**	**Energy Charge per kWh**	**PILT per kWh**	**Plant Investment Fee per kWh**	**Demand Charge per kW**
Residential ≤ 200 amps	R	$15.79	$0.07916	$0.00786	N/A	N/A
Residential > 200 amps	R	$24.93	$0.07916	$0.00786	N/A	N/A
Residential Demand	RD	$24.93	$0.04650	$0.00653	N/A	$7.75
Small General Single Phase	SG	$28.35	$0.09137	$0.00796	$0.00655	N/A
Small General Three Phase	SG	$33.35	$0.09137	$0.00796	$0.00655	N/A
Large General	LG	$150.00	$0.04713	$0.00620	$0.00655	$11.80
Primary Service with Customer Owned Transformer	PT	$167.00	$0.04695	$0.00539	$0.00636	$11.80

Electric Summer Rates • July-Oct						
Customer Class	**Schedule**	**Monthly Base Charge & Monthly Minimum Bill**	**Energy Charge per kWh**	**PILT per kWh**	**Plant Investment Fee per kWh**	**Demand Charge per kW**
Residential ≤ 200 amps	R	$15.79	$0.09594	$0.00876	N/A	N/A
Residential > 200 amps	R	$24.93	$0.09594	$0.00876	N/A	N/A
Residential Demand	RD	$24.93	$0.05050	$0.00708	N/A	$10.30
Small General Single Phase	SG	$28.35	$0.10453	$0.00882	$0.00655	N/A
Small General Three Phase	SG	$33.35	$0.10453	$0.00882	$0.00655	N/A
Large General	LG	$150.00	$0.05223	$0.00762	$0.00655	$16.50
Primary Service with Customer Owned Transformer	PT	$167.00	$0.05120	$0.00625	$0.00636	$17.00

Renewable Energy Premium	
Renewable Energy Premium per 100 Kilowatt-hour (kWh)	$2.80

Electric Self-Generation Non-Summer Rates • Jan-June & Nov-Dec							
Capacity of Self-Generation Unit (kW)	**Monthly Base Charge**	**Energy Charge per kWh**	**Buyback Credit per kWh**	**PILT per kWh**	**Buyback PILT Credit per kWh**	**Plant Investment Fee per kWh**	**Demand Charge per kW**
Residential							
Up to 1.49	$17.38	$0.07916	$0.05884	$0.00786	$0.00443	N/A	N/A
1.5 to 2.49	$18.97						
2.5 to 3.49	$20.56						
3.5 to 4.49	$22.15						
4.5 to 5.49	$23.74						
5.5 to 6.49	$25.33						
6.5 to 7.49	$26.92						
7.5 to 8.49	$28.51						
8.5 to 9.49	$30.10						
9.5 to 10.49	$31.69						
10.5 to 11.49	$33.28						
11.5 to 12.49	$34.87						
12.5 to 13.49	$36.46						
Capacity of Self-Generation Unit (kW)	**Monthly Base Charge & Monthly Minimum Bill**	**Energy Charge per kWh**	**Buyback Credit per kWh**	**PILT per kWh**	**Buyback PILT credit per kWh**	**Plant Investment Fee per kWh**	**Demand Charge per kW**
Small General							
Single Phase: 1 to 400	$28.35	$0.09137	$.05884	$0.00796	$0.00443	$0.00655	N/A
Three Phase: 1 to 400	$33.35						
Large General							
1 to 400	$150.00	$0.04713	$0.05884	$0.00620	$0.00443	$0.00655	$11.80

Electric Self-Generation Summer Rates • July-Oct							
Capacity of Self-Generation Unit (kW)	**Monthly Base Charge**	**Energy Charge per kWh**	**Buyback Credit per kWh**	**PILT per kWh**	**Buyback PILT Credit per kWh**	**Plant Investment Fee per kWh**	**Demand Charge per kW**
Residential							
Up to 1.49	$17.38	$0.09594	$0.07160	$0.00876	$0.00539	N/A	N/A
1.5 to 2.49	$18.97						
2.5 to 3.49	$20.56						
3.5 to 4.49	$22.15						
4.5 to 5.49	$23.74						
5.5 to 6.49	$25.33						
6.5 to 7.49	$26.92						
7.5 to 8.49	$28.51						
8.5 to 9.49	$30.10						
9.5 to 10.49	$31.69						
10.5 to 11.49	$33.28						
11.5 to 12.49	$34.87						
12.5 to 13.49	$36.46						
Capacity of Self-Generation Unit (kW)	**Monthly Base Charge & Monthly Minimum Bill**	**Energy Charge per kWh**	**Buyback Credit per kWh**	**PILT per kWh**	**Buyback PILT Credit per kWh**	**Plant Investment Fee per kWh**	**Demand Charge per kW**
Small General							
Single Phase 1 to 400	$28.35	$0.10453	$0.07160	$0.00882	$0.00539	$0.00655	N/A
Three Phase 1 to 400	$33.35						
Large General							
1 to 400	$150.00	$0.05223	$0.07160	$0.00762	$0.00539	$0.00655	$16.50

Area Lighting

Customer Class	Schedule	Rate per Watt of Bulb	PILT per Watt of Bulb
Area Lighting	AL	$0.06637	$0.00505

Charges when Access Denied

Appointment or Special Trip to	Read the meter during business hours	$31
	Read the meter after business hours	$69
	Change the meter during business hours	$115
	Change the meter after business hours	$165
Note: Regular business hours are Monday through Friday, 7 AM to 4 PM, excludes city holidays.		
Service Disconnect at Junction Box or Overhead Pole		$525
Note: When clear access is denied for the purpose of disconnecting service, actuals will be charged.		

Distribution Designer Deposits

Residential & Duplex of 1-2 Lots	Single Phase Installations		$1,035
Residential Subdivision of 3-10 Lots Commercial Subdivision of 2-10 Lots	Raising, lowering or removing existing power		$1,620
Single Commercial Buildings	Transformer upgrades, raising, lowering or removing existing power		$1,620
Residential Subdivision of more than 10 Lots, Commercial Subdivision of more than 10 Lots, Malls, Shopping Centers, or Hospitals			$3,045
Temporary Residential Connections			$240
Termination and energizing electric services to small devices			$310
Install and terminate secondary riser up to 100 feet (no transformer required)	Residential to 200 amps		$1,160
	Commercial (cable supplied and installed by customer)		$940
Open transformer to pull in secondary and terminate cable up to 130 feet			$635
Transformer Upgrades		**No Other Customers**	**Other Customers**
Single Phase Padmount	Upgrade (1) transformer size	$2,090	$2,755
	Upgrade (2) transformer sizes	$2,540	$3,205
	Upgrade (3) transformer sizes	$2,990	$3,655
Single Phase Overhead	Upgrade (1) transformer size	$1,710	$2,375
	Upgrade (2) transformer sizes	$2,095	$2,765
Note: Deposits will be applied to the actual costs billed by the Water and Power Department upon completion of work performed.			

Electric Annexation Surcharges	
Annexation Surcharge	5%
Note: For areas annexed into the City after January 31, 1987 from areas formerly part of an exclusive service territory granted to a cooperative electric association, there is a percentage surcharge on the electric base, energy and demand charges, and on electric charges on area lighting and flat rate electric customers. This surcharge expires ten years after the City of Loveland's start of electric service date.	

Electric Coincident Peak Demand Service						
Schedule	**Monthly Base Charge & Monthly Minimum Bill**	**Energy Charge per kWh**	**Coincident Demand Charge**	**Distribution Facilities Demand Charge**	**Plant Investment Fee per kWh**	**Power Factor Charge**
Service delivered at the available primary voltage & all serving facilities on the customer's side of the metering point are owned, operated & maintained by the customer	Based on customer cost of service and energy usage profile	All kWh consumed, per kWh, based on customer cost of service and energy usage profile	All billed coincident demand, per KW, based on customer cost of service and energy usage profile	All distribution facilities demand, per KW, based on customer cost of service and energy usage profile	$0.00636	100% of the power factor charge incurred by the City on account of and attributable to service to the customer.
All other coincident peak customers					$0.00655	

Electric Turn Ons/Offs		
Service Turn-Ons at the meter	7:00 AM to 4:45 PM on regular business days	$45
	4:45 PM to 7:00 AM on regular business days, anytime on weekends or city holidays	$210
Service Turn-Offs at the meter	Resulting from an unauthorized Service Turn-On	$45
Note: Requests to turn-on electric services on delinquent accounts will be processed after the account is made current.		

Electric Vehicle Charging	
Fee per hour	$1.00
Minimum fee per charging session	$1.00

Pole Attachments		
Pole Attachment Fee - Wired	per attachment per year	$18.21
Pole Attachment Fee - Wireless	per attachment per year	$200
Pole Attachment Application for Permit Fee	1 to 5 poles	$500
	Per additional pole beyond 5	$100
Note: This annual fee applies to each attachment by a non-City utility to a City power pole. See Municipal Code 13.12.200.		

Residential Service Installation Fees	
Typical Underground with 1/0 Triplex	$340
Typical Underground with 4/0 Triplex	$415

Residential Service Upgrades (≤ 200 amps)	
Residential Underground Service Upgrade Deposit	$800
Residential Overhead Service Upgrade Deposit	$300
Note: This deposit will be applied to the actual costs billed by the Water and Power Department upon completion of work performed.	

Service Connects, Disconnects & Reconnects		
Permanent Service Connect	No disconnect needed	$345
Permanent Disconnect of Service		$345
Disconnect/Reconnect Services	Without engineering	$345
	With engineering	$490

Small Equipment Flat Rates			
Customer Class	**Schedule**	**Flat Rate per Month**	**PILT**
Signal Amplifiers	FE	$39.42	$3.00
Automatic Sprinkler Controls	FE	$5.94	$0.44
Bus Shelters	FE	$24.23	$1.84

Transmission Voltage Service	
Charges for Service	Determined based on unique load characteristics and service requirements of the customer. At minimum, be sufficient to recover the City's cost of service, including, without limitation, wholesale rates and the City's projected operating and maintenance costs. In addition, the customer shall be responsible for all wholesale charges and fees incurred by the City in providing service to the customer, including, without limitation, power factor charges.

DEVELOPMENT FEES

Raw Water, Water & Wastewater Development Fees • Inside City

Customer Type		Raw Water Development Fee	Water System Impact Fee	Wastewater System Impact Fee	Capital Recovery Surcharges		
					Raw Water	Water	Wastewater
					per 1,000 gallons of Water billed	per 1,000 gallons of Water billed	per 1,000 gallons of Wastewater billed
Single Family*	Detached	$1,087	$5,520	$2,880	N/A	N/A	N/A
	Attached	$1,087	$2,870	$2,540			
	Cottage	$680	$2,870	$2,540			
	Micro	$680	$2,870	$2,540			
No. of Dwelling Units per Meter							
Multi-Family*	2 to 8	$680	$2,870	$2,540	N/A	N/A	N/A
	9 to 24	$680	$2,280	$1,970			
	≥ 25	$134	$2,280	$1,970			
Water Tap Size							
Non-Residential	0.75"	$1,087	$8,000	$8,630	N/A	N/A	N/A
	1.00"	$1,848	$19,130	$19,880			
	1.50"	$3,588	$36,080	$36,520			
	≥ 2.00"	N/A	N/A	N/A	$0.160	$0.852	$0.856
Irrigation	0.75"	$1,087	$19,350	N/A	N/A	N/A	N/A
	1.00"	$1,848	$46,380				
	1.50"	$3,588	$106,420				
	2.00"	$5,763	$134,780				
	3.00"	$10,873	$357,250				
	> 3.00"	Established by City Council					

*Note: For residential structures, fees are charged per dwelling unit.

Raw Water, Water & Wastewater Development Fees • Outside City

Customer Type		Raw Water Development Fee	Water System Impact Fee	Wastewater System Impact Fee	Capital Recovery Surcharges		
					Raw Water	Water	Wastewater
					per 1,000 gallons of Water billed	per 1,000 gallons of Water billed	per 1,000 gallons of Wastewater billed
Single Family*	Detached	$1,087	$8,280	$4,320	N/A	N/A	N/A
	Attached	$680	$4,310	$3,810			
	Cottage	$680	$4,310	$3,810			
	Micro	$680	$4,310	$3,810			
No. of Dwelling Units per Meter							
Multi-Family*	2 to 8	$680	$4,310	$3,810	N/A	N/A	N/A
	9 to 24	$680	$3,420	$2,960			
	25+	$134	$3,420	$2,960			
Water Tap Size							
Non-Residential	0.75"	$1,087	$12,000	$12,950	N/A	N/A	N/A
	1.00"	$1,848	$28,700	$29,820			
	1.50"	$3,588	$54,120	$54,780			
	≥2.00"	N/A	N/A	N/A	$0.160	$1.278	$1.284
Irrigation	0.75"	$1,087	$29,030	N/A	N/A	N/A	N/A
	1.00"	$1,848	$69,570				
	1.50"	$3,588	$159,630				
	2.00"	$5,763	$202,170				
	3.00"	$10,873	$535,880				
	>3.00"	Established by City Council					

*Note: For residential structures, fees are charged per dwelling unit.

Fire Tap Plant Investment Fee • Outside City	
Fire Tap Plant Investment Fee	$553
Note: Only applies when the City does not provide domestic water, but does provide a fire sprinkler for non-residential purposes outside the city limits.	

Electric Plant Investment Fees		
Customer Class	**Size of Service**	**Fee**
Residential	150 amp or less	$1,620
	Over 150 amp	$2,080
Non-Residential per kWh	**Customer Type**	**Rate per kWh**
	Small General	$0.00655
	Large General	$0.00655
	Primary Services with Customer Equipment	$0.00636
Coincident Peak Demand	Service delivered at the available primary voltage & all serving facilities on the customer's side of the metering point are owned, operated & maintained by the customer.	$0.00636
	All other coincident peak demand customers.	$0.00655

MISCELLANEOUS ACCOUNT FEES & CHARGES

Miscellaneous Account Fees & Charges	
Filing Fee for Unpaid Bills	$95
Interfering or Tampering with a Meter Fee (Electric or Water)	$130
Late Payment Penalty	$15
New Account Fee	$10
New Account Meter Reading Fee	$10
Penalty for Tampering with a Utility Meter	Set by Municipal Code 13.02.130D
Reactivation Fee	$10
Return Check (Insufficient Funds) Charge	$20
Utility Service Deposit	Set by Municipal Code 13.02.020

APPENDIX

Definitions, rates, charges, and fee schedules.

WATER

CAPITAL RECOVERY SURCHARGE – RAW WATER & WATER

A Capital Recovery Surcharge is required for all new, nonresidential (excluding irrigation), water taps 2" and greater. It replaces the initial Raw Water Development Fee and Water System Impact Fee payment. The Raw Water and Water Capital Recovery Surcharges are paid per 1,000 gallons of billed water on a non-residential customer's utility bill. The original owner(s) requesting water service at that property, and all subsequent tenants or owners of the property, are required to pay the capital recovery surcharge(s). The Capital Recovery Surcharge is for all water use billed at the requesting property and will remain in effect as long as the service remains active and is activated on the parcel of property. For more information, see Municipal Code 13.04.034, 13.04.040.

CONSTRUCTION WATER FEE

The Construction Water Fee is for the initial water furnished to a premises during construction when no water meter had previously been installed. The fee applies to the water used after the water meter is set and prior to issuance of the certificate of occupancy. Water is furnished at a flat rate established by resolution of City Council and is paid with the building permit.

Construction Water Fee ÷ Inside Commercial Water Use Fee = Allotment Gallons
Water use in excess of the allotment amount during the construction period are billed subsequent to the issuance of the certificate of occupancy at the regular meter rate applicable for that service address. For additional information, please see Municipal Code 13.04.031.K.

EXCESS WATER USE SURCHARGE

Commercial customers are required to furnish adequate raw water to meet the customer's demand for treated water. If a Commercial customer exceeds the amount furnished to the City, they are charged an excess water use surcharge in addition to the regular water rates.

Excess Water Use Surcharge is defined as all water use through a meter in excess of the annual base amount set forth in the following table for each meter size in any calendar year.

Meter Size	Annual Base Amount in Gallons
0.75 inch	270,000
1.00 inch	1,080,000
1.50 inch	2,160,000
2.00 inch	3,510,000
3.00 inch	7,020,000
4.00 inch	10,800,000
>4.00 inch	To be set by City Council

Calendar Year: means the twelve billing periods starting with the first billing period beginning on or after January 1st in each year.

Multiple Meters on a Campus: Whenever water use through a meter totals less than the annual base amount during any calendar year, the difference between actual use and the annual base amount may be credited to any other meter on the same property and under the same ownership upon application to and approval of the Director of

Water and Power, or his or her designee. Upon approval, all water furnished through separate meters on the property can be combined for determining the excess water use. Please note that a special billing charge may be imposed to cover additional billing and administrative costs and that these costs may be changed from time to time to reflect changes in costs.

Annual Base Increases: The annual base amounts in the table above may be increased by increments of 270,000 gallons by doing at least one of the following options: (See Municipal Code 13.04.245 for additional information and stipulations.)

1. **Provide Additional Raw Water:** For each additional acceptable acre foot of raw water rights furnished to the City, the customer will receive 270,000 gallons on the annual base amount. (See Municipal Code 19.04.040).
2. **Annexations or Rezonings:** Furnish evidence to the City that the City received raw water rights in conjunction with annexation or rezoning of a property served in excess of the required raw water rights according to meter size as set forth in the table below. The annual base amount will be increased 270,000 gallons for each excess acre foot of raw water rights.

