City of Longmont

# Draft Water Efficiency Master Plan Update

## Update to the 2008 Water Conservation Plan

April 2017
For Public Review

Submitted by

ch2m

WaterDM
DEMAND MANAGEMENT

DRAFT REPORT

# City of Longmont's Water Efficiency Master Plan Update

*Update to the 2008 Water Conservation Master Plan*

DRAFT

*Prepared for*

City of Longmont

April 2017

CH2M HILL Engineers, Inc.
9191 South Jamaica Street
Englewood, CO 80112

Water Demand Management, LLC
1339 Hawthorn Ave.
Boulder, CO 80304

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**Attachments**

1 Summary of Public Comments (Future)
2 City Council Adoption of Water Efficiency Plan (Future)

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# Acronyms and Abbreviations

| | |
|---|---|
| acre-feet | unit of volume to measure water equivalent to an acre of area covered with one foot of water (325,850 gallons), enough to provide water for approximately 6 people for about one year |
| AMI | advanced metering infrastructure |
| AMR | automated meter reading |
| AWWA | American Water Works Association |
| B&V | Black & Veatch |
| BMP | best management practice |
| CBT | Colorado-Big Thompson Project |
| cfs | cubic feet per second |
| CIP | capital improvement program |
| City | City of Longmont |
| CLCP | Carter Lake Connecting Pipeline |
| CRC | Center for ReSource Conservation |
| CWCB | Colorado Water Conservation Board |
| DF | dual flush toilets (no more than 1.6 gallons per flush for solids and 1.1 for liquids) |
| ET | evapotranspiration |
| EV | economic vitality |
| gpcd | gallons per capita per day |
| GIS | geographic information system |
| Gross Per Capita Water Use | total treated water production divided by total service population |
| HE | high efficiency |
| HOA | Home Owner's Association |
| ITWSMP | 2013 Integrated Treated Water Supply Master Plan |
| IWA | International Water Association |
| LACP | Longmont Area Comprehensive Plan |
| LPA | Longmont Planning Area |
| MG | million gallons |
| mgd | million gallons per day |
| MSA | municipal service area |
| NCWCD | Northern Colorado Water Conservancy District (aka Northern Water) |
| NFWTP | Nelson-Flanders Water Treatment Plant and Wade Gaddis WTP |

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| | |
|---|---|
| PACE | Partners for A Clean Environment |
| Plan | 2017 Water Efficiency Master Plan |
| psi | pounds per square inch |
| Residential Per Capita Water Use | total residential + multifamily metered treated water demand divided by total service population |
| RF | radio frequency |
| RWMP | Raw Water Master Plan |
| SVSC | St. Vrain Supply Canal |
| WGWTP | Wade Gaddis Water Treatment Plant |
| WTP | water treatment plant |

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SECTION 1

# Introduction

## 1.1 Purpose

Throughout its history the City of Longmont (the City) has provided safe, reliable potable water to all its customers. Efficient water use has been part of the City planning goals for over two decades, starting with the City's first Water Conservation Master Plan from 1996, the plan updated in 2008, and this 2017 Water Efficiency Master Plan Update (Plan).

The purpose of the Plan is to assess the overall characteristics of current and future City water use, summarize the current status of raw water supply and treatment capacity, and use this information to frame the City's water conservation program with respect to current and ongoing water supply needs and water demand management. In addition, the Plan provides a detailed assessment related to the identification and selection of future water efficiency measures and programs that the City will continue to implement.

The City is committed to responsible, environmentally sound, and efficient use of its precious natural resources. Although the City owns and maintains a robust water rights portfolio, it is constantly aware of the need to evaluate and refine its water supply and demand management efforts. The City and its water utility customers recognize the importance of efficient water use as an essential component of the community's culture—helping to maintain the local quality of life in a responsible, sustainable manner.

## 1.2 Organization

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This Plan was prepared following the steps outlined in the Colorado Water Conservation Board (CWCB) Water Conservation Planning Guidance Document. The steps are as follows:

- Step 1—Profile of Existing Water Supply System
- Step 2—Profile of Water Demands and Historical Demand Management
- Step 3—Integrated Planning and Water Efficiency Benefits and Goals
- Step 4—Selection of Water Efficiency Activities
- Step 5—Implementation and Monitoring

Each step of the planning process has been integrated into the following sections in this Plan:

1. Introduction
2. Profile of Existing Water System (Step 1)
3. Service Area and Water Demands (Step 2)
4. Current and Future Water Efficiency Efforts (Steps 2 and 4)
5. Demand Forecast and Efficiency Goals (Step 3)
6. Plan Adoption and Implementation (Step 5)

## 1.3 Acknowledgements

Development of this Plan was not possible without the cooperative effort and support of the City's Public Works and Natural Resources Department, Parks and Open Space Department, Planning Department, and the Longmont Water Board. The Plan was prepared under the leadership of the Public Works and Natural Resources Department and partially funded with a grant from the CWCB.

SECTION 2

# Profile of Existing Water System

The following section includes information on the City's main infrastructure of the water delivery system: raw water supply, drinking water treatment, and distribution. Current capacity and future capital projects are summarized and if water efficiency improvements impact the timing of major projects.

## 2.1 Raw Water Sources

Mountain watersheds are the City's current and future primary source of raw water for drinking water and raw water irrigation purposes. The City has established a robust raw water supply system with multiple alternate points of diversion. An overview of the City's raw water supply network is provided in **Table 2-1**.

The City has raw water diversion rights from the St. Vrain Creek Basin and the Upper Colorado River Basin. St. Vrain Creek Basin includes the North St. Vrain Creek, South St. Vrain Creek, and St. Vrain Creek. Headwaters of the North St. Vrain Creek are in Rocky Mountain National Park with Ralph Price Reservoir as the City's primary water storage facility. Headwaters of South St. Vrain Creek are near the Indian Peaks Wilderness Area. The north and south forks combine to form the St. Vrain Creek near the town of Lyons downstream of Ralph Price Reservoir. In 2015, 63 percent of Longmont's water supply was from North St. Vrain Creek and St. Vrain Creek (*2015 Water Quality Report*).

The City also has ownership in the Colorado-Big Thompson (CBT) project and Windy Gap trans-mountain diversion projects operated by the Northern Colorado Water Conservancy District (NCWCD). Water from the Colorado River headwaters are stored in several reservoirs west of the continental divide. CBT water is conveyed through the Alva B. Adams Tunnel to the east slope, and then through several lakes and reservoirs to Carter Lake. From Carter Lake, the City receives CBT water through the St. Vrain Supply Canal and Southern Water Supply Pipeline. In 2015, 37 percent of Longmont's water supply was from CBT water (*2015 Water Quality Report*).

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Watershed basins that supply raw water and the infrastructure to deliver the water to the City's water treatment plants (WTPs), the Nelson-Flanders WTP (NFWTP) and Wade Gaddis WTP (WGWTP), are summarized in **Table 2-1.**

Table 2-1. Existing Raw Water Supply System Summary

| Source Water Basin | Infrastructure for Delivery to City of Longmont Water Treatment Plants | Supply to NFWTP | Supply to WGWTP |
|---|---|---|---|
| Upper Colorado[1] | **Carter Lake Connecting Pipeline (CLCP)[2]** – Delivers CBT and Windy Gap Project water via Southern Water Supply Pipeline and CLCP. | Yes | Yes |
| | **St. Vrain Supply Canal (SVSC) and Pipelines[3]** – Delivers CBT and Windy Gap Project from Carter Lake via canal, then through a short pipeline segment to NFWTP from the canal. | Yes | No[4] |
| North St. Vrain | **North Pipeline** – Delivers N. St. Vrain from Ralph Price Reservoir via diversion point from Longmont Reservoir. | Yes | No[4] |
| South St. Vrain | **South Pipeline[4]** – Delivers S. St. Vrain via direct diversion from river to pipeline. | Yes | No |

Table 2-1. Existing Raw Water Supply System Summary

| Source Water Basin | Infrastructure for Delivery to City of Longmont Water Treatment Plants | Supply to NFWTP | Supply to WGWTP |
|---|---|---|---|
| St. Vrain (downstream of the confluence of the North and South St. Vrain) | **Highland Ditch** –Delivers St. Vrain via direct diversion from river. | Yes | Yes[5] |
| St. Vrain | **Burch Lake** – Delivers St. Vrain water conveyed to Burch Lake via Palmerton Ditch. The existing Burch Lake pump station is connected to WGWTP and could be connected to the CLCP in the future. | No | Yes |

[1] Northern Water operates and maintains the CBT Project and Windy Gap Diversion and Firming projects. The City of Longmont owns allotment contracts in each project.
[2] The pipeline that delivers CBT water to the WTPs comprises four projects: CLCP (1999), to pipeline from Highland Ditch to WGWTP (1983), to pipeline along south side of Highway 66 (1974), to pipeline from Highway 66 to NFWTP (2005).
[3] SVSC is owned by Northern Water. The City has constructed two pipelines to deliver water from the SVSC to the NFWTP: Carter pipeline from the SVSC to Carter Pond (1973) and an extension of that pipeline upstream of Carter Pond to the NFWTP (2005).
[4] These raw water sources could be conveyed to WGWTP from NFWTP by reversing the normal flow direction of the CLCP when it is not supplying CBT water.
[5] This diversion is only used in emergency situations and can only convey water to WGWTP when the CLCP is not supplying CBT water.

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Delivery capacity of each raw water supply to each treatment plant is important when evaluating infrastructure needs for ultimate build-out of the City. Current capacities of existing raw water supply infrastructure to each WTP are summarized in **Table 2-2**.

Table 2-2. Existing Raw Water Infrastructure Summary

| Infrastructure for Delivery to City of Longmont Water Treatment Plants | Maximum Delivery to NFWTP (mgd) | Maximum Delivery to WGWTP (mgd) | Notes |
|---|---|---|---|
| Carter Lake Connecting Pipeline (CLCP) | 15.5 | 15.5 | Maximum allotment of CLCP, flow based on southern supply pipeline carriage agreements and not necessarily the hydraulic capacity of the pipeline. This amount of flow can be conveyed to either WTP. Cannot supply CLCP water to NFWTP if the Highland Ditch is open to WGWTP. |
| St. Vrain Supply Canal (SVSC) | 32.3 | 0 | SVSC flow based on 2003 Black & Veatch (B&V) Basis of Design Report and not necessarily the hydraulic capacity of the pipeline. SVSC is not available from November through May each year. Project planned in 2020 to enlarge intake. |
| North Pipeline | 18.1 | 0 | North Pipeline flow based 2003 B&V Basis of Design Report and not necessarily the hydraulic capacity of the pipeline. |

Table 2-2. Existing Raw Water Infrastructure Summary

| Infrastructure for Delivery to City of Longmont Water Treatment Plants | Maximum Delivery to NFWTP (mgd) | Maximum Delivery to WGWTP (mgd) | Notes |
|---|---|---|---|
| South Pipeline | 7.7 | 0 | Flow based on capacity of pipeline with gravity flow (12 cfs). |
| Highland Ditch | 16.1 | 15 | NFWTP value is the capacity of the Highland Ditch Pump Station. WGWTP value is based on actual flow during operation and is not necessarily the pipeline capacity. Cannot supply Highland Ditch water to WGWTP via connection at WGWTP if CLCP is online. |
| Burch Lake | 0 | 18 | Capacity of the influent pump station at WGWTP from Burch Lake. |
| **Total Raw Water Delivery** | **82** | **33 or 33.5** | Total raw water delivery for WGWTP reflects that supply from the CLCP and Highland Ditch to WGWTP cannot occur at the same time. |

The capacity to deliver water to the treatment plants also depends on water rights agreements. For example, the CLCP and North Pipeline are available year round, while the SVSC is not available from November through May each year.

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In addition to delivery capacity, the condition of the raw water supply facilities is also important. The North Pipeline, which supplies water from North St. Vrain, is located in the foothills and is most in need of repair and this has been identified as a project in the City's capital improvement program (CIP) to either repair the pipeline or change the point of diversion. A portion of the North Pipeline was damaged during the 2013 flood and there is a current project underway to repair this segment, as well as relocate a portion of the pipeline from the St. Vrain Creek bed alignment. The diversion to the South Pipeline was destroyed in the 2013 flood and has since been repaired so this is new infrastructure.

In 2015, the total raw water storage capacity was 32,026 acre-feet and the total raw water supply available was 24,558, acre-feet. The estimated annual average treated water demand at build-out will require multiple raw water sources. The flexibility of the raw water supply system decreases at build-out because multiple raw water sources are required to meet demand above the annual average. However, peak demand can still be achieved in multiple ways.

