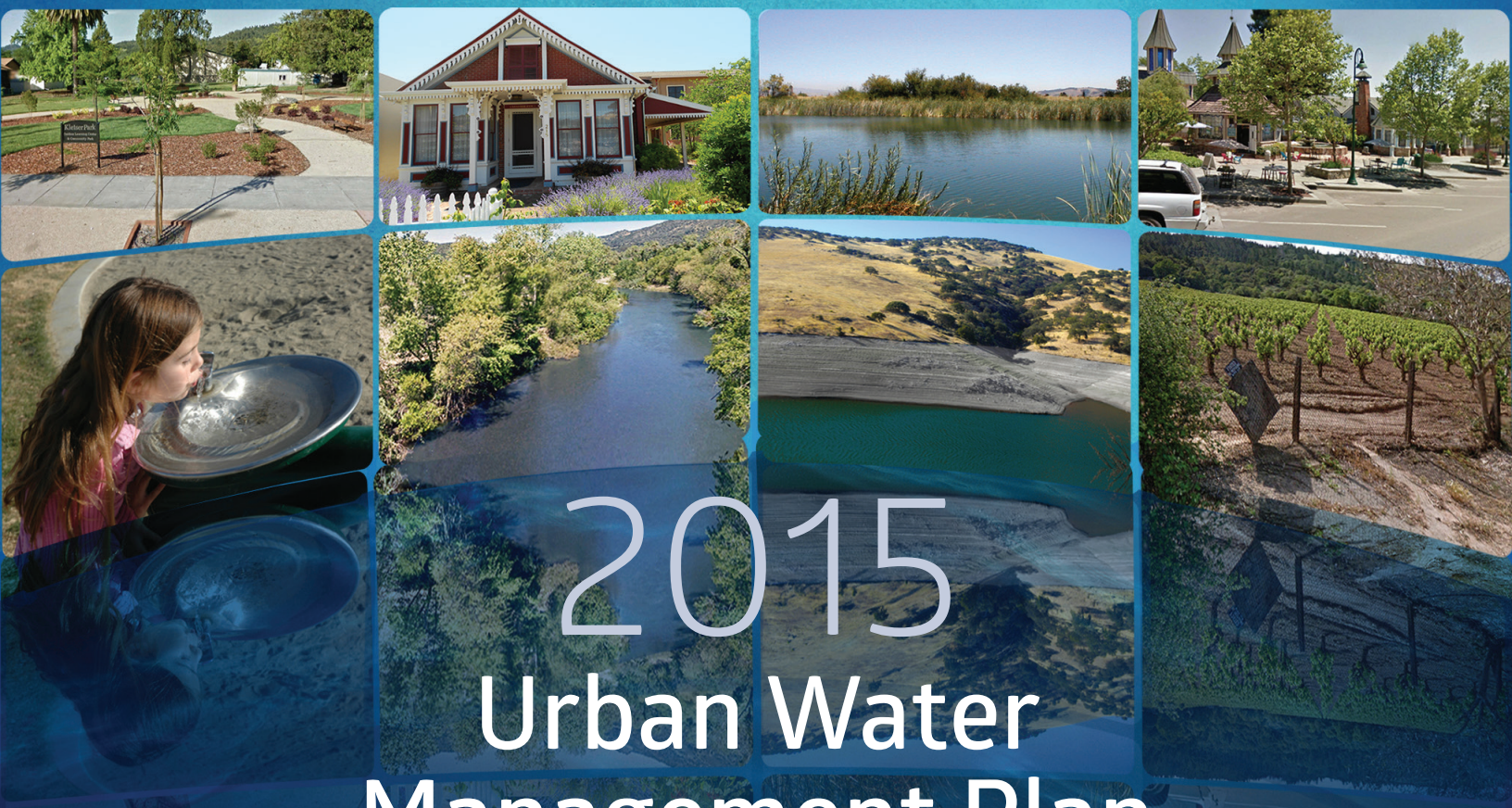
CITY OF
CLOVERDALE



2015 Urban Water Management Plan

June 2016

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water and environment

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City of Cloverdale 2015 Urban Water Management Plan

Final

Prepared by:

June 2016

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List of Acronyms and Abbreviations

AB	Assembly Bill
ABAG	Association of Bay Area Government
Act	Urban Water Management Act
AFY	Acre feet per year
AWWA	American Water Works Association
cfs	Cubic feet per second
City	City of Cloverdale (Water Utility)
CIMIS	California Irrigation Management Information System
County	Sonoma County
Delta	Sacramento-San Joaquin River Delta
DMM	Demand Management Measure
DWR	Department of Water Resources
ET_o	Reference Evapotranspiration
^oF	Degrees Fahrenheit
gpcd	Gallons per capita per day
IRWM	Integrated Regional Water Management
kWh	Kilowatt-hours
LID	Low-Impact Development
MG	Million Gallons
MGD	Million Gallons per Day
MW	Megawatts
NMFS	National Marine Fisheries Service
RRWA	Russian River Watershed Association
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SB X7-7	Water Conservation Bill of 2009
SCWA	Sonoma County Water Agency
SGMA	Sustainable Groundwater Management Act
SOI	Sphere of Influence
TDS	Total Dissolved Solids
UWMP	Urban Water Management Plan
WTP	Water Treatment Plant
WWTF	Wastewater Treatment Facility

Chapter 1 Introduction and Overview

The City of Cloverdale (City) has prepared this Urban Water Management Plan (UWMP) following California state requirements, as defined in the California Water Code. This chapter discusses the requirement for and purpose of an UWMP and provides a summary of this plan.

1.1 Urban Water Management Planning and the California Water Code

1.1.1 Urban Water Management Planning Act

The Urban Water Management Planning Act (Act) was created by AB 797 which was signed into law by Governor Deukmejian on September 21, 1983. The Act requires that urban water suppliers (i.e. municipal water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet annually) prepare and adopt Urban Water Management Plans containing certain specified elements.

The Act was amended by Assembly Bill (AB) 2661, which was signed into law by Governor Deukmejian on July 18, 1990. AB 2661 deleted the January 1, 1991 termination date specified in AB 797. AB 2661 also expanded the elements which are to be addressed in Urban Water Management Plans.

The Act was also amended by AB 1869, which was signed by Governor Wilson on October 13, 1991. AB 1869 requires that urban water suppliers update (not just review) Urban Water Management Plans every five years to include projections of both potable and recycled water use, identify current reclamation practices, address additional alternative conservation measures, and describe findings, actions, and planning related to a number of water conservation and reclamation measures.

The Act was further amended by AB 11X signed by Governor Wilson on October 13, 1991. AB 11X requires that urban water suppliers prepare an Urban Water Shortage Contingency Plan as an amendment to its Urban Water Management Plan. Water Shortage Contingency Plans must be updated every five years and specify proposed measures for response to short- and long-term water shortages.

1.1.2 Water Conservation Bill of 2009

On November 10, 2009, the state legislature passed the Water Conservation Bill of 2009 (also referred to as Senate Bill (SB) X7-7) as a water conservation component to the Sacramento-San Joaquin River Delta (Delta) legislative package. The bill seeks a 20 percent statewide reduction in urban per capita water use in California by December 31, 2020. SB X7-7 requires that each retail agency preparing a 2010 UWMP to calculate baseline water use as well as an interim (for 2015) and final (for 2020) water use reduction target. The methodologies used to calculate both the baseline per capita water use and targets were outlined in the Draft and Final UWMP guidelines published by DWR in December 2010 and March 2011, respectively. Updates to those methodologies were released with the guidelines for the 2015 UWMPs.

1.2 UWMP Organization

This UWMP was prepared based upon the recommended organization presented the DWR guidebook. Chapter titles are included below and a DWR checklist including the location of all required components of the UWMP is included in Appendix A.

Chapter 1	Introduction and Overview
Chapter 2	Plan Preparation
Chapter 3	System Description
Chapter 4	System Water Use
Chapter 5	SB X7-7 Baselines and Targets
Chapter 6	System Supplies
Chapter 7	Water Supply Reliability Assessment
Chapter 8	Water Shortage Contingency Plan
Chapter 9	Demand Management Measures
Chapter 10	Plan Adoption, Submittal, and Implementation
Chapter 11	References

1.3 UWMP Summary

The City has expanded its water delivery to over 3,000 services, therefore requiring the preparation and adoption of an UWMP in compliance with the Act, as amended by ABs 2661, 1869 and 11X, and SB X7-7 of 2009.

Cloverdale, located in Sonoma County along Highway 101, relies on groundwater under direct influence of surface water from the Russian River, per its pre-1914 water rights, as its sole water source. As part of the City's planning, it has regularly completed a Water Master Plan to address its increasing population and development and to evaluate its current water source and potential new sources. As there are no concerns regarding water quality of the Russian River, the City's pre-1914 water right can be leveraged to meet the all of the demands of its residents (just under 9,000 in 2015) under any water year scenario. Some additional water sources have been assessed as potential alternative supplies (discussed later in this plan), but none of them will be pursued during the planning horizon of this document.

As this was the City's first UWMP, its per capita water use baseline and targets—to comply with the Senate Bill (SB) X7-7—had not yet been completed. Using the California Department of Water Resources (DWR) population tool and SB X7-7 verification tables, the City's baseline per capita water use was determined to be 173 gallons per capita per day (gpcd) with a 2015 target of 156 gpcd and a 2020 target of 139 gpcd (a 20% reduction from the baseline). Thanks in part to the aggressive conservation programs employed by the City in light of the statewide drought, the City's 2015 per capita water use was calculated as 107 gpcd, well below its 2015 and 2020 targets. In order to ensure that the post-drought usage bounce does not push Cloverdale above its 2020 target, the City will continue to encourage the elimination of water waste and other conservation practices.

Looking ahead to the City's development and water needs, the City's pre-1914 water rights position it well to meet any future demands regardless of water year type. That said, the City's plans for future water conservation programs, ordinances and changes to the Municipal Code should keep the total water use relatively stable even as the population is projected to grow to about 11,500 in 2040. This plan includes the first Water Shortage Contingency Plan prepared by the City (Chapter 8) which lays the foundation for the City's response to reductions in water availability. Additionally, the City's demand management measures, which are in place regardless of water year type and supply availability, are presented in Chapter 9.

Chapter 2 Plan Preparation

This chapter provides information on the City's process for developing the 2015 UWMP, including efforts in coordination and outreach with other agencies in the region.

2.1 Basis for Preparing a Plan

This is the first UWMP completed by the City and includes all information necessary to meet the requirements of California Water Code, Division 6, Part 2.6. The City acts as an urban, retail public water system with over 3,000 connections and 344 million gallons (MG) of water supplied annually (Table 2-1).

Table 2-1: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015 (MG)
CA4910002	City of Cloverdale	3,342	344
	TOTAL	**3,342**	**344**

2.2 Planning Compliance and Reporting

The City of Cloverdale's primary source of water is groundwater under the direct influence of surface water based on pre-1914 water rights on the Russian River. The City does not receive water from any other source, nor does it provide water to any major water user outside of its service area. The City has prepared this UWMP individually (Table 2-2), but has notified and included stakeholders in the process as discussed in the next section.

Table 2-2: Plan Identification

☒	Individual UWMP
☐	Regional UWMP

Information prepared for and presented in this UWMP is reported based on a calendar year and water volumes are presented in unit of MG as summarized in Table 2-3.

Table 2-3: Agency Identification	
Type of Agency (select one or both)	
☐	Agency is a wholesaler
☒	Agency is a retailer
Fiscal or Calendar Year (select one)	
☒	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
Units of Measure Used in UWMP	
Unit	Million Gallons (MG)

2.3 Coordination and Outreach

The City encouraged public participation in the development of the 2015 UWMP and provided opportunities for public review and comment. In January 2016, the City sent out letters to its regional stakeholders to inform them of the UWMP preparation and welcome any comments or questions they might have. The stakeholders notified include the Permit & Resource Management Department at the County of Sonoma, the Sonoma County Water Agency and the Russian River Watershed Agency. The City did not notify any wholesale supplier (Table 2-4) as it serves as its own water supplier. Additional information regarding outreach and public participation is included in Chapter 10.

Table 2-4: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name
No wholesale water supplier needed to be informed.

Chapter 3 System Description

This chapter provides a general description of the City of Cloverdale's water supply system, including a description of the service area, climate, and future projected population.

3.1 Service Area Physical Description

The City of Cloverdale is located in Sonoma County at the northern end of the Alexander Valley and borders the Russian River. The majority of the City's geographical area extends from the Russian River on the East to the hills on the west and from the confluence of Oat Valley Road and North Redwood Highway to the north to Chrome Iron Road and Highway 128 to the south. The City covers approximately 2.5 square miles with its sphere of influence (SOI) covering about 2 additional square miles. The City's Wastewater Treatment Facility (WWTF) is located centrally in the City just to the east of Highway 101.

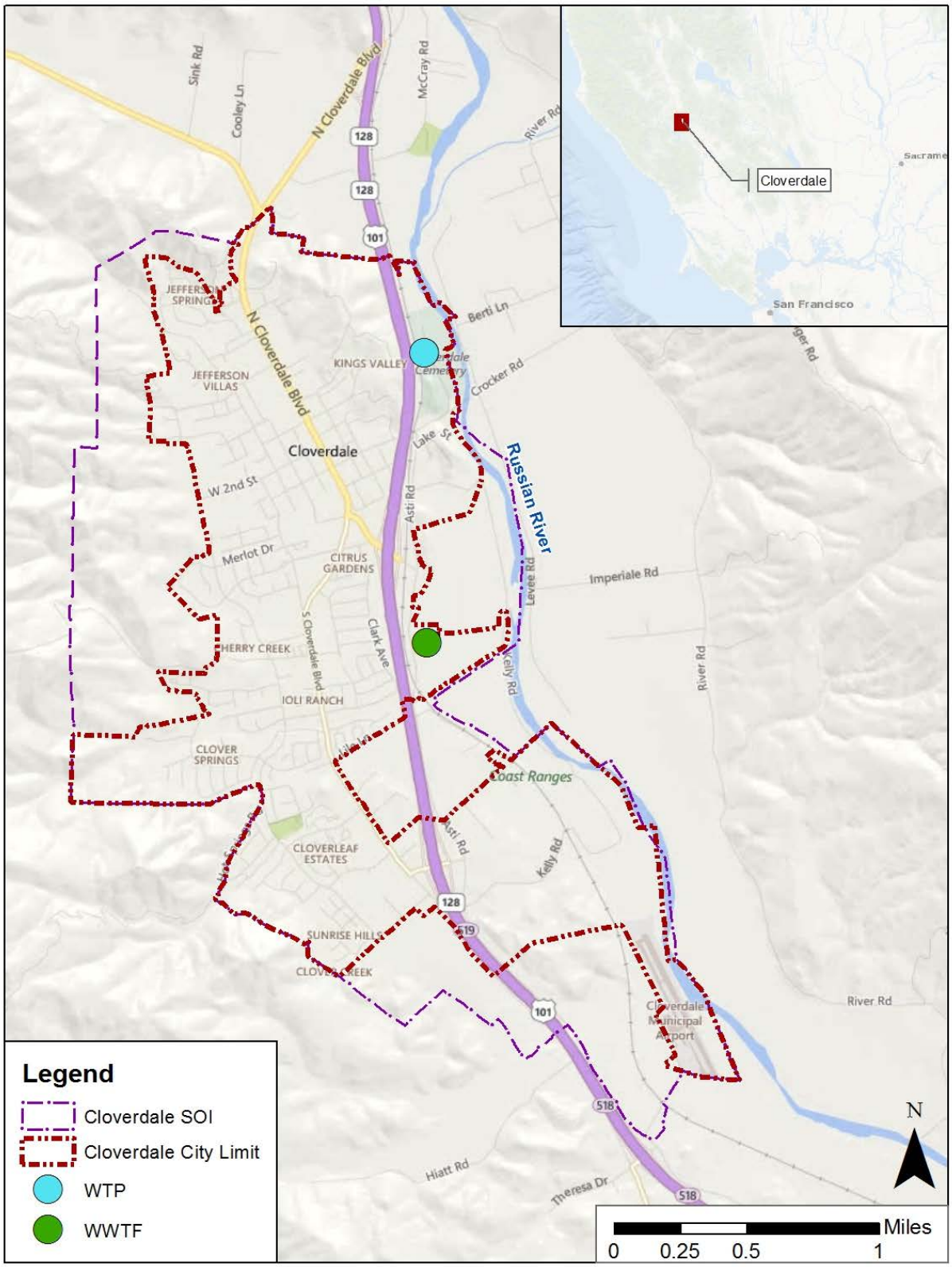
The City's water production and delivery system receives water from the well field and Water Treatment Plant (WTP) located near the Russian River, ¼ mile north of the East First Street Bridge. The City has an estimated 2015 population of 8,801, based on the DWR population tool.