Meter Size	Required Raw Water in Acre Feet
0.75 inch	1
1.00 inch	4
1.50 inch	8
2.00 inch	13
3.00 inch	26
4.00 inch	40
>4.00 inch	To be set by City Council

3. **Fractions of Water Rights & Cash Credits:** Whenever available water right credits are for fractions of acre feet, cash may be paid at the rate established by Municipal Code Section 19.04.040 to make up the difference between available credits and the next full acre foot required.

For additional information on Excess Water Use Surcharge, please see Municipal Code 13.04.245.

FIRE TAP PLANT INVESTMENT FEE

The Fire Tap Plant Investment Fee applies to outside city customers who receive water from the City for the purpose of supplying water for stand pipes and fire sprinkler systems for institutional, commercial and industrial buildings only. This fee does not apply when the outside city customer also receives water service from the City. For more information, see Municipal Code 13.04.205.

HIDDEN VALLEY ESTATES AREA

Customers in the Hidden Valley area includes Hidden Valley Estates I, Hidden Valley Estates II, Hidden Valley Estates III, Wild Valley North and James A Wild Trust Subdivisions. When the Hidden Valley area water system was proposed, the Loveland Water & Power Department and City Council recognized that this area was unique in the following ways:

- **High Cost per Customer Served:** Providing water service to this area requires a significant amount of infrastructure to serve relatively few homes. To provide the service the developer requested costs the City more per customer than the cost to provide water service to our typical customer.
- **Water Quality:** A 4" recirculation waterline that runs continuously was required to be installed parallel to the 8" waterline to prevent the water from becoming stale and protecting against bacterial problems caused by the chlorine residuals dissipating before reaching the taps. The system was designed in this manner to address the long dead ends with no redundant feeds or connections.
- **High Water Pressure Requirements:** Due to the extreme elevation increases in this area, the water distribution system requires special water infrastructure to provide water pressure sufficient to reach the homes at higher elevations while still meeting fire suppression flow requirements. The special infrastructure includes a pump station that includes a fire pump and recirculation pumps that run non-stop to keep chlorine levels adequate and also maintain water pressure.
- **Fire Protection:** Normally the City provides adequate fire suppression flows through hydrants along the distribution system. However, in order to meet fire suppression requirements, this system had to be configured to allow for each home to have a 60 gallon per minute fire line service tap connected to private internal sprinkler systems.

City Council gave direction via Resolutions #R-35-2004 and #R-83-2005 to ensure subdivisions in the Hidden Valley Estates area self-funded the operations, maintenance and future replacement of the water infrastructure required to serve customers in these subdivisions.

The sole purpose of the Hidden Valley Water Availability of Service Fee is to ensure that adequate funds are available when system components must be replaced in the Hidden Valley Estates area. This fee plays a key role in accumulating funds toward covering the replacement cost. This Availability of Service Fee ensures that homes added after the system was initially constructed do not sidestep the financial obligation to contribute their appropriate share toward the future replacement of the Hidden Valley Estates water system. The initial customers, from Hidden Valley Estates I and Hidden Valley Estates II, have been contributing monthly toward this future replacement since July 2005. The Availability of Service Fee is the mechanism to collect the replacement funds from customers who have not been contributing from the start for the replacement of Hidden Valley Estates area's infrastructure replacement and operations and maintenance costs, which had been specifically constructed and operated solely for the benefit of the property owners in the Hidden Valley Estates area subdivisions.

The Hidden Valley Monthly Base Charge continues each month for all Hidden Valley I and Hidden Valley II water taps and for the other lots in the Hidden Valley Estates Area after the Activation of Service Fee is paid.

NATIVE RAW WATER STORAGE FEE

The Native Raw Water Storage Fees are taken from the Raw Water Master Plan and are subject to change at any time by ordinance of City Council. When credit in the City's water bank is received in exchange for the transfer of ditch water rights to the City is applied to satisfy the City's water rights requirements, it is subject to the Native Raw Water Storage Fee (See Municipal Code 19.04.045.B & 19.04.045.C for some exemptions.) The Native Raw

Water Storage Fee does not apply to water bank credits received in exchange for the transfer of Colorado-Big Thompson Project units to the City or water bank credits acquired from the City by cash payment or to payments of the Cash-in-Lieu price. See Municipal Code 19.04.045 for addition information.

Raw Water Development Fee

The Raw Water Development Fee is based on the size of the water tap requested. This fee applies to residential and commercial water taps smaller than 2" and to all irrigation taps. For multifamily dwellings, this fee is charged per dwelling unit. For non-residential taps, 2" and larger, a Raw Water Development Capital Recovery Surcharge is required. The capital recovery surcharge is paid per 1,000 gallons of water billed to the owner of the property, or the responsible party of the water charges. The Raw Water Development Capital Recovery Surcharge for outside city customers is the same as for inside city customers. The Capital Recovery Surcharge is charged per 1,000 gallons of water use billed at the requesting property and will remain in effect as long as the water service remains active on the parcel of property. For more information, see Municipal Code 13.04.040.

Supplying Water to Others Prohibited

No occupant or owner of any building or premises which obtains water from the City shall supply water to other persons or families or to other premises. Such persons will be required to pay double the price of water so used and the Department may shut off the water supply for such violation. See Municipal Code 13.04.110.

System Impact Fees • Water

Water System Impact Fees (SIF) are a one-time charge for each new connection to the water system, and for increases to the water meter size. SIF applies for all residential meters, nonresidential meters smaller than 2" in diameter, and dedicated irrigation meters. (Nonresidential meters 2" and larger are paid through a Capital Recovery Surcharge.) SIF are due at the time a building permit is requested, or, if no building permit is required for that property or structure that the meter will serve, at the time a request is made for activation of the water meter. SIF are applied to the property as long as the building use and size of the water connection remain unchanged. No refund of SIF shall be made for the removal or decrease in the size of water service connected to the City water system except as outlined in Municipal Code 13.04.032 and 13.04.033. For additional information on SIF, see Municipal Code 13.04.030.B and 13.04.038.

Water Rates

Except as provided in Municipal Code 13.04.241 (Rental of Surplus Raw Water), all water sold by the City shall be sold at rates to be established by resolution of the City Council adopted after two readings. See Municipal Code 13.04.240

Water Meter and Tapping Fees

The applicant for a water tap is to pay all meter and tapping fees, at the time of application for the tap. A list of the services and materials provided by the City is available from Loveland Water and Power. These fees may be decreased or waived if the applicant provides all or a portion of the required labor and materials associated with the tap. See Municipal Code 13.04.030.A.

WASTEWATER

CAPITAL RECOVERY SURCHARGE - WASTEWATER

A Wastewater Capital Recovery Surcharge is required for all new commercial sewer taps using a water tap 2" and greater and for increases to existing taps making them 2" and greater. It replaces the initial Wastewater System Impact Fee. The Wastewater Capital Recovery Surcharge is paid per the collection of each 1,000 gallons of wastewater. The original owner(s) requesting wastewater service at that property, and all subsequent tenants or owners of the property, are required to pay the Wastewater Capital Recovery Surcharge. The Wastewater Capital Recovery Surcharge is for all wastewater collection billed at the requesting property and will remain in effect as long as the service remains active and is activated on the parcel of property. For more information, see Municipal Code 13.08.030, 13.08.040, 13.08.041.

FLAT RATE WASTEWATER SEWER SERVICE

This service and the associated fees are for customers who receive their wastewater service from the City and their water service from another water provider.

HIGH STRENGTH WASTEWATER SURCHARGE

Every non-residential property from which is discharged a higher than standard strength sewage as defined by this code for five-day biochemical oxygen demand (BOD) and total suspended solids (TSS), is charged a monthly surcharge as follows:

a. **BOD Charge per Pound:** A charge per pound of BOD when the BOD of wastewater discharged to the City's sewer system exceeds a threshold per liter specified in the current Utility Rates, Charges, and Fees, plus;
b. **TSS Charge per Pound:** A charge per pound of TSS when the TSS of wastewater discharged to the City's sewer system exceeds the threshold specified in the current Utility Rates, Charges and Fees.

For more information, please see Municipal Code 13.08.101.

PUBLIC NOTIFICATION OF VIOLATION

The Director is required to publish annually, in a newspaper of general circulation that provides meaningful public notice within the jurisdiction(s) served by the Utility, a list of the commercial users that, at any time during the previous twelve (12) months, were in significant noncompliance with applicable pretreatment standards and requirements. The term "significant noncompliance" shall be applicable to all significant commercial users, and any other commercial user that violates sections (3), (4), or (8) of the definition of "significant noncompliance" set forth in Section 13.10.104 of the Loveland Municipal Code. The actual costs of this public notice are charged to the significant noncompliance customer. For more information, see Municipal Code 13.10.

SYSTEM IMPACT FEES • WASTEWATER

Wastewater System Impact Fees (SIF) are a one-time charge for each new connection to the wastewater system, and for increases to an existing water meter size. SIF applies for all residential connections to the wastewater system and for nonresidential connections to the wastewater system when the meter is 1.5" or smaller. (SIF for nonresidential meters 2" and larger are paid through a Capital Recovery Surcharge.) SIF are due at the time a building

permit is requested, or if no building permit is required for that property or structure that the water meter will serve, at the time a request is made for activation of the water meter. SIF are credited to the property as long as the building use and size of the water connection remain unchanged. No refund of SIF shall be made for the removal or decrease in the size of water service connected to the City water system except as outlined in Municipal Code 13.04.032 and 13.04.033. For additional information on Wastewater SIF, see Municipal Code 13.08.040.

WASTEWATER CHARGES

1. **Residential:** For all residential properties with metered City water service, the wastewater charge shall be as follows:

   i. for the months of December, January, and February, the wastewater charge shall be based on the metered water consumption for the month being billed;
   ii. for the months of March through November, the wastewater charge shall be based on the lesser of the average monthly water consumption determined by the meter readings shown in the immediately preceding December, January, and February utility billings (the "winter quarter average") or the metered water consumption for the month being billed.

   However, a customer may request, in writing, to be charged the monthly flat rate for the months of March through November. The request must demonstrate to the satisfaction of the Director of Loveland Water and Power that the property's winter quarter average is not representative of the property's wastewater discharge. If the request is approved, the property shall be charged the monthly flat rate, for the months of March through November. Said approval shall be valid only for that calendar year.

2. **Nonresidential:** For all nonresidential properties with metered water service, the wastewater charge for all months shall be based on metered water consumption.

   i. However, a customer may request, in writing, that it be billed for the months of March through November based on the lesser of the property's winter quarter average or the metered water consumption for the month being billed. The request must demonstrate to the satisfaction of the Director of Loveland Water and Power that only a portion of the metered water consumption is discharged to the wastewater system. If the request is approved, the property shall be billed for the months of March through November based on the lesser of the property's winter quarter average or the metered water consumption for the month being billed. Said approval shall be valid only for that calendar year.
   ii. For all nonresidential properties with metered water service from non-City providers, the customer must sign a release permitting the City to have ongoing access to the customer's water consumption data. The City shall not be obligated to provide wastewater service to any customer with water service from a non-city provider who refuses or fails to sign the release required herein.

3. **Flat Rate:** The monthly flat rate for residential and nonresidential properties shall apply to all properties that do not qualify for billing based on metered water consumption.

For additional information on wastewater charges, see Municipal Code 13.08.100.

WASTEWATER WET TAPPING FEE

Applicants for a new wastewater service tap pay a wet tap fee at the time of application for the tap. The tap fee reflects the costs of providing the services and materials for the tap. The customer is responsible for excavating a trench to the wastewater main where the tap will be made. A list of the services and materials provided by the City shall be available from Loveland Water and Power. No charge will be assessed where a wastewater connection is to be made to a service, which has been previously installed in the main wastewater line. Reference Municipal Code 13.08.030.A.

ELECTRIC

ANNEXATION SURCHARGE

There is imposed a surcharge in the amount of five percent of base charges plus charges for energy, demand, payment-in-lieu-of-taxes (PILT) for the sale of electric power to services that come into existence in all areas annexed to the City after January 31, 1987, which areas were formerly a part of an exclusive service territory granted to a cooperative electric association by the Public Utilities Commission. Such surcharge expires ten years after the effective start of electric service date of each such area.

APPLICATIONS FOR ELECTRIC SERVICE

Every person desiring a supply of electric current from the City, or an upgrade or other change in existing service, shall make application therefore to the City upon forms furnished for that purpose.

CHARGES WHEN ACCESS DENIED

Whenever clear access to the meter location is denied, this charge is imposed to cover the additional costs and expenses incurred by the City. Clear access shall be deemed to be denied whenever, because of locked gates, animals confined in the same space as the meter location, or for any other reason, and after making a reasonable attempt to locate a person upon the premises to gain access, an authorized representative of the City is unable to read the meter, change the meter, or perform such other function as such representative is lawfully authorized to perform. Higher after hours charges will be imposed. Regular business hours are defined as 7 AM to 4 PM Monday through Friday, excluding holidays observed by the City. After hours are defined as hours outside of the regular business hours and all holidays observed by the City of Loveland. See Municipal Code 13.02.135

A. **Appointment or Special Trip Fee to Read the Meter:** When clear access is denied for two successive meter readings, and an appointment is made with the consumer or a special trip is made for reading the meter, a charge is imposed for such appointment or special trip.
B. **Appointment or Special Trip Fee to Change the Meter:** When clear access is denied and a special trip is made to change a meter on the department's regular maintenance program, a charge is imposed.
C. **Service Disconnect at Junction Box or Overhead Pole:** When clear access is denied for the purpose of disconnecting service at the junction box or overhead pole, the actual costs will be billed.

DISCONNECT AND RECONNECT SERVICES

Water and Power will perform a typical service disconnect/reconnect where power is energized or de-energized on the line side of the meter, on a flat fee basis. There is a lower fee for each typical service disconnect/reconnect that does not require engineering verses those requiring engineering.

A typical service disconnect/reconnect is defined as one where there is no increase in wire size or length performed on regular working days during regular business hours between 7 AM and 4 PM. All other service disconnect/reconnects will be billed at Water and Power's actual cost. If the disconnect is done during regular business hours and the reconnect is done after regular business hours the flat fee and the actual costs will be prorated appropriately.

DISTRIBUTION DESIGNER DEPOSITS

A customer requesting a new or modified electric service, relocation of facilities, or other work requiring engineering and construction, must make a deposit with the Department. Upon completion of engineering, the customer will deposit with the Department the total deposit required. If the project is cancelled, the deposit will be applied to the actual charges incurred, any resulting credit or debit will be refunded or billed to the customer. For current deposit amounts and categories, please see the current Utility Rates, Charges and Fees.

ENERGIZE ELECTRIC SERVICE TO SMALL DEVICES QUALIFYING FOR FLAT RATE SERVICE

There will be a flat fee for the energizing of electric service to small devices attached to the City's electric distribution system for the purpose of amplifying cable TV and telephone signals or operating automatic sprinkler controls in remote locations. A fee will be charged to the customer for the actual installation of the service. No outlets will be permitted, nor shall there be lighting of any kind connected to this type of service. If there is no existing source and an extension of secondary power is necessary, the customer will pay for actual costs to energize the device

OTHER DEPOSITS

The following jobs are standard in nature, and specific deposits have been established for them. In all cases actual costs will be tracked and any resulting credit or debit will be refunded or billed to the customer.

1. Install and terminate secondary riser up to 100 feet (no transformer required)
    a. Residential to 200 amps
    b. Commercial (cable supplied and installed by customer)
2. Open transformer to pull in secondary and terminate cable up to 130'
3. Single phase padmount transformer upgrade (no other customers)
    a. Upgrade one transformer size
    b. Upgrade two transformer sizes
    c. Upgrade three transformer sizes
4. Single phase padmount transformer upgrade (other customers)
    a. Upgrade one transformer size
    b. Upgrade two transformer sizes
    c. Upgrade three transformer sizes
5. Single phase overhead transformer upgrade (no other customers)
    a. Upgrade one transformer size
    b. Upgrade two transformer sizes
6. Single phase overhead transformer upgrade (other customers)
    a. Upgrade one transformer size
    b. Upgrade two transformer sizes

PERMANENT DISCONNECT AND REMOVAL OF SERVICE

Where a request for permanent disconnection and removal of single-phase service has been requested, there is imposed a flat fee.

Where a request for permanent termination of three-phase service has been requested, charges will be billed at Water and Power's actual cost.

PLANT INVESTMENT FEE

Plant Investment Fees provide for the additional electric transmission, substation and distribution facilities made necessary by the extension of electric service to new connections. The Plant Investment Fee provided herein shall be, in addition to, all of the rates and charges made in connection with the furnishing by the City of electric service, and shall be payable as provided for in this section.

A. Schedule R – Residential Service and Schedule RD – Residential Demand Service. At the time application is made for any dwelling unit to be built within the corporate boundaries of the City, or at the time of application for electric service for any dwelling unit to be built outside the corporate boundaries of the City, there shall be paid to the City a Plant Investment Fee as specified in the current Utility Rates, Charges, and Fees for each electric meter to be installed in connection with the dwelling unit. A larger fee will be required for services greater than 150 amps. (Each dwelling unit within a structure containing more than one dwelling unit shall be separately metered). No energization of a permanent connection to any dwelling unit served by the City shall occur unless and until the Plant Investment Fee is paid.