Future alternatives for additional raw water supply and storage were evaluated in the 2004 Raw Water Master Plan (RWMP) and the 2013 Integrated Treated Water Supply Master Plan (ITWSMP). From these evaluations, future capital projects to maintain the reliability and flexibility of the raw water supply system include:

- Enlargement of the Button Rock Dam to increase the capacity of Ralph Price Reservoir (2004 RWMP)
- Enlargement of Union Reservoir and pipeline (2004 RWMP)
- Participation in Windy Gap Firming Project to construct Chimney Hollow Reservoir (2004 RWMP)
- North St. Vrain pipeline repair (CIP #WTR112)
- North St. Vrain alternate diversion point (2013 ITWSMP)
- South St. Vrain pipeline improvements (CIP #WTR153)
- Union Reservoir pump-back pipeline (CIP # WTR177)

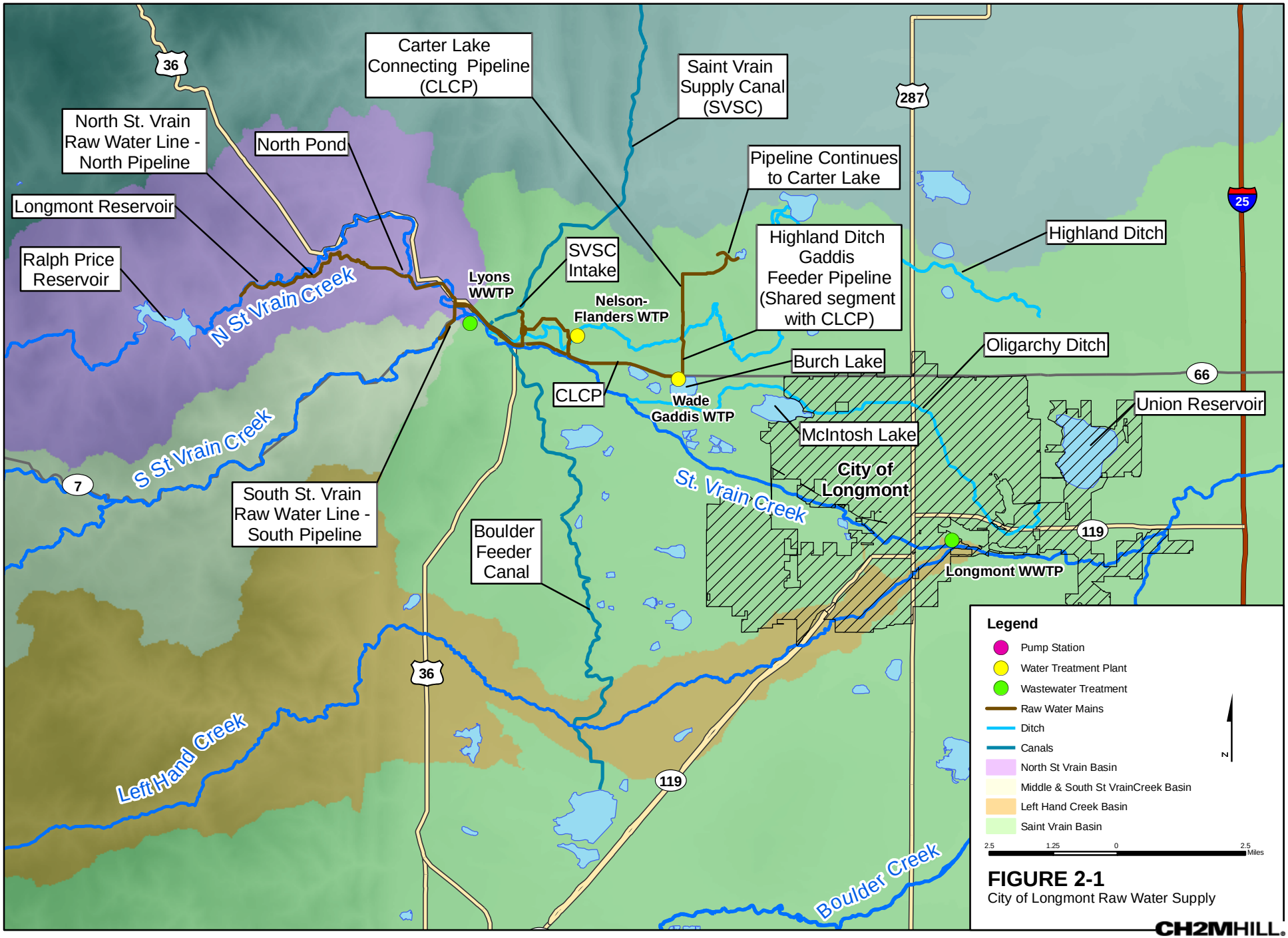


**FIGURE 2-1**
City of Longmont Raw Water Supply

Non-construction options to increase raw water supply include purchasing additional CBT rights, purchasing St. Vrain Creek water rights, and acquiring additional water rights through annexation.

In planning for future raw water supply, City leadership supports additional raw water supply capacity for added sustainability of the raw water system. Therefore, water efficiency may not influence the need for or the timing of the various large capital projects for additional raw water supply and storage.

## 2.2 Water Treatment Plants

The City currently has two WTPs. NFWTP is a 40-million-gallons/day (mgd) plant that became operational in 2007, while WGWTP is an older 15-mgd plant constructed in 1984. The original capacity of the NFWTP was 30 mgd. In 2013 it was re-rated to 40 mgd based on demonstration tests. The current combined total treatment plant capacity is 55 mgd if WGWTP is included at full rated capacity. The WGWTP serves as a peaking plant that provides additional drinking water capacity during the summer months when water demand exceeds the capacity of the NFWTP. However, the WGWTP has not been used since 2011 to meet peak demands. Significant improvements would also be needed to maintain WGWTP capacity and even then the combined plan capacity does not meet the forecasted demands at build-out. The 2013 ITWSMP recommended expansion of the NFWTP to 60 mgd and decommissioning of WGWTP in 5 to 10 years; the City's CIP reflects this approach.

Forecasted peak-day water demand from the 2013 ITWSMP (without accounting for additional conservation measures) reaches 40 mgd between 2023 and 2030, depending on the City's growth rate. The City's CIP has the NFWTP expansion planned to begin in 2020. Water efficiency efforts in the near future would limit the need for operation of the WGWTP to meet peak demands. The NFWTP expansion planned for 2020 is still being evaluated, but one approach would be to construct the infrastructure needed for ultimate plant capacity and phase in equipment over time as demand increases.

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## 2.3 Water Distribution System

The City's water distribution system includes four water storage tanks and five pump stations that supply a network of more than 440 miles of pipe ranging from 2 to 66 inches in diameter. The total amount of storage in the City's existing water distribution system is 27 million gallons (MG). However, several of the pipelines and storage facilities in the City's distribution system have reached the end of their expected life and need replacement. Two major projects identified in the City's CIP are the Clover Basin Water Transmission Line, and the Price Park Tank Replacement. The Clover Basin Water Transmission Line will increase capacity to the southwest portion of the City that is experiencing heavy residential growth. A new Price Park Tank is needed to replace two existing underground tanks that have condition issues and to increase water pressure to this zone.

In addition to large CIP project, the City rehabilitates water lines in the distribution system annually to improve water service, water quality, and decrease the frequency of water line breaks.

The City is also in the process of converting water meters from analog to digital meters that are automated meter reading/advanced metering infrastructure (AMR/AMI) capable (CIP project #WTR150). Approximately one-third of the meters have been replaced and approximately 16,000 are yet to be replaced. The project will also include centralized data management that will improve the City's ability to identify distribution system water loss and improve usage information for customers.

## 2.4 Raw Water for Irrigation

The City has the ability to reduce its overall treated water demand through the use of raw water for outdoor irrigation to save treatment and energy costs, especially in cases where direct ditch rights are available adjacent or in close proximity to irrigable areas. The City has an extensive network of canals

and irrigation ditches that convey raw water to parks, golf courses, schools, and greenways for irrigation. Currently, raw water is available to irrigate approximately 27 City and community parks, 2 golf courses, and 18 schools, representing 56 percent of parks, 66 percent of golf courses, and 60 percent of schools. The site of the City's main recreation facility is also irrigated with raw water. Availability of raw water for irrigation decreases demand for treated water from the treatment plant and conserves energy and chemicals required for treatment. The City continues to evaluate options for using raw water in place of treated water for irrigation and is proceeding with conversion of parks and greenways along Spring Gulch No. 2 south of 17th Avenue.

The City also installed flow monitoring systems on raw water irrigation intake points to improve raw water accounting. The City had started this flow monitoring effort previously, but is now also being required by the Colorado Division of Water Resources, also known as the Office of the State Engineer, to monitor irrigation flows.

**Table 2-3** summarizes the City's estimated raw water supply and use information for 2015.

Table 2-3. Summary of Estimated Raw Water Supply and Use (2015)

| Annual Water Supply | Annual Volume (acre-feet) | Percent Metered |
|---|---|---|
| Raw Water for Irrigation[a] | 1,447 | 100% |
| Raw Water for Treatment | 15,967 | 100% |
| Total Raw Water Used (Accounted) | 17,414 | - |
| Total Annual Revenue Water Sold[b] | 12,994 | 100% |

[a] Required raw water accounts for raw water that is non-transferrable to municipal uses and raw water from the Union Reservoir pump back.
[b] City does not bill municipal properties for treated water used (see Table 3-2).

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Conversion of treated water irrigation to raw water irrigation effectively reduces overall water use by the City, since raw water savings will be realized due to reduced treatment plant water requirements (e.g., filter backwash) and distribution system losses. Additionally, removing irrigation demands from treated water supplies allows instream flows to remain in the St. Vrain Creek from the point of diversion to the WTP to other diversions further downstream. Finally, much of the raw water irrigation is non-virgin flow, creating better efficiency for the entire St. Vrain Creek Watershed.

SECTION 3

# Service Area and Water Demands

The following section describes the City's water service area, includes a summary of historical data characterizing water demand in the service area, and summarizes the City's water rate structure.

## 3.1 Service Area and Population

The City of Longmont is located in Boulder County, approximately 30 miles north of the Denver metro area. St. Vrain Creek flows through the City and is a tributary to the South Platte River basin. The City's water service area follows the Longmont Area Comprehensive Plan (LACP) planning areas for managing the treated water service in the Municipal Service Area (MSA) and Longmont Planning Area (LPA) (**Figure 3-1)**. The MSA is the area that the City considers appropriate for urban development and intends to annex and provide urban services; it represents the greatest level of public investment for installation and maintenance of capital improvements. The LPA is the next tier outside the MSA. The City plans these areas in advance using a neighborhood planning area concept. Neighborhood planning areas are the basis planning unit; they include a mix of land uses that serves residents and workforce.

For purposes of this plan, evaluation of the current and forecasted water demands represent all metered water use in the current MSA and existing services outside the MSA. Existing services provided outside the MSA include water service to some residents in the Hygiene area and the Town of Lyons.

As of 2015, the City' MSA encompassed 28.7 square miles, or 18,367 acres, which has increased from 10.5 square miles in 1980 (*Longmont Community Profile 2015*). Growth has been primarily due to residential homes, but industrial development has also increased, providing a balance between housing and jobs.

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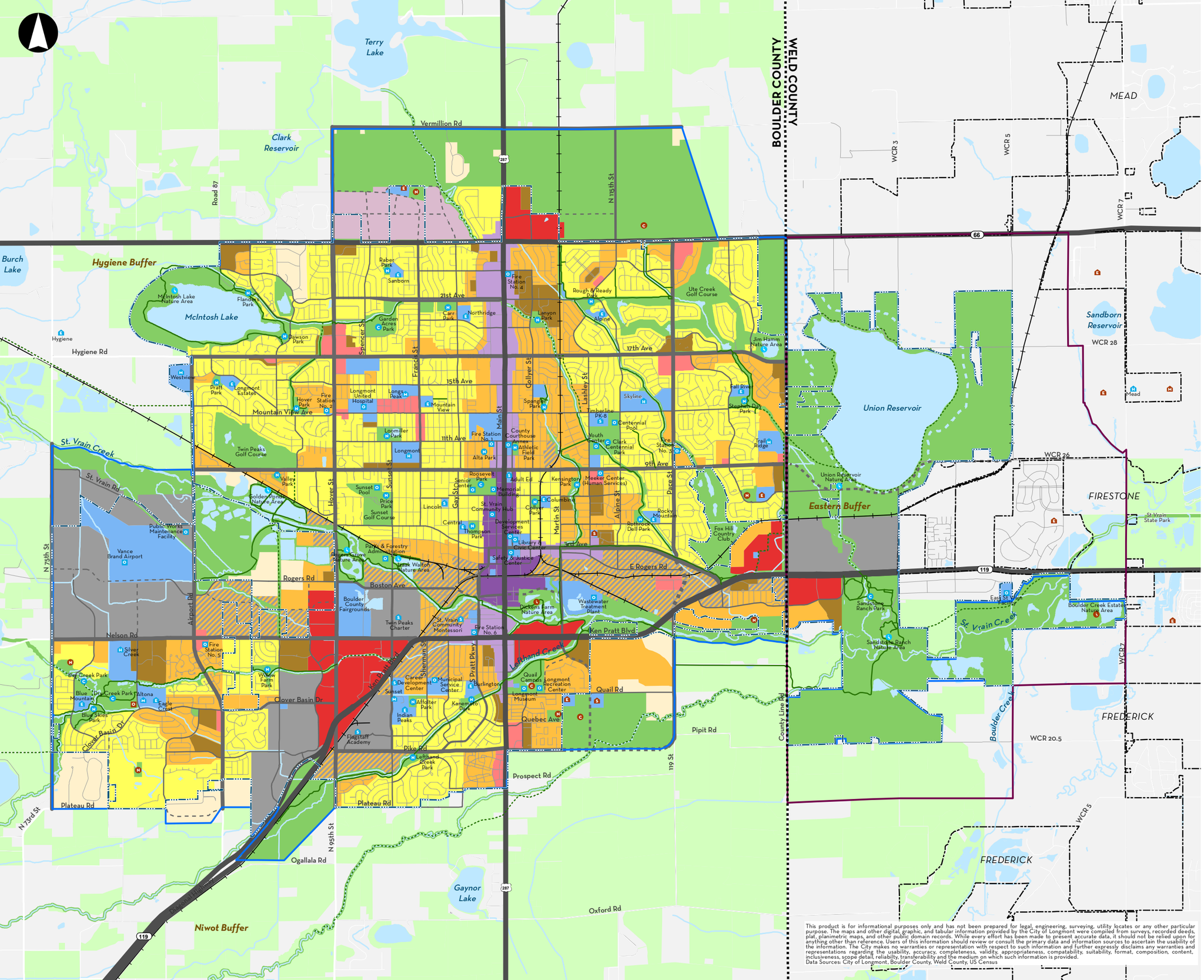
A summary of service population, City population, and active and metered water accounts is summarized in **Table 3-1** for 2007 to 2015.