The City of Cloverdale Water Utility (City) is the sole water purveyor for the City of Cloverdale. The City's service area is contiguous with the City boundaries with the addition of three extended service agreements to provide water and an additional 11 agreements for sewer service to single-family homes just outside the City's boundaries. Additionally, there is one extended service agreement to provide water to a wood products industrial facility which utilizes its service only for fire suppression. While these extended services are outside the City limits, they are within the City's SOI.

The City's service area includes a mix of residential, commercial, and industrial land use, and with large water users including Bear Republic Brewing Company and Cloverdale High School. The area is characterized by sloping landscapes from the hills on the western side of the City down to the Russian River in the east. All buildout development being considered for the City is expected to occur within the present service area, consistent with the City's Urban Growth Boundary (discussed further in the General Plan, last amended in 2015 and available online[1]). The City is not a wholesale supplier and does not sell water outside its service area aside from the four extended service connections. Even though the City sells water to these extended service connections, the volume of water is small and below the reporting threshold of 3,000 acre feet per year (AFY) for the City to be considered a wholesale supplier. A map of the City's service area and the locations of the WTP and WWTF can be found in Figure 3-1.

[1] http://www.cloverdale.net/DocumentCenter/View/1673

Figure 3-1: City of Cloverdale Service Area Boundary



3.2 Climate

The City has cool winters, and hot, dry summers. Temperatures average 61 degrees Fahrenheit (°F) annually, ranging from average winter morning lows in the upper 30's to average summer afternoon highs in the upper 80's/low 90's. During summer months, temperatures may exceed 100˚F, affecting water demands significantly. Annual rainfall averages approximately 43 inches, with most rainfall occurring between October and April. The combination of warmer temperatures and low precipitation during the summer results in peak water demands during that period. Reference evapotranspiration (ET_o) values, which serve as indicators of how much water is required to maintain healthy agriculture and landscaping, range from 1.07 inches during December to 6.67 inches in July. Average temperature, rainfall and evapotranspiration for the City are presented in Table 3-1a.

Table 3-1a: Monthly Average Climate Data Summary

Month	Standard Monthly Average ET_o (inches)[1]	Average Total Rainfall (inches)[2]	Average Temperature (degrees Fahrenheit)[2]	
			Max	Min
January	1.13	8.43	58	39
February	1.67	7.8	62	41
March	3.21	6.14	67	43
April	4.44	2.56	73	46
May	5.72	1.46	80	50
June	6.66	0.16	87	56
July	6.67	0	93	56
August	5.95	0.16	92	55
September	4.56	0.31	88	54
October	3.2	2.13	79	50
November	1.55	5.55	65	44
December	1.07	8.46	57	39

NOTES:

1. Monthly averages from the California Irrigation Management Information System (CIMIS) Windsor station ID 103.
2. U.S. Climate Data: http://www.usclimatedata.com/climate/cloverdale/california/united-states/usca0232

3.2.1 Climate Change

Climate change will affect water management throughout California and could have significant impacts on the City of Cloverdale. The City has elected to complete the voluntary *Climate Change Vulnerability Assessment* as part of this UWMP. This assessment discusses the potential impacts of climate change to the greater San Francisco Bay Area Region as well as those impacts specifically of concern to Cloverdale. Areas of concern for the City include increased flooding, ecosystem loss, water demand, water availability and water quality. The *Climate Change Vulnerability Assessment* can be found in Appendix B. The assessment was prepared based upon the framework established in the DWR guidebook, *Appendix I: Climate Change Vulnerability Assessment.*

3.3 Service Area Population

The City's current population for 2015 is approximately 8,801. Though the City has shown steady growth over the last 10 years, its future growth will be limited by the availability of developable land as Cloverdale's General Plan (2015) cites a buildout residential land use target population of 12,000 residents. The City's future annual growth rate of roughly 1 percent is based on 2013 projections by the Association of Bay Area Governments (ABAG). The majority of growth is expected in multi-family housing, with some growth in single-family residences and commercial development. Roughly 34 percent of the population is considered low-income. Further discussion of low-income household's water use can be found in Section 4.4. The City's current service area population and estimated future populations through 2040 is presented in Table 3-1.

Table 3-1: Population - Current and Projected

	2015	2020	2025	2030	2035	2040
Population Served	8,801	9,497	9,958	10,452	10,978	11,524

NOTES: 2015 population from DWR population tool. 2020-2040 populations from ABAG, Projections 2013

Chapter 4 System Water Use

This chapter describes the City of Cloverdale's current water use and water use projections through the year 2040.

4.1 Water Uses by Sector

Cloverdale's water use is limited to treated groundwater under direct surface water influence (extracted from a surface water right) as the City does not provide raw or recycled water to any of its customers. Cloverdale's water demand has historically been primarily attributed to residential use, with roughly 75 percent of all water demand due to residential use. Of this 75 percent, about 80 percent is attributed to single-family residences with the remaining 20 percent attributed to multi-family residences. Commercial (which includes institutional) is the next largest demand after residential and has remained fairly constant for close to 10 years as there have not been any major commercial developments or redevelopments of previously commercial land nor has there been a change in industrial use. The same can be said of irrigation demand, which has been extremely consistent since the establishment of Vintage Meadow Park in late 2007.

Although water usage has decreased since 2012 due to the drought, the general split of City-wide water usage remained roughly the same in 2015, with 71 percent of water demands attribute to residential users (210 MG of the 295 MG of non-loss demand). A summary of 2015 water demands in MG per year can be found in Table 4-1.

Table 4-1: Demands for Potable and Raw Water - Actual

Use Type	2015 Actual		
	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume (MG)
Single-Family		Drinking Water	**184.2**
Multi-Family		Drinking Water	**25.5**
Commercial		Drinking Water	**43.6**
Industrial		Drinking Water	**16**
Agricultural irrigation		Drinking Water	**25.7**
Other	*Fire hydrant/services*	Drinking Water	**0.3**
Losses		Drinking Water	**48.3**
		TOTAL	**343.6**

NOTES:
1. These volumes include the small volume of water served through the City's extended service contracts.
2. Institutional demand is included in the commercial demand.
3. Water use for landscaping is included in the use type of the respective user conducting the irrigation as the City does not have separate landscaping meters.
4. Losses are estimated based on the difference between the raw water produced by the City and the metered deliveries. This value includes authorized unbilled, unmetered water usage.

Future growth in Cloverdale is projected to follow the historical trend of some residential growth and limited commercial change. As discussed in Section 3.3, population growth is estimated to remain low at around 1 percent, resulting in a slow increase in residential units (primarily multi-family residential). Based on these population projects as well as forecasts of the number of metered connections, demand projections were calculated. Though there will be some future growth, the implementation of water codes and higher water and sewer rates (incorporated into projections) will limit the increase in total City-wide demand, keeping demand relatively flat over the planning period of this UWMP. A technical memorandum describing the methodology used to calculate the demand projections is available in Appendix C. Table 4-2 summarizes the projected water demands in the City. Since there is no recycled water use within the City's service area, City's total water demands are equal to the potable and raw water demands, as summarized in Table 4-3.

Table 4-2: Demands for Potable and Raw Water - Projected

Use Type	Additional Description *(as needed)*	Projected Water Use				
		2020	2025	2030	2035	2040
Single-Family		261	253	247	242	236
Multi-Family		41	48	55	62	69
Commercial		68	68	69	71	72
Agricultural irrigation		32	32	31	30	29
Other	*Fire hydrant/services*	1	1	1	1	1
Losses		55	55	55	55	56
TOTAL (MG)		**458**	**457**	**457**	**460**	**463**

NOTES: Values based on study conducted by M. Cubed (2015). Projected water use by use type in each 5-year increment may not add up to listed sum due to rounding.

Table 4-3: Total Water Demands

	2015	2020	2025	2030	2035	2040
Potable and Raw Water *From Tables 4-1 and 4-2*	344	458	457	457	460	463
Recycled Water Demand *From Table 6-4*	0	0	0	0	0	0
TOTAL WATER DEMAND (MG)	**344**	**458**	**457**	**457**	**460**	**463**

4.2 Distribution System Water Losses

Over the past 20 years, the City's water distribution loss rate has been around 10 percent to 20 percent, with losses peaking at about 28 percent in the mid 2000's. In 2013 and 2014, the City completed a number of repair projects to reduce system loss. Using the American Water Works Association (AWWA) Water Audit software, the City's 2015 real water loss was calculated to be approximately 43.2 MG (Table 4-4). This is equivalent to a 13 percent loss rate, which is consistent with previous years and an indication that recent efforts to reduce water loss may be working. This water loss figure does not include authorized unbilled, unmetered water usage, which has been estimated for the sake of determining real water loss. Results of the Water Audit are available in Appendix D.

Table 4-4: 12 Month Water Audit Reporting

Reporting Period Start Date	Volume of Water Loss
January 2015	43.2 MG
NOTES: Based on the AWWA Water Audit and methods presented in Appendix L of the DWR Guidebook.	

4.3 Estimating Future Water Savings

In order to meet water use targets and continue striving for more efficient water use, the City anticipates an increase in water savings due to enforcement of new plumbing codes, conservation programs and increased water/sewer rates. The water demand projections presented in Table 4-2 (calculated by M.Cubed and included in Appendix C) accounted for these water savings measures (Table 4-5). Plumbing codes and water and sewer rate increases are projected to reduce demands by roughly 7.5 percent each (a total of a 15 percent reduction) by 2040.

In 2010, City Ordinance 674-2010 went into effect, establishing requirements for landscape irrigation efficiency for any new construction and rehabilitation projects with large irrigable areas. This ordinance will continue to reduce water usage City-wide as new development takes place. In addition to the ordinance, Chapter 13 of the City's Municipal Code contains prohibitions on the waste of water (13.05.040) and the nonessential use of water in water emergencies (13.05.050). City Ordinance 674-2010 and referenced sections of the City's Municipal Code are included in Appendix E.

While not in the City plumbing code, there are anticipated water savings from increases in the efficiency of toilets, urinals, showerheads, clothes washers, and dishwashers. New homes and businesses will install more efficient plumbing fixtures and water using appliances than is currently reflected in the existing stock upon which baseline average water use is based. Additionally, existing homes will eventually replace their current fixtures and appliances as they wear out or as part of remodeling with more efficient fixtures and appliances. Over time this will result in a predictable decline in indoor water use per dwelling unit or service meter. These water savings were calculated using the Alliance for Water Efficiency's Water Conservation Tool[2] and were included in the demand projections presented in Table 4-2. This tool is in wide use in California and throughout North America and is specifically designed to estimate water savings

[2] http://www.allianceforwaterefficiency.org/Tracking-Tool.aspx

associated with plumbing codes, appliance standards, and utility-based conservation programs.[3] The tool follows similar methodology to that presented in Appendix K of DWR's UWMP Guidebook; *Estimating Future Water Savings from Adopted Codes, Standards, Ordinances, or Transportation and Land Use Plans*.

Other water savings can be attributed to increases in the water and sewer rates. City Council Resolution No. 007-2013 established water and sewer rate increases through 2016 and the City is currently working on a new study to determine future rate changes. A complete version of the City's new Water and Sewer Rate Study is available on the City's website.[4]

4.4 Water Use for Lower Income Households

CWC Section 10631.1(a) requires suppliers to estimate projected water use for single-family and multi-family residential housing needed for lower income households, as identified in the Housing Element of the General Plan for the service area of the supplier. It does not require quantification of current water use by lower income households. According to the City's current Housing Element 2015-2023 (Cloverdale 2014), an estimated 34 percent of households in the City are lower-income, as defined as having income below 80 percent of the area median income.

Further, per the Housing Element, the City's Regional Housing Need Allocation for 2014 through 2022 for lower income housing is 68 units. The Regional Housing Need Allocation does not break down the housing need by housing type (single-family versus multi-family). Therefore, the projected water demand for lower income housing was conservatively estimated based on the average 2015 water demands for single-family residential customers. At 0.064 MG per household[5] and 715 lower income household units (Housing Element 2015-2023), the projected water demand for lower income housing units is 45.8 MG in 2020.[6] This estimate is considered to be conservative because multi-family residential housing uses less water on a per-dwelling unit than single-family housing. As stated in Table 4-5, this demand is incorporated in overall demand projections in this UWMP by assuming lower income housing grows proportionally to City population growth.

Table 4-5: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections?	Yes
Location in UWMP	Section 4.3
Are Lower Income Residential Demands Included in Projections?	Yes

[3] Currently, approximately 400 utilities throughout North America are using the Alliance for Water Efficiency's Water Conservation Tool for conservation program planning.
[4] http://www.cloverdale.net/DocumentCenter/View/1807
[5] Based on 2,897 single-family households with a demand of 184.2 MG in 2015.
[6] While the current Housing Element does not include projections for low income housing through 2040, an estimate of growth in this sector can be estimated based on the projected growth of the general population. Assuming a 1 percent annual increase in the population of lower income residents (and a related change in lower income housing units), the projected water demand for lower income housing units is estimated to be 58.9 MG in 2040.

4.5 Climate Change

Climate change has the potential to impact the City's and the region's water demands. As proven by the recent statewide drought, increases in temperature and decreases in precipitation can have significant impacts in water supply availability and usage. While a single year of higher temperatures often results in an increase in water demands as users act to stay cool and save irrigable vegetation, an extended period of higher temperatures and lower precipitation would likely result in lower demands as consumers become accustomed to water-saving habits or conservation actions with long-term effects implemented (such as a "cash for grass" program). The projections completed by M.Cubed accounted for weather pattern forecasts in an effort to incorporate potential climate change related effects into the City's water use projections. In addition, a qualitative discussion of the potential climate change impacts on City's water demand is included in the *Climate Change Vulnerability Assessment* in Appendix B.

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Chapter 5 SB X7-7 Baselines and Targets

This chapter describes the City's compliance with SB X7-7. Some of the SB X7-7 verification tables are included in this chapter and a complete set of the SB X7-7 tables can be found in Appendix F.

5.1 Updating Calculations from 2010 UWMP

2015 will be the first time the City is calculating its water use targets. The calculations presented in this chapter utilize population figures from the most recent U.S. Census data (2010).

5.2 Baseline Periods

As stated earlier, this is the first year that the City has prepared an UWMP; therefore, this is the first time the City has determined a baseline period. Since the City had no recycled water use in 2008, a 10-year baseline period was used. Based on available data, the City used data from January 1, 1997 to December 31, 2006 as the 10-year baseline period and from January 1, 2003 to December 31, 2007 as the 5-year baseline period.