For the purpose of this section, "dwelling unit" means one or more rooms and a kitchen area designed for or occupied as a unit for living and cooking purposes, that is located within a single family, multiple family or mobile home, but excluding congregate care facilities, as those terms are defined in Municipal Code 18.04. A congregate care facility may receive service under Schedules R, RD, SG, LG, PT, or Coincident Peak Demand Service.

Upon application, the Water and Power Department may allow a single meter to serve a multiple family dwelling if such multiple family dwelling is a federally assisted and federally supervised project and the project sponsor is required by the federal agency having jurisdiction thereof to include the provision of electric service within the rent structure for the project. Such project may receive service under Schedules R, RD, SG, LG, PT, or Coincident Peak Demand Service. If any such projects should cease to be federally supervised, then the project shall revert to the requirement of individual metering, the Plant Investment Fee for residential service shall be paid and a credit shall be applied against such Plant Investment Fee in the amount of the Plant Investment Fees paid while receiving service under another class.

B. Schedule SG – Small General Service. The Plant Investment Fee for accounts receiving Small General Service shall be collected in each billing period. The amount of the Plant Investment Fee to be billed in each period shall be for each kWh used by the account during the billing period.

In establishing the Plant Investment Fees in 1979, customers served prior to May 1, 1979, are exempt from the Plant Investment Fee at the existing location only. Customers who have paid the five-year Plant Investment Fee for a particular location are exempt from the fee at the location covered.

C. Schedule LG – Large General Service. The amount of Plant Investment Fee to be billed in each billing period shall be for each kWh used by the account during the billing period.

D. Schedule PT– Primary Service with Transformer. The amount of Plant Investment Fee to be billed in each billing period shall be for each kWh used by the account during the billing period.

E. Coincident Peak Demand Service. The amount of Plant Investment Fee to be billed in each billing period shall be for each kWh used by the account during the billing period for customers whose primary voltage and all serving facilities on the customer's side of the metering point are owned operated and maintained by the customer. A higher Plant Investment Fee per kWh will be billed in each billing period for all other customers.

F. Discontinuance of Service. In addition to all of the remedies available to the City, electric service may be discontinued for failure to pay the Plant Investment Fee provided for in this section, and such discontinuance shall be in accordance with the notice procedures set forth in Municipal Code 13.02.070.

RESALE OF ELECTRIC CURRENT PROHIBITED

It is unlawful for any consumer who purchases electric service from the City to sell such service to others.

PUBLIC ELECTRIC VEHICLE CHARGING STATION SERVICE USER FEES

1. **Availability:** Designated electric vehicle charging stations will be made available by the City for public use within the corporate limits of the City at the user fees set forth in the Utility Rates, Charges, and Fees. The fees set forth below shall apply to all public electric vehicle charging stations owned and operated by the City.
2. **User Fees:** Public electric vehicle charging station service user fees (including Payment In Lieu of Taxes) will be provided and billed on a session basis as follows:

Level 2 – 240 Volt Charging	per hour charge
Minimum Charge	per charging session

Please see the current Utility Rates, Charges and Fees for the current rates in each of the above categories.

3. **Payment of Fees:** Payment for electric vehicle charging station services will be collected directly from the customer at the point of service (the charging station) through credit card or other electronic payment processing service.

RENEWABLE ENERGY PREMIUM

1. **Availability:** The renewable energy premium is available as an option to all residential, commercial, and industrial customers served under Schedules R, RD, SG, LG, PS, PT, and Coincident Peak Demand Service. The renewable energy premium is not available to Transmission Voltage Service, Area Light or Flat Rate customers served under Schedules TS, AL or FE.

2. **Monthly Rate:** A premium per each 100 kWh increment of energy is charged. (See current Utility Rates, Charges, and Fees for the current premium). This charge is in addition to all other regular charges the customer incurs for electric service.

3. **Monthly Minimum:** The minimum bill will be established for each 100 kWh increment requested by the customer in the service agreement, plus the minimum bill as identified in the principal rate schedule for the customer. (See current Utility Rates, Charges, and Fees for the current monthly minimum bill amount.)

4. **Service Restrictions**: The supply of renewable energy is limited to the resources made available to the department by its power supplier, Platte River Power Authority (PRPA), and is therefore subject to all terms and conditions identified in PRPA's tariff for Renewable Energy Service.

5. **Service Agreement:** The renewable energy premium is an optional charge and requires the customer to sign a service agreement with Loveland Water and Power.

6. **Service Agreement Period:** The renewable energy premium for all eligible rate schedules shall be available for a minimum initial period of 12 consecutive months and then continuing month to month thereafter until terminated. After the minimum period, the obligation to purchase or provide renewable energy may be terminated upon 30 day notice by either party. Termination of the principal service shall also terminate the agreement unless the customer chooses to advance the agreement to the new service address.

7. **Service Agreement Amount:** Customer may request renewable energy in 100 kWh increments. The billable monthly renewable energy premium will be the number of 100 kWh increments requested by the customer in the service agreement. The actual kilowatt-hours used by the customer in any given month may be more or less than the average.

RESIDENTIAL SERVICE INSTALLATIONS AND UPGRADES FOR SINGLE FAMILY AND DUPLEX DWELLINGS

A. A typical new residential service installation will be performed by the Water and Power Department on a flat fee basis.

A typical new underground service is defined as having a trench length of 100 feet or less; trenching to be performed in normal soil conditions.

1. **Typical Underground Service with 1/0 Triplex:** For a service using 1/0 triplex with a panel size of 150 amps or less, the residential service installation fee is imposed and the Plant Investment Fee, as described in the Utility Rates, Charges and Fees is also collected.

2. **Typical Underground Service with 4/0 Triplex:** For a service using 4/0 triplex with a panel size of 200 amps, a higher residential service fee than the 1/0 will be imposed and the Plant Investment Fee, as described in the Utility Rates, Charges and Fees is also collected.

New overhead service is not allowed except through exemption by the Director of Water & Power, or their designee. A typical new overhead service is defined as a service length of

80 feet of less, does not require setting a pole or transformer, is #2 triplex with a panel size of 150 amps or less, or 1/0 triplex with panel size of 200 amps. For this type of service, a deposit is collected.

A service not meeting the above criteria will be billed at the Water and Power Department's actual cost of installation.

Within the city limits of the City of Loveland, the fees shall be collected by the department issuing the building permit for the residence. If outside the city limits, the fee will be collected by the Water and Power Department before work can proceed.

B. Residential service upgrades resulting in services larger than 150 amps and no larger than 200 amps shall require a deposit. This deposit will be applied to the actual costs billed by the Water and Power Department upon completion of work performed.

SERVICE TURN-ON FEE AT THE METER

There is imposed a service turn-on fee for each service turn-on where power is energized at the meter. After hours fees apply to all requests received during non-business hours Monday through Friday, anytime Saturday or Sunday, and all holidays observed by the City of Loveland. Regular business hours are Monday through Friday 7 AM to 4 PM excluding holidays observed by the City.

TEMPORARY EXTENSIONS

The following requirements apply to all temporary extensions/connections necessary to serve customers such as transient shows, carnivals, fairs, circuses, concessions, residential construction work, or others of a temporary nature, excluding commercial development construction as defined in the *Contractor Construction Standards*.

A. The customer shall pay a flat rate for the cost of installation and removal of the temporary extension as defined in the *Contractor Construction Standards*, under "Temporary Construction Service". Customers with extensions not meeting these standards will be billed for the actual costs.

B. The customer shall pay for electric consumption monthly under the applicable rate.

C. No temporary service shall continue beyond the time of building occupancy, or twelve months from connection of such temporary service, whichever occurs sooner, without the consent of the City.

D. The City may refuse to connect additional customers to temporary extensions until the temporary extensions have become permanent.

Schedule AL • Area Lighting (Existing Contracts Only)

Availability
Effective January 1, 2019, installation of new Area Lights for the purpose of lighting private property will no longer be available. For customers who currently have Area Lights, routine maintenance consisting of replacing light bulbs and photocells will continue to be performed by Loveland Water and Power. Once the Area Light reaches the point of needing more than routine maintenance, the fixture will be removed from the electric distribution system by Loveland Water and Power.

Monthly Rate
The rate for area lighting service shall consist of the sum of the following categories:

	Area Lighting Schedule AL
Rate per watt of bulb	Yes
PILT per watt of bulb	Yes

Please see the current Utility Rates, Charges and Fees for the actual rates in each of these categories.

Schedule CP • Coincident Peak Demand Service

Definitions: For the purposes of the Coincident Peak Demand Rate, the following definitions shall apply:

1. **Campus:** One parcel, or two or more contiguous parcels, where each parcel is owned or leased by a single customer.

2. **Coincident Demand:** The 60 minute integrated demand recorded during the Platte River Power Authority's system peak hour and day in the billing period.

3. **Distribution Facilities Demand:** The highest rate of use in kilowatts during any 15-minute interval of the billing period.

Availability

1. Coincident Peak Demand Service is required for non-residential customers in which the monthly average distribution facilities demand exceeds 1,400 kW over 12 consecutive months. For a customer with two or more meters located on a campus, the average monthly distribution facilities demand will be determined by adding the distribution facilities demand for each meter on the campus.

2. The Coincident Peak Demand rate classification will be applicable to all new customers without an annual billing history based on the following:
   - The new customer must present sufficient information to the City indicating that the operating schedule and electrical equipment are such that the monthly distribution facilities demand would qualify it for the rate.

- The City reserves the right to analyze and verify all information provided. If the City is satisfied that the monthly distribution facilities' demand of the new customer will exceed 1,400 kW, such customer will be placed on the Coincident Peak Demand rate.
- If the monthly distribution facilities' demand during the first three months indicate that the customer does not qualify for the Coincident Peak Demand rate, the City will immediately transfer such new customer to the appropriate rate classification.

3. Once qualified, each such customer shall remain on the Coincident Peak Demand rate for a minimum of twelve consecutive months. After twelve months, the City will use the twelve-month running average distribution facilities' demand to determine applicability of the Coincident Peak Demand rate.

Monthly Rate

Rates shall be developed for each individual customer subject to the Coincident Peak Demand rate classification. The rates shall be based on the cost-of-service to each individual customer and will apply only to such customer. Rates will be updated annually to reflect the cost-of-service to the individual customer, and shall include the following:

	Primary Service with Transformer Schedule PT
Monthly base charge	Based on customer cost of service and energy usage profile.
Monthly minimum bill	Yes
Energy charge per kWh	All kWh consumed, per kWh, based on customer cost of service and energy usage profile.
Coincident demand charge	All billed coincident demand, per kW, based on customer cost of service and energy usage profile.
Distribution facilities demand charge	All distribution facilities demand, per kW, based on customer cost of service and energy usage profile
Plant investment fee per kWh	There is a different rate for customers whose service is delivered at the available primary voltage and all serving facilities on the customer's side of the metering point are owned, operated and maintained by the customer verses all other customers. Please see the current Utility Rates, Charges, and Fees for the current rates.
Power factor charge	100% of the power factor charge incurred by the City on account of and attributable to service to the customer may be billed to the customer.
**Note: There are different summer rates (July –Oct) verses non-summer rates (Jan-June, Nov0Dec) for these categories.*	

The Water and Power Department Director shall be authorized to develop the rate for each individual customer subject to the Coincident Peak Demand rate classification in accordance with this rate definition.

Schedule FE • Flat Rate Service

Availability

Small devices attached to the City's electric distribution system for the purpose of amplifying cable TV and telephone signals or operating automatic sprinkler controls in remote locations after June 1, 1992, will not require metering and will be billed on a flat monthly rate. Accounts existing prior to June 1, 1992, shall continue to be metered and billed at their present rate unless the customer requests conversion to the flat rate set forth in this schedule.

Monthly Rates

Type of Device	Signal Amplifiers*	Automatic Sprinkler Controls**	Bus Shelters
Flat Rate per Month	Yes	Yes	Yes
PILT per Month	Yes	Yes	Yes

Please see the current Utility Rates, Charges and Fees for the actual rates in each of these categories.

Conditions

A. *Signal amplifiers can be no greater than 5 amps per device.
B. **Automatic sprinkler controls can be no greater than 1.0 amp per device.
C. The department may randomly install meters as it deems necessary in order to monitor the actual consumption.
D. A customer with multiple device locations existing prior to June 1, 1992, requesting a conversion of said devices to the Flat Rate Schedule, must convert all devices existing prior to June 1, 1992, to the Flat Rate Schedule.

Schedule LG • Large General Service

Availability
Large General Service is required for all non-residential customers with a monthly average demand over a consecutive 12-month period exceeding 50 kW.

Continuation for Certain Customers
Customers on the Large General Service rate on January 31, 1999, with a monthly average demand over a consecutive 12-month period of 50 kW will be grandfathered into the LG rate.

Monthly Rate
The rate for Larger General Service shall consist of the sum of the following categories:

	Large General Service Schedule LG
Monthly base charge	Yes
Monthly minimum bill	Yes
Energy charge per kWh*	Yes
PILT charge per kWh*	Yes
Plant investment fee per kWh	Yes
Demand charge per kW*	Yes
Power Factor charge	Yes
**Note: There are different summer rates (July –Oct) verses non-summer rates (Jan-June, Nov-Dec) for these categories.*	

Please see the current Utility Rates, Charges and Fees for the actual rates in each of these categories.

Conditions
A. For new installations and service upgrades that are 120/208 volt three-phase 800 amps and larger, and 277/480 volt three-phase 400 amp and larger shall be initially classified as a Large General Service.
B. For single-phase, three-wire service, the customer's equipment shall be connected so that the current carried by the neutral conductor shall be not greater than 15 percent of the maximum current in either of the two conductors. For three-phase wye or delta service, the customer's equipment shall be connected so that the current carried by any one-phase conductor shall be no greater than 115 percent of the current in either of the two-phase conductors.

Billing Demand
The demand shall be the highest rate of use in kilowatts during any 15-minute interval of the billing period.

Power Factor Charge
Power factor charge of one hundred percent of the power factor charge incurred by the City on account of and attributable to service to the customer may be billed to the customer.

Schedule PT • Primary Service with Transformer

Availability
Primary Service is available to all non-residential customers with a monthly average demand over a consecutive 12-month period exceeding 50 kW where service is delivered and metered at the available primary voltage and all serving facilities on the customer's side of the metering point are owned, operated and maintained by the customer.

Monthly Rate
The rate for Primary Service in which the customer owns the transformers shall consist of the sum of the following categories:

	Primary Service with Transformer Schedule PT
Monthly base charge	Yes
Monthly minimum bill	Yes
Energy charge per kWh*	Yes
PILT charge per kWh*	Yes
Plant investment fee per kWh	Yes
Demand charge per kW*	Yes
Power factor charge	Yes
**Note: There are different summer rates (July –Oct) verses non-summer rates (Jan-June, Nov-Dec) for these categories.*	

Please see the current Utility Rates, Charges and Fees for the actual rates in each of these categories.

Billing Demand
The demand shall be the highest rate of use in kilowatts during any 15-minute interval of the billing period.

Power Factor Charge
A power factor charge of one hundred percent of the power factor charge incurred by the City on account of and attributable to service to the customer may be billed to the customer.

Conditions
Transformer ownership and maintenance is the responsibility of the customer receiving service under this rate schedule. The customer requesting this rate schedule is solely responsible for all costs associated with the installation and maintenance of the primary metering equipment and facilities. See the Water and Power Department's *Contractor Construction Standards* for equipment specifications.

Schedule R • Residential Service

Availability
Residential Service is available for single-family dwelling units and individually metered multi-family dwelling units at any location within the area served by Loveland Water and Power. Single-family dwelling units and individually metered multi-family dwelling units shall mean those buildings or units used solely as residences and not used in part for any other purpose. This rate is applicable to existing and new residential customers. Service will be delivered through a single meter per dwelling unit, at one point of delivery.

Monthly Rate:
The rate for Residential Service shall consist of the sum of the following categories:

	Residential Service • Schedule R
Monthly base charge	Yes
Monthly minimum bill	Yes
Energy charge per kWh*	Yes
PILT charge per kWh*	Yes
**Note: There are different summer rates (July –Oct) verses non-summer rates (Jan-June, Nov-Dec) for these categories.*	

Please see the current Utility Rates, Charges and Fees for the actual rates in each of these categories.

Schedule RD • Residential Demand Service

Availability
No new customers will be added to Schedule RD after December 31, 2014. Residential Demand Service is for single-family dwelling units and individually metered multi-family dwelling units at any location within the area served by Loveland Water and Power. Single-family dwelling units and individually metered multi-family units means those buildings or dwelling units used solely as residences and not used in part for any other purpose. Service is delivered through a single meter per dwelling unit, at one point of delivery.

Monthly Rate
The rate for Residential Demand Service shall consist of the sum of the following categories:

	Residential Demand Service Schedule RD
Monthly base charge	Yes
Monthly minimum bill	Yes
Energy charge per kWh*	Yes
PILT charge per kWh*	Yes
Demand charge per kW*	Yes
Power Factor charge	Yes
**Note: There are different summer rates (July –Oct) verses non-summer rates (Jan-June, Nov-Dec) for these categories.*	

Please see the current Utility Rates, Charges and Fees for the actual rates in each of these categories.