Table 3-1. Population and Water Account Summary

| Year | Service Population[a] | City Population | City Population Annual % Change | Total Water Accounts |
|---|---|---|---|---|
| 2007 | 86,410 | 85,762 | 1.3% | 26,289 |
| 2008 | 86,817 | 86,194 | 0.5% | 25,999 |
| 2009 | 86,926 | 86,303 | 0.1% | 26,513 |
| 2010 | 88,080 | 87,461 | 1.3% | 26,636 |
| 2011 | 88,462 | 87,850 | 0.5% | 26,740 |
| 2012 | 88,453 | 87,841 | 0% | 26,933 |
| 2013 | 90,891 | 90,262 | 2.8% | 26,843 |
| 2014 | 92,629 | 91,911 | 1.8% | 27,007 |
| 2015 | 93,575 | 92,852 | 1.0% | 27,223 |

[a] Population includes customers outside of the MSA and does not include the Town of Lyons; source: *Water Utility Annual Statistical Summary Reports*.

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Data Sources: City of Longmont, Boulder County, Weld County, US Census

ENVISION LONGMONT
ENGAGING OUR COMMUNITY PLANNING OUR FUTURE

# FUTURE LAND USE & TRANSPORTATION SYSTEM

**Boundaries**
- Municipal Service Area (MSA)
- Longmont Planning Area (LPA)
- Coordinated Planning Area (CPA)
- Neighboring Municipalities

**Neighborhoods**
- Rural Neighborhood
- Single-Family Neighborhood
- Mixed Neighborhood
- Multi-Family Neighborhood

**Mixed-Use**
- Downtown/CBD
- Regional Center
- Neighborhood Center
- Mixed-Use Corridor

**Employment**
- Mixed-Use Employment
- Primary Employment

**Community**
- Parks, Greenways, Open Space
- Public/Quasi-Public
- Union Reservoir Expansion Area

**Other**
- Terry Lake Mixed-Use Area
- Protected Lands Outside LPA

**Transportation Network**
- Regional Arterial
- Principal Arterial
- Minor Arterial
- Collector
- Local Street
- Multi-Use Trail
- Railroad
- Future Arterial
- Future Minor Arterial
- Future Collector
- Future Multi-Use Trail

**Community Facilities**

| Existing | Proposed | |
|---|---|---|
| N | N | Neighborhood Park |
| C | C | Community Park |
| | | Nature Areas |
| E | E | Elementary School |
| M | M | Middle School |
| H | H | High School |
| S | S | Special School |
| O | O | Other Facility |

0 0.5 1 2 Miles

The City has been experiencing consistent growth over the last several years. Since 2007, the average rate of population growth has been approximately 1.0 percent per year. Water meter accounts have grown approximately 0.5 percent per year in the same time period.

# 3.2 Treated Water Demand

In this plan the description of water demand is consistent with the International Water Association (IWA) and American Water Works Association (AWWA) Water Balance approach, which was published in 2000 as part of the IWA publication, *Performance Indicators for Water Supply Services,* to provide utilities a consistent method for assessing water loss. Though the full assessment of a water balance is outside the scope of this plan, the terminology is consistent and is summarized in **Figure 3-2**.

Figure 3-2. IWA/AWWA Water Balance Summary (Source: 4th Edition AWWA M36 Manual (2016))

| | | | | |
|---|---|---|---|---|
| System Input Volume (corrected for known errors) | Authorized Consumption | Billed Authorized Consumption | Billed Metered Consumption (including water exported) | Revenue Water |
| | | | Billed Unmetered Consumption | |
| | | Unbilled Authorized Consumption | Unbilled Metered Consumption | Non-Revenue Water (NRW) |
| | | | Unbilled Unmetered Consumption | |
| | Water Losses | Apparent Losses | Unauthorized Consumption | |
| | | | Customer Metering Inaccuracies | |
| | | | Systematic Data Handling Errors | |
| | | Real Losses | Leakage on Transmission and Distribution Mains | |
| | | | Leakage and Overflows at Utility's Storage Tanks | |
| | | | Leakage on Service Connections up to point of Customer metering | |

## 3.2.1 Customer Billing Classifications

Potable water use is billed according to the following six customer classifications: residential (single family and duplexes), multifamily, small commercial, large commercial-industrial, and irrigation. The first meters on residential single-family homes were installed in 1975 and at of the end of 2006 there were no unmetered residential connections. Multifamily dwellings had meters first installed in 1976 and are completely metered. Meters for large commercial and small commercial customers were first installed in 1983 and 1984, respectively, and are now completely metered as well. Irrigation was separated into a new customer classification beginning in 2001 and primarily represents homeowners association (HOA) neighborhood irrigation systems, and separate irrigation taps for new small commercial establishments. Customer classification descriptions are summarized in **Table 3-2** and represent accounts that generate revenue for the City.

Table 3-2. Customer Billing Classification

| Rate Category | Description |
|---|---|
| Residential- Single family and duplexes | Residential single family homes and duplexes. |
| Multifamily | Three or more attached living units, includes mobile home parks. Newer developments may have multiple detached living units on one lot and are classified as multifamily. New multifamily complexes will have a multifamily tap to each building and a dedicated irrigation tap, and may also have a separate tap to the clubhouse area. The buildings are classified as multifamily, irrigation tap as irrigation, and the clubhouse area as small commercial. |
| Small commercial | Commercial taps that provide water to the building, including hotels, assisted living, and nursing homes. Commercial establishments may also have an irrigation tap, which is classified as irrigation. |
| Large commercial and industrial | Negotiated services based on water use characteristics. There are currently no active accounts within this category. |
| Irrigation | Dedicated irrigation taps. A separate irrigation tap is required in all new multifamily complexes and will eventually be required for all commercial unless the landscaping is less than a certain square footage. Irrigation for HOA areas and pocket parks are also included in this category. |
| Lyons | The City of Longmont treats water for the Town of Lyons and delivers through a separate metered tap. This service is labeled as "Lyons" throughout this plan. |
| City (non-billed) | City facilities such as libraries, memorial buildings, City buildings, fire stations, golf courses, greenways, arterials, and parks. |

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### 3.2.2 Water Use

A summary of water usage for each billing classification, including the City's own use, is provided in **Table 3-3** and **Table 3-4** for 2007 to 2015 (units of MG and acre-feet respectively), and is presented in **Figure 3-3**. WTP production is also shown in **Figure 3-3** and represents the treated water entering the distribution system, also referred to as WTP effluent.

Table 3-3. Metered Water Use by Customer Classification 2007-2015 (MG)

| Year | Residential | Multi-family | Small Commercial | Large Commercial | Irrigation | Lyons | Hydrant Meters | City | Total |
|---|---|---|---|---|---|---|---|---|---|
| 2007 | 2790 | 487 | 905 | 264 | 607 | 89 | 19 | 365 | **5,527** |
| 2008 | 2651 | 475 | 785 | 209 | 304 | 98 | 13 | 357 | **4,891** |
| 2009 | 2427 | 479 | 764 | 56 | 273 | 88 | 10 | 340 | **4,436** |
| 2010 | 2576 | 603 | 923 | 56 | 322 | 102 | 7 | 479 | **5,068** |
| 2011 | 2633 | 630 | 819 | 47 | 343 | 196 | 6 | 383 | **4,967** |
| 2012 | 2920 | 553 | 1022 | 4 | 406 | 128 | 5 | 390 | **5,428** |
| 2013 | 2396 | 508 | 797 | 0.3 | 310 | 89 | 28 | 281 | **4,410** |
| 2014 | 2306 | 515 | 861 | 0 | 317 | 205 | 19 | 294 | **4,515** |
| 2015 | 2428 | 538 | 825 | 0 | 348 | 85 | 10 | 272 | **4,506** |

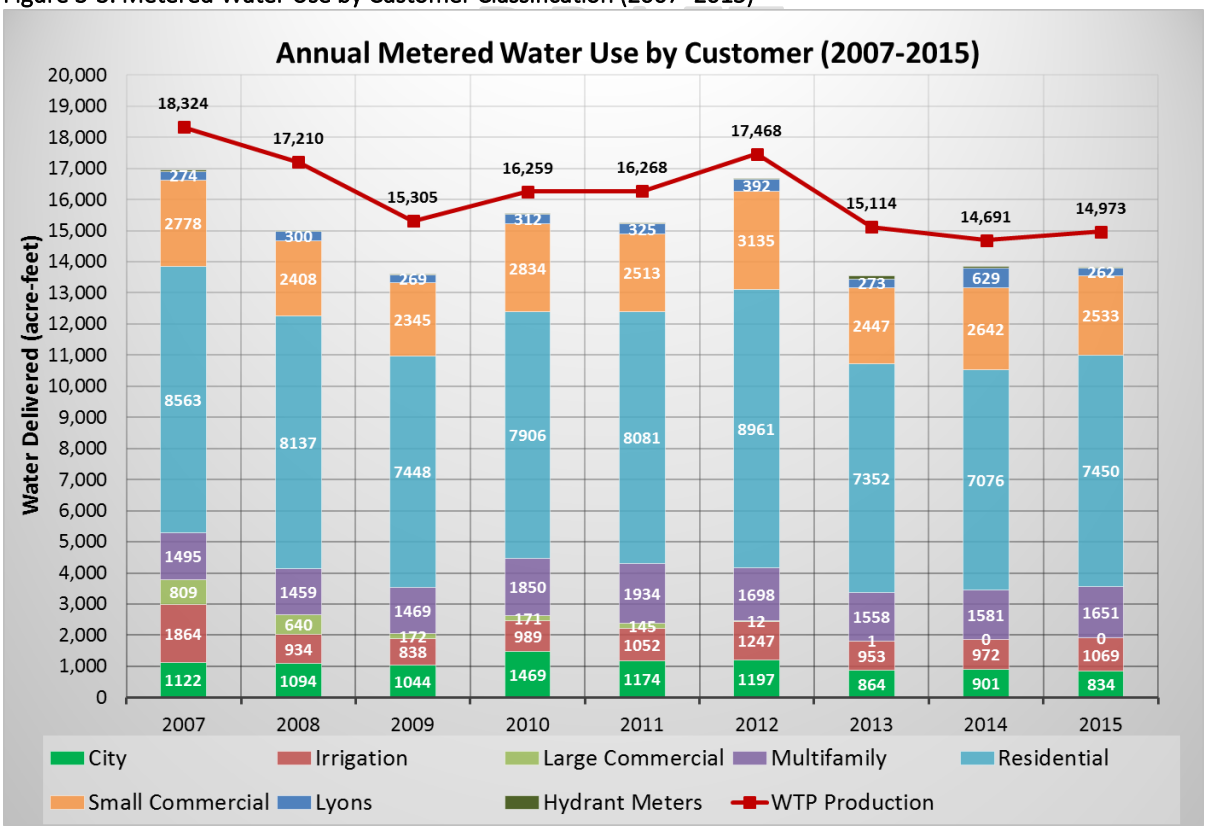
Source: *City of Longmont Monthly Billing Data*

Table 3-4. Metered Water Use by Customer Classification 2007-2015 (acre-feet)

| Year | Residential | Multi-family | Small Commercial | Large Commercial | Irrigation | Lyons | Hydrant Meters | City | Total |
|---|---|---|---|---|---|---|---|---|---|
| 2007 | 8,563 | 1,495 | 2,778 | 809 | 1,864 | 274 | 60 | 1,122 | **16,964** |
| 2008 | 8,137 | 1,459 | 2,408 | 640 | 934 | 300 | 40 | 1,094 | **15,011** |
| 2009 | 7,448 | 1,469 | 2,345 | 172 | 838 | 269 | 29 | 1,044 | **13,614** |
| 2010 | 7,906 | 1,850 | 2,834 | 171 | 989 | 312 | 22 | 1,469 | **15,533** |
| 2011 | 8,081 | 1,934 | 2,513 | 145 | 1,052 | 325 | 19 | 1,174 | **15,244** |
| 2012 | 8,961 | 1,698 | 3,135 | 12 | 1,247 | 392 | 15 | 1,197 | **16,658** |
| 2013 | 7,352 | 1,558 | 2,447 | 1 | 953 | 273 | 87 | 864 | **13,534** |
| 2014 | 7,076 | 1,581 | 2,642 | 0 | 972 | 629 | 57 | 901 | **13,859** |
| 2015 | 7,450 | 1,651 | 2,533 | 0 | 1,069 | 262 | 30 | 834 | **13,828** |

In 2015, the total metered water demand was 13,828 acre-feet, or 4,506 MG. Usage by the large commercial customers has decreased and was not measurable in 2014 and 2015. The City also meters and bills developers and contractors for water used from hydrants for construction or other purposes. Hydrant meter data are tracked separately through the City's Hydrant Meter Permit Program and are not in the monthly metered water use by customer classification.

Figure 3-3. Metered Water Use by Customer Classification (2007–2015)




Per capita water usage is a standard calculation to track usage efficiency and for comparison with other municipalities. For summary purposes in this Plan, three per capita values have been calculated: gross, metered, and residential, which are defined as follows:

- Gross per capita water use is calculated as the total treated water production (less usage by Town of Lyons) divided by the total service population.
- Metered per capita water use is calculated as the total metered usage (less usage by Town of Lyons) divided by the total service population.
- Residential per capita water use is calculated as the total metered usage from residential and multifamily accounts divided by the City's service population.

Treated water production, gross per capita, metered per capita, and residential per capita water use from 2007 to 2015 are provided in **Table 3-5** and **Figure 3-4**.