5.3 Service Area Population

The City's service area correlates with the city boundary; therefore, historical population data from the Department of Finance and U.S. Census could be easily used. Historical population data was extracted from the DWR population tool and the output from the tool is included in Appendix G. The population for 2015 (8,801) was determined using the DWR population tool which estimated a persons-per-connection factor (2.63, rounded) and multiplied that by the number of City connections in 2015 (3,342). Population projections were taken from the ABAG *2013 Projections*, which incorporated 2010 U.S. Census data into their projections. Baseline populations are included in Table 5-1a.

Table 5-1a (SB X7-7 Table 3): Service Area Population			
Year		Population	Notes
10 to 15 Year Baseline Population			
Year 1	1997	5,153	From DWR population tool
Year 2	1998	5,212	
Year 3	1999	6,903	
Year 4	2000	7,064	
Year 5	2001	7,246	
Year 6	2002	7,433	
Year 7	2003	8,433	
Year 8	2004	8,753	
Year 9	2005	8,746	
Year 10	2006	8,757	
5 Year Baseline Population			
Year 1	2003	8,433	From DWR population tool
Year 2	2004	8,753	
Year 3	2005	8,746	
Year 4	2006	8,757	
Year 5	2007	8,758	
2015 Compliance Year Population			
2015		8,801	From DWR population tool

5.4 Gross Water Use

Over the baseline period, the City saw a steady rise in gross water use, consistent with growth and development. The City is not eligible for any deductions as it does not use recycled water, export water, deliver water for agricultural use or has had any changes in the distribution system storage. 2015 saw a sharp drop in gross water usage, due to drought-related water use reductions. A summary of the water usage during the baseline years and 2015 have been included in Table 5-1b.

Table 5-1b (SB X7-7 Table 4): Annual Gross Water Use

	Baseline Year *From SB X7-7 Table 3*	Volume Into Distribution System *From SB X7-7 Table 4A*	Deductions						Annual Gross Water Use
			Recycled Water	Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *From SB X7-7 Table 4-B*	Water Delivered for Agricultural Use	Process Water *From SB X7-7 Table 4-D*	
10 to 15 Year Baseline - Gross Water Use									
Year 1	1997	375	0	0	0	0	0	0	375
Year 2	1998	374	0	0	0	0	0	0	374
Year 3	1999	444	0	0	0	0	0	0	444
Year 4	2000	460	0	0	0	0	0	0	460
Year 5	2001	473	0	0	0	0	0	0	473
Year 6	2002	478	0	0	0	0	0	0	478
Year 7	2003	490	0	0	0	0	0	0	490
Year 8	2004	529	0	0	0	0	0	0	529
Year 9	2005	471	0	0	0	0	0	0	471
Year 10	2006	503	0	0	0	0	0	0	503
10 - 15 year baseline average gross water use									**460**
5 Year Baseline - Gross Water Use									
Year 1	2003	490	0	0	0	0	0	0	490
Year 2	2004	529	0	0	0	0	0	0	529
Year 3	2005	471	0	0	0	0	0	0	471
Year 4	2006	503	0	0	0	0	0	0	503
Year 5	2007	500	0	0	0	0	0	0	500
5 year baseline average gross water use									**498**
2015 Compliance Year - Gross Water Use									
2015		344	0	0	0	0	0	0	**344**

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5.5 Baseline and Target Daily Per Capita Water Use

To calculate the City's baseline daily per capita water use, the gross water use was divided by the population for each year of the baseline period. The daily per capita water use for each year in the baseline period was then averaged to determine the baseline use in gpcd. The 10-year baseline was determined to be 173 gpcd and the 5-year baseline was calculated as 157 gpcd. The 2020 target was then calculated using Method 1, which is a 20 percent reduction from the 10-year baseline per capita water use value (139 gpcd). The 2020 target of 139 gpcd was confirmed once it was determined to be less than 95 percent of the 5-year baseline water use figure (149 gpcd). The 2015 interim target was set as the midpoint between the baseline and 2020 target (156 gpcd). The baseline calculations are presented in Table 5-1c (which also includes the per capita calculation for 2015) and the targets are summarized in Table 5-1.

Table 5-1c (SB X7-7 Table 5): Gallons Per Capita Per Day (GPCD)

Baseline Year *From SB X7-7 Table 3*		Service Area Population *From SB X7-7 Table 3*	Annual Gross Water Use *From SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1997	5,153	375	199
Year 2	1998	5,212	374	196
Year 3	1999	6,903	444	176
Year 4	2000	7,064	460	178
Year 5	2001	7,246	473	179
Year 6	2002	7,433	478	176
Year 7	2003	8,433	490	159
Year 8	2004	8,753	529	165
Year 9	2005	8,746	471	147
Year 10	2006	8,757	503	157
10-15 Year Average Baseline GPCD				**173**
5 Year Baseline GPCD				
Baseline Year *From SB X7-7 Table 3*		Service Area Population *From SB X7-7 Table 3*	Gross Water Use *From SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	8,433	490	159
Year 2	2004	8,753	529	165
Year 3	2005	8,746	471	147
Year 4	2006	8,757	503	157
Year 5	2007	8,758	500	156
5 Year Average Baseline GPCD				**157**
2015 Compliance Year GPCD				
2015		8,801	344	**107**

Table 5-1: Baselines and Targets Summary					
Baseline Period	Start Years	End Years	Average GPCD	2015 Interim Target	Confirmed 2020 Target
10-15 year	1997	2006	173	156	139
5 Year	2003	2007	157		

5.6 2015 Compliance Daily Per Capita Water Use (GPCD)

As presented in Table 5-1c (SB X7-7 Table 5), the 2015 water usage was calculated from the DWR population tool estimate and the gross water usage. The City's 2015 daily per capita water use number (107 gpcd) is well below their 2015 target and therefore no usage adjustments (such as weather normalization or economic adjustments) were calculated. This water usage number is also well below the City's 2020 target, though there is some usage bounce expected when the drought lets up. Even with this bounce, the City's conservation program and measures taken to reduce water use during the drought are expected to keep the daily per capita water use below the 2020 target of 139 gpcd. A summary of the City's compliance with its 2015 target can be found in Table 5-2.

Table 5-2: 2015 Compliance*								
Actual 2015 GPCD	2015 Interim Target GPCD	**Optional Adjustments to 2015 GPCD** Enter "0" for adjustments not used *From Methodology 8*					2015 GPCD *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		Extraordinary Events	Economic Adjustment	Weather Normalization	TOTAL Adjustments	Adjusted 2015 GPCD		
107	156	0	0	0	0	107	107	Yes
**All values are in Gallons per Capita per Day (GPCD)*								
NOTES: No adjustments were included as the actual 2015 gpcd met the 2015 interim target.								

Chapter 6 System Supplies

This chapter describes the current and future water supplies available to the City.

6.1 Purchased or Imported Water

The City does not currently purchase or import water nor does it have any plans to do so.

6.2 Groundwater

The City falls within the Cloverdale Area Subbasin of the Alexander Valley groundwater basin. The basin has a storage capacity of roughly 71,000 acre-feet and the Alexander Valley basin has not seen major changes in water levels since 1961 (DWR, 2004). However, data from two DWR monitoring wells recently indicated that there may be declining groundwater levels in the basin (Sonoma County, 2008).

The groundwater quality is generally good and suitable for all uses. According to the Environmental Protection Agency's (EPA) Superfund Website, one site located at the southern edge of Cloverdale (identified as MGM Brakes) was placed on the Superfund National Priorities List in 1983. Soils on and off-site were reported to contain polychlorinated biphenyls and xylenes. The facility overlies a shallow aquifer 8 to 25 feet below the ground surface. Runoff from the facility drains into Icaria Creek, a tributary to the Russian River; however, this facility is located downstream of the City's supply wells (DWR, 2004).

The City does not currently pump or plan on pumping groundwater in the future (Table 6-1). The City has discussed using groundwater as an emergency backup water supply (as part of their water shortage contingency plan, catastrophic supply interruption, Section 8.8); however, the City does not overlay an area that provides easy access to a sufficient supply groundwater.

Table 6-1: Groundwater Volume Pumped

☒	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Cloverdale Area Subbasin (Alexander Valley)	0	0	0	0	0
	TOTAL	0	0	0	0	0

6.3 Surface Water

The City relies solely on groundwater under the direct influence surface water for its water supply. This section describes the City's surface water rights, water quality, and water supply system.

6.3.1 Surface Water Rights

The Russian River watershed covers 1,485 square miles in Mendocino and Sonoma Counties. The river runs approximately 110 miles and has an average annual discharge of roughly 500,000 MG. The river is dammed in two locations, creating Lake Mendocino and Lake Sonoma. These dams help to manage flows on the river which provides water to both agricultural and urban users alike.

Cloverdale has one of the oldest water rights on the Russian River. The following description of Cloverdale's water rights is based on a letter prepared by Matthew L Emrick, Esq., of the Law Firm Soluri, Emrick, and Meserve and sent to the California State Water Resource Control Board, dated March 31, 2008.

Incorporated in 1872, The City's use has been continuous, beneficial and ongoing since the late 1800's. To fulfill the future and expanding water needs of Cloverdale, a private company known as the Riverside Water Company ("Riverside") was formed in about 1884 by William Sink and others with the intent to provide Cloverdale with water from the Russian River.

The purpose of Riverside's water diversion facilities was in part to provide municipal water to the City of Cloverdale to meet both its present and future needs. In order to construct the necessary facilities to serve Cloverdale, Riverside acquired certain pipeline easements to access its reservoir site within Cloverdale. The first water deliveries to Cloverdale from Riverside occurred in 1886. Cloverdale granted Riverside a franchise by way of Ordinance for the purpose of constructing its pipelines within the City's streets in the 1880's.

In order to meet an ever faster growing City, Riverside filed and recorded a Notice of Appropriation for Sulfur Creek – just upstream of Riverside's existing facilities on the Russian River. The Notice set forth the intent to divert 5000 miners' inches of water (125 cubic feet per second (cfs) which is equal to roughly 29,000 MG per year) for a variety of different purposes, including uses within the City of Cloverdale. This Notice indicates that Riverside provided water for an area larger than just Cloverdale.

In about 1903, Cloverdale began the process of acquiring Riverside's facilities and water rights. The transfer was completed in 1905 by way of Deed. The Deed identifies the facilities and point of diversion. The source of water is identified as the Russian River and "adjacent points" – obviously referring to Riverside's rights to Big Sulfur Creek, which were diverted at Riverside's pumping plant. Cloverdale's present diversion facilities are located in nearly the same area as Riverside's original diversion.

Based on the discussion above and the supporting evidence, the City of Cloverdale has the following rights:

- A pre-1914 appropriative water right to the Russian River in the amount of at least 2.5 million gallon per day (MGD) (910 MG per year), based on current use, with a priority of 1884 and the right to further expand that use.
- A pre-1914 appropriative right to divert water from Big Sulfur Creek in the amount of 125 cfs (24,000 MG per year) with a priority of 1895.

These water rights will ensure the City's ability to meet existing and buildout water demand.

6.3.2 Surface Water System

The City diverts water from the Russian River via the use of shallow wells along the west bank of the river near the WTP, located approximately ¼ mile north of the East First Street (Crocker Road) Bridge. Water for the City is currently provided from seven wells classified by the California Department of Public Health as "utilizing groundwater under the direct influence of surface water" from the Russian River. Under ideal conditions, all seven of the wells are not operated at a time, allowing for the wells to be rotated and their operational life extended. However, in times of lower groundwater elevations, which typically coincides with periods of higher demand, the production capacity of the wells are limited by the entrainment of air. As a result of this, the City recently installed a de-aeration system to increase the capacity of its wells during low flow. Additionally, the City has taken measures to reduce the maximum day demand by instituting water conservation measures during the peak water demand months. These conservation measures are discussed in more detail in Chapter 9.

The City's WTP was constructed and put into service in 1996. Raw water is drawn from the adjacent well field into the WTP where it is treated with the following processes:

- Chemical injection of aluminum sulfate
- Static mixer (baffled) for rapid mixing and coagulation
- Flow through upflow adsorption clarifier for solids removal
- Filtration through mixed media gravity filters
- Post-disinfection by gas chlorination treatment
- Chemical injection of caustic (NaOH) for corrosion control

The storage and distribution facilities include the piping network and fire hydrants, pumps, and reservoirs for the three pressure zones in the City. Zone 1 is the main pressure zone and serves roughly 2,000 connections, accounting for about 67 percent of the water demand for the entire system. Zone 1 has approximately 2.5 MG of storage capacity and is served directly from treated WTP water. Zone 2 serves about 350 connections and accounts for approximately 13 percent of the City's water demand. Zone 2 includes 500,000 gallons of storage and is served by Zone 1. Zone 3 serves approximately 600 connections or about 20 percent of the City's demand. Zone 3 includes 1.25 million gallons of storage and is fed by water from Zone 1.

The City conducted a voluntary analysis of its water system energy intensity including extraction, storage, conveyance, treatment and distribution. Results for 2015 indicated that the City uses approximately 768 kilowatt-hours (kWh) per acre foot of water supplied (or 2,360 kWh per MG). A complete energy intensity report is available in Appendix H. While not included in the report, the City does have plans to install solar panels to provide some of the power required at the WTP. The City's plan to install solar at both the WTP and WWTP has been suspended due to a breach in contract with the solar vendor. The City still intends to pursue a solar installation and will be considering options throughout 2016.

6.3.3 Surface Water Quality

Water quality of the Russian River has been monitored by the North Coast Regional Water Quality Control Board (RWQCB) and other agencies since the 1970's. The North Coast RWQCB has deemed the entire Russian River watershed as an impaired water body due to excessive sedimentation and temperature.[7] The temperature impairment is likely due to climate change and will be addressed through the development of a region-wide policy. The sedimentation impairment is attributed to historic grazing, agriculture, logging, road construction, and habitat modification (Sonoma County, 2008). Monitoring results indicate that the river is in compliance with water quality objectives, however some sections of the river are associated with higher concentrations of total dissolved solids (TDS), turbidity, and high bacteria concentrations associated with the excessive sedimentation and siltation. Even with the effects of sedimentation, the City's water has not had any water quality issues, as discussed further in Section 7.1. The Russian River watershed is managed by the Russian River Watershed Association (RRWA), a coalition of eleven cities, counties and special districts (including the City of Cloverdale). The RRWA coordinates regional programs for clean water, fisheries restoration and watershed enhancement and has been working to address water quality concerns in the river. A copy of the RRWA's most recent work plan is available on the RRWA's website.[8]

6.4 Stormwater

The City does not currently recover and reuse stormwater; however, the City adopted Low-Impact Development (LID) standards in 2015 to encourage the utilization of stormwater and improve stormwater

[7] http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/russian_river/
[8] http://www.rrwatershed.org/sites/default/files/RRWA%202015-16Work%20Plan%20text%20FINALcompiled.pdf

quality. In partnership with Sonoma County and the City of Santa Rosa, the City became a co-permittee on a Municipal Separate Storm Sewer System (MS4) Phase 1 Permit, to regulate stormwater discharges into its system, to exempt specific non-stormwater discharges and to adopt LID best management practices. To comply with the permit, the City adopted a storm water ordinance to regulate storm water discharges into its system. Additionally, the City will be implementing new LID standards which include stormwater best management practices to reduce problems with erosion and will increase the chance for on-site filtration and purification of storm water. This is often accomplished by using vegetated areas and the natural purification of soil and plants. While stormwater will not be a directly controlled water source, implementation of the best management practices will likely offset some of the City's irrigation demand by encouraging utilization of stormwater.