Billing Demand
The demand shall be the highest rate of use in kilowatts during any 15-minute interval of the billing period.

Power Factor Charge
Power factor charge of one hundred percent of the power factor charge incurred by the City on account of and attributable to service to the customer may be billed to the customer.

Schedule SG • Small General Service

Availability
Small General Service is required for all non-residential customers with a monthly average demand over a consecutive 12-month period of less than or equal to 50 kW. This also includes temporary power for non-permanent non-residential customers (for example: firework stands and holiday lights).

Monthly Rate
The rate for Small General Services shall consist of the sum of the following categories:

	Small General Service Schedule SG
Monthly base charge	Yes
Monthly minimum bill	Yes
Energy charge per kWh*	Yes
PILT charge per kWh*	Yes
Plant Investment Fee per kWh	Yes
**Note: There are different summer rates (July –Oct) verses non-summer rates (Jan-June, Nov-Dec) for these categories.*	

Please see the current Utility Rates, Charges and Fees for the actual rates in each of these categories.

Conditions

A. For new installations and service upgrades, if the customer's monthly peak demand exceeds 50 kW at any point during the first three months, the City will immediately transfer such new customer to the appropriate rate classification.

B. Whenever metered demand exceeds a monthly average 50 kW in a consecutive 12-month period, Loveland Water and Power will notify the customer and further service provided to such customer shall be furnished at the Large General Service Rate. The department may install such meters as it deems necessary in order to determine the metered demand.

C. For single-phase, three-wire service, the customer's equipment shall be connected so that the current carried by the neutral conductor shall be not greater than 15 percent of the maximum current in either of the two conductors. For three-phase wye or delta service, the customer's equipment shall be connected so that the current carried by any one-phase conductor shall be no greater than 115 percent of the current in either of the two-phase conductors.

Schedule TS • Transmission Voltage Service

Eligibility Requirements
Transmission Voltage Service is available to any customer:

1. Whose load is of sufficient magnitude or of an unusual nature such that it cannot be served from the distribution system; and
2. Whose premises are adjacent to transmission lines that are, or by contract can become, lines that supply wholesale power to the City's system; and
3. Who meets the criteria for large user service as set forth in Platte River Power Authority's Tariff 9, or applicable successor tariff.

Character of Service
The power furnished under Schedule TS shall be three phase alternating current and approximately 60 hertz, and delivered at approximately 115kV, or at other voltages subject to conditions as agreed upon, metered at each delivery point.

Charges for Service
The charges for service under Schedule TS shall be determined based on the unique load characteristics and service requirements of the customer. The rate for service delivered under Schedule TS shall at a minimum be sufficient to recover the City's cost of service, including, without limitation, wholesale rates and the City's projected operating and maintenance costs. In addition, the customer shall be responsible for all wholesale charges and fees incurred by the City in providing service under Schedule TS to the customer, including, without limitation, power factor charges.

Conditions of Service
In order to receive service under Schedule TS, the customer must meet the eligibility requirements set forth above and enter into an electric service agreement with the City. All such agreements must meet the requirements of this Schedule TS, protect the integrity of the City's electric system, protect against interference with other city electric customers, and shall address, at a minimum, the following material terms:

- Term of the agreement, including initial date of service;
- Charges for service, including rate adjustments;
- Metering, including configuration, ownership, and maintenance;
- Infrastructure, including ownership and maintenance;
- Load factor, including any penalties for failure to comply;
- Nature and frequency of interruptions (if service is provided on an interruptible basis), including any penalties for failure to comply;
- Any other terms and conditions required to be addressed pursuant to Platte River Power Authority's Tariff 9, or applicable successor tariff.

In addition, the agreement must include a waiver of all liability for the City and Platte River Power Authority for actual and consequential damages resulting from interruptions in accordance with the agreement. The City Manager shall be authorized to negotiate all such agreements, in consultation with Platte River Power Authority, and to execute such agreements on behalf of the City.

Self-Generation Rate

Availability
The Self-Generation Rate is available as an option to all electric service customers who own, operate and maintain their own generation equipment.

Residential – Monthly Rate: This rate is a composite of the following charges:

	Residential Self-Generation Service
System size range limitation	**Up to 13.49 kW**
Monthly base charge*	Yes
Energy charge per kWh**	Yes
PILT charge per kWh**	Yes
Buyback credit per kWh**	Yes
**Note:* The monthly residential base charge is determined by the capacity of the Self-Generating Unit in kilowatts (kW). Increments range up to 13.49 kW. ***Note: There are different summer rates (July –Oct) verses non-summer rates (Jan-June, Nov-Dec) for these categories.*	

Please see the current Utility Rates, Charges and Fees for the actual rates in each of these categories.

Non-Residential – Monthly Rate: This rate is a composite of the following charges:

	Small General Self- Generation Service		Large General Self-Generation Service	
System size range limitation	**1-50 kW**	**51-400 kW**	**1-50 kW**	**51-400 kW**
Monthly base charge	Yes	Yes	Yes	Yes
Monthly minimum bill	Yes	Yes	Yes	Yes
Energy charge per kWh*	Yes	Yes	Yes	Yes
PILT charge per kWh*	Yes	Yes	Yes	Yes
Buyback credit per kWh*	Yes	Yes	Yes	Yes
Plant Investment Fee per kWh*	Yes	Yes	Yes	Yes
Demand charge per kW*	No	No	Yes	Yes
**Note: There are different summer rates (July –Oct) verses non-summer rates (Jan-June, Nov-Dec) for these categories.*				

Please see the current Utility Rates, Charges and Fees for the actual rates in each of these categories.

The Self-Generating customer must be in compliance with the technical specifications and requirements contained in the Standard for Interconnecting Distributed Resources with the City of Loveland Electric Power System as found in the City's Municipal Code 13.12.180 and must enter into a contract with the City.

MISCELLANEOUS ACCOUNT FEES & INFO

ACCESS TO UTILITY METER AND OTHER CITY FACILITIES AND APPURTENANCES

Authorized City employees shall, at all reasonable times, have clear access to any premises within or without the City served by a City utility for the examination or survey thereof or for inspection and repair of City facilities and appurtenances, connection and disconnection of services, reading meters, or for any other purpose whatever in connection with the necessary discharge of their duties and the enforcement of the provisions of this chapter.

In the event an authorized City employee is not provided clear access to the premises, the customer will be notified in writing at the address on file with utility billing to schedule an appointment for the authorized representative to have clear access the premises. If the customer fails to schedule an appointment within 10 days after receipt of the notification, or if any scheduled appointment is not kept by the customer, a 2nd notice will be mailed to the customer address on file, advising the customer that service may be discontinued after the 10th day following the mailing of such notice if clear access to the premises is not permitted prior to such day. In the event clear access is not permitted prior to said day, the applicable utility service shall be discontinued.

Any customer who fails to provide clear access for the purposes set forth in this section is liable for all expenses related to the City's attempts to gain clear access, including costs of labor and materials and specified fees. Clear access is deemed to be denied whenever, because of locked gates, animals confined in the same space as the meter, facility or appurtenance location, or for any other reason, and after making a reasonable attempt to locate a person upon the premises to gain access, an authorized city employee is unable to perform functions the employee is lawfully authorized to perform. See Municipal Code 13.02.135.

AFTER HOURS

After hours fees apply to all requests received before 7 AM or after 4 PM Monday through Friday, anytime Saturday or Sunday, and on all holidays observed by the City of Loveland.

APPLICATION OF PAYMENT

(See Municipal Code 13.02.090) Every payment made to the City for utility service will be applied in the following order:

1. **Prior Billing Period Charges:** Payment will first be applied toward all charges incurred in a prior billing period and not yet paid, except those amounts for which extended payment has been arranged and which are not yet due.
2. **Current Billing Period Charges:** Then payment will be applied to charges incurred during the current billing period
3. **Extended Payment Arrangement:** Then payment will be applied to all charges presently due pursuant to an extended payment arrangement.

CHARGES DUE – WHEN

All charges for the use of utilities are due and payable 15 days after the billing date and are considered in arrears if not paid within 15 days after the billing date. (See Municipal Code 13.02.120.)

INTERFERING OR TAMPERING WITH A UTILITY METER

It is unlawful for any person to:

1. Interfere with or remove, alter, or tamper with any meter provided for measuring or registering the quantity of water, or electricity passing through said meter without the knowledge and consent of the utility supplying such water or electricity; or
2. Connect any pipe, tube, stopcock, wire, cord, socket, motor, or other instrument or contrivance with any main, service pipe, or other medium conduction or supplying water or electricity to any building, lot or parcel without the knowledge and consent of the utility supplying such water or electricity.

If any evidence of interfering with or removal of, altering, or tampering with a meter or unlawful startup of service is found, the utility may terminate service immediately. All costs for water or electricity received, and expenses related to terminating service pursuant to this section, including costs of labor and materials and specified fees, shall be paid by the person responsible for such interference, removal, alteration, tampering or unlawful startup. See Municipal Code 13.02.130.

Presumption:

1. There is rebuttable presumption that the customer or occupant of any premises where interference, removal, altering, tampering, or unlawful startup is proven to exist caused or permitted such interference, removal, altering, tampering, or unlawful startup if the tenant or occupant had access to the part of the utility supply system on the premises where the interference, removal, altering, tampering, or unlawful startup is proven to exist and if said customer or occupant was responsible or partially responsible for payment, either directly or indirectly, to the utility or to any other person for utility services provided for the premises.
2. The presumption provided in this section shall only shift the burden of going forth with evidence and shall in no event shift the burden of proof to the defendant in any action brought pursuant to this section.
3. Any person convicted of violating this section shall be subject to the penalties set forth in Municipal Code 1.12.010, except that a minimum mandatory fine specified in Municipal Code 13.02.130.D shall be imposed for each such violation.

LATE PAYMENT PENALTY

A late payment penalty is imposed upon each delinquent bill. (See Municipal Code 13.02.060.)

NEW ACCOUNT OR REACTIVATION FEE AND NEW ACCOUNT METER READING FEE

Connection fees are imposed and collected with the first utility bill rendered after utility service has been established or a customer account or utility service is reactivated following voluntary or involuntary termination for the following reasons:

- Activation or establishment of a customer account for a service address
- Meter reading charge for service address if read by Utility Billing Division
- Reactivation of a customer account for a service address
- Interfering or Tampering with a Meter

Please see Section 13.02.130 of the Loveland Municipal Code for more information on additional fines regarding interfering or tampering with utility meters.

RETURNED CHECK FEE

Whenever a check accepted by the City is returned unpaid for any reason not the fault of the City, a returned check fee will be imposed. See the actual amount in the Miscellaneous Account Fees & Charges Section of this document. (See Municipal Code 13.02.100.)

SERVICE REINSTATED

Utility service terminated will not be restored until all delinquent fees and charges, together with the expenses of terminating and restoring service, including costs of labor and materials and specified fees, and payment of a deposit in the amount set forth in Municipal Code 13.02.020 are paid in full. The utility service may be restored upon such other arrangement for extended payment of the amounts due as may be approved by the utility billing manager. (See Municipal Code 13.02.080.)

SUSPENSION OF SERVICE TERMINATION

Termination of utility service may be suspended by the field service representative at the service address upon immediate payment of all amounts then due, plus a collection fee in an amount as established by resolution of the City Council. (See Municipal Code 13.02.071.)

TERMINATING UTILITY SERVICES

When a customer fails to pay the amount due on their utility bill by 5 pm on the 32nd day after the billing date, the account becomes delinquent and the following steps will occur in the service termination process. (See Municipal Code 13.02.010 and 13.02.070.)

1. **Written Notice of Intent to Disconnect** utility service will be mailed to the customer address on file.
2. **Written Notice of Termination of Service:** If the bill is still not paid, a written notice of termination of services will either be posted on the premise or mailed to the customer billing address on file and to the service address, if different from the billing address, at least 8 days after the written notice of intent to disconnect was sent.
3. **Service Terminations** will be made as soon as practicable after 8 AM on the 8th day after written notice of termination of service was posted or mailed.

UTILITY SERVICE DEPOSIT

A refundable deposit is required upon application for utility service as a condition of providing any utility service for a new customer or a customer who changes the address to which utility service is furnished, unless the customer has been a nondelinquent customer. (See Municipal Code 13.02.020 for the deposit amount and additional details.)

RESOURCE LINKS

BROADBAND WEBSITE
www.LovelandPulse.com

COINCIDENT PEAK RATE
www.cityofloveland.org/CPRate

HELPING A NEIGHBOR IN DISTRESS (HAND) PROGRAM
www.cityofloveland.org/HAND

HYDROZONE
www.cityofloveland.org/hydrozone

Municipal Code

- Title 13 - Utilities http://online.encodeplus.com/regs/loveland-co/doc-viewer.aspx?secid=3136&keywords=fractions%20of%20acre%20feet#secid-3078
- Title 19 – Water Rights http://online.encodeplus.com/regs/loveland-co/doc-viewer.aspx?secid=3136&keywords=fractions%20of%20acre%20feet#secid-3743
- Legislation Enacted, but Not Yet Added to the On-line Code http://www.cityofloveland.org/government/municipal-code

RANCH WATER
www.cityofloveland.org/ranchwater

RENEWABLE ENERGY PREMIUM (GREENSWITCH)
www.cityofloveland.org/greenswitch

REQUIREMENTS FOR ELECTRIC SERVICE WEBPAGE
www.cityofloveland.org/res

- Current Requirements for Electric Service
- Index and Revision Log
- Electric Service Worksheet (Commercial)
- Electric Service Worksheet (Residential)
- Pulse Meter Request Form
- Grant of Easement

SELF-GENERATION WEBSITE
www.cityofloveland.org/Interconnection

UNDERSTANDING YOUR UTILITY BILL
www.cityofloveland.org/LWPBill

UTILITY BILLING WEBSITE
www.cityofloveland.org/utilitybilling

UTILITY BILLING PAYMENT OPTIONS
www.cityofloveland.org/paymentoptions

WATER AND WASTEWATER DEVELOPMENT STANDARDS WEBPAGE

www.cityofloveland.org/wwwds

- Current Development Standards
- Water and Wastewater Wet Tap Fee Form
- Hydrant Flow Test Form
- Hydrant Meter Rentals
- Grant of Easement
- Joint Sewer Service Agreement
- Fire Hydrant/Fire Service Form
- Water Service Installation Form
- Residential Water Service Summary Report
- Sewage Lift Station Standard

Cover photo was taken by Dick Knapp from Dick's Photography.

Appendix B - City of Loveland Irrigation Plan

Irrigation Conservation Plan

City of Loveland Parks and
Public Grounds
2019

IRRIGATION CONSERVATION PLAN:

The purpose of this plan is for the conservation of irrigation water during a supply shortage. It includes both domestic and raw water irrigation systems stemming from Parks to Public Grounds. A multi-level approach was used to determine the extent of conservation needed based on water availability, budget considerations, local mandates, and emergency situations.

IRRIGATION SYSTEM WATER REQUIREMENTS:

1. Under normal operating conditions the Parks and Public Grounds irrigation systems are capable of applying 1.50" (inches) of water per week on average. This translates into about 40,712 gallons per acre per week during peak demand periods or about 2 acre-feet of water per acre per year. Several factors need to be applied when calculating actual turf watering requirements: types of grasses being irrigated (Blue Grass, Buffalo Grass, Turf Type Fescue, etc.); site conditions (shady, sunny, hillside, low area, soil type, soil compaction, etc.); site impacts (low use, high use, sports turf, green belts, etc.); safety concerns regarding recreation activities (hard playing surfaces, large cracks in the soil, bare ground, etc.); current weather conditions (evapotransporation rates, temperatures, soil moisture levels, wind, sunshine, weekly rain totals); aesthetics (public buildings, sculpture parks, planned public events, etc.).

2. It would be impractical to develop a conservation plan that could take every possible environmental and site use consideration into account. The watering requirements under this plan will take an average for each area of consideration and place the highest priority on recreational safety, long-term turf damage and tree loss followed by aesthetics and special event considerations.

3. System designs and limitations will also play a key role in the ability to adjust programming and watering schedules. Several park sites lack the capacity to water the entire area in just one night. In these situations, half of the irrigation controllers will run one night and the other half of the controllers run the second night. This creates an odd/even watering schedule to accommodate at least several applications of water per week. In the event of a local mandate by the City Council to limit the watering days to specific days of the week rather than odd or even, we could lose 50% or more of our irrigation watering window. Example: a normal four-day schedule reduced to two days with the same watering window would equal a 50% reduction, on the other hand, a odd/even system reduced to two days per week would result in each controller operating only one time per week or a 75% reduction. This would exceed mandated target amounts and result in increased the losses to landscape.

SITE PRIORITIES:

Before a conservation plan can be implemented all sites need to be first ranked according to an individual priority within the entire system. This will allow for other considerations such as budgets, special events, raw water availability, and recreational programming needs. Sites that have high levels of recreational activities and community parks/public grounds are given top priority. Within each of these sites there is often an area of lessor priority that will be given a lower ranking in the site-specific conservation plan.