Table 3-5. Treated Water Production, Metered Use, and Per Capita Use from 2007-2015

| Year | Total Treated Water Production[a] (acre-feet) | Total Metered Use (acre-feet) | Residential Per Capita[b] (gpcd) | Metered Per Capita[c] (gpcd) | Gross Per Capita[d] (gpcd) |
|---|---|---|---|---|---|
| 2007 | 18,324 | 16,964 | 105 | 172 | 187 |
| 2008 | 17,210 | 15,011 | 99 | 151 | 174 |
| 2009 | 15,305 | 13,614 | 92 | 137 | 154 |
| 2010 | 16,259 | 15,553 | 100 | 155 | 162 |
| 2011 | 16,268 | 15,244 | 102 | 151 | 161 |
| 2012 | 17,468 | 16,658 | 108 | 164 | 172 |
| 2013 | 15,114 | 13,534 | 88 | 130 | 146 |
| 2014 | 14,691 | 13,859 | 84 | 128 | 136 |
| 2015 | 14,973 | 13,828 | 88 | 129 | 140 |

[a] Treated water entering the distribution system after treatment, also referred to as WTP effluent.
[b] Residential + multifamily metered use divided by City of Longmont population.
[c] Total metered use divided by total service population.
[d] Total treated water production divided by total service population.

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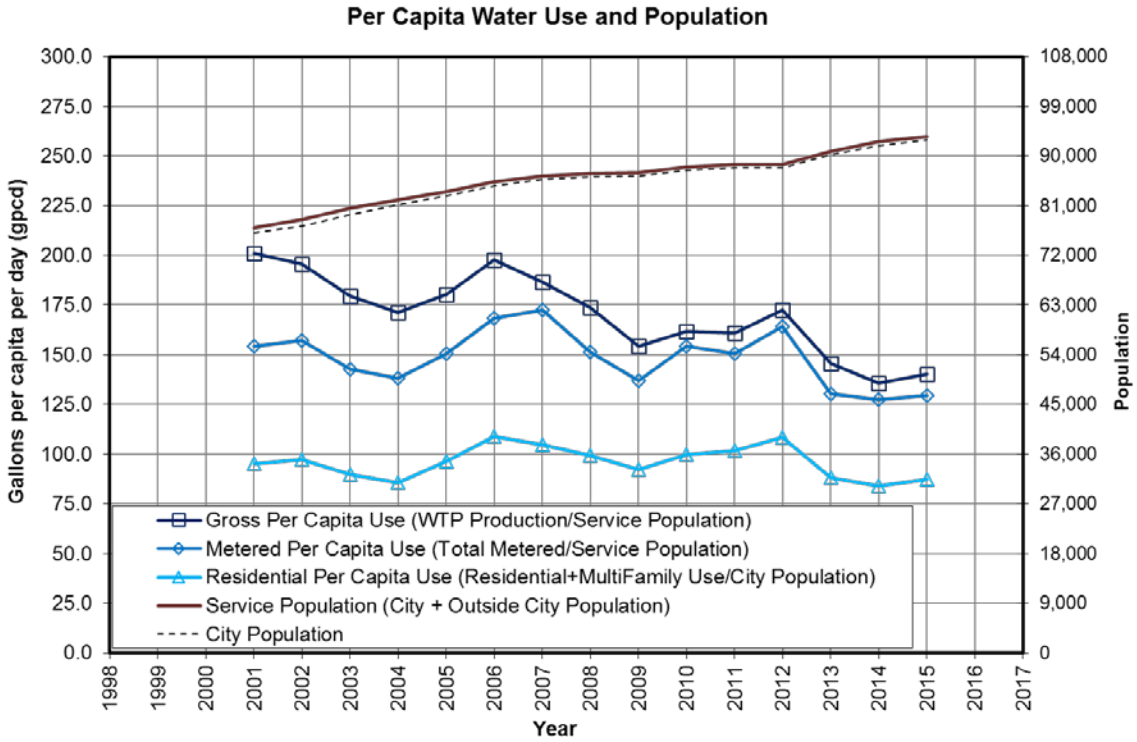
Figure 3-4. Per Capita Water Use and Population



Since 2008, when the City's previous water conservation plan was adopted, the average residential per capita water use from 2009 to 2015 was 95 gpcd. For the same time period the gross per capita water use was 153 gpcd. The reduction in gross per capita usage and production may be attributed to a variety of factors including, but not limited to, better accounting of water use, reduction in water loss, media attention on drought conditions, and increased water conservation practices. Residential water accounts were not fully metered until the end of 2006, and since that time the additional data have allowed for refinement of the estimated unit demand rates used for planning purposes and quantification of the volume of water losses. The trends in per capita use in Longmont suggest that long-term water efficiency measures have contributed to the decrease in per capita use, as anticipated. The City will continue to monitor these trends in the future to ensure efficiency gains planned into the future are realized.

### 3.2.3 Non-Revenue Water

Non-revenue water includes water that is entering the distribution system but not generating revenues for the City. In this plan non-revenue water is separated into three main categories:

1. **Authorized unbilled metered consumption**—such as City billing classification and plant water at WGWTP
2. **Authorized unbilled unmetered consumption**—such as firefighting, fire training, inspection and pressure testing, parks and forestry watering, sanitary sewer jetting, hydrant flushing, storm sewer jetting, street sweeping, and tank cleaning
3. **Water loss**
   - **Apparent losses**—unauthorized uses, metering inaccuracies, and data handling errors
   - **Real losses**—main and service line leakage, and overflows

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In order to more accurately characterize water demand, following the nomenclature shown earlier in **Figure 3-2**, estimates were made to quantify both the unbilled authorized water use and the apparent and real water losses from the system. The unbilled authorized use was developed looking at unbilled metered and unbilled unmetered authorized use. For 2015 the City provided estimates of the total annual volume of these unbilled authorized water uses, presented in **Table 3-6**. The estimated amount of unbilled unmetered water in **Table 3-6** is consistent with estimates in the City's 2012 Water Demand Evaluation, which estimated these uses at approximately 1 percent of the WTP production.

Table 3-6. Unbilled Authorized Water Consumption Estimate for 2015 (Treated Water Only)

| Unbilled Authorized Consumption Category | Estimated Volume (acre-feet) | Notes |
|---|---|---|
| Unbilled Metered | 0.3 | Plant water at WGWTP (NFWTP plant water is accounted for prior to treated water production value), excludes the City billing classification that is tracked separately |
| Unbilled Unmetered | 147 | Firefighting, fire training, inspection and pressure testing, parks and forestry watering, sanitary sewer jetting, hydrant flushing, storm sewer jetting, street sweeping, and tank cleaning |
| **Total** | **147.3** | Non-revenue categories not accounted for in this estimate include unknown data handling errors, meter inaccuracies, and leakage. |

For 2015, the total estimated unbilled authorized water use was 147.3 acre-feet (48.1 MG).

Treated water not accounted for by billed authorized use (metered use), shown earlier in **Table 3-3**, and unbilled authorized use shown in **Table 3-6**, is considered water loss, either real or apparent. Essentially, water loss represents the difference between total treated water production entering the distribution system and the authorized consumption. **Table 3-7** provides a summary of metered use, unbilled authorized use, treated water production, and estimated water loss for 2015.

Table 3-7. Annual Water Loss Estimate (2015)[a]

| Parameter | (acre-feet and [MG]) | Comments |
|---|---|---|
| Customer Metered Use | 13,797 [4,496] | Total metered use of customer categories including the Town of Lyons and City |
| Hydrant Meter Program | 30 [9.7] | Hydrant meters are not included in customer billing system |
| Other Unbilled Authorized Use | 147 [48] | Unbilled metered and (estimated) unmetered |
| Total Authorized Use | 13,976 [4,554] | |
| Treated Water Production | 14,973 [4,879] | Water production leaving the water treatment plants |
| Approximate Water Loss | 101 [33] | Water Loss = Treated Water Production – Billed Authorized Use – Unbilled Authorized Use |
| %Treated Water Loss | 7 | % Water Loss = Water Loss/Treated Water Production |

[a] Water loss estimate provided by City based on refined data gathering for meters and authorized uses.

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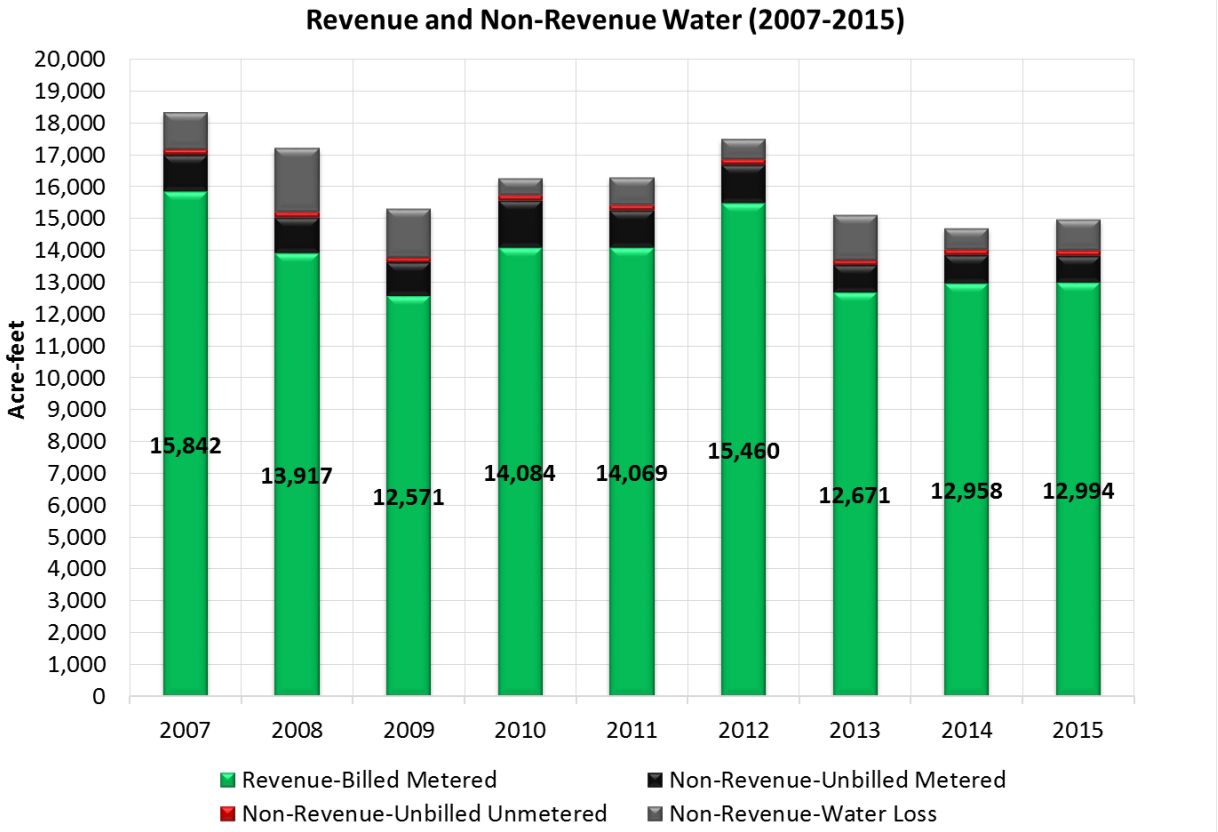
The IWA/AWWA Water Balance Method also has a formula to estimate the theoretical low limit of leakage that could potentially be obtained if all available best technologies were successfully applied. The theoretical estimate is based on the miles of water mains, number of service connections, average pressure in the system, and the distance of private water lines (to the curb stop). Based on rough assumptions for the distance of private water lines and an average system pressure of 70 pounds per square inch (psi), the theoretical low limit of annual water loss for the City would be 196 MG per year. Total water treatment plant production for 2015 was 4,879 MG (14,973 acre-feet). The theoretical low limit of water loss from the system is approximately 4 percent. This low limit number does not represent a realistic goal, but gives a theoretical reference point for the quantity of additional water savings that may be realized with an improved leak detection and repair program.

A summary of revenue and non-revenue water is provided in **Figure 3-5**.

Figure 3-5. Revenue and Non-Revenue Water (2007–2015)

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For 2015, the estimated water loss from the City's potable water system was approximately 7 percent and the overall non-revenue water was at approximately 15 percent. These rates of water loss are relatively low compared to utilities across North America. A survey by the AWWA of 662 North American public water systems showed an average water loss of 12 percent (Billings). Water losses can vary tremendously with age of the system usually being the most significant factor. The City monitors water loss and non-revenue water annually to identify changes that may require additional evaluation or pipeline repair.

## 3.3 Water Billing and Rate Structure

The City recently completed an update to its water rates; the update includes monthly meter reads, monthly billing, a monthly service charge (based on meter size), and charges based on the metered volume for residential, multifamily, small commercial, large commercial, and irrigation users. Longmont measures usage in gallons and thousands of gallons, considered a best practice per *AWWA G480 Conservation Program Operation and Management Standard* (2013).

The volume charge for residential users (single family and duplexes) is based on a four-tier increasing block rate structure, so the cost per unit of water increases with increasing usage. The volume charge for all other users is based on a uniform rate per 1,000 gallons. The City's volume-based water rate structure, effective January 1, 2017, is summarized in **Table 3-8**.