6.5 Wastewater and Recycled Water

The City manages its own WWTF, collecting and treating wastewater from the City's service area. The WWTF currently uses the following processes to treat the effluent flows:

- Influent from the collection system within the City flows into the WWTF headworks and passes through mechanical screens to remove solids from the waste stream. From the headworks, the wastewater flows into the first of two aeration ponds.
- The first aeration pond consists of extended aeration (Biolac) equipment including air infusion through bubble diffusers and baffles. The wastewater then flows into the second aeration pond which contains six mechanical surface floating aerators. Depending on the biological oxygen demand of the wastewater, aerators can be turned on or off to inject more or less oxygen into the wastewater in this pond. In combination, these ponds inject oxygen into the wastewater to aid in the biologic process of breaking down components of the wastewater.
- From the second aeration pond, water flows to a settling pond (also sometimes referred to as a polishing pond.) The settling pond allows the heavier suspended solids to settle and fall to the bottom of the pond.
- From the settling pond, the wastewater is transmitted to a chlorine contact point, then pumped into a pipe that allows for adequate contact time for the chlorine to react with the wastewater.

After treatment, the effluent is distributed into one of seven possible evaporation/percolation ponds. A summary of the wastewater collected, treated and discharged in 2015 is presented in Tables 6-2 and 6-3.

The City's wastewater treatment plant does not currently produce recycled water nor does the City import recycled water from neighboring water agencies. The City is not currently anticipating the use of recycled water in the planning horizon of this UWMP (Table 6-4 and Table 6-5).

As part of the voluntary analysis of the City's system energy intensity mentioned in Section 6.3.2, the City calculated the energy intensity for the wastewater system including collection, treatment and discharge. Results for 2015 indicated that the City uses approximately 1,920 kWh per acre foot of wastewater treated (or 5,840 kWh per MG). A complete energy intensity report is available in Appendix H. As noted in Section 6.3.2, the City does have plans to install solar panels to provide some of the power required at the wastewater treatment plant.

6.5.1 Actions to Encourage and Optimize Future Recycled Water Use

As a part of the City's last Sewer Master Plan (Coastland, 2009), a preliminary study was conducted to determine the upgrades needed to produce and utilize recycled water. The results of that study indicated that treatment plant upgrades and the installation of a recycled water distribution system would cost in excess of $25,000,000, which is beyond the City's means at this time. The City has not evaluated the

possibility of coordinating with a neighboring agency in order to send wastewater effluent away for additional treatment or to receive recycled water for use in the City.

Although the City is not currently anticipating its use, recycled water will continue to be a significant, reliable source of supply throughout California. In order to encourage recycled water use, the City could explore potential funding mechanisms from local, state and federal agencies to offset the large capital costs of the WWTF upgrade and recycled water distribution system. However, the City will likely need to develop a recycled water option with a lower capital cost in order to reach a level of cost effectiveness that outside funding options require. Additionally, partnering with a neighboring agency could also be viewed as a potential pathway to the development of a local recycled water source; however, the nearest recycled water producer is over 15 miles away, making the economics of a local partnership unrealistic for the City even with outside funding. Table 6-6 summarizes the City's possible actions to encourage future recycled water use. A copy of the City's most recent Sewer Master Plan can be found on the Cloverdale website.[9]

[9] http://www.cloverdale.net/documentcenter/view/1328

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Table 6-2: Wastewater Collected Within Service Area in 2015						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
100	Percentage of 2015 service area covered by wastewater collection system					
100	Percentage of 2015 service area population covered by wastewater collection system					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party?
City of Cloverdale	Metered	185	**City of Cloverdale**	**Cloverdale Waste Water Treatment Facility**	Yes	No
Total Wastewater Collected from Service Area in 2015:		185				

Table 6-3: Wastewater Treatment and Discharge Within Service Area in 2015										
☐	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2015 volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Cloverdale Waste Water Treatment Facility	Cloverdale Waste Water Treatment Facility	Evaporation/ percolation ponds at WWTF	1B84032OSON	Percolation ponds	No	Secondary, Disinfected - 23	185	185	0	0
						Total	185	185	0	0

Table 6-4: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area*									
☒	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.								
Name of Agency Producing (Treating) the Recycled Water:			**City of Cloverdale**						
Name of Agency Operating the Recycled Water Distribution System:			**City of Cloverdale**						
Supplemental Water Added in 2015									
Source of 2015 Supplemental Water									
Beneficial Use Type		General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035	2040
Agricultural irrigation		n/a	n/a	0	0	0	0	0	0
Landscape irrigation (exc golf courses)		n/a	n/a	0	0	0	0	0	0
Golf course irrigation		n/a	n/a	0	0	0	0	0	0
Commercial use		n/a	n/a	0	0	0	0	0	0
Industrial use		n/a	n/a	0	0	0	0	0	0
Geothermal and other energy production		n/a	n/a	0	0	0	0	0	0
Seawater intrusion barrier		n/a	n/a	0	0	0	0	0	0
Recreational impoundment		n/a	n/a	0	0	0	0	0	0
Wetlands or wildlife habitat		n/a	n/a	0	0	0	0	0	0
Groundwater recharge (IPR)		n/a	n/a	0	0	0	0	0	0
Surface water augmentation (IPR)		n/a	n/a		0	0	0	0	0
Direct potable reuse		n/a	n/a		0	0	0	0	0
Other	*Type of Use*	n/a	n/a	0	0	0	0	0	0
			Total:	0	0	0	0	0	0
IPR - Indirect Potable Reuse									
** This may include use outside the UWMP area that is NOT included in another UWMP area. It is to be noted in the general description cell.*									

Table 6-5: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual			
☒	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.		
Use Type		2010 Projection for 2015	2015 actual use
Agricultural irrigation		n/a	0
Landscape irrigation (exc golf courses)		n/a	0
Golf course irrigation		n/a	0
Commercial use		n/a	0
Industrial use		n/a	0
Geothermal and other energy production		n/a	0
Seawater intrusion barrier		n/a	0
Recreational impoundment		n/a	0
Wetlands or wildlife habitat		n/a	0
Groundwater recharge (IPR)		n/a	0
Surface water augmentation (IPR)		n/a	0
Direct potable reuse		n/a	0
Other	**n/a**	n/a	0
	Total	0	0
NOTES: This is City's first UWMP; thus, 2010 projections for 2015 are not applicable (n/a).			

Table 6-6: Methods to Expand Future Recycled Water Use			
☒	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
6-4	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Secure Funding	Secure funding from local, state and federal agencies to offset capital costs	n/a	n/a
		Total	0

6.6 Desalinated Water Opportunities

Desalination is not currently being used by the City nor is it being considered within the planning horizon of this UWMP due to the fact that there is no significant source of ocean or brackish water readily available to the City.

6.7 Exchanges or Transfers

The City does not currently participate in any water exchanges or transfers. While the City does not currently plan on participating in any exchanges or transfers, there are potential regional partners for the City to negotiate with. Many regional water providers have indicated that Cloverdale could act as an emergency water supplier. Additionally, the City could explore transfer opportunities with neighboring agencies that pump groundwater in the interest of diversifying its water portfolio; however, those opportunities are limited. By utilizing a transfer for groundwater, the City would not have to install its own wells and could secure a water supply should river flows become adversely impacted by climate change or see the rise of a water quality concern. This is discussed further as part of the Water Shortage Contingency Plan in Chapter 8.

6.8 Future Water Projects

The City has identified a maximum build-out population and maximum commercial and industrial build-out that results in an annual demand of approximately 475 MG (Coastland, 2010). The City's existing population and commercial and industrial development is roughly 75 percent of the maximum build-out, which will be approached after the year 2040. In order to meet that demand, the City recently installed three new wells (bringing the total installed to seven) using the City's existing water right. Additionally, existing well #3 was redeveloped and successfully restored to full flow. In the planning period of this UWMP (2040), the seven wells that the City now operate should be adequate to meet the projected demand.

With increases in the demand, the City will have to increase the production of its WTP. The existing facility is sized to accommodate projected build-out demands with limited construction at the WTP. The WTP has been improved to allow use of all four filters during peak demand which will provide capacity to meet peak demands. Future build-out in Cloverdale will eventually require improvements be made to the transfer pump system and chlorine disinfection system at the WTP to allow adequate throughput. Additionally,

recent improvement (2014-2016) to water delivery efficiency (direct loss) and water conservation measures, have resulted in a significant reduction in City-wide per capita water use.

Per the City's most recent Water Master Plan, there are a few projects required to increase storage capacity and reliability. First, two sub-surface tanks near Highway 101 in Zone 1 should be replaced with above ground storage away from the highway to reduce risk of storage failure due to hillside stability concerns. Second, additional storage will be required to meet fire flow capacity and additional demands when the area to the south of the current City limits are developed during buildout. These tanks will become a part of Zone 1.

Table 6-7: Expected Future Water Supply Projects or Programs					
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.				
☒	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.				
6-11	Provide page location of narrative in the UWMP				
Name of Future Projects or Programs	Joint Project with other agencies?	Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
Future water supply projects are not compatible with this table and are described in narrative format.					

6.9 Summary of Existing and Planned Sources of Water

The City currently utilizes groundwater under the direct influence of surface water from the Russian River, exercising its longstanding water right. As discussed in Section 6.8, the City plans to increase its use of water supply source water under its existing water right as build-out and development occurs by implementing minor system changes (such as transfer pump station upgrades) to ensure capacity to meet build-out demands. Aside from the increased use of groundwater under the direct influence of surface water, the City does not have any plans to use alternative water sources in addition to the implementation of water savings through actions such as plumbing codes and other conservation plans, as discussed in more detail in Chapter 9. As the City holds pre-1914 water rights, the City will be able to meet its demands with water from the Russian River. Summaries of existing and projected water supplies are presented in Tables 6-8 and 6-9, respectively. Future water supplies were set equal to the projected future demand as the City can leverage its water right to meet any demand.

Table 6-8: Water Supplies — Actual

Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Surface water[1]	*Shallow wells on the Russian River*	344	Raw Water	Pre-1914
Total[2]		**344**		

NOTES:
1. Here "Surface Water" means "Groundwater under the direct influence of surface water," the latter of which is not an option in the official DWR table
2. Water supplies are equal to City demands

Table 6-9: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	**Projected Water Supply** *Report To the Extent Practicable*									
		2020		**2025**		**2030**		**2035**		**2040**	
		Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Surface water[1]	*Shallow wells on the Russian River*	458	Pre-1914	457	Pre-1914	457	Pre-1914	460	Pre-1914	463	Pre-1914
Total[2]		**458**		**457**		**457**		**460**		**463**	

NOTES:
1. Here "Surface Water" means "Groundwater under the direct influence of surface water," the latter of which is not an option in the official DWR table
2. Water supplies are equal to projected City demands.

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6.10 Climate Change Impacts to Supply

Climate change is likely to affect water supply and management throughout California and could have significant impacts on the City of Cloverdale. Changes in temperature and rainfall seasonality may impact flows and quality of the Russian River, thus effecting the reliability of the City's water source. However as discussed in Section 6.8, the City will still likely be able to meet its demand even in times of low flow due to its senior water rights and infrastructure plans. Also, experience from the recent drought indicates that low precipitation is not likely to significantly impact the water quality of the Russian River. Chapter 8 addresses the City's plans in times of water shortage or catastrophic supply interruption. In addition, the potential climate change impacts on City's water supply and water quality are discussed qualitatively in the *Climate Change Vulnerability Assessment* in Appendix B.

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Chapter 7 Water Supply Reliability Assessment

The section describes the overall reliability of the City of Cloverdale's water supplies, including constraints on the water sources and reliability in dry years.

7.1 Constraints on Water Sources

The City relies solely on groundwater under the direct influence of surface water from the Russian River for its water supply. As discussed in Section 6.3, when there is lower flows in the river and thus lower groundwater elevations, the production capacity of the wells are limited by the entrainment of air. Well capacity during low flows have been increased thanks to the recently constructed de-aeration system. The construction of additional well capacity will also help the City to overcome any reduction in well yield in times of low flow. Reduced yield is not a serious threat to water supply.

Flow in the Russian River is maintained by mandatory releases of water from Lake Mendocino as part of fisheries maintenance. The City's minimum available water supply is based on a combination of natural water flow and this mandated release. Currently, releases are required to achieve a flow of 125 cfs in an average year or 85 cfs in a dry year. The Sonoma County Water Agency (SCWA), in partnership with the National Marine Fisheries Service (NMFS), has evaluated the potential to reduce the volume of the mandated release (in accordance with the 2008 Biological Opinion).[10] As the recommended flow reduction (from 85 cfs to 70 cfs) is implemented, the City's primary water source may become more constrained; however, changes in reservoir management are not expected to influence the City's water reliability due to already completed water supply projects (additional wells).

As discussed in Section 6.3.3, the Russian River has been deemed an impaired water body due to excessive sedimentation and temperature. That said, those concerns do not have any major impact on the water quality for the City's supply because of the treatment provided at the WTP. A copy of the City's 2014 Consumer Confidence Report is included in Appendix I.

7.2 Reliability by Type of Year

The City's senior water right on the Russian River limit the chance of water use curtailment even in critically dry years.[11] However, reductions in the minimum flows released to the Russian River from Lake Mendocino during critically dry years—such as that incurred by SCWA's Temporary Urgency Change Petitions submitted in April and May of 2015—could impact the production of the City's wells. As discussed in previous sections, the construction of the de-aeration system and additional supply wells should allow the City to meet its demand under these conditions.

Table 7-1 summarizes the City's supply availability by water year type. These numbers reflect the assumption that the available water supply will be equal to the demand projections for each potential water year type through 2040 as the City should be able to use its senior water right to fulfill its demands. Weather based adjustment factors were calculated based on precipitation and temperature data from reference years (2013 for a single-dry year or 1988-1990 for multiple-dry years) compared to data averaged over the period of record (1920-2014). These factors were then applied to the average supply (equivalent to the demand) to determine the available volume in different water year types.

[10] http://www.scwa.ca.gov/decision1610/

[11] During the recent drought, only post-1914 water right holders upstream of the Russian River confluence with Dry Creek were curtailed (from May to November 2014).

Table 7-1: Bases of Water Year Data			
Year Type	Base Year	Available supplies if year type repeats	
		Volume available	% of avg supply
Average Year	1920-2014	463	100%
Single-Dry Year	2013	485	105%
Multiple-Dry Years 1st Year	1988	475	103%
Multiple-Dry Years 2nd Year	1989	462	100%
Multiple-Dry Years 3rd Year	1990	465	100%
NOTES: Volume available has been set to the projected production volumes for each potential water year type in 2040 as the City should be able to leverage its water right to fulfill its demands.			

7.3 Supply and Demand Assessment

The City's senior water rights on the Russian River all but ensure that its water demands will be met. Therefore, for the supply and demand analysis, water supplies were set equal to projected water demand for all water year types. Water demand projections accounted for development in the City, water codes, ordinances and appliance standards and conservation efforts. Projections for a normal year are presented in Table 7-2, while those for a single-dry year and multiple-dry years are presented in Table 7-3 and Table 7-4, respectively.

Table 7-2: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals (MG)	458	457	457	460	463
Demand totals (MG)	458	457	457	460	463
Difference	**0**	**0**	**0**	**0**	**0**
NOTES: Assumed that the City can use senior water right to supply water equal to its demand.					

Table 7-3: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040
Supply totals (MG)	479	478	479	482	485
Demand totals (MG)	479	478	479	482	485
Difference	**0**	**0**	**0**	**0**	**0**
NOTES: Assumed that the City can use senior water right to supply water equal to its demand.					

Table 7-4: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040
First year	Supply totals (MG)	469	468	469	472	475
	Demand totals (MG)	469	468	469	472	475
	Difference	**0**	**0**	**0**	**0**	**0**
Second year	Supply totals (MG)	457	456	457	459	462
	Demand totals (MG)	457	456	457	459	462
	Difference	**0**	**0**	**0**	**0**	**0**
Third year	Supply totals (MG)	459	458	459	462	465
	Demand totals (MG)	459	458	459	462	465
	Difference	**0**	**0**	**0**	**0**	**0**
NOTES: Assumed that the City can use senior water right to supply water equal to its demand.						