DETERMINING THE NEED FOR CONSERVATION:

The need to implement a water conservation plan may be driven by either internal or external factors. These factors may include community water shortages caused by a drought, disruption of the supply lines due to mechanical failures, water diversions to other communities experiencing shortages, or budget shortfalls. The severity and duration of such events will be a key factor as to the level of conservation that will be required. For the purposes of this plan, a four-tier approach will be used to conserve water to varying degrees. This will allow for a general systematic approach to conservation based on current conditions and restrictions. The intent of this plan is to provide a sound basis for conservation and to allow for changing variables.

FOUR TIER APPROACH:

A four-tier approach was used to determine a target level of required water savings and an action plan to achieve these targets for each individual site. The action plan for each site is based on the primary areas of use, function, and priority ranking.

Table 1 - Drought Stages and Impacts

Drought Stage	Reduction Goal	Response Options	Anticipated User Impacts	Anticipated Landscape Impacts
Stage I **Moderate**	10%	Reduce irrigation programs by 10%	N/A	No noticeable loss short term.
Stage II **Serious**	25%	Cut the equivalent of one watering day from the normal watering schedule.	1st year -aesthetic impact. Two or more years increased risk of sports injury and poor aesthetics.	1st year 5% turf loss. 2nd year 15% turf loss. 3 plus years > 15% turf loss and increased tree mortality in younger trees.
Stage III **Severe**	50%	Cut the equivalent of two days from the normal watering schedule	1st year- fields will show a significant increase in wear. 2nd year plus- fields may become a safety issue and might need to be closed or have restricted use	1st year-10% turf loss. 2nd year 30% turf loss. 3 plus years > 50% turf loss and increased tree mortality including established trees
Stage IV **Extreme**	75%	Cut the equivalent of three days from the normal watering schedule.	1st year- fields may become a safety issue and might need to be closed or have restricted use. 2nd year- Fields will be closed to all users.	1st year-50% turf loss. 2nd year plus >50% turf loss. And high tree mortality including established trees

TIER I - MODERATE

Use Reduction Target - 10 percent

This tier is intended for a seasonal drought or a possible minor disruption in water distribution system. A 10 percent reduction in the micro managed irrigation watering window will accomplish this goal. No noticeable loss of turf or landscape would be anticipated as a result of this short term reduction

TIER II - SERIOUS

Use Reduction Target - 25 percent

This tier is intended for a multiple year drought with imposed community watering restrictions with a target reduction rate of 25 percent. A 25 percent reduction in the micro managed watering window for sites requiring an odd/even programming schedule or the equivalent elimination of one watering day at all other locations with a normal program of four days per week will accomplish this goal. Some minor turf loss would be anticipated as a result of this reduction in the first two years. Continued reductions for more than two years at this level may result in an overall turf loss in excess of fifteen percent and a twenty percent increase in tree mortality rates. The most noticeable effects will be in high use areas

TIER III - SERVERE

Use Reduction Target - 50 percent

This tier is intended for a multiple year drought with imposed community watering restrictions with a target reduction rate of 50 percent. For sites requiring an odd/even programming schedule a change would be made to switch these sites to specific days of the week. Odd controllers would run Sunday and Wednesday; even controllers would run Monday and Thursday. Both types of controllers would run at 80 percent of normal to achieve a 50 percent reduction. The equivalent elimination of two watering days at all other locations normally programmed for four days per week will achieve a 50 percent reduction at those locations. At community parks and public grounds additional controller modifications may include reducing watering times on low use areas within a site and adding that savings to an extra run on a third day for high use areas at the same location. A ten to thirty percent overall turf loss would be anticipated as a result of this reduction in the first two years. Continued reductions for more than two years at this level may result in an overall turf loss in excess of fifty percent and an increase in tree mortality rates above twenty percent. The most noticeable effects will be in high use areas and recently planted landscape.

TIER IV - EXTREME

Use Reduction Target - 75 percent

This tier is intended for a long term multiple year drought with imposed community watering restrictions with a target reduction rate of 75 percent. For sites requiring an odd/even programming schedule a change would be made to switch these sites to specific days of the week. Odd controllers would run Sunday and Wednesday; even controllers would run Monday and Thursday. Both types of controllers would run at 50 percent of normal and very low use areas would be turned off as needed to achieve a 75 percent reduction. The equivalent elimination of two watering days at all other locations normally programmed for four days per week and reducing these controllers to fifty percent of normal will achieve a 75 percent reduction at these locations. At community parks and public grounds additional controller modifications may include reducing watering times on low use areas within a site and adding that savings to increased percents on high use areas at the same location. A fifty percent or more overall turf loss would be anticipated as a result of this reduction in the first two years. Continued reductions for more than two years at this level may result in a complete turf loss and an increase in tree mortality rates above fifty percent including well established trees. The effects will be noticeable at all locations.

POTABLE WATER CONSERVATION - IRRIGATION:

This plan is broken down to specific sites that have a potable irrigation water source. These sites are listed on a priority basis. The first few sites on the list have the highest priority for irrigation and would be impacted last by any mandatory watering reductions if such mandates allow for selection. The sites listed further down the list are of lower priority for irrigation and would be subject to the initial water conservation. In the conservation site plan section each facility is listed alphabetically and are divided into two sections, Parks and Public Grounds. Each facility has a four-tier approach to water conservation with recommended irrigation programming schedules, zone deletions, and special considerations. The calculations show the amount of water that could potentially be saved when compared to normal operating practices. Each site is followed by a brief summary that explains the possible impacts, such as the long-term effects and recreational/aesthetic implications.

Site Priority Ranking

Parks:

1. Loch Lon
2. Osborn/Winona
3. Dwayne Webster
4. Eagleview
5. Seven Lakes
6. South Shore Parkway
7. Junior Achievement
8. Woodmere
9. Sherri-Mar
10. McKee
11. Edmondson
12. Silver Glen
13. Derby Hill
14. Namaqua
15. Estrella
16. Westside
17. Sunnyside
18. Kirkview
19. Loch Mount

Public Grounds:

1. Civic Center
2. McWhinney Hahn Visitor Center
3. Police Courts
4. Glen Arbor
5. Service Center
6. Fire Station #1
7. Fire Station #2
8. Fire Station #3
9. Fire Station #4
10. Fire Station #5
11. Fire Station #6
12. South West 14th
13. Xeriscape Garden
14. Park Maintenance Shop
15. Iron Shirt
16. Museum
17. Detention Pond Tyler
18. Detention Pond Dotsero
19. Wilson Street Median

Note: Sites on the top of this list have the highest priority for continued irrigation and the sites on the bottom of this list have the lowest priority.

Table 2 - Annual Potable Water Target Reductions

Location	Potable Irrigation A.F. Used on Average	Savings Tier I (10%)	Savings Tier II (25%)	Savings Tier III (50%)	Savings Tier IV (75%)
Civic Center	25.00	2.50	6.25	12.50	18.75
Loch Lon	23.90	2.390	5.975	11.950	17.925
Osborn	18.00	1.800	4.500	9.000	13.500
Dwayne W.	11.70	1.170	2.925	5.850	8.775
S.S. Parkway	8.10	0.810	2.025	4.050	6.075
Eagleview	14.52	1.45	3.63	7.26	10.89
J.A.	4.00	0.400	1.000	2.000	3.000
Woodmere	6.90	0.690	1.725	3.450	5.175
Sherri-Mar	7.10	0.710	1.775	3.550	5.325
Edmondson	6.09	0.609	1.522	3.045	4.567
Silver Glen	7.79	0.779	1.947	3.895	5.842
Derby Hill	6.12	0.612	1.530	3.060	4.590
Namaqua	6.64	0.664	1.660	3.320	4.980
Estrella	3.58	0.358	0.895	1.790	2.685
Westside	2.99	0.299	0.747	1.495	2.242
Kirkview	3.99	0.399	0.997	1.995	2.992
Loch Mount	3.29	0.329	0.822	1.645	2.467
McWhinney	8.44	0.844	2.110	4.220	6.330
Glen Arbor	4.19	0.419	1.047	2.095	3.142
Service Center	*11.80	1.180	2.950	5.900	8.850
S.W. 14th	1.81	0.181	0.452	0.905	1.357
Xeriscape	0.93	0.093	0.232	0.465	0.697
Park Shop	1.07	0.107	0.267	0.535	0.802
Iron Shirt	0.33	0.033	0.082	0.165	0.247
Sunnyside	8.00	0.80	2.00	4.00	6.00
Det. Tyler	1.75	0.175	0.437	0.875	1.312
Det. Dotsero	1.81	0.181	0.452	0.905	1.357
Wilson ST	0.54	0.053	0.134	0.268	0.401
Total A.F.	**200.38**	**20.03**	**50.09**	**100.18**	**150.28**

A.F. = Acre Feet (325,850 gallons)

Note: The irrigation systems for all fire stations and the museum are on the same meter as the buildings. These sites are not metered for irrigation only and have no historical data.

* Service Center includes potable water for the warehouse. The amount of water used by the warehouse is considered insignificant when compared to irrigation and is not metered separately.

The combined average of the 2000 & 2001; 2014 &2015 irrigation seasons is used as the base line for all calculations.

RAW WATER CONSERVATION - IRRIGATION:

This plan is broken down to specific sites that have a raw water irrigation source. These sites are listed on a priority basis. The first few sites on the list have the highest priority for irrigation and would be impacted last by any mandatory (political/budgetary) watering reductions if such mandates allow for selection. Most of these sites are independent of each other and rely on separate raw water sources. Conservation methods will normally be based on water availability from specific sources rather than by a site priority. When feasible the sites listed further down the list are of lower priority for irrigation and would be subject to the initial water conservation. The conservation site plan lists each site alphabetically and is divided into two sections, Parks and Public Grounds. Each facility has a four-tier approach to water conservation with recommended irrigation programming schedules, zone deletions, and special considerations. The calculations show the amount of water that could potentially be saved when compared to normal operating practices. Each site is followed by a brief summary that explains the possible impacts, such as the long-term effects and recreational/aesthetic implications.

Site Priority Ranking

Parks:

1. LSP
2. North Lake
3. Centennial
4. Barnes
5. Mehaffey
6. Kroh
7. Benson
8. Silver Lake

Public Grounds:

N/A

Table 3 - Annual Raw Water Target Reductions

Location	Raw Water Irrigation Used on Average	Savings Tier I (10%)	Savings Tier II (25%)	Savings Tier III (50%)	Savings Tier IV (75%)
Kroh	72.00	7.20	18.00	36.00	54.00
North Lake/Benson	115.00	11.50	28.75	57.50	86.25
Centennial	40.00	4.00	10.00	20.00	30.00
Barnes/Fairgrounds	61.77	6.17	15.44	30.88	46.32
Mehaffey	47.09	4.70	11.77	23.54	35.17
LSP	61.72	6.17	15.43	30.86	46.29
Silver Lake	10.00	1.00	2.50	5.00	7.50
Total A.F.	**407.58**	**40.75**	**101.89**	**203.79**	**305.68**

A.F. = Acre Feet (325,850 gallons)

Park/Public Ground: LSP Park

Brief Site Description:

This is a 45- irrigated acres community Sports Park used primarily for shelter rentals, water playground, soccer and football. This facility is irrigated with raw water from the Farmers Ditch Company. The holding pond that is located south of the park in the Koppes addition (S. of CTY 20 E.) and has a 4-acre foot capacity. This holding pond also receives some of its water through springs in wet years that do have water rights for the park. During the peak of the irrigation season this site requires about 3.5 to 4.0 acre feet of water per week depending on athletic programing and turf rehabs. A total loss of irrigation would result in excessive turf damage in the playing fields and around the playground. This would contribute to unsafe playing conditions on the fields.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Low use areas outside of soccer fields, playgrounds and shelter areas may be reduced to 60% of normal watering (area along Boyd Lake Ave and south property line above playing areas). Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on zones that impact fields. Set the water budget on field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the athletic field zones.

- Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Athletic areas include all playing fields, but may include high use shelter areas and playground (Water feature in Playground may also be turned off) if deemed necessary by upper management. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering days will be Monday and Thursday

- Turn off all non-recreational area half head zones.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones that impact playing fields. Set the water budget on athletic field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones in non-recreational areas.

- Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include soccer fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday. Turn off water feature at the playground.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas and water playground

Park/Public Ground: Kroh Park

Brief Site Description:

This is a 37.3 acre community park used primarily for soccer. This facility is irrigated with raw water from the Louden Ditch Company with supplemental domestic water in the off-season. The holding pond that is located in the center of the park and has about a 12-acre foot capacity. During the peak of the irrigation season this site requires about 3.5 to 4.0 acre-feet of water per week. A total loss of irrigation would result in excessive turf damage and unsafe playing conditions on the soccer fields.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan.

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Sunday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on zones that impact soccer fields. Set the water budget on field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Sunday, Wednesday, and Friday on the athletic field zones.

- Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Athletic areas include soccer/ball fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering days will be Tuesday and Thursday

Tier#4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones that impact soccer fields. Set the water budget on athletic field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include soccer/ball fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.

- Turn off all half head zones in non-recreational areas.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

Park/Public Ground: North Lake Park

Brief Site Description:

This is a 60.2-acre community park used primarily for recreation, swimming, picnics, community events, stage productions, and high school athletics. This facility is irrigated with raw water from the Louden Ditch Company. The holding pond that is located near the amphitheater has an 18-acre foot capacity. During the peak of the irrigation season this site requires about 4.5 to 5.0 acre-feet of water per week. A total loss of irrigation would result in excessive turf damage around shelters, the swim beach, recreation areas, and event locations and would contribute to unsafe playing conditions on the soccer and baseball fields. Special Note: The School District shares this raw water source with North Lake Park and Benson Park. Any conservation methods would need to be done jointly with the School District in order to achieve the desired results. Please refer to the Benson Park conservation plan for further details relating to that facility.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan.

Tier #2 Conservation:

- Reduce the watering percent on the odd/even controllers by 25%, based on current weather and site considerations, but no more than 75% of normal. Watering days will continue to be odd/even.

- Turn off all buffalo grass zones

Tier#3 Conservation:

- Reduce the watering schedule to three days on lower use areas (controllers Ab, B, E, F, G, H, and L) from the normal odd/even cycle and water up to 50% of normal based on current weather and site considerations. Watering days on low use areas will be Sunday, Tuesday, and Friday. On high use areas including athletic fields and shelter areas change the odd/even schedule to four days per week (controllers A, D, I, J, K, and M) and water up to 70% of normal based on current weather and site considerations. Watering days on high use areas will be Saturday, Monday, Wednesday, and Thursday.

- Turn off all buffalo grass zones

- Turn off all half-head irrigation zones in non-recreational/low use areas and add savings to high use areas as needed.

Tier#4 Conservation:

- Reduce the watering schedule to two days on lower use areas (controllers Ab, B, E, F, G, H, and L) from the normal odd/even cycle and water up to 50% of normal based on current weather and site considerations. Watering days on low use areas will be Sunday and Friday. On high use areas including athletic fields and shelter areas change the odd/even schedule to two days per week (controllers A, D, I, J, K, and M) and water up to 60% of normal based on current weather and site considerations. Watering days on high use areas will be Monday and Thursday.

- Turn off all half-head irrigation zones in non-recreational/ low use areas and add savings to high use areas as needed.

- Turn off all buffalo grass zones

- Turn off parking island near the swim beech lot

- Turn off irrigation on flat area north and east of the tennis courts

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in athletic and shelter areas. Tier three may require the closure of some or all athletic fields after one year and potentially the cancellation of special events or shelter reservations. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in athletic and shelter areas. Tier four would require the immediate closure of all athletic fields, and the cancellation of shelter reservations and special events.

Park/Public Ground: Barnes/Fairgrounds Park

Brief Site Description:

This is a 45.0- irrigated acres community park used primarily for baseball. This facility is irrigated with raw water from the Farmers Ditch Company. The holding pond that is located in the southeast corner of the park has a 3-acre foot capacity. This holding pond also receives some of its water through ground water infiltration in wet years and can loses water due to groundwater outflow in dry years. During the peak of the irrigation season this site requires about 4.5 to 5.0 acre feet of water per week depending on ground water levels at the holding pond. A total loss of irrigation would result in excessive turf damage in the ball fields and around the playground. This would contribute to unsafe playing conditions on the baseball fields.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Low use areas outside of ball fields, playgrounds and shelter areas may be reduced to 60% of normal watering (area along Hwy 287 and trail corridor). Watering days will be Monday, Wednesday, and Friday. Turn off splash Park

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on zones that impact ball fields. Set the water budget on field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the athletic field zones.

- Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Athletic areas include all ball fields, but may include high use shelter areas at Fairgrounds if deemed necessary by upper management. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering days will be Monday and Thursday. Turn off Splash Park

- Turn off all non-recreational area half head zones. Recreational areas include ball fields only.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones that impact ball fields. Set the water budget on athletic field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones in non-recreational areas.

- Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include ball fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday. Turn off Splash Park.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

Park/Public Ground: Centennial Park

Brief Site Description:

This is a 35-acre community park used primarily for picnics, and baseball. This facility is irrigated with raw water from the Big Thompson Ditch Company. The holding pond that is located on the south side of First Street has a 30-acre foot capacity. During the peak of the irrigation season this site requires about 1.75 to 2.0 acre feet of water per week. A total loss of irrigation would result in excessive turf damage in the ball fields and around the playground. This would contribute to unsafe playing conditions on the baseball fields.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan.

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on zones that impact ball fields. Set the water budget on field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the athletic field zones.

- Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Athletic areas include all ball fields. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering days will be Tuesday and Thursday

Tier#4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones that impact ball fields. Set the water budget on athletic field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones in non-recreational areas.

- Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include ball fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

Park/Public Ground: Loch Lon Park

Brief Site Description:

This is a 10.7 acre neighborhood park used for general recreation and soccer. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 410,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage in the soccer fields and around the playground. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on zones that impact soccer fields. Set the water budget on field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the athletic field zones.

- Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Athletic areas include all soccer fields. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering days will be Monday and Thursday

- Turn off all non-recreational area half head zones. Recreational areas include soccer fields only.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones that impact soccer fields. Set the water budget on athletic field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones in non-recreational areas.

- Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include soccer fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

Park/Public Ground: Mehaffey Park

Brief Site Description:

This is a 64 acre neighborhood park used for general recreation, tennis, Skate Park, and playground. This facility is irrigated with raw water. During the peak of the irrigation season this site requires about 697,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage in the playing fields and around the playground. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on zones that impact soccer fields and playground. Set the water budget on field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the athletic field zones.

- Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Athletic areas include all soccer fields. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering days will be Monday and Thursday

- Turn off all non-recreational area half head zones. Recreational areas include soccer fields and playground area.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones that impact soccer fields. Set the water budget on athletic field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones in non-recreational areas.

- Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include soccer fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

Park/Public Ground: Osborn Park/Pool

Brief Site Description:

This is a 13 acre neighborhood park and community pool complex used for soccer, softball and swimming. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 326,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage in the soccer fields and around the pool area. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on zones that impact the soccer field and zones inside the pool area when the pool is open. Set the water budget on field zones at 75% and pool zones to 60% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the athletic field zones.

- Turn off two days on all non-athletic field area irrigation zones including the pool area during the months the pool is not open from the normal four day schedule. Athletic areas include all soccer fields. Reduce the percent on these zones to 65% or less based on current weather and site considerations. Watering days will be Monday and Thursday

- Turn off all non-recreational area half head zones unless the zone is sole source for a specific area. Recreational areas include soccer field and zones inside the pool fence only.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones that impact soccer fields. Set the water budget on the soccer field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones in non-recreational areas.

- Turn off three days on all non-athletic field area irrigation zones including the pool area from the normal four-day schedule. Athletic areas include soccer fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas including the pool.

Park/Public Ground: Dwayne Webster Park

Brief Site Description:

This is a 5.4 acre neighborhood park used for picnics and family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 430,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage in around the playground and shelter areas. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan.

Tier #2 Conservation:

- Reduce the watering percent on the odd/even controllers by 25%, based on current weather and site considerations, but no more than 75% of normal. Watering days will continue to be odd/even.

Tier#3 Conservation:

- Reduce the watering schedule from the normal odd/even schedule to a three day schedule. Implement the emergency micro management watering schedule to accommodate all zones watering in a single night. This will automatically cut 25% off the normal run times per zone on average. Set the water budget on this reduced schedule to 100% or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

- Turn off all non-recreational area half head zones unless a zone is sole source for a specific area. Recreational areas include shelter areas only.

Tier #4 Conservation:

- Reduce the watering schedule from the normal odd/even schedule to a two day schedule. Implement the emergency micro management watering schedule to accommodate all zones watering in a single night. This will automatically cut 25% off the normal run times per zone on average. Set the water budget on this reduced schedule to 75% or less based on current weather and site considerations. Watering days will be Monday and Friday.

- Turn off all non-recreational area half head zones unless a zone is sole source for a specific area. Recreational areas include shelter areas only.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

Park/Public Ground: Eagleview Park

Brief Site Description:

This is a 12.0 acre neighborhood park (8.0 irrigated) used for family and general recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 280,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage in the soccer/ball field. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on zones that impact the ball field and playground area. Set the water budget on field zones at 70% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the field zones.

- Turn off two days on all low use area irrigation zones from the normal four day schedule. Reduce the percent on these zones to 50% or less based on current weather and site considerations. Watering days will be Monday and Thursday

- Turn off all half head zones not affecting the playground or ball field and are not sole source for a specific area.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the athletic field and playground area. Set the water budget on athletic field zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones in low use areas.

- Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the west end between the soccer field and Lincoln Ave, the area adjacent to the west fence line just north of the church parking and the sledding hill. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Seven Lakes Park

Brief Site Description:

This is a 10.2 acre neighborhood park used for soccer and picnics. This facility is irrigated with potable water. During the peak of the irrigation season this site requires about 1.25 acre-feet of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage in the soccer fields and around the playground. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on zones that impact the soccer field. Set the water budget on field zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the athletic field zones.

- Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Athletic areas include the soccer field only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering days will be Monday and Thursday

- Turn off all non-recreational area half head zones unless a zone is sole source for a specific area. Recreational areas include soccer fields only.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones that impact the soccer field. Set the water budget on athletic field zones at 75% of

normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones in non-recreational areas.

- Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include the soccer field only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of some or all athletic fields after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

Park/Public Ground: South Shore Scenic Way

Brief Site Description:

This is a 5.3 acre scenic walkway along Lake Loveland. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 138,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage around the parking lots and poor aesthetics along highway 34.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on all zones. Set the water budget to 67% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget to 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased wear in high use areas near the parking lots. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would require a consideration to be made regarding the potential impacts of the Fourth of July celebration.

Park/Public Ground: Benson Park

Brief Site Description:

This is a 13.5 acre sculpture park. This facility is irrigated with raw water from the Louden Ditch Company. The pumping station is located on the holding pond in North Lake Park. This holding pond is used jointly by the RJ2 School District for Loveland High School and by North Lake/Benson Parks. During the peak of the irrigation season this site requires about 1.25 acre-feet of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics quality of the park and possible turf damage during major events. Please refer to the North Lake Park conservation plan for further details.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan.

Tier #2 Conservation:

- Reduce the watering percent on the odd/even controllers by 25%, based on current weather and site considerations, but no more than 75% of normal. Watering days will continue to be odd/even.

Tier#3 Conservation:

- Reduce the watering schedule to three days on lower use areas (controllers C and D) from the normal odd/even cycle and water up to 50% of normal based on current weather and site considerations. Watering days on low use areas will be Sunday, Tuesday, and Friday. On high use areas including the sculpture show section and the pavilion area change the odd/even schedule to four days per week (controllers A, B, and E) and water up to 60% of normal based on current weather and site considerations. Watering days on high use areas will be Saturday, Monday, Wednesday, and Thursday.

- Turn off all half-head irrigation zones in low use areas to provide water savings needed for the high use areas.

Tier#4 Conservation:

- Reduce the watering schedule to two days on lower use areas (controllers C and D) from the normal odd/even cycle and water up to 50% of normal based on current weather and site considerations. Watering days on low use areas will be Tuesday and Friday. On high use areas including the sculpture show area and pavilion change the odd/even schedule to two days per week (controllers A, B, and E) and water up to 60% of normal based on current weather and site considerations. Watering days on high use areas will be Monday and Thursday.

- Turn off all half-head irrigation zones in low use areas (all areas north of the pavilion and all zones along the ponds) this will provide savings for the high use areas as needed.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased turf loss near high traffic areas. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential turf failures in the sculpture show areas. Tier three may require the potential cancellation of special events such as the sculpture show. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would require the immediate cancellation of the sculpture show and other special events.

Park/Public Ground: Junior Achievement Park

Brief Site Description:

This is a 1.5 acre neighborhood park used for general recreation and skate boarding. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 60,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage in the soccer/ball fields. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on zones that impact the athletic field area. Set the water budget on field zones at 60% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the field zones.

- Turn off two days on all non-athletic field area irrigation zones from the normal four day schedule. Reduce the percent on these zones to 50% or less based on current weather and site considerations. Watering days will be Monday and Thursday

- Turn off all non-recreational area half head zones that are not sole source for a specific area. Recreational areas include flat open area on the south side only.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones that impact athletic field. Set the water budget on athletic field zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones in non-recreational areas.

- Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include soccer fields only. Reduce the percent on these zones to 65% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of the athletic field area after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

Park/Public Ground: Woodmere Park

Brief Site Description:

This is a 4.0 acre neighborhood park used for family and general recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 140,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage in the soccer/ball field. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on zones that impact the ball field and playground area. Set the water budget on field zones at 70% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the field zones.

- Turn off two days on all low use area irrigation zones from the normal four day schedule. Reduce the percent on these zones to 50% or less based on current weather and site considerations. Watering days will be Monday and Thursday

- Turn off all half head zones not affecting the playground or ball field and are not sole source for a specific area.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the athletic field and playground area. Set the water budget on athletic field zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones in low use areas.

- Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the west end between the fence and the sidewalk and the entrance to the park from the south. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Sherri-Mar Park

Brief Site Description:

This is a 2.7 acre neighborhood park used for family and general recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 110,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage in the soccer/playing areas. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on zones that impact the playing field and playground area. Set the water budget on field zones at 60% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the field zones.

- Turn off two days on all low use area irrigation zones from the normal four day schedule. Reduce the percent on these zones to 50% or less based on current weather and site considerations. Watering days will be Monday and Thursday

- Turn off all half head zones not affecting the playground or playing field and are not sole source for a specific area.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the playing field and playground area. Set the water budget on athletic field zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones that are not sole source for a specific area.

- Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the north third of the park. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Edmondson Park

Brief Site Description:

This is a 2.61 acre neighborhood park used for family and general recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 106,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the playing field and playground area. Set the water budget on the field and playground zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones that are not sole source for a specific area.

- Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the area east of the tennis court. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Silver Glen Park

Brief Site Description:

This is a 3.88 acre neighborhood park used for family and general recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 157,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the playing field and playground area. Set the water budget on the field and playground zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones that are not sole source for a specific area.

- Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the area east of the area between the playground sidewalk and the west fence. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Derby Hill Park

Brief Site Description:

This is a 3.45 acre neighborhood park used for family and general recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 120,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to no more than 75% of the normal odd/even based on current weather and site considerations. Watering days will continue to be odd/even.

Tier#3 Conservation:

- Reduce the watering schedule to two days by implementing the revised conservation micro schedule to replace the normal odd/even day cycle on all zones. Set the water budget on all zones on this revised micro schedule to 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days by implementing the revised conservation micro schedule to replace the normal odd/even day cycle on all zones. Set the water budget on all zones on this revised micro schedule to 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones that are not sole source for a specific area.

- Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the area south east of the playground and the entrance area off Eugene. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Namaqua Park

Brief Site Description:

This is a 4.0 acre neighborhood park used for picnics and general family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 125,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the playing field, shelter, and playground area. Set the water budget on the field, shelter and playground zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones that are not sole source for a specific area.

- Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the eastern third of the park. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Mckee Park

Brief Site Description:

This is a 3.8 acre neighborhood park used for general family recreation and picnics. This facility is irrigated with raw water from the Seven Lakes Reservoir Company. This is a shared reservoir with the Upper and Lower Hoffman Lake property owners and McKee Hospital. Refer to the Seven Lakes Park conservation plan for further details. During the peak of the irrigation season this site requires about 0.50 acre-feet of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage in the soccer/ ball fields and around the playground. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to no more than 75% of the normal odd/even based on current weather and site considerations. Watering days will continue to be odd/even.

Tier#3 Conservation:

- Reduce the watering schedule to two days by implementing the revised conservation micro schedule to replace the normal odd/even day cycle on all zones. Set the water budget on all zones on this revised micro schedule to 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days by implementing the revised conservation micro schedule to replace the normal odd/even day cycle on all zones. Set the water budget on all zones on this revised micro schedule to 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones that are not sole source for a specific area or around the playground.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Estrella Park

Brief Site Description:

This is a 1.3 acre neighborhood park used for picnics and general family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 53,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones in areas that impact the playing field, shelter, and playground area. Set the water budget on the field, shelter and playground zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones that are not sole source for a specific area or the playground.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Westside Park

Brief Site Description:

This is a 1.4 acre neighborhood park used for picnics and general family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 57,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier # 3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Sunnyside Park

Brief Site Description:

This is a 3.6 acre neighborhood park used for general recreation and soccer. This facility is irrigated with potable water. During the peak of the irrigation season this site requires about 125,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage in the soccer fields. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on zones that impact the soccer field. Set the water budget on field zones at 60% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday on the soccer field zones.

- Turn off two days on all non-soccer field area irrigation zones from the normal four day schedule. Reduce the percent on these zones to 50% or less based on current weather and site considerations. Watering days will be Monday and Thursday

- Turn off all non-recreational area half head zones that are not sole source for a specific area. Recreational areas include soccer fields only.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones that impact soccer fields. Set the water budget on athletic field zones at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones in non-recreational areas.

- Turn off three days on all non-athletic field area irrigation zones from the normal four-day schedule. Athletic areas include soccer fields only. Reduce the percent on these zones to 75% or less based on current weather and site considerations. Watering day will be Monday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in low use areas and potential field failures in high use areas. Tier three may require the closure of the soccer field area after one year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in low use areas and field failures in high use areas. Tier four would require the immediate closure of all athletic fields/high use areas.

Park/Public Ground: Kirkview Park

Brief Site Description:

This is a 1.6 acre neighborhood park used for picnics and general family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 66,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Silver Lake Park

Brief Site Description:

This is a 5.0 acre neighborhood park used for picnics and general family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 204,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in excessive turf damage around the playground and general recreational areas. This would contribute to unsafe playing conditions.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Loch Mount Park

Brief Site Description:

This is a 0.9 acre neighborhood park used for general family recreation. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 37,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Civic Center

Brief Site Description:

This is a 7.66 acre public ground facility that is the site of the City of Loveland municipal building, library and recreation/senior center. This facility is irrigated with potable water. During the peak of the irrigation season this site requires about 275,000 gallons of water per week plus varying amounts of water to refill the Foote Lagoon depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle on all zones. Set the water budget at 67% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four-day cycle on zones in all areas. Set the water budget at 55% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Turn off all half head zones in low use areas that are not sole source for a specific site.

- Turn off three days on all low use area irrigation zones from the normal four-day schedule. Low use areas include the area between the Senior Housing and the Chilson Center, the area west of the Library, and the areas south of the south parking lot. Reduce the percent on these zones to 60% or less based on current weather and site considerations. Watering day will be Monday

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf and could impact special events.

Park/Public Ground: McWhinney Hahn Visitor Center

Brief Site Description:

This is a 4.2 acre public ground facility that is the site of the City of Loveland Chamber of Commerce and Visitor Center. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 175,000 gallons of water per week plus varying amounts of water to refill the sculpture pond depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Police and Courts Center

Brief Site Description:

This is a 2.1 acre (irrigated) public ground facility that is the site of the City of Loveland Justice Center and Police Department. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 72,500 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier#3 Conservation:

Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

Reduce the watering schedule to two days from the normal four-day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Glen Arbor Parkway

Brief Site Description:

This is a 1.85 acre public ground facility that is primarily a green belt along highway 287. This facility is irrigated with domestic water. During the peak of the irrigation season this site requires about 70,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose potential safety concerns due to compaction and loss of turf.

Park/Public Ground: Service Center

Brief Site Description:

This is a 4.52 acre public ground maintenance facility for public works, water and power, traffic, vehicle maintenance and school district busses. This facility is irrigated with domestic water from two separate taps. One of these water taps also supplies potable water to the warehouse. During the peak of the irrigation season this site requires about 185,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

Park/Public Ground: Fire Station #1

Brief Site Description:

This is a 0.2 acre fire station. This facility is irrigated with domestic water from the service tap for the entire building including potable water for the station. During the peak of the irrigation season this site requires about 6,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

Park/Public Ground: Fire Station #2

Brief Site Description:

This is a 0.60 acre fire station. This facility is irrigated with domestic water from the service tap for the entire building including potable water for the station. During the peak of the irrigation season this site requires about 24,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

Park/Public Ground: Fire Station #3

Brief Site Description:

This is a 0.67 acre fire station. This facility is irrigated with domestic water from the service tap for the entire building including potable water for the station. During the peak of the irrigation season this site requires about 25,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

Park/Public Ground: Fire Station #4

Brief Site Description:

This is a 0.65 acre fire station. This facility is irrigated with domestic water from the service tap for the entire building including potable water for the station. During the peak of the irrigation season this site requires about 25,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

Park/Public Ground: Fire Station #5

Brief Site Description:

This is a 0.75 acre fire station. This facility is irrigated with domestic water from the service tap for the entire building including potable water for the station. During the peak of the irrigation season this site requires about 30,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

Park/Public Ground: Fire Station #6

Brief Site Description:

This is a 0.75 acre facility with one turf area. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 30,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term turf impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in 55 to 15% turf loss. Tier three would reduce the watering requirements by about 50% and would result in 10% to 30% turf loss in the first year. Tier four would reduce the watering requirements by about 75% and would result in large scale turf loss.