Table 3-8. City of Longmont Current Water Volume Rates (effective January 1, 2017)

| | Inside City Limits | Outside City Limits |
|---|---|---|
| ***Residential Volume Rate*** | | |
| 0 to 5,000 gallons | $2.58 | $3.87 |
| 5,001 to 15,001 gallons | $3.69 | $5.54 |
| 15,001 to 35,000 gallons | $4.70 | $7.05 |
| All over 35,000 | $6.53 | $9.80 |
| **Multifamily Volume Rate** per 1,000 gallons | $3.03 | $4.55 |
| **Small Commercial, Mixed Use and Airport Volume Rate** per 1,000 gallons | $3.20 | $4.80 |
| **Irrigation Volume Rate** per 1,000 gallons | $4.11 | $6.17 |

The City evaluates fixed services charges and volume rates on a regular basis, and has adopted an annual service charge and rate increase plan through 2019. More information is available on the City's website at longmontcolorado.gov/utilities. For example, a typical residential customer will see their water bill increase by approximately $2.50 from 2016 to 2017. Rate increases for multifamily, small commercial, and irrigation are similar.

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# Current and Future Water Efficiency Efforts

The City's first Water Conservation Master Plan in 1996 initiated a number of water conservation best management practices (BMPs) that helped the City prolong the adequacy of its existing water resources, and as appropriate, defer capital construction of new treatment plants, reservoirs, and related facilities. The City chose the primary emphasis of its BMPs to be education and effective communications rather than regulation. The underlying belief, which continues today, is that if Longmont's citizens understand the economics, methods, and positive effects of water efficiency, they will make informed decisions.

Since 1996, the City has expanded its water efficiency measures and programs, beyond those first BMPs identified. An update to the Water Conservation Master Plan was completed in 2008 and an in-depth evaluation of the effectiveness of efficiency programs was completed in January 2013 (*Water Conservation Program Evaluation*). The current water efficiency programs implemented by the City closely follow the recommended measures and programs from the 2013 *Water Conservation Program Evaluation*. **Table 4-1** lists water efficiency measures and programs the City currently offers and indicates the approximate year it started and program element status.

Table 4-1. City of Longmont Water Efficiency Program Summary

| Program | Year Started | Residential | Commercial | City | Notes/Status |
|---|---|---|---|---|---|
| ***Indoor Water Efficiency Programs*** | | | | | |
| Toilet Rebates (Dual Flush and Low Volume) | 2003 | X | X | | Ongoing |
| Dishwasher Rebates | 2006 | X | | | Ongoing |
| Clothes Washer Rebates | 2003 | X | | | Offered through 2016 |
| Low Flow Bathroom Fixtures | 2007 | | | X | Completed for City facilities |
| Pre-Rinse Nozzle Conversion | 2005 | | X | | Coordinated with Partners for A Clean Environment (PACE); 35 restaurants in 2009-2010. Coordinated with CRC; 25 restaurants in 2015-2016. |
| Indoor Audits | 2011 | X | X | | Residential: Coordinated with Center for ReSource Conservation (CRC) pilot program 2010<br>Commercial: Coordinated with PACE |
| ***Outdoor Water Efficiency Programs*** | | | | | |
| Irrigation Audits | 2005 | X | X | X | Ongoing |
| Garden in a Box | 2005 | X | | | Ongoing |
| Rain Sensor Rebates | 2009 | X | X | X | Ongoing |
| Evapotranspiration (Smart Controller) Rebates | - | | | | Planned but not yet rolled out |

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Table 4-1. City of Longmont Water Efficiency Program Summary

| Program | Year Started | Residential | Commercial | City | Notes/Status |
|---|---|---|---|---|---|
| Conversion to Raw Water Irrigation | 1988 | | | X | Project MUW-173, $674,000 budgeted for 2012-2016 |
| ***Metering and Water Loss Prevention*** | | | | | |
| Automated Meter Reading (AMR) | 1999 | X | X | | Currently being converted from analog to digital with radio frequency (RF) capability. Approximately one-third of units have been converted as of 2016. |
| Water Loss Prevention | - | X | X | X | Annual CIP and operation budget to improve distribution system |
| ***Education and Outreach*** | | | | | |
| Children's Water Fair with Education Kits | 1998 | X | | | Last held May 2015 |
| Public Outreach | 1993 | X | X | | Ongoing |
| Local Paper Advertising | 1993 | X | X | | Ongoing |
| City Newsletter | 1993 | X | X | | Annually |
| Training Workshops | 2000 | X | | | Annually |
| ***Ordinances and Enforcement*** | | | | | |
| Watering Restrictions | - | X | X | X | In Code of Ordinances - Chapter 14.04.450 |
| Water Wasting | - | X | X | X | In Code of Ordinances - Chapter 14.04.490 |
| Plumbing fixtures | - | X | X | X | In Code of Ordinances - Chapter 14.04.500 |
| Landscape and open space regulations | 2007 | X | X | X | In Code of Ordinances - Chapter 15.05.040 Section H |
| Soil amendments | - | X | X | | Design Standards Section 602 |
| Irrigation | - | X | X | | Design Standards Section 603 |

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This section summarizes the City's current water efficiency measures and programs under the following categories: indoor programs, outdoor programs, metering, education and outreach, and ordinances and enforcement.

# 4.1 Indoor Water Efficiency Programs

## 4.1.1 Residential

The City currently offers rebates to residential customers as follows according to the 2008 Water Conservation Plan:

- **Toilets**: Dual flush ($100) and low volume toilet ($50) rebates

- **High efficiency dishwashers**: $25 rebate

Participation in the rebate programs is steady, but the return on investment for the City diminishes each year as non-efficient appliances become obsolete and new appliances alternatives are predominately higher efficiency.

The high efficiency clothes washer rebate offer ended in 2016. This decision is warranted because national codes and standards have reduced the water and energy use of nearly all washers in the market today. The City is also evaluating better targeting of the toilet rebate program to achieve higher savings. Longmont will reallocate some of the budget previously set aside for these rebates and re-distribute these funds to outdoor programs such as water audits, Garden In A Box, and evapotranspiration (ET) smart controllers.

A pilot program of residential indoor audits was completed in 2010, coordinated with the CRC. There was low interest in the indoor audits; the City is trying to increase participation and interest by having Slow the Flow offer an indoor audit while onsite for the outdoor water audit. Outreach and education to residents on water efficiency may be combined with the City's Sustainability Plan communications strategy based on two-way communication with neighborhood groups and community organizations.

### 4.1.2 Commercial

Commercial development typically lags behind residential development in the City, which provides an opportunity to implement water efficient practices with new commercial development. The City has continued to develop indoor water efficiency techniques for small commercial and industrial businesses. Moving forward, it will be valuable for the City to help commercial customers identify potential water savings measures that can be implemented to improve the efficiency of their processes and water applications. Outreach and efforts to engage commercial customers in water efficiency programs may be combined with the economic vitality (EV) strategies in the City's Sustainability Plan. Strategy EV-2 is to create a Longmont sustainable business recognition program, which would build upon PACE programs to recognize sustainable business practices.

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The City continues to work with PACE and CRC to expand these programs. In 2015 and 2016, with coordination with CRC, the City replaced old dishwashing pre-rinse nozzles with water efficient nozzles in 28 restaurants throughout the City.

## 4.2 Outdoor Water Efficiency Programs

### 4.2.1 Residential Audits and Garden In A Box

The City offers the following outdoor programs aimed at residential customers:

- Irrigation audits with the CRC
- Garden In A Box with CRC
- Xeriscape Garden Seminars with CRC (the City is hosting two in Longmont in 2017)

For several years the City has sponsored free irrigation audits to customers in cooperation with the CRC. The audits are free to customers and information is provided in the City's monthly newsletter sent with utility bills (City Line) and on the City's website. Participation in outdoor irrigation audits remains steady. CRC incorporates education on water efficient practices during each audit. Also in cooperation with the CRC, the City offers affordable Garden In A Box packages that include several planting plan options with various plants and information on maintaining the plants. Participation in the Garden In A Box program has been high and the City is responding to the demand by increasing budget for this program if available.

ET controllers (smart controllers), or rebates on this equipment, for irrigation systems have been offered by the City in the past; the City plans to continue this as part of the plan to increase the focus on outdoor water efficiency.

### 4.2.2 Commercial and Homeowner Associations

The City offers irrigation audits through CRC to its commercial and HOAs. Since 2015, there has been an increasing demand for this program from HOAs. As new commercial development continues it will be important for the City to have adequate resources to continue the outdoor irrigation audit program for commercial and HOA customers; therefore, the City is planning to increase the budget for these programs. Commercial development will likely continue beyond when residential build-out occurs so the outdoor program for commercial customers should continue.

### 4.2.3 City's Use of Raw Water for Irrigation

Much of the City's water usage is for irrigation of parks, schools, greenways, arterials, and other public spaces. The City has an extensive network of canals and irrigation ditches that convey raw water to City facilities for irrigation. Currently, raw water is available to irrigate approximately 27 City and community parks, 2 golf courses, and 18 schools, representing 56 percent of parks, 66 percent of golf courses, and 60 percent of schools; totaling approximately 2,036 acres. The site of the City's main recreation facility is also irrigated with raw water. Availability of raw water for irrigation decreases demand for treated water from the treatment plant and conserves energy and chemicals required for treatment. The use of irrigation water also increases flows in the St. Vrain creek, below the Water Treatment Point of Diversion, which is viewed favorably for the environment.

To improve raw water tracking and meet State Engineer requirements, the City installed flow monitoring stations on raw water intake points from natural streams that previously did not have monitoring.

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The City continues to maximize its use of raw water for irrigation instead of treated water. The City is proceeding with a design to convert parks, greenways and schools along spring Gulch #2, south of 17th Avenue, to raw water irrigation. A study is also planned to evaluate the capacity of the existing raw water system to irrigate additional ball fields at Sandstone Ranch Community Park.

In addition, on City open space properties, with conversion of irrigation from treated water to raw water, the City is also evaluating opportunities to convert raw water irrigation from flood irrigation to center-pivot irrigation which uses less water. City open space properties are leased to tenant farmers and use raw water for irrigation. This program has started and the City plans to continue its implementation on a case by case basis.

## 4.3 Metering and Water Loss Prevention

### 4.3.1 Automated Meter Reading (AMR)

Accurate and efficient water use metering has been a priority of the City's for many years. The City's treated water system is fully metered, aside from the few authorized uses listed earlier in **Table 3-5**. The City has taken steps to improve registering water use with AMR systems and meters with leak detection capabilities for high volume users. Meter connections greater than 3 inches are equipped with leak detection capability and are tested biannually.

Water meters throughout the City are currently being converted from analog to digital with RF capability. Approximately one-third of units have been converted as of 2016. Fixed base data collectors will be constructed that can read the RF signal, which will enable the utility to improve management of meter reading, reduce field labor, and increase options for tracking water use. The City's CIP has $475,000 budgeted over the next 5 years (through 2021) to complete this conversion.

### 4.3.2 Water Loss Prevention

Programs to reduce water loss and water main breaks are part of the City's annual operating plan. The City has several annual maintenance programs to continually repair the distribution system and decrease leakage and water main breaks. The City's annual operating budget for water distribution maintenance projects for the past 5 years is summarized in **Table 4-2**.

Table 4-2. Water Distribution Line Repair/Maintenance Operating Budget Summary (2012–2017)

| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|
| Line Repair/Maintenance | $210,000 | $215,000 | $220,000 | $220,000 | $220,000 | $220,000 |
| Hydrant Repair/Maintenance | $3,000 | $4,000 | $4,000 | $4,000 | $4,000 | $4,000 |
| Meter Repair/Maintenance | $12,000 | $12,000 | $12,000 | $12,000 | $12,000 | $12,000 |
| **Total Repair/Maintenance** | **$225,000** | **$231,000** | **$236,000** | **$236,000** | **$236,000** | **$236,000** |

In addition to the annual operating budget for water line repair and maintenance, the City's CIP has an annual budget to address water distribution system improvements. The budget is typically used for large capital projects to improve areas that are currently being serviced by aging infrastructure that have frequent breaks or leaks. The 2017–2021 CIP has $5,510,740 budgeted for these types of repair projects to improve maintenance access, reduce water line leaks and breaks, and improve water delivery.

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### 4.3.3 Metering Raw Water

The City is in the process of installing flow monitoring systems on raw water irrigation intake points to improve raw water accounted. The City had completed this flow monitoring effort, but is now also being required by the Colorado Division of Water Resources, also known as the Office of the State Engineer to monitor irrigation flows.

## 4.4 Ordinances and Standards

Several practices supporting efficient water use and responsible building practices have been implemented into City ordinances and design standards. A summary of applicable ordinances and design standards that support efficient water use is provided in **Table 4-3**.

Table 4-3. Summary of Ordinances and Design Standards that Support Efficient Water Use

| Ordinance or Standard | Description | Summary |
|---|---|---|
| Code of Ordinances – Chapter 14.04 Water Utility and Wells | 14.04.450 Watering restrictions | Provides director of public works and natural resources authority to implement watering restrictions if necessary |
| Code of Ordinances – Chapter 14.04 Water Utility and Wells | 14.04.490 Waste of water prohibited | Customers shall not cause or permit water "to run to waste in any gutter or other impervious surface, or other application". |
| Code of Ordinances – Chapter 14.04 Water Utility and Wells | 14.04.500 Plumbing fixture standards established | Requires developers to install fixtures that meet certain water use criteria for urinals, toilets, faucets and showerheads |

| | | |
|---|---|---|
| Code of Ordinances - Chapter 15.05 Development Standards | 15.05.040 Section H Landscape and open space regulations | Requires developer to utilize xeric practices in the design, installation and maintenance of landscaping and irrigation systems in private common open spaces areas in residential developments |
| Design Standards and Construction Specifications | Section 602 Grading and Find Grading | Requires a soil amendment of three cubic yards per 1,000 feet, tilled to a depth of six inches, to obtain a Certificate of Occupancy |
| Design Standards and Construction Specifications | Section 603 Irrigation | Requires developer to utilize xeric practices in the design, installation and maintenance of landscaping and irrigation systems in common open spaces areas in residential developments and City property |

The City now contracts with a landscape development contractor to confirm there is compliance with Section 15.05.040 to utilize xeric practices. In 2017 the City is planning to update the Design Standards and Construction Specifications to incorporate sustainability and efficient water use practices.