7.4 Regional Supply Reliability

Though the City of Cloverdale relies solely on groundwater under the direct influence of surface water for its water supply, groundwater is an important source for agricultural, industrial and domestic water supply throughout Sonoma County. The Russian River acts as the primary domestic water source for most of the County's urban areas and most rural areas are served by groundwater. Sonoma County overlays nine groundwater basins, all of varying volume, recharge rates and water quality (Sonoma County, 2008). Development throughout the County has led to an increase in private wells being drilled, raising concerns over decreasing groundwater levels. In response to decreasing groundwater levels, the County has attempted to increase the availability of groundwater data for the region to allow for more active and informed management. With the passage of the Sustainable Groundwater Management Act (SGMA) in 2014, the County has begun work to comply with state guidelines for managing a groundwater basin. Compliance with this law will help ensure that the region's groundwater supply remains intact and can continue to compliment the carefully managed Russian River watershed.

Additionally, the San Francisco Bay Area Integrated Regional Water Management (IRWM)—with participation from Sonoma County—has implemented a plan to improve water quality and sustainability in the region through collaborative projects and programs. The region will be looking to reduce overall demand with efficiency and conservation efforts, increase water supply through the implementation of recycled water projects, and improve water quality with pollution prevention programs (Kennedy/Jenks, 2013).

Cloverdale has been participating in County-wide efforts to manage local water resources. The City has implemented conservation and water-efficiency programs in coordination with the County efforts in order to minimize wasteful use. Additionally, the City has helped to manage water use and wastewater discharge by major water users in the area to ensure reliable water supply and quality for those users downstream of the City. The City has also been in talks with neighboring water supply agencies to potentially serve as their emergency water supplier in case their systems fail.

Chapter 8 Water Shortage Contingency Plan

This chapter describes the City's plans for water supply shortage or catastrophic supply interruptions. Prior to the preparation of this UWMP, the City did not have a formal Water Shortage Contingency Plan. The City prepared this Water Shortage Contingency Plan based upon sections of the City's municipal code as well as regional contingency plans.

8.1 Stages of Action

The stages of action for the Water Shortage Contingency Plan are based upon the 2014 updates to Chapter 13.05 (Conservation of Water Supply) of the City's municipal code which added three stages of water emergency measures (Appendix E). These emergency measures were used as the basis for voluntary and mandatory reductions. The triggers for each stage were based upon existing contingency plans prepared by neighboring water agencies and depend on the severity and anticipated duration of the water supply shortage. The triggers for each stage are summarized in Table 8-1.

Table 8-1: Stages of Water Shortage Contingency Plan

Stage	Percent Supply Reduction	Water Supply Condition
1	*<15%*	*Up to a 15% Reduction in City Supply*
2	*15-25%*	*15-25% Reduction in City Supply*
3	*>25%*	*Above a 25% Reduction in City Supply*

8.2 Prohibitions on End Use

The specific rationing measures for the three stages are summarized in Table 8-2. The narrative description of the stages of action and restrictions and prohibitions on end use is provided in the following sections.

Stage 1 – Introductory Stage (Voluntary Reduction)

Stage 1 is always in place as a water waste prohibition to provide a conservation program framework for reducing City demands up to around 15 percent. During Stage 1, the City implements a public information campaign and advocate for a number of voluntary water reduction measures as well as discourage wasteful water practices. The campaign includes billing inserts and online informational postings as well as public water conservation workshops to inform customers of the special need to conserve water due to drought conditions or any other factor which may cause a reduction in the City's water supply. The level of City campaigning will depend on the reduction in City water supply, with greater effort to encourage voluntary reductions and eliminate water waste occurring as supply reduction approached 15 percent. Below is a list of the recommended water saving actions that the City can promote for all customers during Stage 1:

1. Apply irrigation water only during the evening and early morning hours to reduce evaporation losses.
2. Inspect all irrigation systems, repair leaks and adjust spray heads to provide optimum coverage and eliminate avoidable over-spray.
3. For irrigation valves controlling water applied to turf grass, vary the minutes of run-time consistent with fluctuations in weather.
4. Reduce minutes of run-time for each irrigation cycle if water begins to run off to gutters and ditches before the irrigation cycle is completed.

5. Swimming pools, spas, ponds and fountains shall be equipped with re-circulating pumps and shall not be refilled.
6. Sidewalks, driveways, parking areas, tennis courts, patios or other paved or hard surface areas should not to be washed down except to alleviate immediate fire or sanitation hazards.
7. The washing of automobiles, trucks, trailers, boats, airplanes and other types of mobile equipment is permitted, but recommended to be performed with a handheld bucket or a handheld hose with an automatic shutoff nozzle.

During Stage 1, customers are also encouraged to utilize water conservation incentive and rebate programs to replace water guzzling plumbing fixtures and appliances with water efficient models; and use the information provided by the City on how to use water efficiently, read a water meter, repair ordinary leaks, and how to apply water efficiently to the landscape.

Table 8-2: Restrictions and Prohibitions on End Uses

Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Landscape - Limit landscape irrigation to specific times	Limit irrigation to evening and early morning hours	No
1	Landscape - Restrict or prohibit runoff from landscape irrigation		No
2	Landscape - Prohibit certain types of landscape irrigation		Yes
2	Other water feature or swimming pool restriction	Initial filling of swimming pool requires approval	Yes
2	CII - Restaurants may only serve water upon request		Yes
2	Water Features - Restrict water use for decorative water features, such as fountains	Only water features using recycled water may be in operation	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		Yes
3	Other	Water allotment for each meter	Yes

NOTES: Enforcement for Stage 2 and 3 is as follows: 1. First offense results in a warning; 2. Second offense results in request for corrective action; and 3. Additional offenses result in monetary penalty.

Stage 2 – Mandatory Rationing

Stage 2 will be triggered by a 15-25 percent reduction in the City's supply. In the event that further water conservation beyond Stage 1 is needed, the City will impose mandatory water reductions seeking a 15-25 percent reduction in consumption. The City shall inform customers that water shortage conditions require the reduction or elimination of many non-essential uses of water.

In addition to those activities described in the Stage 1 reductions, the following additional uses are also declared to be nonessential:

1. Any residential use (excluding irrigation only use) in excess of that resulting from application of the mandatory residential rationing requirement established by the City council.
2. Any irrigation only use in excess of that resulting from application of the mandatory irrigation rationing requirement established by the City council.
3. Any nonresidential use (excluding irrigation only use and healthcare and public safety use) in excess of that resulting from application of the overall mandatory rationing requirement established by the City council.
4. Any water used for healthcare and public safety (excluding irrigation only use) in excess of the minimum amount required to adequately provide for healthcare and public safety.
5. The washing of mobile vehicles except for those where the health, safety, and welfare of the public is contingent upon frequent vehicle cleanings, such as garbage trucks and vehicles used to transport food and perishables.
6. Any use of water from a fire hydrant except for fighting fires or for other emergency use deemed essential by the fire chief shall require a permit issued by the city engineer.
7. Watering of any existing turf grass, ornamental plant, garden, landscaped area, trees, shrubs or other plants except from a hand-held hose or container or drip irrigation system except as provided in Section 13.05.070 of the City code.
8. Watering of new turf grass or replacement turf grass.
9. Initial filling of any swimming pool for which approval of a construction permit issued by the City was made after the date on which the initial water shortage emergency condition was originally declared to exist.
10. Use for service of drinking water at any restaurant, cafe, cafeteria or other public place where food is sold, served or offered for sale, unless expressly requested by a patron.

Stage 3 – Mandatory Rationing

Stage 3 will be triggered by a 25 percent or more reduction in the City's supply. If it is determined that further water consumption reductions beyond Stage 2 are necessary or that Stage 2 reduction methods are not effective, it may be recommended that water customers implement a water allotment/penalty method. Water allotments will be assigned for each water use class depending on the necessary water conservation percent reduction. The City manager, in consultation with the City engineer, may increase or decrease the allotment for any customer if he or she determines that special circumstances exist and that to do so would better achieve equity in allocation of available water or better meet health and safety concerns. As water supply conditions change (such as supply reductions in excess of 50 percent), the City manager may adjust the water allotment for any and all customers as necessary to meet demand reduction needs.

In addition to those activities described in the Stage 1 and 2 reductions, water use in excess of the following allotments established for each meter is declared to be nonessential:

1. Residential meters serving single-family detached homes including mother-in-law or second units that are served by the same meter: sixty-five gpcd times the number of permanent occupants. Permanent occupants shall be a whole number. Babies, children, adults and senior citizens whose principal place of residence is in the dwelling in question shall each count as one occupant. In

determining the number of permanent occupants, the City shall rely upon data it has acquired from the customer or other sources. Provided sufficient time is available, the City will attempt to canvass customers to obtain current data on permanent household occupants.

2. Residential meters serving multiple units: any use in excess of that resulting from application of the mandatory residential rationing requirement established by the City council.
3. Irrigation only meters: any use in excess of that resulting from application of the mandatory irrigation rationing requirement established by the City council.
4. Meters serving any nonresidential use (excluding irrigation only metered use and healthcare and public safety use): any use in excess of that resulting from application of the overall mandatory rationing requirement established by the City council.
5. Meters serving water used for healthcare and public safety (excluding irrigation only use): any use in excess of the minimum amount required to adequately provide for healthcare and public safety.
6. Meters serving mixed uses: an allotment to be determined by the City engineer based upon the criteria contained in subsections 1 through 5 of Stage 3.

8.3 Penalties, Charges, Other Enforcement of Prohibitions

During Stages 2 or 3, violations of the water use restrictions and prohibitions shall be enforced as follows:

1. For the first such violation, the customer shall be given a warning, generally by phone or directly in person by a City employee, or by leaving a door tag notice informing the customer of the problem and asking that it be corrected.
2. If the violation continues or is repeated, a certified letter shall be mailed to the customer who receives the water bill. Said letter shall describe the violation and request that it be corrected, cured and abated immediately or within such specified time as the finance manager determines is reasonable under the circumstances. Said letter shall state the consequences of noncompliance with the request.
3. If the violation continues, the City's finance manager may impose any penalty established by the City council under a resolution declaring a water emergency, pursue enforcement action pursuant to Chapters 1.10 through 1.15 of the City Code or order disconnection of the service where the violation occurs.
4. During Stage 3, any customer exceeding their allotment, based on metered billing records, shall be billed and required to pay a penalty established by the City council by resolution at the time Stage 3 water shortage emergency is declared. This penalty charge shall be waived for the first bill received after Stage 3 is implemented and shall terminate the day Stage 3 water shortage emergency period ends.

8.4 Consumption Reduction Methods

When the Water Shortage Contingency Plan is put into effect, the City will implement various consumption reduction methods depending on the stage of action. These consumption reduction methods are described below and summarized in Table 8-3.

Stage 1 will result in an expanded public information and education campaign. The City will create a bill insert with conservation information, post additional conservation information on its website and host informational sessions. The insert, online campaign and informational sessions will focus on providing a list of examples for ways consumers can reduce their water usage and optional programs they can take part in such as home reuse of greywater, maintenance of leaks, and high efficiency fixture installation.

Once Stage 2 of the Water Shortage Contingency Plan is put into effect, the City will look to assist users further reduce their water consumption through rebate programs. These rebate programs have historically been setup by Sonoma County with the City of Cloverdale as a participating agency. The first rebate

program is a high-efficiency fixture direct-install program. This program includes the replacement of older high-flow toilets and shower heads with new high-efficiency models. The second rebate program is a turf replacement initiative that includes a maximum rebate for the replacement of a lawn and sprinkler system with low water use plants and a drip irrigation system. For both rebate programs, users must meet the eligibility requirements set by the County.

In addition to the rebate programs, Stage 2 of the Water Shortage Contingency Plan will include the implementation of a drought rate structure. The drought rate structure will consist of a drought surcharge implemented to encourage a reduction in the volume of water used by its customers while also maintaining adequate revenues to meet system revenue requirements. Should Stage 3 of the Water Shortage Contingency Plan be put into effect, the surcharge will be increased to account for the further loss of revenue. This rate structure is explained further in the City's 2016 Water and Sewer Rate Study which is available on the City's website.[12]

Table 8-3: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods

Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference
1	Expand Public Information Campaign	Bill insert, online information and informational sessions
2	Provide Rebates on Plumbing Fixtures and Devices	Setup by Sonoma County
2	Provide Rebates for Turf Replacement	Setup by Sonoma County
2	Implement or Modify Drought Rate Structure or Surcharge	
3	Implement or Modify Drought Rate Structure or Surcharge	Modify the Drought Rate Structure implemented in Stage 2

8.5 Determining Water Shortage Reductions

As each stage of the Water Shortage Contingency Plan is implemented, the City will track water savings by monitoring City-wide water usage. The City will track water meter data—both production and usage—to determine the actual water savings made during each stage. By tracking the water usage data, the City can adjust its response to the water shortage through more aggressive savings tactics if necessary. Water use for individual accounts will also be monitored, especially under Stage 3 conditions, to ensure that demand reduction goals and mandates are being met. Comparing individual water users' demand during Stage 2 and 3 to non-shortage conditions will help the City to set and enforce water use restrictions and impose penalties if necessary.

8.6 Revenue and Expenditure Impacts

If there is cause for the implementation of the Water Shortage Contingency Plan, the City's revenue will decrease as usage decreases. Since the City is the sole provider of its raw water (relying only on its Russian River water right), the City will not experience any increase in expenditures on water often associated with

[12] http://www.cloverdale.net/DocumentCenter/View/1807

decreases in supply. The City will likely experience increases in expenditures from the occasional operation of an additional well or two to offset any reduction in well production during low river flows as well as increased public outreach and conservation efforts (such as rebate programs). As discussed in Section 8.4, Stages 2 and 3 of the Water Shortage Contingency Plan include the implementation of a drought rate structure. This rate structure will include volumetric surcharges to encourage the reduction of water use as well as offset lost revenue from decreases in water usage. The City does not maintain financial reserves for severe drought scenarios so any emergency drought expenditures not covered by the drought specific rates would have to be covered with existing water fund and general fund money. The rate structure is explained further in the City's 2016 Water and Sewer Rate Study, available on the City's website.[13]

8.7 Resolution or Ordinance

The City has prepared a draft water shortage contingency resolution which can be found in Appendix J. In the event of a water shortage emergency, the draft resolution will be passed by the City Council.

8.8 Catastrophic Supply Interruption

The Water Code Section 10632(c) requires actions to be undertaken by the water supplier to prepare for, and implement during a catastrophic interruption of water supplies. A catastrophic event that constitutes a proclamation of a water shortage would be any event, either natural or manmade, that causes a severe shortage of water. Water shortages may result from variations in weather, natural disasters, or unanticipated situations (i.e. systems failures, acts of terror).

In the event of a supply emergency, the City would increase media attention to the water supply situation during a shortage and would step up public water education programs, encourage property owners to apply for a landscape and interior water use survey and advertise the importance of customers installing water efficient plumbing fixtures.

If an earthquake, or other form of disaster, were to damage the Coyote Valley Dam on Lake Mendocino or impact the delivery of raw water, the City could potentially utilize the local groundwater aquifer as a raw water supply; however, the City would still likely be drawing from the same hydrological unit as its existing riverbank wells. As many users in the area rely on water from the Russian River, there is not a reliable option for a regional intertie to act as an emergency supply.