Park/Public Ground: Detention Pond at 1st and Tyler

Brief Site Description:

This is a 1.28 acre storm water detention facility. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 46,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

Park/Public Ground: S.W. 14th

Brief Site Description:

This is a 1.06 acre highway median with buffalo grass and junipers. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 30,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

Park/Public Ground: Xeriscape Garden

Brief Site Description:

This is a 0.75 acre xeriscape demonstration garden with turf and shrub plots. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 18,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

- Reduce the watering schedule on normal three day zones to 75% or less based on current weather and site conditions. Watering days will be set as normal

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Reduce the watering schedule to two days on normal three day zones and reduce the run time to 75% of normal or less based on current weather and site conditions. Watering days will be Monday and Thursday

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

- Reduce the watering schedule to one day on normal three day zones and set the run time to 100% of normal or less based on current weather and site conditions. Watering days will be Monday and Thursday

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

Park/Public Ground: Park Maintenance Shop

Brief Site Description:

This is a 0.5 acre (landscaped area only) maintenance facility. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 20,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

Park/Public Ground: Iron Shirt

Brief Site Description:

This is a 0.2 acre highway median. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 4,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to 75% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal three day cycle on all zones. Set the water budget on all zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to one day from the normal three day cycle on all zones. Set the water budget at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in some minor loss of shrubs. Tier three would reduce the watering requirements by about 50% and would result in shrub and tree loss. Tier four would reduce the watering requirements by about 75% and would result in large scale shrub and tree loss in all areas.

Park/Public Ground: Museum

Brief Site Description:

This is a 0.03 acre facility with shrub beds only. This site is irrigated with domestic water from the museum building water supply. During the peak of the irrigation season this site requires about 750 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to 75% of normal or less based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal three day cycle on all zones. Set the water budget on all zones at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to one day from the normal three day cycle on all zones. Set the water budget at 75% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in some minor loss of shrubs. Tier three would reduce the watering requirements by about 50% and would result in shrub and tree loss. Tier four would reduce the watering requirements by about 75% and would result in significant shrub and tree loss in all areas.

Park/Public Ground: Detention Pond at 1st and Dotsero

Brief Site Description:

This is a 1.04 acre storm water detention facility. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 32,000 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in poor aesthetics.

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Summary:

Conservation methods in tier one would reduce the watering requirements by about 10% and would have no short term landscape impacts. Water conservation methods in tier two would reduce the watering requirements by about 25% and would result in turf loss in low use areas and increased field wear. Tier three would reduce the watering requirements by about 50% and would result in turf and tree loss in all areas and potential complete field failures in high use areas. Tier four would reduce the watering requirements by about 75% and would result in large scale turf and tree loss in all areas. Tier four would pose erosion concerns due to compaction and loss of turf.

Park/Public Ground: Wilson Street Median/Trail Parking

Brief Site Description:

This is a 0.53 acre median and adjacent trail head parking with shrubs and trees only on drip irrigation. This site is irrigated with domestic water. During the peak of the irrigation season this site requires about 1,300 gallons of water per week depending on evapotransporation rates. A total loss of irrigation would result in loss of trees and shrubs

Conservation Methods:

Tier #1 Conservation:

- Reduce the water budget/ times on all irrigation zones by 10% of normal based on current weather and site considerations, but not to exceed 90% of the maximum settings as determined by the micro management plan

Tier #2 Conservation:

- Reduce the watering schedule to three days from the normal four day cycle and continue to water up to 100% of normal based on current weather and site considerations. Watering days will be Monday, Wednesday, and Friday.

Tier #3 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget on all zones at 100% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Tier #4 Conservation:

- Reduce the watering schedule to two days from the normal four day cycle on all zones. Set the water budget at 50% of normal or less based on current weather and site considerations. Watering days will be Monday and Thursday.

Appendix C - Modified Worksheets D-G & J

Worksheet D - Identification and Screening of **Foundational Activities**

Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Identification			Qualitative Screening [5]				Carry to Evaluation [6]	Reason for Elimination [7]
		Existing/ Potential Activity [3]	Targeted Customer Categories [4]	Within LWP's ability to implement.	Low Cost w/ Significant Water Savings	Beneficial to Community	Reduces Summer Time Peak Demand	Notes on Additional Pros/Cons to Consider		
Metering (BP1)	**V, VII**									
Automatic Meter Reading Installation and Operations	V, VII	E/P	Select			x		On about 110 accounts - primarily with difficult access.		Not offered at this time due to expense & possible public negative response.
Submetering for Large Users (Indoor and Outdoor)	V	E	Large customers			x		In place on a limited number of large accounts (hospitals, industrial, etc.)		No specific program in place. Addressed as need arrives. Not evaluated in cost/benefit analysis.
Meter Testing and Replacement	V	E	All	x	x	x			x	Already existing activity. Not evaluated in cost/benefit analysis.
Meter Upgrades	V	E	All	x	x	x			x	
Identify Unmetered/Unbilled Treated Water Uses	V	E/P	City Use, Utility Use	x	x	x			x	
Data Collection - Monitoring and Verification (BP2)	**VII**									
Frequency of Meter Reading	VII	E	All	x	x	x		Monthly		Already existing activity. Not evaluated in cost/benefit analysis.
Tracking Water Use by Customer Type	VII	E	All	x	x	x				
Upgrade Billing System to Track Use by Sufficient Customer Types	VII	E	All	x	x	x				
Tracking Water Use for Large Customers	VII	E/P	HOA, Com	x		x	x	Easier with new CIS	x	
Area of Irrigated Lands in Service Area (e.g. acres)	VII	P	Irr							Not financially feasible.
Water Use Efficiency Oriented Rates and Tap Fees	**VII, VIII**									
Volumetric Billing	VII, VIII	E	All	x	x	x	x			Already existing activity. Not evaluated in cost/benefit analysis.
Water Rate Adjustments	VII, VIII	E	All	x		x	x			
Frequency of Billing	VII	E	All	x	x	x	x			
Inclining/Tiered Rates	VII, VIII	P	All		x	x	x			Not offered at this time due to expense & possible public negative response
Water Budgets	VII, VIII	E/P	Irr	x	x	x	x		x	
Tap Fees with Water Use Efficiency Incentives	VII, VIII	E	Irr	x	x	x	x		x	Already existing activity. Not evaluated in cost/benefit analysis.
System Water Loss Management and Control (BP3)	**V**									
System Wide Water Audits	V	E	All	x	x	x			x	Already existing activity. Not evaluated in cost/benefit analysis.
Control of Apparent Losses (with Metering)	V	E	All	x	x	x			x	
Leak Detection and Repair	V	E/P	All	x	x	x			x	Already existing activity. Will re-evaluate expanding with future planning efforts.

Water Line Replacement Program	V	E/P	All	x	x	x			x	Will continue with existing program.
Study to optimize water used to backwash filters at the Water Treatment Plant		P	Utility	x	x				x	
Conversion to non-pot water in the rotary drum thickeners at the Wastewater Treatment Plant		P	Utility	x	x				x	
Conversion to non-pot water in headworks step screens at the Wastewater Treatment Plant		P	Utility	x	x				x	
Repair the leaky bottom of the lagoon at the Civic Center grounds.		P	City Use	x	x	x			x	
Planning (BP2)										
Integrated Water Resources Plans		P	All							Not very applicable to this region.
Master Plans/Water Supply Plans		E	All	x		x			x	Already existing activity. Not evaluated in cost/benefit analysis.
Capital Improvement Plans		E	All	x		x			x	
Feasibility Studies (use non-pot water for sanitary sewer jetting)		P	Utility	x					x	

Staff (BP4)										
Water Conservation Coordinator		P	Res, Com			x				Resources not available for this activity.
Integration of Land Use Efforts	**IV(f)(i)**									
Establish Regular Contact and Information Sharing		E/P	All	x		x			x	
Align Data and Information Used		E	All	x					x	
Establish Coordinated Procedures for Post-Occupancy Monitoring and Enforcement		E/P	All						x	
Integrate Water Considerations into the Development Approval Process		E/P	All	x		x	x		x	
Integrate Long Term Land Use and Water Planning		E/P	All	x					x	

Instructions:
[1] This column provides a list of possible activities & identifies the Best Practice activity as defined in the Colorado WaterWise Guidebook of Best Practices (BP) for Municipal Water Conservation in Colorado. List additional activities identified through the planning process.
[2] This column identifies, by roman numeral, the elements that correspond with the best practices and that shall be fully considered in the planning process per Colorado State Statute 37-60-126.
[3] Specify whether the activity is "Existing" or a "Potential" activity to carry through screening by entering an "E" or "P", respectively.
[4] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.
[5] Enter screening criteria based on qualitative goals developed in Step 3 and insert an "X" for activities that meet the listed screening criteria.
[6] Based on the screening process, indicate which activities will be carried onto the evaluation phase with an "X".
[7] If eliminated via screening, comment on why.

Worksheet D - Identification and Screening of **Foundational Activities**

Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Identification			Qualitative Screening [5]				Carry to Evaluation [6]	Reason for Elimination [7]
		Existing/ Potential Activity [3]	Targeted Customer Categories [4]	Within LWP's ability to implement.	Low Cost w/ Significant Water Savings	Beneficial to Community	Reduces Summer Time Peak Demand	Notes on Additional Pros/Cons to Consider		
Metering (BP1)	**V, VII**									
Automatic Meter Reading Installation and Operations	V, VII	E/P	Select			x		On about 110 accounts - primarily with difficult access.		Not offered at this time due to expense & possible public negative response.
Submetering for Large Users (Indoor and Outdoor)	V	E	Large customers			x		In place on a limited number of large accounts (hospitals, industrial, etc.)		No specific program in place. Addressed as need arrives. Not evaluated in cost/benefit analysis.
Meter Testing and Replacement	V	E	All	x	x	x			x	Already existing activity. Not evaluated in cost/benefit analysis.
Meter Upgrades	V	E	All	x	x	x			x	
Identify Unmetered/Unbilled Treated Water Uses	V	E/P	City Use, Utility Use	x	x	x			x	
Data Collection - Monitoring and Verification (BP2)	**VII**									
Frequency of Meter Reading	VII	E	All	x	x	x		Monthly		Already existing activity. Not evaluated in cost/benefit analysis.
Tracking Water Use by Customer Type	VII	E	All	x	x	x				
Upgrade Billing System to Track Use by Sufficient Customer Types	VII	E	All	x	x	x				
Tracking Water Use for Large Customers	VII	E/P	HOA, Com	x		x	x	Easier with new CIS	x	
Area of Irrigated Lands in Service Area (e.g. acres)	VII	P	Irr							Not financially feasible.
Water Use Efficiency Oriented Rates and Tap Fees	**VII, VIII**									
Volumetric Billing	VII, VIII	E	All	x	x	x	x			Already existing activity. Not evaluated in cost/benefit analysis.
Water Rate Adjustments	VII, VIII	E	All	x		x	x			
Frequency of Billing	VII	E	All	x	x	x	x			
Inclining/Tiered Rates	VII, VIII	P	All		x	x	x			Not offered at this time due to expense & possible public negative response
Water Budgets	VII, VIII	E/P	Irr	x	x	x	x		x	
Tap Fees with Water Use Efficiency Incentives	VII, VIII	E	Irr	x	x	x	x		x	Already existing activity. Not evaluated in cost/benefit analysis.
System Water Loss Management and Control (BP3)	**V**									
System Wide Water Audits	V	E	All	x	x	x			x	Already existing activity. Not evaluated in cost/benefit analysis.
Control of Apparent Losses (with Metering)	V	E	All	x	x	x			x	
Leak Detection and Repair	V	E/P	All	x	x	x			x	Already existing activity. Will re-evaluate expanding with future planning efforts.

Water Line Replacement Program	V	E/P	All	x	x	x			x	Will continue with existing program.
Study to optimize water used to backwash filters at the Water Treatment Plant		P	Utility	x	x				x	
Conversion to non-pot water in the rotary drum thickeners at the Wastewater Treatment Plant		P	Utility	x	x				x	
Conversion to non-pot water in headworks step screens at the Wastewater Treatment Plant		P	Utility	x	x				x	
Repair the leaky bottom of the lagoon at the Civic Center grounds.		P	City Use	x	x	x			x	
Planning (BP2)										
Integrated Water Resources Plans		P	All							Not very applicable to this region.
Master Plans/Water Supply Plans		E	All	x		x			x	Already existing activity. Not evaluated in cost/benefit analysis.
Capital Improvement Plans		E	All	x		x			x	
Feasibility Studies (use non-pot water for sanitary sewer jetting)		P	Utility	x					x	

Staff (BP4)										
Water Conservation Coordinator		P	Res, Com			x				Resources not available for this activity.
Integration of Land Use Efforts	**IV(f)(i)**									
Establish Regular Contact and Information Sharing		E/P	All	x		x			x	
Align Data and Information Used		E	All	x					x	
Establish Coordinated Procedures for Post-Occupancy Monitoring and Enforcement		E/P	All						x	
Integrate Water Considerations into the Development Approval Process		E/P	All	x		x	x		x	
Integrate Long Term Land Use and Water Planning		E/P	All	x					x	

Instructions:
[1] This column provides a list of possible activities & identifies the Best Practice activity as defined in the Colorado WaterWise Guidebook of Best Practices (BP) for Municipal Water Conservation in Colorado. List additional activities identified through the planning process.
[2] This column identifies, by roman numeral, the elements that correspond with the best practices and that shall be fully considered in the planning process per Colorado State Statute 37-60-126.
[3] Specify whether the activity is "Existing" or a "Potential" activity to carry through screening by entering an "E" or "P", respectively.
[4] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.
[5] Enter screening criteria based on qualitative goals developed in Step 3 and insert an "X" for activities that meet the listed screening criteria.
[6] Based on the screening process, indicate which activities will be carried onto the evaluation phase with an "X".
[7] If eliminated via screening, comment on why.

Worksheet F - Identification and Screening of **Ordinances and Regulations**

Water Efficiency Activitities for Screening [1]	State Statute Requirement [2]	Identification					Qualitative Screening [6]					Carry to Evaluation [7]	Reason for Elimination [8]
		Existing/ Potential Activity [3]	SWSI Framework Levels [4] Level 1 Customer Type(s) within the Existing Service Area	Level 2 New Development	Level 3 Point of Sales on Existing Building Stock	Targeted Customer Categories [5]	Low Cost w/ Significant Water Savings	Beneficial to Community	Within LWP's ability to implement.	Reduces Summer Time Peak Demand	Notes on Additional Pros/Cons to Consider		
General Water Use Regulations	**IX**												
Water Waste Ordinance (BP 5)	IX	E/P	x	x		All		x	x	x		x	
Time of Day Watering Restriction	IX	E	x	x		All	x	x	x	x	Possibly limit to	x	
Day of Week Watering Restriction	IX	E	x	x		All	x	x	x	x		x	
Water Overspray Limitations	IX	E/P	x	x		All		x		x			Not enough staffing resources
Landscape Design/Installation Rules and Regulations	**IX**												
Rules and Regulations for Landscape Design/Installation (BP 9)	IX	E/P		x		All	x	x	x	x		x	Already in place
Landscaper Training and Certification (BP 8)	IX	E		x									Already offered through Northern Water
Irrigation System Installer Training and Certification (BP 8)	IX	E		x									
Soil Amendment Requirements (BP 9)	IX	E		x									Already in place.
Turf Restrictions (BP 9)	IX	P		x								x	
Irrigation Equipment Requirements	IX	P											Will re-evaluate with fuutre planning efforts
Outdoor Water Audits/Irrigaton Efficiency Regulations (BP 10)	IX	P	Res										Audit already offered
Outdoor Green Building Construction (BP 8,9)	IX	P											Will re-evaluate with fuutre planning efforts
Indoor and Commercial Regulations													
High Efficiency Fixture and Appliance Replacement (BP 12)	IX	P											Pursue by rebates and direct install program
Green Building Construction (BP 12)	IX	P											Will re-evaluate with fuutre planning efforts
Indoor Plumbing Requirements (BP 12)	IX	E		x			x	x	x				Already existing activity
City Facility Requirements (BP 12)	IX	E	x	x		Retrofits, and New	x	x	x				
Required Indoor Residential Audits (BP 13)	IX	P											Not enough staff resources at this time
Required Indoor Commercial Audits (BP 14)	IX	P											

Commercial Water Wise Use Regulations (Car Washes, Restaurants, etc.)	IX	P											Pursue by technical assistance than regulation
Integration of Land Use Efforts	**IV(f)(i)**												
Examine Existing Land Use Regulations for Barriers and Conflicts												x	
Adopt or Strengthen Water-Related Ordinances or Regulations		E/P										x	
Water Conservation in New Development, Re-Development, and Annexation		P										x	
Incorporate Water Efficiency into Zoning Codes and Rezoning Procedures		E											Already exists through allowing more varieties of multi-family and attached housing that decrease per capita water use
Subdivision or Site Plan Regulations that Include Water Conservation		P											Re-evaluate at future time
Implement Requirements that Contribute to Water Efficiency and Compact Infrastructure		E											Existing - Different standards for multi-family and commercial for infill and includes redevelopment
Water Efficient Landscape Code		E/P											Already exists.
Building and Plumbing Codes		P											Already in place.
Ordinances Promoting Efficient Fixtures in Existing Buildings		P											Re-evaluate at future time
Regional Coordination of Water Policy and Procedures		E											Northern Water already fills this role

Instructions:
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[2] This column identifies, by roman numeral, the elements that correspond with the best practices and that shall be fully considered in the planning process per Colorado State Statute 37-60-126.
[3] Specify whether the activity is an "Existing" or "Potential" activity to carry through screening by entering an "E" or "P", respectively.
[4] Specify which level the historical/potential activities fall under by entering an "X" in the appropriate column.
[5] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.
[6] Enter screening criteria based on qualitative goals developed in Step 3 and insert an "X" for activities that meet the listed screening criteria.
[7] Based on the screening process, indicate which activities will be carried on the evaluation phase with an "X".
[8] If eliminated via screening, comment on why.