# 4.5 Water Reuse

The City has a water rights portfolio that allows for reuse of certain water rights transfers of consumptive uses and Windy Gap water. Currently, the City uses downstream exchanges of its treated wastewater effluent return flows to allow for increased surface water diversions at its water treatment plant and other raw water supply ditches. In the future, the City will evaluate other options to capture and reuse treated wastewater effluent return flows using Union Reservoir and the existing network of canals and ditches that cross the City. Given the complexity of the water rights, the potential reuse scenarios and variability due to climate change, the evaluation of reuse options is periodically reviewed.

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# 4.6 Education and Outreach

## 4.6.1 Education and Outreach

Educational programs have long been the hallmark of local water efficiency programs in Colorado; however, this trend is changing as more programs are being identified for municipalities to effectively reduce customer water demand at a reasonable cost and/or for municipalities to more efficiently distribute and bill for water. It is important to maintain a public outreach program promoting the work that the water utility performs for the City's citizens. However, a public relations program does not necessarily promote wise water use and water use efficiency. To this point, it is important to identify those educational programs that link to and complement the water efficiency programs that the City chooses to implement. The City's network of public water efficiency resources continues to evolve, and includes several different lines of communication to share information. Education and outreach is focused on the following:

- Water efficiency program messaging through the City's Water Matters brand (image below)
- Information printed periodically in *City Line* (the City's monthly newsletter that is sent with each customer's utility bill)
- Information accessible on the City's website (City Line newsletter, water efficiency tips, rebate program information, etc.)
- Hosting seminars by Center for ReSource Conservation on Xeriscape Gardens, etc.

Outreach and efforts to engage commercial customers in water efficiency seminars may be combined with the strategies in the City's Sustainability Plan.

### 4.6.2 City as an Example

In order to encourage changes in water use behavior and demonstrate its commitment to water conservation, the City has replaced toilets in its offices, public buildings, and recreation facilities with water efficient fixtures. The Public Works and Natural Resources building also has dual flush toilets in its facility. The City continues to identify opportunities to improve water efficiency of its own facilities where feasible.

## 4.7 Existing Program Effectiveness

The effectiveness of water efficiency programs may be difficult to quantify due to other factors that influence water use such as variable weather, changes in customer behavior, and organic replacement of old fixtures with more efficient fixtures. Historical water treatment plant production, gross per capita, and residential per capita water use from 1996 to 2015 are shown in **Figure 4-1**. However, using the metric of gross per capita water use, the total treated water production divided by total service population, a general decrease in water use per capita is observed from 1996 to 2015.

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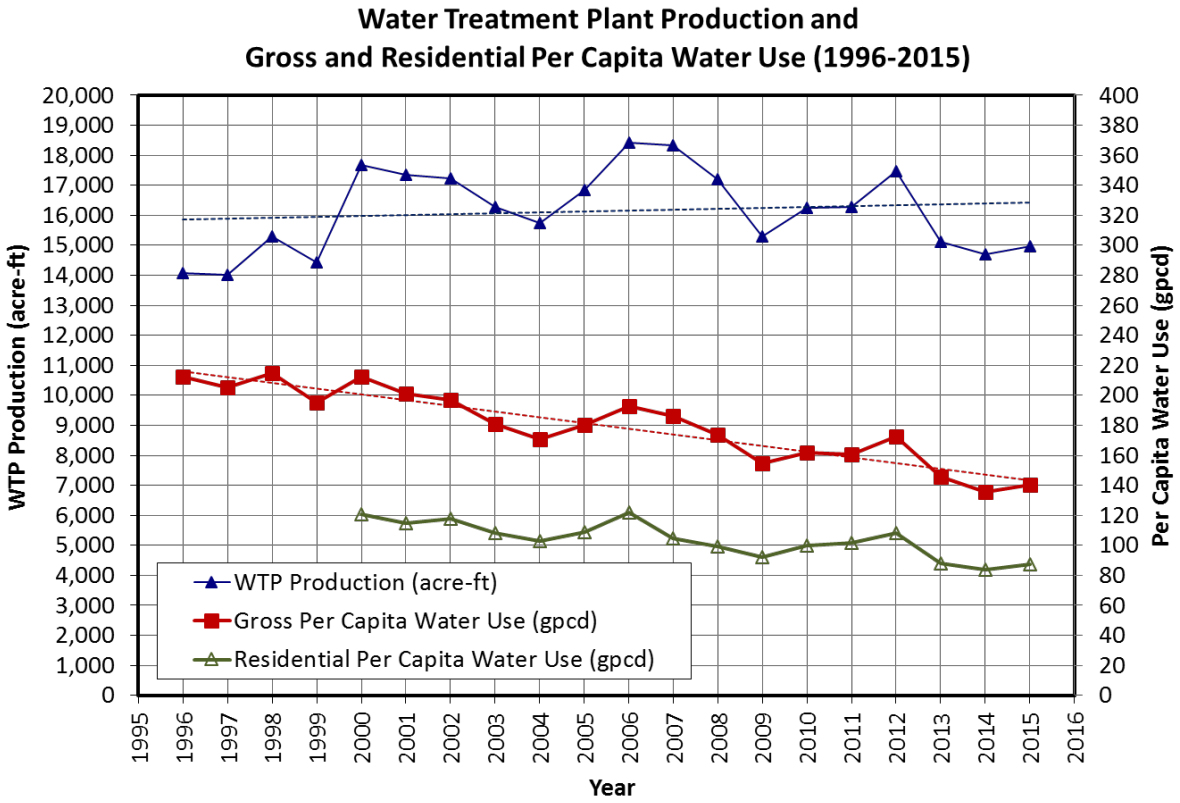
Figure 4-1. Per Capital Water Use and Total Service Population

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The general decline in gross per capita water use after 1996 is likely due to a number of reasons, and increased customer-side efficiency is an important part of the story. The City's first water conservation planning effort started in 1996, and efforts have only increased since that time at the local, state, and national levels. The impact of increased customer education and various municipal retrofit projects likely assisted in the reduction of overall per capita water use in the late 1990s. However, it wasn't until the year 2000 when the City implemented inclining block water rates, and 2006 when the system was fully metered that per capita water use began to steadily drop. Average gross per capita water use from 1997 to 2000 was about 210 gpcd. After the system was fully metered, coupled with the drought of 2002 and subsequent customer response, the gross per capita water use from 2006 to 2008 averaged 186 gpcd. More recently, the gross per capita water use from 2013 to 2015 averaged 141 gpcd. One reason for the decrease in gross per capita water use is that residential development is ahead of small commercial and industrial development. As small commercial and industrial development catches up with residential buildout, overall water use may increase and the gross per capita metric may level off and not continue to decrease.

However, residential per capita water use, also shown on **Figure 4-1,** has remained fairly steady since 2000. There appears to be a decrease from 2013 to 2015 compared to previous years, but the decrease in 2013 may be attributed to the September 2013 flood, with potentially lasting effects into subsequent years as residents were more aware of rainfall events and may have adjusted their irrigation practices more than in years prior to 2013.

In addition to tracking per capita metrics, the City also completed a *Water Conservation Program Evaluation* in 2013 to assess the effectiveness of the rebate, Garden In A Box, and irrigation audits water efficiency programs and recommended adjustments to these programs. The evaluation revealed the most successful programs include the City's rebate programs; however, other water demand reductions are occurring in the City, perhaps due to a combination of other City programs and organic changes in customer water use brought on by changing technology and behaviors. A summary of the water demand

reductions from the 2013 evaluation is provided in **Table 4-4** (this is the same as Table 14 in the 2013 *Water Conservation Program Evaluation*).

Table 4-4. Summary of Program Water Demand Reductions
*(From Table 14 in 2013 Water Conservation Program Evaluation)*

| Program | Number of Participants | Estimated Water Demand Reductions (Avg. acre-feet per year) |
|---|---|---|
| ***Rebate Programs*** | | |
| High Efficiency (HE) Clothes Washers | 2,250 | 39.8 |
| HE Dishwashers | 1,450 | 6.2 |
| ULV Toilets | 1,177 | 28.1 |
| DF Toilets | 414 | 5.0 |
| ***Promotional Programs*** | | |
| Garden in a Box | 325 | 0.3 |
| Slow the Flow Irrigation Audits | 546 | 4.6 |
| Total Water Savings from Programs | - | 84 |
| ***Estimated Overall Savings (Programs, Organic Fixture Replacement, and Customer Behavior)[2]:*** | | |
| Single Family Residential (Indoor) | 24,800 connections | 390 |
| All Customers (Indoor and Outdoor) | 87,850 population[1] | 2,400[2] |

[1] 2011 Population Estimate for the City of Longmont from the Department of Economic Development Planning Division.

[2] Based on the reduction in water use from the average gross per capita use from 2005-2007 compared to 2009-2011.

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The full 2013 *Water Conservation Program Evaluation* is available on the City's Water Conservation website for reference.

# 4.8 Recommended Water Efficiency Programs

Based on the information presented in Sections 4.1 to 4.6, the implementation of measures and programs planned through 2024 is summarized in **Table 4-5**. The estimated water savings for each efficiency program were developed using technical resources and engineering estimates and are summarized in **Table 4-6**. Actual water savings will be dependent upon numerous internal and external forces influencing customer water use. The City will periodically monitor the progress of its proposed water efficiency programs. Implementation of water efficiency programs each year is subject to available funds in the City's budget which is reviewed annually and may change to address higher priority projects.

In addition to the water efficiency programs it is recommended the City complete a water audit that follows the AWWA publication *M36 Water Audits and Loss Control Programs*. The City tracks water use according to similar method but the M36 method is a recommended best practice.

Table 4-5

**Recommended Water Efficiency Programs (for annual budget of approximately $150,000)**

| Program | Estimated Annual Qty. (2017) | Unit Cost[1] | Total Budget |
|---|---|---|---|
| **Indoor Programs** | | | |
| Low Volume (LV) Toilet Rebates | 75 | $50 | $3,750 |
| Dual Flush (DF) Toilet Rebates | 35 | $100 | $3,500 |
| Pre-Rinse Nozzle Conversion | 25 | $50 | $1,250 |
| **Outdoor Programs** | | | |
| Evapotranspriation (ET) Controller Rebates | 100 | $50 | $5,000 |
| MP Rotators (10 MP heads per unit) | 400 | $25 | $10,000 |
| Rain Sensor Rebate | 20 | $35 | $700 |
| Garden in a Box | 175 | $50 | $8,750 |
| **Water Audit Program** | | | |
| Residential - Irrigation Audits (Slow the Flow) | 150 | $75 | $11,250 |
| HOA - Irrigation Audits (Slow the Flow) | 15 | $650 | $9,750 |
| Commercial - Indoor | 15 | $1,200 | $18,000 |
| **Education & Outreach Program** | Rain | | |
| Education and Outreach | Lump sum | $20,000 | $20,000 |
| **Programs Subtotal** | - | - | **$91,950** |
| **Contract Services** | Rain | | |
| Contract Services (CRC, etc) | Lump sum | $30,610 | $30,610 |
| **Contract Servcies Subtotal** | - | - | **$30,610** |
| **Personnel Needs** | Hours | Cost/Hour[2] | Cost |
| Indoor Rebates | 100 | $38 | $3,800 |
| Outdoor Rebates | 40 | $38 | $1,520 |
| Outdoor Promotional Programs | 40 | $38 | $1,520 |
| Audits | 80 | $38 | $3,040 |
| Ordinances | 80 | $38 | $3,040 |
| Soil Amendment Enforcement | 140 | $38 | $5,320 |
| Water Waste Complaints | 80 | $29 | $2,320 |
| Education | 80 | $29 | $2,320 |
| Monitoring | 120 | $38 | $4,560 |
| **Personnel Subtotal** | 760 | - | **$27,440** |
| **Water Efficiency Program Total** | | | **$150,000** |

[1] Unit cost may represent base program fee plus unit cost (i.e. Garden in a Box has a base program fee and an additional cost for each garden supplied beyond the original contract amount).

[2] Professional full-time engineer (FTE) at $80,000 annually ($38/hour), average FTE at $60,000 annually ($29/hour), seasonal employee at $20,000 annually ($12/hour) including some time for support from an FTE.