During declared catastrophes, or when a catastrophe declaration appears imminent, the City manager or his/her designee, who serves as chair, activates a City Water Shortage Response Team. The team includes: water, engineering, finance, emergency services, public affairs, and parks and recreation representatives. This team will coordinate its activities with the City manager's office, the Cloverdale Fire Department, and SCWA. A summary of actions for a number of catastrophic events are summarized in Table 8-3a and additional details on the City's Emergency Response Plan are included in the General Plan (available on the City's website).[14]

Additional action items that may be pursued in preparing for and responding to a catastrophic water supply interruption could include:

- Determine what constitutes a proclamation of a water shortage.
- Stretch existing water storage.
- Develop/obtain additional water supplies.
- Determine where funding will come from.
- Contact and coordinate with other agencies.

[13] http://www.cloverdale.net/DocumentCenter/View/1807
[14] http://www.cloverdale.net/documentcenter/view/1673

- Create a Catastrophe Preparedness Plan.
- Put employees/contractors on-call.
- Develop methods to communicate with the public.
- Develop methods to prepare for water quality interruptions.

Table 8-3a: Preparation Actions for a Catastrophe

Possible Catastrophe	Summary of Actions
Earthquake	Shut-off isolation valves and above ground use of flexible piping for ruptured mains
Floods	Use of backup water supply while Russian River wells sites are interrupted
Toxic Spills	Use of backup water supply while Russian River wells sites are interrupted
Fire	Storage supplies for fire flows
Power Outage or Grid Failure	Portable and emergency generators available for City, wells and treatment plant
Severe Winter Storms	Portable and emergency generators available for City, wells and treatment plant
Hot Weather	Portable and emergency generators available for City, wells and treatment plant

8.9 Minimum Supply Next Three Years

As discussed in previous sections, the City's senior water rights should allow it to meet its water demands under any river condition. The minimum water supply for the next three years—presumed to derive entirely from the Russian River—is presented in Table 8-4. As shown in this table, the City could supply in excess of 400 MG annually; however, conservation and other demand management measures are likely to push the demand below this figure in dry years.

Table 8-4: Minimum Supply Next Three Years

	2016	2017	2018
Available Water Supply	413	413	412

NOTES: The minimum supply available in the next three years is based on the supply available in consecutive dry years (using weather factors from 1988, 1989 and 1990).

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Chapter 9 Demand Management Measures

This chapter presents a detailed analysis of the Demand Management Measures (DMMs) utilized by the City. A DMM is a program designed to maximize the efficient use of water and minimize water waste. As the City is not a member of the California Urban Water Conservation Council, it will not be submitting its most recent Best Management Practice reports in lieu of the following sections.

9.1 Demand Management Measures

This section discusses the City's current DMMs including water waste prevention ordinances, metering, conservation pricing, public education and outreach, programs to asses and manage distribution system loss and water conservation program coordination and staffing.

9.1.1 Water Waste Prevention Ordinances

In 2013 the City passed an ordinance (Water Efficient Landscape, added to Title 15, Chapter 15.30 of the Cloverdale Municipal Code) which stated that any new construction and rehabilitated landscapes requiring a building permit would be required to submit irrigation plans in order to limit water waste. This ordinance (and the added portion of the Municipal Code) is in effect at all times. A copy of the ordinance (including the Municipal Code sections) is included in Appendix E.

In 2014, the City updated its Conservation of Water Supply Ordinance (Chapter 13.05). The update included changes to its Waste of Water section to prohibit water waste from the:

1. Washing of sidewalks, walkways, driveways, parking lots, and other hard-surfaced areas
2. Breaks or leaks within a customer's distribution system for any substantial period of time
3. Excessive irrigation
4. Washing vehicles with a hose not equipped with a shutoff nozzle
5. Water for non-recycling decorative water fountains
6. Water for single pass evaporative cooling systems for air conditioning
7. Water for new non-recirculating conveyor car wash system
8. Water for new non-recirculating industrial clothes wash system

9.1.2 Metering

The City meters all of its deliveries, which allows it to track water usage throughout the City. The City uses Badger and Neptune brand meters which are both estimated to be about 95% accurate by their respective manufacturers (the City has not conducted an independent check). The City uses its meter data to help determine the locations of large system loss and gather data for targeted conservation efforts.

The City manually reads its meters, with reading of the whole system taking about a month. The City has experienced some instances of meter reading error or the need for meter correction, but they are not common occurrences aside from initial meter adjustments after installation. The City monitors its meters and identifies individual or groups of meters for replacement as they reach the end of their useful life or show signs of leakage or malfunction.

9.1.3 Conservation Pricing

The City adopted a new tiered rate structure in 2013 for single-family residences that has helped to reduce domestic water use. This rate structure include three tiers for domestic water use and discouraged wasteful water practices. However, the City is transitioning towards a uniform water rate in response to a recent

court decision related to Proposition 218 and cost of service issues. The City is hopeful that tendencies established while the tiered rate structure were in place will remain and it plans to continue its strong conservation message to help offset any increases in water usage that would occur from the abandonment of tiered rates. A complete version of the City's Water and Sewer Rate Study is available on the City's website.[15]

9.1.4 Public Education and Outreach

The City runs an extensive conservation program through public education and outreach and the implementation of various water savings programs. The City has partnered with SCWA on Proposition 84, Round 2 funding which created three water conservation programs—a "Cash for Grass" rebate, a High-Efficiency Fixture Direct-Install Program (including a high-efficiency clothes washer rebate) and rebates for professional water assessments. These programs originated from participation in the Sonoma-Mendocino Immediate Drought Relief Project and has since seen additional funds committed by the City.

All three of these programs are advertised on the City website[16] and can be discussed via the City's conservation phone line. The "Cash for Grass" program offers customers a rebate to remove their lawn or replace it with lower-water-use plants. The fixture direct install program offers replacement of high-water-using fixtures such as toilets, shower heads and clothes washers. Finally, the City offers rebates for professional water assessments which offer customers the opportunity to better understand their water use and determine ways in which they can reduce their usage. City Council Resolution 055-2015, which extended these programs, is included in Appendix K.

In addition to these programs, the City has also posted additional conservation information on its website[17] and refers to such materials on its utility bills. Finally, Cloverdale does host occasional public outreach events to promote water savings practices or programs.

9.1.5 Programs to Assess and Manage Distribution System Real Loss

As discussed in Chapter 4, the City completed a number of repair projects to reduce system loss in 2013 and 2014. Water-loss related projects are determined based on water meter data and staff operations. The City is continuing to monitor system water loss and develop projects to reduce loss. Unfortunately, the lack of an extensive network of real-time meters limits the City's ability to fully track water use and loss throughout the system, but continued refinement of the system should result in an improvement on the City's water loss. Results of the AWWA Water Audit for 2015 are available in Appendix D.

9.1.6 Water Conservation Program Coordination and Staffing Support

Cloverdale's Water Conservation Representative, Eric Janzen, leads the City's conservation efforts. Mr. Janzen prepares conservation materials rebate programs and educational outreach and is available to answer questions via email and phone (ejanzen@ci.cloverdale.ca.us or 707-894-1728).

SCWA has a larger conservation staff including the turf replacement contact Claire Nordlie (claire.nordlie@scwa.ca.gov or (707) 524-1165) and the fixture replacement contact Brian Lee (brian.lee@scwa.ca.gov or (707) 547-1918).

9.1.7 Other Demand Management Measures

The City does not have other demand management measures aside from the DMMs already described above.

[15] http://www.cloverdale.net/DocumentCenter/View/1807
[16] http://www.cloverdale.net/index.aspx?nid=263
[17] http://www.cloverdale.net/index.aspx?nid=263

9.2 Implementation over the Past Five Years

This section discusses the implementation of the DMMs discussed in the previous section since 2010.

9.2.1 Water Waste Prevention Ordinances

The 2013 and 2014 City ordinances discussed in Section 9.1.1 utilized City staff hours, but no additional financial resources, and was made public through the City's website and local paper.

9.2.2 Metering

The City's accounts are all metered and the City has not implemented any major metering changes over the last five years.

9.2.3 Conservation Pricing

The City's tiered rate structure was adopted in 2013 for single-family residences and included three tiers to encourage reductions in water use. The 2013 tiers increased in price from $3.09 for the first 10 hundred cubic feet, to $3.86 for the next 20 hundred cubic feet to $4.63 for use over 30 hundred cubic feet. Water users (around 3,000 residential accounts) were informed of the rate structure change via bill inserts, public notices in the local newspaper and website postings. However, as mentioned in the previous section, the City is transitioning towards a uniform water rate in response to a recent court decision related to Proposition 218 and cost of service issues. The City is hopeful that tendencies established while the tiered rate structure were in place will remain.

9.2.4 Public Education and Outreach

With the onset of the drought, the City increased its outreach effort to educate the public regarding water supply shortages and conservation practices. The City's partnership with SCWA provides rebates of $0.50 per square foot (up to $250) for the removal or replacement of eligible lawns.[18] The High-Efficiency Fixture Direct-Install Program offers predetermined standard toilets or fixtures totaling about 190 units of which 109 units have been installed, or a rebate of $50 to $150 for participants wishing to install a non-standard, qualified fixture.[19] The City will offer rebates for up to 250 toilet replacements and 275 washer replacements over and above the units installed under the Direct-Install program. Water assessments are eligible for $100 rebates and are limited to the first 180 eligible participants. In total, the City has approved $17,313 in funds to match the Proposition 84 grant.

The City also hosted an informational session on the use of greywater in September 2015 to promote greywater use as a way to decrease potable water demand. Additionally, the City provides information regarding water savings tips and how to spread the word about conservation on its website. [20]

The City had implemented a "Sprinkler Waiver" program in 2014 which would determine customers' irrigation budgets as part of the City's Stage 2 mandatory water conservation measures; however, the City has rolled back to voluntary conservation and suspended the program. The program had applied to any user that used City-delivered water for irrigation and prescribed an acceptable irrigation budget based upon their irrigable area.

9.2.5 Programs to Assess and Manage Distribution System Real Loss

Water system projects to reduce system loss are factored into the City's annual capital improvement program (CIP). Total water system improvements cost roughly three million dollars over the last five years

[18] http://www.cloverdale.net/index.aspx?nid=305
[19] http://www.scwa.ca.gov/drought/direct-install/
[20] http://www.cloverdale.net/index.aspx?nid=263

and the City has budgeted roughly 30 million dollars over the next 25 years for water system projects, about 4 million dollars of which is tagged for improvements to the existing distribution network.

9.3 Planned Implementation to Achieve Water Use Targets

While the City of Cloverdale has already met its 2020 water use target, the City is wary of a post-drought water use bounce. While the City has drastically reduced its water use over the last few years (from about 170 gpcd in 2012 to 104 gpcd in 2015), water use will increase once the drought lessens or lets up. The City is confident that the effects of the recently implemented DMMs and continued conservation efforts will lead to a sustained reduction in water usage.

For those customers that participated in the "Cash for Grass" or fixture replacement, their water usage will remain reduced even after the drought ends as the effects of those changes will be long-lasting. To encourage additional conservation, the City will continue its educational campaign, including tips on water saving practices and self-water meter monitoring. The City will also continue to partner with SCWA on various rebate and other conservation programs.

Chapter 10 Plan Adoption, Submittal, and Implementation

The City prepared this 2015 UWMP Update during the winter of 2015 and spring of 2016. This UWMP includes the water use and planning data for the entire calendar year 2015. This chapter summarizes the City's compliance with the State's notification, adoption and submittal procedure for UWMPs.

10.1 Notice of Public Hearing

The City provided notice to the public agencies listed in Table 10-1 (Sonoma County and the Russian River Watershed Association) on January 7, 2016, fulfilling the 60 day notification requirement. Cloverdale provided follow up notice regarding the public hearing on May 2, 2016. Copies of the notification letters are included in Appendix L.

Table 10-1: Notification to Cities and Counties

County Name	60 Day Notice	Notice of Public Hearing
Sonoma County	☒	☒
NOTES: Both the Permit & Resource Management Department and the Water Agency at Sonoma County were notified. Additionally, the City notified the Russian River Watershed Association, which is a consortium of Cities and Counties.		

10.2 Notice to the Public

In order to comply with Government Code 6066, the City notified the public of the UWMP preparation via a newspaper announcement in the Cloverdale Reveille and online posting. Released in April, May and June, these notices (copies available in Appendix M) were released in anticipation of the 30 day public review period and the adoption hearing. During the public review period, which lasted from April 19 to May 18, 2016, the Public Draft 2015 UWMP was made available for public inspection on the City's website and at City Hall.

On May 10, 2016, a presentation was made to City Council and the public to receive comments, questions and concerns from the public regarding the UWMP. This meeting provided an opportunity for the City's customers/residents and employees in the area to learn about the water supply situation and the plans for providing a reliable, safe, high-quality water supply for the future.

10.3 Public Hearing, Adoption and Plan Submittal

The City first presented the UWMP to the Public Works subcommittee of the Cloverdale City Council on March 29, 2016. Then, during the public review period, the City held its public hearing in front of the full City Council on May 10, 2016. The UWMP was adopted by City Council at its meeting on June 14, 2016 and submitted to DWR prior to the July 1, 2016 deadline. A copy of the resolution can be found in Appendix N. The UWMP will be submitted to DWR electronically through DWR's online submittal tool WUEdata. Once submitted to DWR, a copy of the UWMP (including the Water Shortage Contingency Plan) will be provided to Sonoma County, the Russian River Watershed Association and the California State Library within 30 days of adoption as required by California Water Code Section 10644(a). A copy of the adopted

UWMP will be available on the City website. If the City makes any modifications or amendments to the adopted UWMP, it will go through the process of notification, public hearing, adoption, and submittal as described above for the amended plan.

Chapter 11 References

City of Cloverdale. “2014 Consumer Confidence Report” June 2015.

City of Cloverdale. “General Plan Update” January 2015.

Coastland. “Sewer Master Plan Update” June 2009.

Coastland. “Water System Master Plan Update” August 2010.

Department of Water Resources. *Bulletin 118.* “Alexander Valley Groundwater Basin, Alexander Subbasin” February 2004.

Kennedy/Jenks Consultants. “San Francisco Bay Area Integrated Regional Water Management Plan” September 2013

PMC. “City of Cloverdale Housing Element 2015-2023” December 2014.

Sonoma County. “Sonoma County General Plan 2020” September 2008.