Worksheet G - Identification and Screening of **Education Activities**

Water Efficiency Activitities for Screening [1]	State Statute Requirement [2]	Identification					Qualitative Screening [6]					Carry to Evaluation [7]	Reason for Elimination [8]
		Existing/ Potential Activity [3]	SWSI Framework Levels [4]			Targeted Customer Categories [5]	Low Cost w/ Significant Water Savings	Beneficial to Community	Within LWP's ability to implement.	Reduces Summer Time Peak Demand	Notes on Additional Pros/Cons to Consider		
			Level 1 One-Way	Level 2 One-Way with Feedback	Level 3 Two-Way Communication								
Customer Education (BP6)	**VI**												
Bill Stuffers	VI	E	x			All		x	x			x	Already exisitng activity. Not evaluated in cost/benefit analysis.
Newsletter	VI	E	x			All		x	x			x	
Newspaper Articles	VI	E	x			All		x	x			x	
Mass Mailings	VI	E	x			All		x	x			x	
Web Pages	VI	E			x	All		x	x			x	
Water Fairs	VI	E			x	All		x	x			x	
K-12 Teacher and Classroom Education Programs	VI	E			x	All		x	x			x	
Message Development/Campaign	VI	E	x			All		x	x			x	
Interactive Websites	VI	E			x	All		x	x			x	
Social Networking (e.g. Facebook)	VI	E			x	All		x	x			x	
Customer Surveys	VI	E			x	All		x	x			x	
Focus Groups	VI	P			x	Com		x	x				Will re-evaluate with future planning efforts
Citizen Advisory Boards	VI	E			x	All		x	x			x	Already exisitng activity. Not evaluated in cost/benefit analysis.
Technical Assistance	**VI**												
Customer Water Use Workshops	VI	E			x	Res		x	x	x		x	Already exisitng activity. Not evaluated in cost/benefit analysis.
Landscape Design and Maintenance Workshops	VI	E			x	Res		x	x	x		x	
Xeriscape Demonstration Garden	VI	E	x			Res		x	x	x		x	
Water Conservation Expert Available	VI	E/P			x	Res, HOA	x	x	x	x	Can refer out to expert, but not on staff	x	
Integration of Land Use Efforts	**IV(f)(i)**												
Consistent Online Information		P						x	x				Already in place.
Water Provider and Planning Department Work Together to Educate the Public		E/P										X	
Lead by Example		E/P											Already in place.
Jointly Engage with the Development Community and HOAs		P										X	
Share Success Stories and Case Studies with Other Communities and the Public		E/P											Shared indoor/outdoor water use study with County
Coordinate Education and Outreach Across the Region		E											Already in place through Northern Water

Instructions:
[1] This column provides a list of possible activities & identifies the Best Practice activity as defined in the Colorado WaterWise Guidebook of Best Practices (BP) for Municipal Water Conservation in Colorado. List additional activities identified through the planning process.
[2] This column identifies, by roman numeral, the elements that correspond with the best practices and that shall be fully considered in the planning process per Colorado State Statute 37-60-126.
[3] Specify whether the activity is an "Existing" or "Potential" activity to carry through screening by entering an "E" or "P", respectively.
[4] Specify which level the historical/potential activities fall under by entering an "X" in the appropriate column.
[5] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.
[6] Enter screening criteria based on qualitative goals developed in Step 3 and insert an "X" for activities that meet the listed screening criteria.
[7] Based on the screening process, indicate which activities will be carried on the evaluation phase with an "X".
[8] If eliminated via screening, comment on why.

Worksheet J - **Implementation Plan**

Selected Water Efficiency Activities [1]	Period of Implementation [2]	Implementation Actions [3]	Milestone Deadlines [4]	Entity/Staff Responsible for Implementation [6]	Coordination and Public Involvement [7]
Foundational Activities					
Meter Testing, Rehabbing & Replacement Program	2011-2029	Continue present plan	None specified	Water Metering Staff	
Metering Unmetered Unbilled Locations Irrigation at Water Utility Sites	2020-2020	Install water meters by end of 2020 at two tank and pump station sites	End of 2020	Water Metering Staff	
Cost/Benefit Analysis and Install Meters at the Fire Training Grounds	2021-2029	Complete cost/benefit analysis with updated costs and implement if so desired.	End of 2021	Water Engineering Staff	
Metering Unmetered Billed Locations	2020-2029	Install meters on Public Works vehicles with water tanks	End of 2020	Water Metering Staff	
Upgraded Customer Information System with On-line Water Use Portal and Access to Improved Reports for Staff	2020-2029	Roll out new system.	End of 2020	CIS Staff	
Scheduled Rate Increases & Cost of Service Rate Studies	2019-2029	Continue present plan. Update as needed based on future cost of service rate studies.	Rate studies scheduled for 2021, 2024, and 2027	Utility Accounting Staff & Contracted Rate Analyst	
Excess water use surcharge – expand to all irrigation accounts	2024-2029	Obtain City Council Approval. Outreach efforts to existing customers.	2024	Water Resources Staff	Meetings to be scheduled to invite large irrigators to learn about the changes and educate them on programs available to help more effectively lower their water consumption.
Tap Fees with Water Use Efficiency Incentives for Single Family Attached, Multi-Family, Micro, and Cottage homes.	2019-2029	Receive City Council approval for reduced water rights on specified residential categories.	2019	Water Resources Staff	
Water Loss Control Program	2020-2029	Coninue current plan	None specified	Michelle Erickson, Carlos Medina, Water Engineering, Water Operations	Present the annual water loss finding to the Loveland Utilities Commission

Worksheet J - **Implementation Plan**

Selected Water Efficiency Activities [1]	Period of Implementation [2]	Implementation Actions [3]	Milestone Deadlines [4]	Entity/Staff Responsible for Implementation [6]	Coordination and Public Involvement [7]
Targeted Technical Assistance and Incentives					
Optimize Water Used to Backwash Filters at the Water Treatment Plant	October 2019 to 2029	Continue updated operations	2019	Water Treatment Plant Manager	
Conversion to non-pot water in the rotary drum thickeners at the Wastewater Treatment Plant	2020-2029	Implement the switch from treated water.	2020	Wastewater Treatment Plant Manager	
Conversion to non-pot water in headworks step screens at the Wastewater Treatment Plant	2020-2029	Implement the switch from treated water.	2020	Wastewater Treatment Plant Manager	
Repair the leaky bottom of the lagoon at the Civic Center grounds	2020-2029	Complete repairs.	2020	City Facilities (Michael Hogan)	
Hybrid Waterless Urinals and Evaporative Cooling System Pilot Program	2020-2022			City Facilities (Michael Hogan)	
Feasibility Study to Use Non-Potable Water for Sanitary Sewer Jetting	2026-2029	Complete feasability study	2025	Water Engineering Staff	
Hydrozone Program	2019-2029	Continue present plan	None specified	Water Resources Staff (Nathan Alburn)	
Northern Water Grants for Landscape Conversions	2019-2029	Continue present plan	None specified	Northern Water (Frank Kinder)	
Direct Installs of Efficient Plumbing Fixtures (shower heads, bathroom aerators, kitchen aerators, toilet tank bags, toilets, etc.) through Larimer County Conservation Corps and Resource Central	2011-2029	Continue present plan	None specified	Customer Relations Staff	
Slow-the-Flow (Sprinkler Audits)	2019-2029	Continue present plan	None specified	Customer Relations Staff	
Garden-in-a-Box (Discounted xeric landscaping plants)	2007-2029	Continue present plan	None specified	Customer Relations Staff	
Efficiency Works (Rebates on water-efficient fixtures and appliances)	2011-2029	Advirtise rebate program through website and in local stores. Roll out toilet and urinal rebates.	2020	Customer Relations Staff	
Ordinance and Regulations					
Water Waste Ordinance Expansion	2021-2029	Obtain City Council approval to update Municipal Code	2021	Michelle Erickson and Derek Turner	
Require 25% Reduction in Irrigation Requirements & Water Rights on all New Irrigation Accounts	2022-2029	Obtain City Council approval to update Municipal Code	2022	Water Resources Staff	

Worksheet J - **Implementation Plan**

Selected Water Efficiency Activities [1]	Period of Implementation [2]	Implementation Actions [3]	Milestone Deadlines [4]	Entity/Staff Responsible for Implementation [6]	Coordination and Public Involvement [7]
Educational Activities					
City Update (Utility Bill Insert)	2019-2029	Continue present plan	None specified	Customer Relations Staff	
Residential e-Newsletter	2019-2029	Continue present plan	None specified	Customer Relations Staff	
Colorado Waterwise (Live Like You Love It)	2015-2029	Continue present plan	None specified	Customer Relations Staff	
Xeric Demonstration Gardens	2014-2029	Continue present plan	None specified	Customer Relations Staff	
Children's Water Festival	2013-2029	Continue present plan	None specified	Customer Relations Staff	
Seminars & Lectures (Water Wise Seminars & Community Stewardship Lecture Series)	2016-2029	Continue present plan	None specified	Customer Relations Staff	
Social Media	2014-2029	Continue present plan	None specified	Customer Relations Staff	
Video Views (YouTube and Facebook)	2017-2029	Continue present plan	None specified	Customer Relations Staff	

Instructions:
[1] Provide the list of water efficiency activities selected for implementation during Step 4.
[2] Provide period in which activity is going to be implemented.
[3] Include information on specific actions necessary to implement the activites (e.g. advertise rebates to public).
[4] Indicate timing of when the action are scheduled to be implemented (e.g. when leaks will be repaired, when rebate program will start, etc.).
[5] Insert anticipated annual costs.
[6] Specify which entity/staff responsible for implementing the activities.
[7] If applicable, comment on necessary coordination among staff/other entities and how the public will be involved. This includes educational campaigns, feedback, direct participation in certain actions, etc.
[8] Add any additional comments.

Worksheet J - **Implementation Plan**

Anticipated Annual Costs [5]

Selected Water Efficiency Activities [1]	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**Total**
Foundational Activities												
Meter Testing, Rehabbing & Replacement Program	$ 86,025	$ 201,025	$ 205,915	$ 211,005	$ 216,315	$ 221,855	$ 227,625	$ 233,645	$ 239,925	$ 246,465	$ 253,285	**$ 2,343,084**
Metering Unmetered Unbilled Locations Irrigation at Water Utility Sites	$ -	$ 760	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 760**
Cost/Benefit Analysis and Install Meters at the Fire Training Grounds	$ -	$ -	$ 100,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 100,000**
Metering Unmetered Billed Locations	$ -	$ 184	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 184**
Upgraded Customer Information System with On-line Water Use Portal and Access to Improved Reports for Staff	$ 627,500	$ 627,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 1,255,000**
Scheduled Rate Increases & Cost of Service Rate Studies	$ -	$ -	$ 45,000	$ -	$ -	$ 45,000	$ -	$ -	$ 45,000	$ -	$ -	**$ 135,000**
Excess water use surcharge – expand to all irrigation accounts	$ -	$ -	$ -	$ 9,250	$ 9,250	$ -	$ -	$ -	$ -	$ -	$ -	**$ 18,500**
Tap Fees with Water Use Efficiency Incentives for Single Family Attached, Multi-Family, Micro, and Cottage homes.	$ 20,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 20,000**
Water Loss Control Program	$ 1,788,233	$ 2,581,353	$ 2,623,353	$ 3,485,633	$ 3,792,883	$ 4,218,103	$ 4,796,453	$ 5,689,183	$ 11,595,283	$ 6,645,303	$ 6,485,813	**$ 53,701,596**

Worksheet J - **Implementation Plan**

Anticipated Annual Costs [5]

Selected Water Efficiency Activities [1]	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Targeted Technical Assistance and Incentives												
Optimize Water Used to Backwash Filters at the Water Treatment Plant	$ 3,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 3,000**
Conversion to non-pot water in the rotary drum thickeners at the Wastewater Treatment Plant	$ 15,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 15,000**
Conversion to non-pot water in headworks step screens at the Wastewater Treatment Plant	$ 1,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 1,000**
Repair the leaky bottom of the lagoon at the Civic Center grounds	$ -	$ 250,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 250,000**
Hybrid Waterless Urinals and Evaporative Cooling System Pilot Program	$ (100,000)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ (100,000)**
Feasibility Study to Use Non-Potable Water for Sanitary Sewer Jetting	$ -	$ -	$ -	$ -	$ -	$ -	$ 30,000	$ -	$ -	$ -	$ -	**$ 30,000**
Hydrozone Program	$ 10,680	$ 10,680	$ 10,680	$ 10,680	$ 10,680	$ 10,680	$ 10,680	$ 10,680	$ 10,680	$ 10,680	$ 10,680	**$ 117,480**
Northern Water Grants for Landscape Conversions	$ 300	$ 300	$ 300	$ 300	$ 300	$ 300	$ 300	$ 300	$ 300	$ 300	$ 300	**$ 3,300**
Direct Installs of Efficient Plumbing Fixtures (shower heads, bathroom aerators, kitchen aerators, toilet tank bags, toilets, etc.) through Larimer County Conservation Corps and Resource Central	$ 20,888	$ 20,888	$ 20,888	$ 20,888	$ 20,888	$ 20,888	$ 20,888	$ 20,888	$ 20,888	$ 20,888	$ 20,888	**$ 229,770**
Slow-the-Flow (Sprinkler Audits)	$ 22,069	$ 22,069	$ 22,069	$ 22,069	$ 22,069	$ 22,069	$ 22,069	$ 22,069	$ 22,069	$ 22,069	$ 22,069	**$ 242,760**
Garden-in-a-Box (Discounted xeric landscaping plants)	$ 5,720	$ 5,720	$ 5,720	$ 5,720	$ 5,720	$ 5,720	$ 5,720	$ 5,720	$ 5,720	$ 5,720	$ 5,720	**$ 62,921**
Efficiency Works (Rebates on water-efficient fixtures and appliances)	$ -	$ 30,000	$ 31,111	$ 32,222	$ 33,333	$ 34,444	$ 35,556	$ 36,667	$ 37,778	$ 38,889	$ 40,000	**$ 350,000**
Ordinance and Regulations												
Water Waste Ordinance Expansion	$ -	$ -	$ 4,025	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 4,025**
Require 25% Reduction in Irrigation Requirements & Water Rights on all New Irrigation Accounts	$ -	$ 11,825	$ 11,825	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 23,650**

Worksheet J - **Implementation Plan**

Anticipated Annual Costs [5]

Selected Water Efficiency Activities [1]	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**Total**
Educational Activities												
City Update (Utility Bill Insert)	$ 24,545	$ 24,720	$ 24,979	$ 25,341	$ 25,568	$ 25,793	$ 26,018	$ 26,241	$ 26,461	$ 26,670	$ 26,878	**$ 283,213**
Residential e-Newsletter	$ 2,929	$ 2,946	$ 2,971	$ 3,005	$ 3,027	$ 3,049	$ 3,070	$ 3,091	$ 3,112	$ 3,132	$ 3,152	**$ 33,484**
Colorado Waterwise (Live Like You Love It)	$ 6,799	$ 6,799	$ 6,799	$ 6,799	$ 6,799	$ 6,799	$ 6,799	$ 6,799	$ 6,799	$ 6,799	$ 6,799	**$ 74,794**
Xeric Demonstration Gardens	$ 1,560	$ 1,560	$ 1,560	$ 1,560	$ 1,560	$ 1,560	$ 1,560	$ 1,560	$ 1,560	$ 1,560	$ 1,560	**$ 17,160**
Children's Water Festival	$ 7,091	$ 7,091	$ 7,091	$ 7,091	$ 7,091	$ 7,091	$ 7,091	$ 7,091	$ 7,091	$ 7,091	$ 7,091	**$ 78,001**
Seminars & Lectures (Water Wise Seminars & Community Stewardship Lecture Series)	$ 1,830	$ 1,830	$ 1,830	$ 1,830	$ 1,830	$ 1,830	$ 1,830	$ 1,830	$ 1,830	$ 1,830	$ 1,830	**$ 20,129**
Social Media	$ 11,730	$ 11,730	$ 11,730	$ 11,730	$ 11,730	$ 11,730	$ 11,730	$ 11,730	$ 11,730	$ 11,730	$ 11,730	**$ 129,035**
Video Views (YouTube and Facebook)	$ 25,043	$ 25,043	$ 25,043	$ 25,043	$ 25,043	$ 25,043	$ 25,043	$ 25,043	$ 25,043	$ 25,043	$ 25,043	**$ 275,468**

Instructions:
[1] Provide the list of water efficiency activities selected for implementation during Step 4.
[2] Provide period in which activity is going to be implemented.
[3] Include information on specific actions necessary to implement the activites (e.g. advertise rebates to public).
[4] Indicate timing of when the action are scheduled to be implemented (e.g. when leaks will be repaired, when rebate program will start, etc.).
[5] Insert anticipated annual costs.
[6] Specify which entity/staff responsible for implementing the activities.
[7] If applicable, comment on necessary coordination among staff/other entities and how the public will be involved. This includes educational campaigns, feedback, direct participation in certain actions, etc.
[8] Add any additional comments.

Appendix D - Public Comment Notices and Public Comments