Table 4-6

**Per Unit Savings (2017-2024)**

**Annual Savings Decay Rate = 0.05**

| | | Cumulative Water Savings (MG) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **2017** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** | **Comments/Source** |
| **Indoor Programs** | | | | | | | | | | |
| Low Volume (LV) Toilet Rebates | qty. | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | |
| *Unit Savings (gal/toilet)* | 8,000 | 0.60 | 1.17 | 1.74 | 2.31 | 2.88 | 3.46 | 4.03 | 4.60 | Based on WRF Residential End Uses of Water research |
| Dual Flush (DF) Toilet Rebates | qty. | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | |
| *Unit Savings (gal/toilet)* | 10,000 | 0.35 | 0.68 | 1.02 | 1.35 | 1.68 | 2.02 | 2.35 | 2.68 | Based on WRF Residential End Uses of Water research |
| Pre-Rinse Nozzle Conversion | qty. | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | |
| *Unit Savings (gal/nozzle)* | 14,000 | 0.35 | 0.68 | 1.02 | 1.35 | 1.68 | 2.02 | 2.35 | 2.68 | Based on City data, pre- vs. post- replacement flow |
| **Outdoor Programs** | | | | | | | | | | |
| ET Smart Controller Rebates | qty. | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| *Unit Savings (gal/controller/year)* | 10,000 | 1.00 | 1.95 | 2.90 | 3.85 | 4.81 | 5.76 | 6.71 | 7.66 | Average estimate based on smart controller research |
| MP Rotators (10 MP heads per unit) | qty. | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | |
| *Unit Savings (gal/day/nozzle)* | 1.6 | 0.11 | 0.22 | 0.33 | 0.44 | 0.54 | 0.65 | 0.76 | 0.87 | MWD Field Research (WSI 2016) |
| Rain Sensor Rebates | qty. | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | |
| *Unit Savings (gal/sensor/year)* | 15,000 | 0.30 | 0.59 | 0.87 | 1.16 | 1.44 | 1.73 | 2.01 | 2.30 | 3,000 gallons per rain shutdown x 5 rain events per season |
| Garden in a Box | qty. | 175 | 175 | 175 | 175 | 175 | 175 | 175 | 175 | |
| *Unit Savings (gal/box)* | 400 | 0.07 | 0.14 | 0.20 | 0.27 | 0.34 | 0.40 | 0.47 | 0.54 | Engineering estimate, WaterDM |
| **Water Audits** | | | | | | | | | | |
| Residential Irrigation Audits (Slow the Flow) | qty. | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | |
| *Unit Savings (gal/audit)* | 2,500 | 0.38 | 0.73 | 1.09 | 1.45 | 1.80 | 2.16 | 2.52 | 2.87 | Engineering estimate, WaterDM |
| HOA Irrigation Audits (Slow the Flow) | qty. | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | |
| *Unit Savings (gal/audit)* | 50,000 | 0.75 | 1.46 | 2.18 | 2.89 | 3.61 | 4.32 | 5.03 | 5.75 | Engineering estimate, WaterDM |
| Commercial - Indoor | qty. | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | |
| *Unit Savings (gal/audit)* | 100,000 | 1.50 | 2.93 | 4.35 | 5.78 | 7.21 | 8.64 | 10.07 | 11.50 | Engineering estimate, WaterDM |
| | | | | | | | | | | |
| **Annual Savings (MG)** | | 5.4 | 10.5 | 15.7 | 20.8 | 26.0 | 31.1 | 36.3 | 41.4 | |
| **Annual Savings (AF)** | | 16.6 | 32.4 | 48.2 | 64.0 | 79.8 | 95.6 | 111.4 | 127.2 | |
| **Cumulative Savings (MG)** | | 5.4 | 16.0 | 31.7 | 52.5 | 78.5 | 109.6 | 145.9 | 187.4 | |
| **Cumulative Savings (AF)** | | 16.6 | 49.0 | 97.1 | 161.1 | 240.9 | 336.5 | 447.9 | 575.1 | |
| **Cumulative Cost of Programs Only ($)** | | $91,950 | $183,900 | $275,850 | $367,800 | $459,750 | $551,700 | $643,650 | $735,600 | Excludes City personnel costs |
| **Cummulative Cost of Water Conservation** | | $150,000 | $300,000 | $450,000 | $600,000 | $750,000 | $900,000 | $1,050,000 | $1,200,000 | |

SECTION 5

# Demand Forecast and Efficiency Goals

## 5.1 Water Demand Forecast

Forecasting and estimating water demands are important parts of the master planning process. Water demand forecasts allow the City to prioritize and define capital project needs across a wide range of infrastructure areas: raw water storage and conveyance, drinking water treatment, drinking water distribution, wastewater collection, and wastewater treatment.

The City completed an extensive study of total water demand as part of the *Water Demand Evaluation*, which was accepted by the Longmont City Council in January 2012. The *Water Demand Evaluation* provided an updated forecast of total water demand, including both raw and treated water demands, for build-out of the LPA. The basis for the City's water demand forecast is based on unit demand rates for each of the land use classifications included within the LACP. Unit demand rates were developed based on a review of historic water records. The City's GIS, in combination with Microsoft Excel spreadsheets and pivot tables, were used to complete the evaluation. Considerable effort was completed by the City to thoroughly review and modify, as appropriate, the multiple data sets and GIS coverage to increase confidence in analysis results. The *Water Demand Evaluation* also included an adjustment to water demand for irrigation due to climate variability. Based on the procedures developed during the *Water Demand Evaluation,* the City will periodically evaluate and update the underlying assumptions that are input into the water demand forecast.

Following the 2012 *Water Demand Evaluation*, and based on its method, the City completed the ITWSMP in 2013, which focused on the treated water demand forecast. The ITWSMP evaluated data to determine peaking factors and estimated timeframe to build-out. The treated water demand forecast from the 2013 ITWSMP is presented here as the basis for the water demand forecast and the potential savings due to water efficiency programs moving forward.

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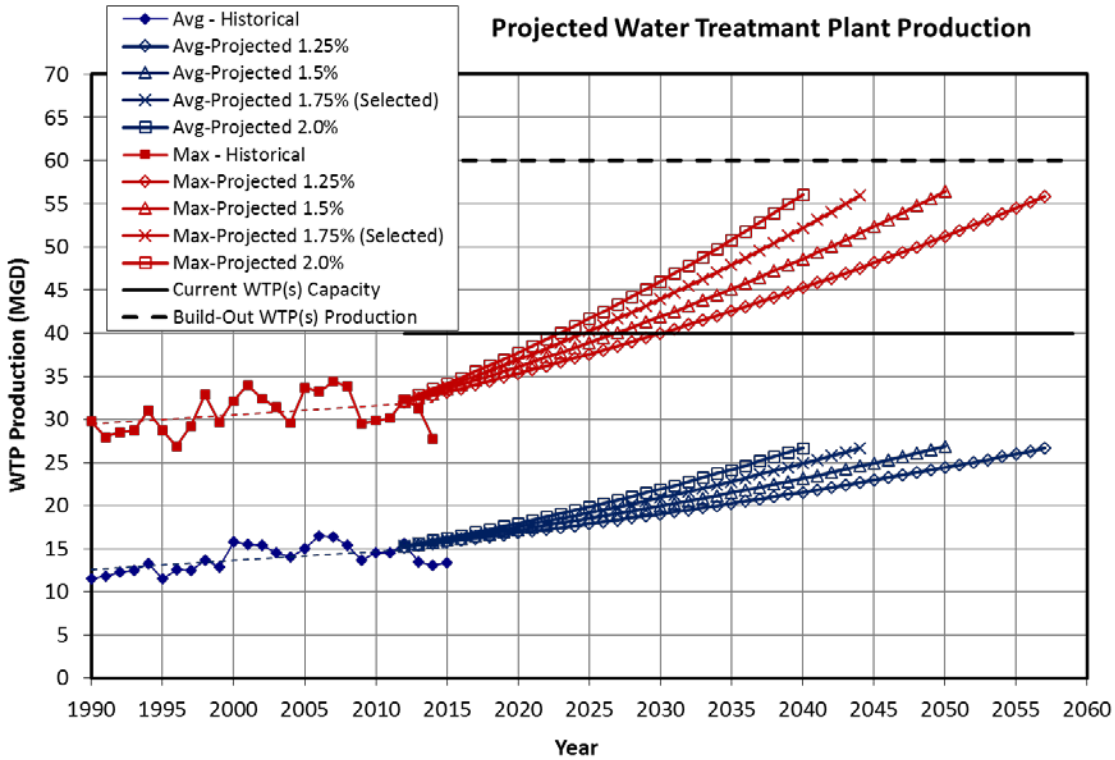
The treated water demand forecast through buildout and various growth rates is presented in **Figure 5-1**, which is the same forecast that was presented in the ITWSMP, with the addition of data points through 2015.

Figure 5-1. Treated Water Production Forecast (*from 2013 ITWSMP Figure 1-3*)




For purposes of this Plan, the water demand forecast will focus on the near-term forecast from 2017 to 2024 when these measures and programs will be implemented and only for the average forecast. The near-term annual average forecast, not accounting for additional water conservation, is presented in **Figure 5-2** and summarized in tabular format in **Table 5-1**.

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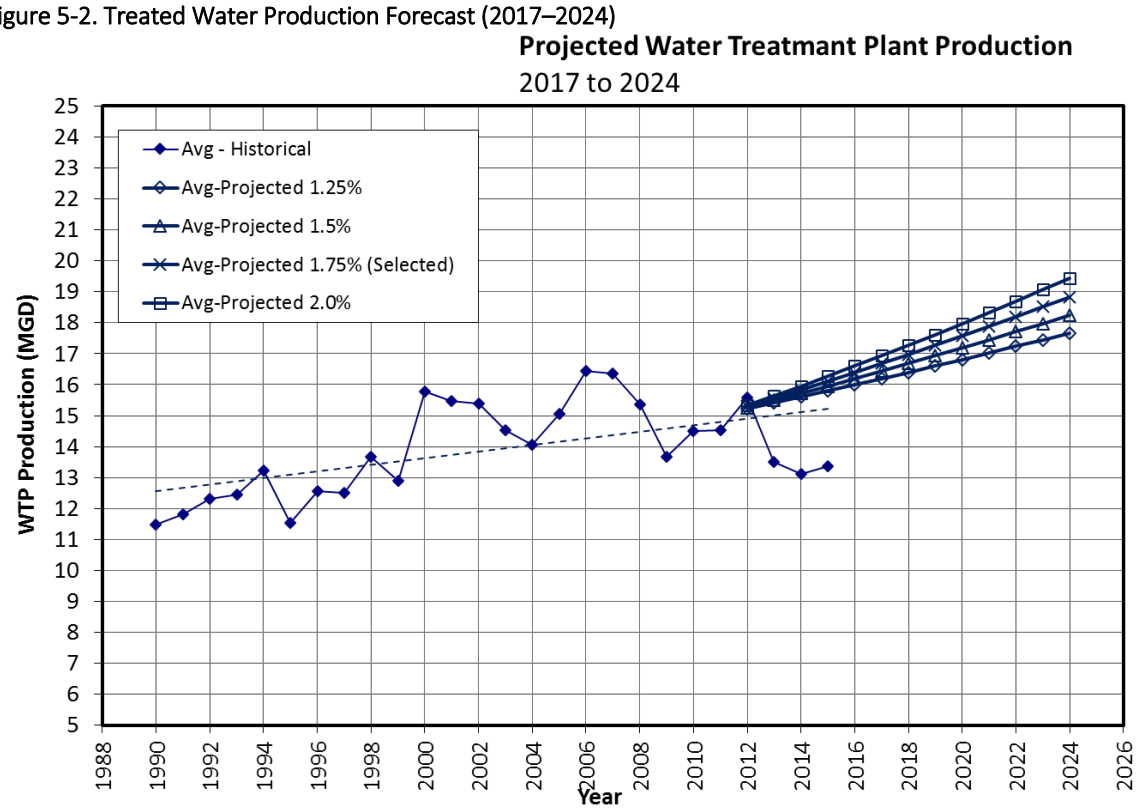
Figure 5-2. Treated Water Production Forecast (2017–2024)



The near-term annual average forecast, not accounting for additional water conservation, is summarized in tabular format in **Table 5-1**.

Table 5-1. Treated Water Demand Forecast (2017–2024)

| Units: acre-feet (mgd) | 1.25% Growth | 1.5% Growth | 1.75% Growth | 2.0% Growth |
|---|---|---|---|---|
| 2017 | 18,143 (16.2) | 18,413 (16.4) | 18,687 (16.7) | 18,964 (16.9) |
| 2018 | 18,369 (16.4) | 18,689(16.7) | 19,014 (16.9) | 19,343 (17.3) |
| 2019 | 18,599 (16.6) | 18,970 (16.9) | 19,347 (17.3) | 19,730 (17.6) |
| 2020 | 18,832 (16.8) | 19,254 (17.1) | 19,685 (17.5) | 20,125 (18.0) |
| 2021 | 19,067 (17.0) | 19,543 (17.5) | 20,030 (17.9) | 20,527 (18.3) |
| 2022 | 19,305 (17.2) | 19,836 (17.7) | 20,380 (18.2) | 20,938 (18.7) |
| 2023 | 19,547 (17.5) | 20,134 (18.0) | 20,737 (18.5) | 21,357 (19.1) |
| 2024 | 19,791 (17.7) | 20,436 (18.2) | 21,100 (18.8) | 21,784 (19.5) |

## 5.2 Efficiency Goals

The City has a diverse and flexible water supply portfolio. Because of past planning and securing needed water supply, the City does not have pressing infrastructure or raw water supply shortages that require immediate aggressive water efficiency activities. Therefore, the goals and objectives for future water efficiency measures and programs set by the City have been developed to help address future community sustainability and regional water supply reliability. The City has always been a good steward of the community, the region and the environment, and those policies that the City has established and implemented in the past will be further strengthened by additional, meaningful water efficiency.

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To this end, the City's goal is to reduce customer and City raw water demands by approximately 10 percent by buildout (assumed to be 2048), for an expected reduction of about 3,500 acre-feet (1,141 MG). This goal was originally established in the 2004 Raw Water Master Plan when the projected raw water demand at buildout was approximately 35,580 acre-feet (11,594 MG). This goal is consistent with the 2008 *Water Conservation Master Plan* and is consistent with the City's *Sustainability Plan* completed and adopted by City Council in November 2016.

Based on the 2013 Water Conservation Evaluation, the estimated annual treated water savings from measures and programs was approximately 2,400 acre-feet (782 MG). This estimate of savings is conservative as it does not account for additional raw water savings from efficient irrigation practices from educational outreach. Even in terms of treated water demand, the City is closing in on the goal to reduce demands by 3,500 acre-feet annually by buildout. This plan will focus on measures and programs for the next 10 years from 2017 to 2027 and would need to achieve additional annual savings of approximately 1,100 acre-feet (358 MG) to meet the City's goal.