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Appendices

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Appendix A - DWR UWMP Checklist

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Checklist Arranged by Subject

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location *(Optional Column for Agency Use)*
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	**Page 2-1**
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	**Page 2-2**
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	Plan Preparation	Section 2.5.2	**Page 2-2 / Page 10-1**
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	**Page 3-1**
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	**Page 3-3**
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	**Page 3-4**
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	**Page 3-4**
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	**Page 3-4**
10631(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	**Page 4-1**
10631(e)(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	**Page 4-3**
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	**Page 4-4**
10608.20(b)	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	**Page 5-5**
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and	Baselines and Targets	Chapter 5 and App E	**Page 5-5**

	compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.			
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply is the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	**Page 5-5**
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	**Page 5-6**
1608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.8.2	**Page 5-6**
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	**n/a**
10608.40	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	**Page 5-6**
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	**Page 6-12**
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	**Page 6-1**
10631(b)(1)	Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2	**Page 6-1**
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	**Page 6-1**
10631(b)(2)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	**n/a**
10631(b)(2)	For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.	System Supplies	Section 6.2.3	**n/a**
10631(b)(3)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water	System Supplies	Section 6.2.4	**Page 6-1**

	supplier for the past five years			
10631(b)(4)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2 and 6.9	**Page 6-1**
10631(d)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	**Page 6-11**
10631(g)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years.	System Supplies	Section 6.8	**Page 6-11**
10631(i)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	**Page 6-11**
10631(j)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use projections from that source.	System Supplies	Section 2.5.1	**n/a**
10631(j)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	**n/a**
10633	For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.1	**Page 6-4**
10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	System Supplies (Recycled Water)	Section 6.5.2	**Page 6-4**
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2.2	**Page 6-4**
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and 6.5.4	**Page 6-4**
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4	**Page 6-4**
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.4	**Page 6-4**

10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.5	**Page 6-5**
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	**Page 6-5**
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	**Page 7-4**
10631(c)(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	**Page 7-1**
10631(c)(1)	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	**Page 7-2**
10631(c)(2)	For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.	Water Supply Reliability Assessment	Section 7.1	**Page 7-2**
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1	**Page 7-1**
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	**Page 7-1**
10632(a) and 10632(a)(1)	Provide an urban water shortage contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage.	Water Shortage Contingency Planning	Section 8.1	**Page 8-1**
10632(a)(2)	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency.	Water Shortage Contingency Planning	Section 8.9	**Page 8-7**
10632(a)(3)	Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.	Water Shortage Contingency Planning	Section 8.8	**Page 8-6**
10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	**Page 8-2**
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	**Page 8-4**
10632(a)(6)	Indicated penalties or charges for excessive use, where applicable.	Water Shortage Contingency Planning	Section 8.3	**Page 8-4**

10632(a)(7)	Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.	Water Shortage Contingency Planning	Section 8.6	**Page 8-5**
10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	**Page 8-6 / Appendix J**
10632(a)(9)	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	**Page 8-5**
10631(f)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3	**Page 9-3**
10631(f)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	**n/a**
10631(j)	CUWCC members may submit their 2013-2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU.	Demand Management Measures	Section 9.5	**n/a**
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Section 10.3	**Pge 10-2**
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	**Page 10-1**
10621(d)	Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	**Page 10-2**
10635(b)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	**To be added later**
10642	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	**Page 10-1 / Appendix M**

	about the plan.			
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Sections 10.2.1	**Page 10-1 / Appendix L**
10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	**Plan 10-2 / Appendix N**
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4.3	**To be added later**
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	**To be added later**
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	**To be added later**
10645	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	**To be added later**

Appendix B - Climate Change Vulnerability Assessment

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DRAFT Technical Memorandum

City of Cloverdale 2015 UWMP

Subject:	**Climate Change Vulnerability Assessment**
Prepared For:	Eric Janzen, City of Cloverdale
Prepared by:	Ian Jaffe, RMC
Reviewed by:	Sevim Onsoy, RMC
Date:	April 2016
Reference:	0286-005

1 Introduction

The City of Cloverdale (City) has elected to prepare a voluntary Climate Change Vulnerability Assessment as presented in Appendix I of the *2015 Urban Water Management Plans Guidebook for Urban Water Suppliers* (DWR, 2016). Appendix I provides guidance for preparing a regional and local assessments of potential climate change impacts. The following sections include a qualitative description of potential regional (San Francisco Bay Area) and local (in and around Cloverdale) impacts. The regional assessment is based on information provided in the 2013 *San Francisco Bay Area Integrated Regional Water Management Plan* (Kennedy/Jenks, 2013).

2 Potential Impacts of Climate Change

2.1 Water Demand

Regional

Water demand in the San Francisco Bay Area Region (Region) varies dramatically based upon the primary water users in each sub-region. Throughout the Region, those areas in which irrigation is the primary demand display a distinct seasonality in their water use, with the majority of demand occurring during the warmer spring and summer months. Urbanized areas with larger residential lot sizes also reflect a similar, albeit smaller, use pattern due to outdoor irrigation of landscaping. Climate change could impact irrigation demands due to both a change in evapotranspiration rates as well as responses by climate-sensitive crops.

In addition to the agricultural irrigation, there is significant demand for process water at vineyards and breweries, cooling/process water for refineries, power plants and other industrial and agri-businesses. As average temperatures increase, cooling water needs may also increase. Currently, cooling/process water users utilize both surface water and groundwater. These water supplies may become limited due to regulation (Sustainable Groundwater Management Act) or climate change (variations in surface water availability).

Aside from urban, industrial and agricultural demands, many streams and rivers in the Region have environmental flow requirements. Flow requirements in the Region are currently adequate to support aquatic life. If climate change begins to impact natural river and stream flows, updated biological opinions may be required or modified in order to establish new environmental discharge requirements.

Local

While not as drastic as agricultural demands, the City's urban demands do have some seasonality, with monthly summer demands roughly 50 percent above the annual average and winter demands roughly 50 percent below average. While the City does not serve any agriculture directly, significant area around the City is used for winegrape production, which could be affected by climate change. In addition to the winegrape irrigation, there is significant demand for process water at the vineyards around Cloverdale, as well as at Bear Republic Brewing, which is served by the City. Changes in temperatures could impact the seasonality of the City's demands as well as the needs of the local agriculture and vineyards and the brewery.

Aside from urban, industrial and agricultural demands, the Russian River has in place an environmental flow requirement. The biological opinion has recently been updated to recommend lowering the releases from Lake Mendocino to the Russian River. More information on the biological opinion can be found online at the website below.[1]

2.2 Water Supply

Regional

Throughout much of the Region, water is imported from Sierra Nevada Mountains and Delta diversions, accounting for roughly 66 percent of the water sources in the area. A significant portion of this water can be attributed to snowmelt and will likely be adversely effected by climate change reducing the yearly snowpack. Because the Region relies heavily on imported supplies, any reduction or change in the timing or availability of those supplies could have negative impacts on the Region. Changes in local hydrology could affect surface storage of water and natural recharge to the local groundwater and the quantity of groundwater that could be pumped in a sustainable manner. The operations of reservoirs that deliver water to the Region may change to address climate change, but it is not yet known how those changes would impact water storage for the Region.

While droughts have occasionally impacted the Region, water shortage contingency plans have allowed water providers to meet their demands. Many water distributors have seen their water use decrease significantly during the recent drought due to conservation programs. Like other parts of the State, the Region has seen some agricultural land fallowed as a result of the drought.

Local

Changes in temperature and rainfall seasonality may impact flows in the Russian River, thus effecting the reliability of the City's water source. However, the City will still likely be able to meet its demands, even in times of low flow, due to its senior water rights and infrastructure plans. The City does have a contingency plan in place to managed supplies and demands during times of water shortage.

While droughts have occasionally impacted the City, its aggressive conservation programs in drought conditions have managed water demands to minimize impacts to reduced supply. For example, the City has been able to reduce its water usage by upwards of 25 percent over the last few years with programs such as the "Cash for Grass" rebate and high-efficiency fixture installation. Sonoma County has also successfully implemented urban conservation programs, but like other parts of the State, has seen some agricultural land fallowed as a result of the recent drought.

[1] http://www.scwa.ca.gov/rrifr/

2.3 Water Quality

Regional

The Region utilizes both groundwater and surface water sources. Groundwater quality in the Region is relatively good and even though coastal aquifers have shown some signs of salt intrusion. That said, decreased infiltration and increasing sea levels potentially occurring due to climate change could have a negative effect on groundwater quality. By reducing withdrawals and more effectively managing the groundwater basin, the Region hopes to maintain its good groundwater quality.

The Region does not rely on surface water bodies with current or recurrent water quality issues aside from some high levels of sedimentation. Sedimentation could become a larger issue in the Region if wildfire frequency and intensity increases due to increasing temperatures and reduced precipitation. Additionally, increased temperature due to climate change would likely reduce the dissolved oxygen levels in surface water sources which would promote algal blooms. Aside from temperature impacts, flow reductions from reduced precipitation may result in a limitation on the water bodies' assimilative capacity; however, the recently observed low flows throughout the Region have not resulted in any water quality concerns during the recent drought. Alternatively, larger intensity rainfall events may exacerbate water quality issues for treatment facility operations during wet weather events. In particular, those areas with combined sewer/stormwater systems (such as San Francisco) would likely see additional problems should rainfall event intensities increase (Kennedy/Jenks, 2013).

Local

Like the rest of the Region, the City does not rely on a water supply with any major water quality concerns aside from some high levels of sedimentation. Wildfire frequency and intensity increases due to increasing temperature and reduced precipitation could become an issue for water quality (and property damage) as the climate changes.

The City does not have a combined sewer system, so it has not experienced any water quality issues due to the overloading of its treatment facilities during wet weather events. In fact, the City's new Low Impact Development program should help to manage any potential water quality issues posed during large storms through its encouragement of stormwater utilization and management.

2.4 Sea Level Rise and Flooding

Regional

The San Francisco Bay Area Region (Region), is home to one of the more complex levee systems in the United States around the Sacramento-San Joaquin River Delta (Delta). This area is extremely susceptible to sea level rise and could see severe consequences if the levees were to fail. There is a significant amount of coastal infrastructure in the Region, located less than six feet above mean sea level, including 10 wastewater treatment plants (representing almost 350 million gallons per day (MGD) of capacity) and 11 power plants (about 1,700 megawatts (MW) of generation capacity). In addition to those facilities, there are roads and a population of roughly 3,100 people that would be at risk should the sea level rise up to six feet; however, those homes are not located within Cloverdale. Additionally, portions of Contra Costa and Solano counties lie within the Sacramento-San Joaquin Drainage District, which is susceptible to overflows from the Sacramento and San Joaquin rivers.

There has not been any observed problems with coastal erosion nor have there been any issues with flooding during high tides or storm surges. While there is no evidence of tidal increases above the national average at this time, climate change may impact the height of tides and storm surges which may cause problems in the Region.

Local

Located along the Russian River, sections of the City reside along large levees. However, as the City is located around 350 feet above mean sea level, sea level rise attributed to climate change is not likely to impact Cloverdale in the planning horizon of this UWMP. Potential increases in the intensity of regional rainstorms and the resultant river level rise could result in flood events and property damage. As more information is collected on the potential impacts of climate change on the occurrence of riverine flooding, the City will coordinate its efforts with relevant agencies to address possible levee deficiencies.

2.5 Ecosystem and Habitat Vulnerability

Regional

Ecosystems in the San Francisco Bay Area Region are at great risk due to climate change. In addition to numerous rivers in the Region, the Delta is one of the most complicated ecosystems in California. Changes in temperature and rainfall volume and seasonality could have a large impact on water temperatures as well as the volume and seasonality of riverine flows. Changes in riverine flows could affect erosion and sedimentation as well as general water quality in the various regional waterbodies. These climate change-related effects may impact the various migratory and endangered species in the area. Additionally, climate change may also worsen the frequency and impact of wildfires, which are already a concern within the Region.

Local

The Russian River ecosystem is an extremely important aquatic habitat that may be effected by climate change. Changes in temperature and rainfall volume and seasonality could have a large impact on the Russian River and could impact the various migratory and endangered species in the area. Changes in riverine flow could affect water quality and have subsequent impacts on required reservoir releases for environmental flows. The City will play an active role in coordinating efforts with the Sonoma County and relevant State and Federal agencies to address possible ecosystem loss and impacts to endangered species. Like much of the Region, wildfires are a concern for Cloverdale and the frequency and impact of wildfires may worsen due to climate change

2.6 Hydropower

Regional

Hydropower does provide electricity to the Region and could be affected by climate change if precipitation volumes are greatly decreased for multiple years resulting in severe reservoir depletion. Energy needs in the Region are expected to increase, however there are no plans for additional hydropower generation.

Local

Cloverdale does not currently (nor does it plan to) rely on hydropower as a source of electricity.

3 References

Kennedy/Jenks Consultants. “San Francisco Bay Area Integrated Regional Water Management Plan,” September 2013

Appendix C - Demand Projections Memorandum

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M.CUBED
POLICY ANALYSIS FOR THE PUBLIC AND PRIVATE SECTORS

5358 MILES AVENUE
OAKLAND, CA 94618
PH: 510-547-4369
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MITCHELL@MCUBED-ECON.COM

DATE: December 7, 2015
TO: Leslie Dumas
FR: David Mitchell
RE: Draft Cloverdale Water Demand Forecast

This memorandum presents the draft Cloverdale water demand forecast along with the data and methodology used to generate it.

Forecast Summary

Table 1 provides a summary of the demand forecast. The forecast is for unrestricted demand under normal weather conditions. The forecast for 2015 is therefore expected to exceed 2015 actual demand which was reduced by the State's Emergency Drought Regulation. As explained later in the memo, forecasts of population, housing units, and service meters tie back to ABAG's 2013 Projections for City of Cloverdale. The forecast includes adjustments for future water savings from plumbing codes and appliance standards, as well as future increases in water rates. These adjustments counteract increases in forecasted demand caused by population and housing growth, resulting in a total production forecast that is essentially flat over the forecast period. Per capita demand is projected to decrease throughout the forecast period.

Table 1. Summary of Cloverdale Water Demand Forecast

	2015	2020	2025	2030	2035	2040
Population	9,051	9,497	9,958	10,452	10,978	11,524
Meters	3,487	3,541	3,601	3,684	3,768	3,856
Demand in AF						
Single Family	829	800	778	759	742	725
Multi Family	102	126	147	169	190	212
Commercial	209	209	209	211	216	222
Irrigation	101	99	97	95	92	90
Other	2	2	2	2	2	2
Total Demand	1,242	1,236	1,233	1,235	1,243	1,251
Losses	169	169	168	168	169	171
Total Production	**1,412**	**1,404**	**1,402**	**1,404**	**1,412**	**1,421**
Per Capita Demand in GPCD						
Residential	92	87	83	79	76	73
Total Production	139	132	126	120	115	110

Demand forecasts were also prepared for a single dry year and multiple dry year scenarios. The forecasts were adjusted to account for the effects of weather on demand in dry years using the CUWCC's GPCD Weather Normalization Methodology (Western Policy Research, 2011). The driest year on record since 1920 was chosen as the reference year for the single dry year forecast. This year was 2013. The driest three consecutive years on record since 1920 were selected as the reference years for the multiple dry year forecast. These years were 1988-1990. The dry year demand forecasts are summarized in Table 2.

Table 2. Dry Year Demand Forecasts

Total Production	2015	2020	2025	2030	2035	2040	Reference Weather Year
			Demand in AF				
Normal Year	1,412	1,404	1,402	1,404	1,412	1,421	NA
Single Dry Year	1,479	1,471	1,468	1,471	1,479	1,489	2013
Multiple Dry Years							
Year 1	1,448	1,440	1,437	1,440	1,448	1,458	1988
Year 2	1,408	1,401	1,398	1,401	1,409	1,418	1989
Year 3	1,417	1,409	1,406	1,409	1,417	1,426	1990

Forecast Methodology

The demand forecast is constructed stepwise as follows:

1. For each residential service class, the forecast of dwelling units is multiplied by baseline average use per dwelling unit to get baseline future demand. For non-residential service classes, service meters rather than dwelling units are used. Baseline use per dwelling unit (or service meter) is set to 2013 weather-normalized average use. Forecasts of residential dwelling units and non-residential service meters are derived from ABAG's 2013 population and housing projections for City of Cloverdale.

2. Baseline water use is adjusted for expected water savings from plumbing codes and appliance standards, which are predicted to increase the efficiency of toilets, urinals, showerheads, clothes washers, and dishwashers over time. Water savings are estimated with the Alliance for Water Efficiency's Water Conservation Tracking Tool.

3. A second adjustment to baseline water use is made to account for customer response to increases in the real cost of water over time. Estimates of price elasticity for each service class in combination with a forecast of the growth in the real cost of water are used to make this

adjustment.[1]

4. An estimate of system loss is added to the forecast of adjusted baseline water demand to get the forecast of system production.

The calculations are enacted in an Excel workbook[2] which holds the data and adjustment parameters. The forecast workbook can be used to audit the forecast data and calculations. It can also be used to generate alternative forecasts that rely on different data or adjustment assumptions.

Population, Dwelling Unit, and Service Meter Projections

Population and total dwelling unit projections are taken from ABAG's 2013 Projections. New dwelling units are allocated between single family and multi-family units. For the near-term period 2016-2020, a 10-to-1 ratio between new multi-family and single family dwelling units is assumed. After 2020, the ratio of new multi-family to single-family dwelling units is assumed to decrease to 5-to-1. The near-term ratio is based on information provided by City staff. The post-2020 ratio is based on historical rates of housing growth.