## 5.3 Impacts of Proposed Water Efficiency on Forecast

The City is planning to implement water efficiency measures and programs, as discussed in Section 4, for purposes of reducing the amount of raw water used on an annual basis by the City's customers. A reduction of raw and treated water use will allow the City to extend its current water supplies further into the future without additional water supply development, maintain more flow in the St. Vrain Creek

as it passes through the City, and reduce energy and water treatment costs associated with the production of potable and non-potable water supplies.

The total estimated water savings that the City will realize through the implementation of proposed water efficiency efforts (shown earlier in **Table 4-5**) over the next 7 years are summarized in **Table 5-2**.

Table 5-2. Estimated Treated Water Conserved (2017–2024)

| Year | Annual Treated Water Conserved (acre-feet) | Cumulative Treated Water Conserved (acre-feet) |
|---|---|---|
| 2017 | 17 | 17 |
| 2018 | 32 | 49 |
| 2019 | 48 | 97 |
| 2020 | 64 | 161 |
| 2021 | 80 | 241 |
| 2022 | 96 | 337 |
| 2023 | 111 | 448 |
| 2024 | 127 | 575 |

The updated treated water forecast from 2017 to 2024 with the water efficiency programs accounted for is provided in **Figure 5-3**.

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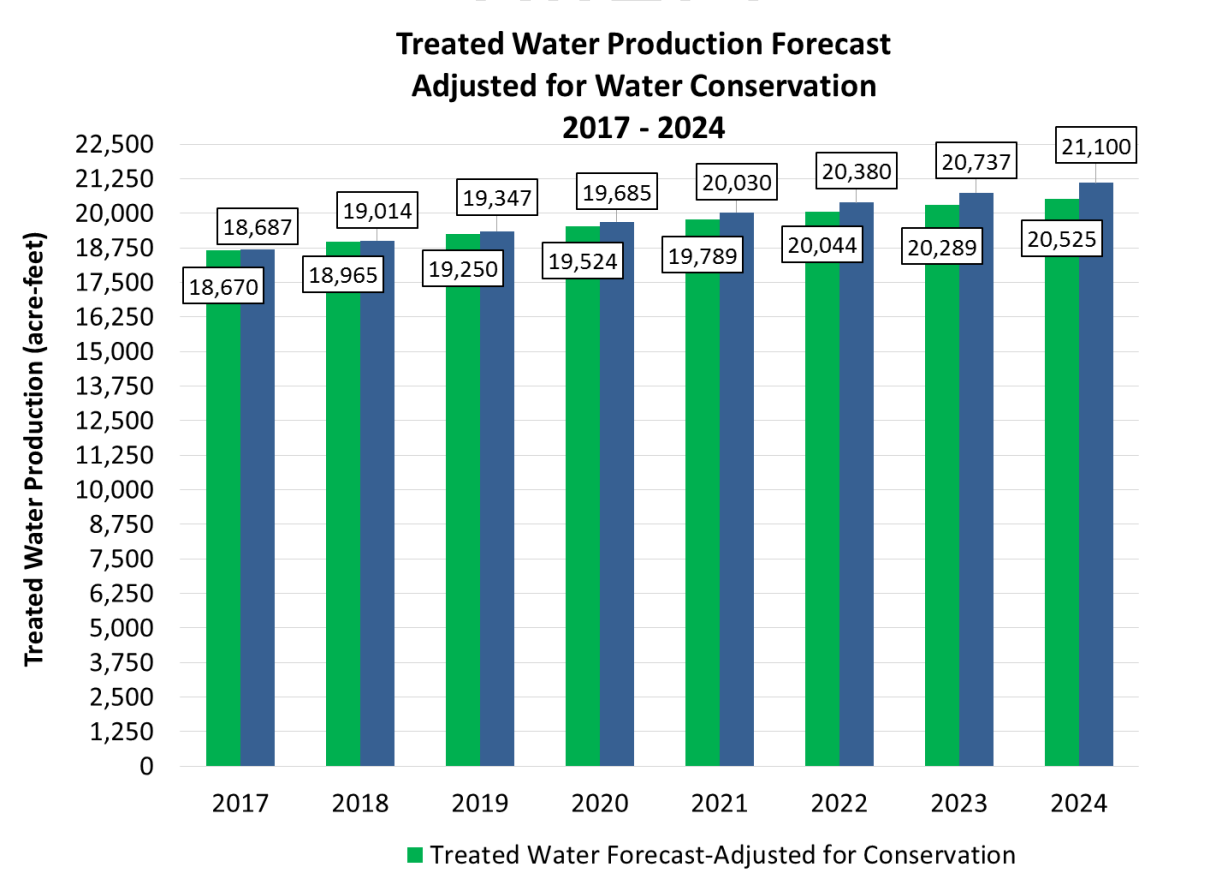
Figure 5-3. Treated Water Production Forecast with Conservation Programs (2017–2024)



The estimated cumulative savings from the selected water efficiency programs amount to approximately 575 acre-feet by 2024, which is just over half of the additional water savings the City needs (1,100 acre-feet) to achieve to meet the efficiency goal in Section 5.2. Continuation of the City's Water Efficiency Plan beyond 2024 will include the remaining savings.

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SECTION 6

# Plan Adoption and Implementation

The following section will discuss the process the City used to adopt the Plan, the estimated implementation schedule of selected measures and programs, and the plan for monitoring and updating the Plan.

*NOTE: THIS SECTION WILL BE COMPLETED AFTER THE PUBLIC INPUT PROCESS IS COMPLETE*

## 6.1 Public Input

Public participation and support of the efficiency plan is critical for plan implementation. The public information and input process for this plan is summarized in **Table 6-1**.

Table 6-1. Public Information Process During Plan Development

| Event | Date |
|---|---|
| Water Board Meeting – Open to Public | February 27, 2017<br>March 20, 2017 |
| Big Projects Open House | March 2, 2017 |
| Official Posting of Plan for Public Comment | TBD, 2017 |
| Public Notice in Daily Times Call | TBD, 2017 |
| City Council Review with Public Input Opportunity | TBD, 2017 |
| Water Board Meeting – Open to Public | March 20, 2017 |
| End Public Comment | TBD, 2017 |
| Adopted by City Council | TBD, 2017 |

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Documentation of the public input process, a copy of the public notice advertised, and a summary of the comments received during the public input process are included in **Attachment 1**.

The City also completed a public input process for the Sustainability Plan, which included three public workshops as well as online comments; the plan was adopted by City Council in December 2016. These public comments were also reviewed as part of preparing this Water Efficiency Plan. Several of the comments were focused on improving outdoor water efficiency and promoting water-efficient landscape options, which is consistent with the City's plan to focus on outdoor water efficiency programs.

This Water Efficiency Plan was officially adopted by City Council on TBD, 2017; a copy of the City Council adoption is provided in **Attachment 2**.

## 6.2 Monitoring and Plan Updates

Monitoring and verification of program effectiveness will be a continuous process conducted through a combination of tracking efforts to measure the value of various individual measures and programs being implemented by the City. The monitoring and verification metrics that the City proposes to initiate for each measure or program are presented in **Table 6-2**.

Table 6-2. Summary of Monitoring and Verification Activities for Tracking Water Savings

| | Tracking Method and Metric | | | | | |
|---|---|---|---|---|---|---|
| **Measures and/or Programs** | **Number of Audits and/or Rebates** | **Individual Customer Water Use** | **Customer Class Water Use** | **Per capita Water Use** | **Unaccounted for Water** | **Peak and Annual Treated Water Demand** |
| ***Indoor Programs*** | | | | | | |
| Rebates | X | X | X | X | | X |
| Audits | X | X | X | X | | X |
| ***Outdoor Programs*** | | | | | | |
| Irrigation Audits | X | X | X | X | | X |
| **Metering and Water Loss Prevention** | | | | | X | |
| **Ordinances and Standards** | | | | X | | |
| **Education and Outreach** | | X | X | X | X | X |

## 6.3 Water Efficiency Plan Cost and Funding

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The estimated annual cost to implement the recommended measures and programs and support the City's water efficiency efforts with staff is approximately $150,000 per year. The overall cost to implement this Plan is estimated to be approximately $1,200,000 from 2017 to 2024. The estimated annual water savings in 2024 is 575 acre-feet, which is a cost of approximately $2,300 per acre-foot of water conserved in 2024. For comparison, the future cost of a new water supply is currently estimated at $11,375 per acre-foot for a new water supply. For the City to obtain a similar amount of replacement water to meet this supply (i.e., 575 acre-feet), it would cost approximately $6.5 million.

Implementation of water efficiency programs each year is subject to available funds in the City's budget, which is reviewed annually and may change to address higher priority projects.

It is anticipated that the City will pursue implementation grants from the State over the next 7 years to supplement City funds. The grant requests will focus on providing audits, education, and rebates to the City's commercial and irrigation customers.

SECTION 7

# Compliance with State of Colorado Planning Requirements

Colorado Revised Statute § 37-60-126 requires a covered entity to develop, adopt, make publicly available, and implement a water conservation plan that will encourage its domestic, commercial, industrial, and public facility customers to use water more efficiently. Key compliance elements that must be considered in development of the plan are listed as follows:

1. Water-saving measures and programs, including: (I) water-efficient fixtures and appliances; (II) water-wise landscapes; (III) water-efficient industrial and commercial water-using processes; (IV) water reuse systems; (V) distribution system leak identification and repair; (VI) information and education; (VII) conservation oriented rate structure; (VIII) technical assistance; (IX) regulatory measures designed to encourage water conservation; and (X) incentives to implement water conservation techniques including rebates.
2. Role of conservation in the entity's supply planning.
3. Plan implementation, monitoring, review, and revision.
4. Future review of plan in 7 years.
5. Estimated savings from previous conservation efforts as well as estimates from implementation of current plan and new plan.
6. A 60-day minimum public comment period.

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The City of Longmont developed this Water Efficiency Plan to comply with C.R.S. § 37-60-126. Each element of compliance is summarized in **Table 7-1** and where it is discussed in the Plan.

Table 7-1. Water Efficiency Plan Compliance with State Statutes

| Compliance Element | Completed/Discussion | Location in Plan |
|---|---|---|
| 1. Name and contact information | Yes | Cover Letter |
| 2. Organizations and individuals assisting with plan development | Yes | Section 1.3 |
| 3. Quantified annual retail water delivery | Yes | Section 3.2 |
| 4. Identified population served by retail water delivery | Yes | Section 3.1 |
| 5. Public comment period | The Water Efficiency Plan approval process included the required 60-day comment period. The public participation process started TDB, through presentation of the draft plan to the Longmont Water Board. A 60-day comment period ending on TBD, followed and was concluded with the adoption of the plan by City Council on TBD. A total of TBD public comments were received. | Section 6.1 |

Table 7-1. Water Efficiency Plan Compliance with State Statutes

| Compliance Element | Completed/Discussion | Location in Plan |
|---|---|---|
| 6. Signature with authority to commit resources of the submitting entity | Yes | Cover Letter |
| 7. Water saving measures and programs | - | - |
| (I) water-efficient fixtures and appliances | The current program includes rebates for HE clothes washers, dishwashers, and toilets | Section 4.1 |
| (II) water-wise landscapes | The current program includes steady promotion of water efficiency landscaping with Garden In A Box and Slow the Flow Irrigation Audits. | Section 4.2 |
| (III) water-efficient industrial and commercial water-using processes | The current program includes partnering with PACE to promote water-efficient commercial fixtures. | Section 4.1 |
| (IV) water reuse systems | Effluent water from the wastewater plant is used to satisfy augmentation, return flow, and potable and non-potable demands (by exchange). | Section 4.5 |
| (V) distribution system leak identification and repair | The City implements industry best management practice approaches to water loss control. Longmont has a low rate of non-revenue water and water loss and has programs and procedures in place to ensure these remain low. | Section 4.3 |
| (VI) information and education | The current program includes various public information campaigns with bill stuffers and related informational materials, and Xeriscape education. | Section 4.6 |
| (VII) conservation oriented rate structure | Longmont bills customers monthly using a conservation-oriented increasing block rate structure. | Section 3.3 |
| (VIII) technical assistance | Longmont applied for and received a grant from the CWCB to complete this plan with the assistance of CH2M HILL Engineers, Inc. and WaterDM. | Cover Letter |
| (IX) regulatory measures designed to encourage water conservation | The current program includes: voluntary watering restrictions, efficient plumbing fixture ordinance, soil amendment ordinance, water wasting ordinance, and irrigation ordinances. | Section 4.4 |
| (X) incentives to implement water conservation techniques including rebates | A range of incentive and rebate programs are included in the rebates described above as well as free products. | Sections 4.1 and 4.2 |
| 8. Role of conservation in the entity's supply planning | Longmont has an annual expenditures of approximately $150,000 for conservation. The conservation program is well integrated into overall water supply planning and anticipated conservation savings are included in future demand projections. Water demand forecasts include the expected impacts of water conservation. | Section 5.1 |

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Table 7-1. Water Efficiency Plan Compliance with State Statutes

| Compliance Element | Completed/Discussion | Location in Plan |
|---|---|---|
| 9. Plan implementation, monitoring, review, and revision | Longmont has developed a plan implementation program along with monitoring mechanisms and scheduled review and revisions. | Section 6 |
| 10. Estimated savings from previous conservation efforts as well as estimates from implementation of current plan and new plan | The Longmont Water Conservation Program has accomplished significant demand reductions. The savings attributed to water efficiency rebate programs in 2013 was approximately 2,400 acre-feet. Longmont has established a goal of an additional 650 acre-feet through implementation of this Plan through 2024. | Section 4.7 and Section5.2 |

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# Attachment 1
# Summary of Public Comments (Future)

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# Attachment 2
# City Council Adoption of Water Efficiency Plan (Future)