Growth of commercial service meters is assumed to keep pace with population growth. Irrigation meters and miscellaneous accounts are assumed to remain at their present count in the forecast.[3] Table 3 shows the population, dwelling unit, and service meter projections used in the water demand forecast.

Table 3. Cloverdale Population, Dwelling Unit, and Service Meter Projections

	2015	2020	2025	2030	2035	2040
Population	9,051	9,497	9,958	10,452	10,978	11,524
Single Family DU	3,045	3,060	3,083	3,108	3,133	3,158
Multi Family DU	457	582	697	819	936	1,057
Service Meters						
Single Family	3,045	3,060	3,083	3,108	3,133	3,158
Multi Family 1/	108	137	164	193	220	249
Commercial	222	232	242	252	267	282
Irrigation	76	76	76	76	76	76
Other	36	36	36	36	36	36
Total Service Meters	3,487	3,541	3,601	3,665	3,732	3,801

1/ Based on 4.25 DU per service meter, on average, per City billing records.

[1] Price elasticity measures the rate at which demand for a good changes in relation to changes in its price. Specifically, it measures the percentage change in demand given a percentage change in price. If, for example, price elasticity is estimated to be -0.2, this means that a 1% increase in price would be expected to result in a 0.2% decrease in demand. Price elasticities for municipal water demand are typically in the range of -0.1 to -0.5.

[2] Cloverdale_water_demand_forecast_workbook_v1.xlsx.

[3] According to City staff, irrigation accounts are not expected to increase in the near future.

Baseline Average Use per Dwelling Unit and Service Meter

Baseline average use per dwelling unit and service meter is set to 2013 weather-normalized average annual use for each service class. Weather normalization follows the CUWCC GPCD Weather Normalization Methodology. This methodology adjusts demand in each month based on deviations from monthly average temperature and precipitation.[4] Demand is positively correlated with deviations in temperature and negatively correlated with deviations in precipitation. The amount of adjustment varies by season and by the amount of outdoor water use in the service area, as measured by the ratio of peak month to minimum month demand. The 2013 monthly adjustment factors are shown in Table 4. The last row of the table shows the annual adjustment factor, which is a production weighted-average of the monthly adjustment factors.

Table 4. 2013 Weather Normalization Factors

Month	Precip Factor	Temp Factor	Combined Factor
January	1.03	1.04	1.07
February	1.03	1.08	1.12
March	1.01	1.05	1.06
April	1.10	1.13	1.24
May	1.07	1.04	1.11
June	0.96	1.04	1.01
July	1.00	1.01	1.01
August	1.00	0.96	0.97
September	0.99	0.96	0.95
October	1.04	1.00	1.04
November	1.02	1.09	1.11
December	1.04	1.12	1.15
Weighted Annual	**1.02**	**1.03**	**1.05**

Weather-normalized baseline average demand is calculated by dividing 2013 average demand by the annual combined weather normalization factor. Actual and weather normalized baseline average demands by service class are shown in Table 5.

Table 5. Weather Normalized Baseline Average Annual Demand by Service Class

Service Class	Units	Actual	Weather Normalized
Single Family	CCF/DU	124.2	118.5
Multi Family	CCF/DU	101.7	97.1
Commercial	CCF/Meter	429.2	409.7
Irrigation	CCF/Meter	606.1	578.6
Other	CCF/Meter	26.4	25.2

[4] Monthly estimates of precipitation and average maximum daily air temperature for the period 1920-2014 for latitude 38.7997 longitude -123.0126 were downloaded from the PRISM Climate Group website (http://www.prism.oregonstate.edu/explorer/).

Unadjusted Baseline Demand Forecast

The unadjusted baseline demand forecast is calculated by multiplying the weather normalized baseline average demands in Table 5 by the forecast of dwelling units and service meters in Table 3. The unadjusted baseline demand forecast is given in Table 6.[5] The forecast in Table 6 does not include adjustments for expected water savings from plumbing codes and appliance standards or growth in the real cost of water.

Table 6. Unadjusted Baseline Demand Forecast in AF

	2015	2020	2025	2030	2035	2040
Single Family	829	833	839	846	852	859
Multi Family	102	130	155	183	209	236
Commercial	209	218	228	237	251	265
Irrigation	101	101	101	101	101	101
Other	2	2	2	2	2	2
Total Demand	1,242	1,284	1,325	1,368	1,415	1,463

Baseline forecast does not include adjustments for expected water savings from plumbing codes and appliance standards or growth in the real cost of water.

Adjustments for Plumbing Codes and Appliance Standards

Over the next decades plumbing codes and appliance standards will work to increase the efficiency of toilets, urinals, showerheads, clothes washers, and dishwashers. For example, the standard for toilets recently changed from 1.6 to 1.28 gpf while the standard for urinals went from 1.0 to 0.25 gpf. Similarly, standards scheduled to take effect in 2016 and 2018 will ratchet down water used by showerheads, clothes washers, and dishwashers. This means new homes and businesses will install more efficient plumbing fixtures and water using appliances than is currently reflected in the existing stock upon which baseline average water use is based. It also means that existing homes will eventually replace their current fixtures and appliances as they wear out or as part of remodeling with more efficient fixtures and appliances. Overtime this will result in a predictable decline in indoor water use per dwelling unit or service meter.

Expected water savings from plumbing fixture and appliance efficiency standards were estimated with the Alliance for Water Efficiency's Water Conservation Tracking Tool.[6] This is a model in wide use in California and throughout North America specifically designed to estimate water savings associated with plumbing codes, appliance standards, and utility-based conservation programs.[7] The model uses the forecasts of population and dwelling units along with estimates of average persons per household and plumbing fixtures and appliances per household to estimate plumbing fixture and appliance water uses with and without the efficiency standards. The difference between the two forecasts provides the estimate of the expected water savings. These estimates are shown in Table 7.

[5] Volumes in Table 6 have been converted from CCF to AF.
[6] http://www.allianceforwaterefficiency.org/Tracking-Tool.aspx
[7] The Alliance for Water Efficiency estimates there are currently 400 utilities throughout North America using the model for conservation program planning.

Table 7. Demand Adjustments for Plumbing Fixture and Appliance Efficiency Standards in AF

	2015	2020	2025	2030	2035	2040
Single Family	0	-20	-35	-47	-55	-62
Multi Family	0	-3	-7	-11	-15	-19
Commercial	0	-7	-13	-18	-23	-27
Irrigation	0	0	0	0	0	0
Other	0	0	0	0	0	0
Total Adjustment	0	-30	-55	-76	-93	-108

Adjustments for Growth in Real Cost of Water

As the real cost of water increases, demand for water will be affected. Municipal water service is a normal economic good in that as price goes up less is demanded. This has been demonstrated conclusively through numerous empirical studies of municipal water use.[8]

The degree of responsiveness to changes in the real cost of water is measured by price elasticity. Price elasticity estimates the percentage change in demand given a percentage change in the real (inflation-adjusted) price. Price elasticity has been estimated for numerous municipal water providers in California. Recent estimates include studies by M.Cubed (2013, 2015a, 2015b, 2015c), A&N Technical Services (2014), and Western Policy Research (2014). Jenkins et al. (2003) provide a summary of estimates from studies done in the 1980s and 1990s. The CUWCC's Conservation Rate Handbook also provides recommended price elasticities for residential water demand. Based on these and other studies, we have set the price elasticity parameters for each service class to the ranges shown in Table 8. We have used the mid-point estimate to calculate the price-induced demand adjustments in the forecast presented in this memorandum.

Table 8. Water Demand Price Elasticity Ranges

	Lower	Mid-Point	Upper
Single Family	-0.15	-0.20	-0.25
Multi Family	0.00	-0.05	-0.10
Commercial	-0.10	-0.15	-0.20
Irrigation	-0.20	-0.25	-0.30

There is significant uncertainty regarding the future growth in water rates over the forecast period. Over the past two decades, rates for municipal water service have been increasing faster than inflation in most of California and in much of the rest of the country. For example, between 2004 and 2016, Cloverdale's water rates are scheduled to increase at an average annual rate of 5.8% while inflation has averaged about 2.5% over this period. Water rates in California are expected to continue to rise faster

[8] See Renzetti (2002) for a comprehensive review of the empirical evidence of municipal demand response to changes in price. Other reviews of the empirical evidence are provided by Dalhuisen et al. (2003) and Espey et al. (1997).

than general inflation as water systems reinvest in aging infrastructure and develop new, more expensive sources of water supply. In economic studies done for the Bay Delta Conservation Plan, DWR assumed water rates in Southern California and the Bay Area would rise at an average annual rate of 5% over the next 50 years while it assumed inflation would average 2% over the same period (Sunding et al., 2013). This translates to a 3% average annual rate of growth in the real cost of water.

For this forecast we have assumed that rates will increase at an average annual rate of 4% and inflation will average 2.5% over the forecast period. This means we are forecasting that the real cost of water will increase at an average annual rate of 1.5%. The resulting demand adjustments are summarized in Table 9.

Table 9. Demand Adjustments for Growth in Real Cost of Water in AF

	2015	2020	2025	2030	2035	2040
Single Family	0	-13	-26	-40	-55	-72
Multi Family	0	0	-1	-2	-3	-5
Commercial	0	-2	-5	-8	-12	-16
Irrigation	0	-2	-4	-6	-9	-11
Other	0	0	0	0	0	0
Total Adjustment	0	-17	-36	-57	-79	-104

Adjusted Baseline Demand Forecast

The adjusted baseline demand and system production forecast is summarized in Table 10. System production is the sum of adjusted baseline demand and system losses. System losses are estimated at 12% of total production based on historical production data.

Table 10. Adjusted Baseline Demand Forecast in AF

	2015	2020	2025	2030	2035	2040
Unadjusted Baseline Demand						
Single Family	829	833	839	846	852	859
Multi Family	102	130	155	183	209	236
Commercial	209	218	228	237	251	265
Irrigation	101	101	101	101	101	101
Other	2	2	2	2	2	2
Total Demand	1,242	1,284	1,325	1,368	1,415	1,463
Adjustments for Plumbing Code and Appliance Standards						
Single Family	0	-20	-35	-47	-55	-62
Multi Family	0	-3	-7	-11	-15	-19
Commercial	0	-7	-13	-18	-23	-27
Irrigation	0	0	0	0	0	0
Other	0	0	0	0	0	0
Total Adjustment	0	-30	-55	-76	-93	-108
Adjustments for Growth in Real Cost of Water						
Single Family	0	-13	-26	-40	-55	-72
Multi Family	0	0	-1	-2	-3	-5
Commercial	0	-2	-5	-8	-12	-16
Irrigation	0	-2	-4	-6	-9	-11
Other	0	0	0	0	0	0
Total Adjustment	0	-17	-36	-57	-79	-104
Adjusted Baseline Demand						
Single Family	829	800	778	759	742	725
Multi Family	102	126	147	169	190	212
Commercial	209	209	209	211	216	222
Irrigation	101	99	97	95	92	90
Other	2	2	2	2	2	2
Total Adjusted Demand	1,242	1,236	1,233	1,235	1,243	1,251
System Losses	169	169	168	168	169	171
Total Production	**1,412**	**1,404**	**1,402**	**1,404**	**1,412**	**1,421**

Dry Year Demand Forecasts

The same methodology used to weather-normalize 2013 baseline average demand is used to calculate the weather adjustments for the dry-year demand forecasts. In this case, however, we multiply the forecast by the combined annual weather normalization factor rather than divide by it as we did to weather normalize 2013 demand.[9] In the case of the single dry year scenario, which is based on the 2013 weather year, the combined adjustment factor is the one given in Table 4. The adjustment factors for the multiple dry year forecasts are given in Table 11. The weather reference years for the multiple dry year forecasts are 1988-1990.

It is interesting to note that even though 1988-90 are the driest three consecutive years since 1920, the monthly pattern of rainfall and temperature in these years is not expected to have a significant impact on overall annual demand. Weather effects are significant in certain months, such as in April of 1989 and 1990, but in other months the weather effects are negligible, and in still other months they would be expected to cause demand to decrease. Importantly, the weather effects in the key outdoor water use months of May through September are small, which is why the overall annual effect is small. This is not unique to Cloverdale. In general the impact of a dry year on available water supply is what matters most. While drier and hotter than normal weather also causes a bump in demand, it is usually not more than a few percent across the entirety of a year.

Table 11. Combined Weather Adjustment Factors for 1988-90

Month	1988	1989	1990
January	1.00	1.06	1.02
February	1.17	1.00	0.99
March	1.11	0.92	1.02
April	1.07	1.18	1.22
May	0.98	1.05	0.78
June	0.96	0.96	1.00
July	1.02	1.00	1.00
August	1.01	1.00	0.99
September	1.02	0.89	1.00
October	1.05	0.90	1.06
November	0.97	1.09	1.07
December	1.06	1.09	0.99
Weighted Annual	**1.03**	**1.00**	**1.00**

The dry year demand forecasts are given in Table 12. This table is simply a reproduction of Table 2.

[9] This is because we are taking a forecast based on normal weather and adjusting it to reflect the actual weather for the reference year. In the case of the 2013 reference year, the drier and hotter weather is estimated to cause annual demand to increase by 5% from what we would expect if monthly weather had been normal. When we weather normalized 2013 demand, the opposite was the case. We started with demands that reflected the actual weather in 2013 and reduced them by 5% to reflect what demands would have been had monthly weather been normal.

Table 12. Dry Year Demand Forecasts

Total Production	2015	2020	2025	2030	2035	2040	Reference Weather Year
			Demand in AF				
Normal Year	1,412	1,404	1,402	1,404	1,412	1,421	NA
Single Dry Year	1,479	1,471	1,468	1,471	1,479	1,489	2013
Multiple Dry Years							
Year 1	1,448	1,440	1,437	1,440	1,448	1,458	1988
Year 2	1,408	1,401	1,398	1,401	1,409	1,418	1989
Year 3	1,417	1,409	1,406	1,409	1,417	1,426	1990

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Appendix D - Distribution System Water Loss (AWWA Audit)

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AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

American Water Works Association.
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? Click to access definition
+ Click to add a comment

Water Audit Report for: Cloverdale
Reporting Year: 2015 | 1/2015 - 12/2015

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

						Pcnt:	Value:	
Volume from own sources:	+ ?	8	343.500	MG/Yr	+ ? 4	0.25%		MG/Yr
Water imported:	+ ?	n/a	0.000	MG/Yr	+ ?			MG/Yr
Water exported:	+ ?	n/a	0.000	MG/Yr	+ ?			MG/Yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 342.643 MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

					Pcnt:	Value:	
Billed metered:	+ ?	8	295.200	MG/Yr			
Billed unmetered:	+ ?	n/a	0.000	MG/Yr			
Unbilled metered:	+ ?	n/a	0.000	MG/Yr			
Unbilled unmetered:	+ ?	5	4.283	MG/Yr	1.25%		MG/Yr

Default option selected for Unbilled unmetered - a grading of 5 is applied but not displayed

AUTHORIZED CONSUMPTION: ? 299.483 MG/Yr

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption) 43.160 MG/Yr

Apparent Losses

					Pcnt:	Value:	
Unauthorized consumption:	+ ?		0.857	MG/Yr	0.25%		MG/Yr
Customer metering inaccuracies:	+ ?	3	15.537	MG/Yr	5.00%		MG/Yr
Systematic data handling errors:	+ ?	5	0.738	MG/Yr	0.25%		MG/Yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 17.131 MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 26.029 MG/Yr

WATER LOSSES: 43.160 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 47.443 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	7	32.3	miles
Number of active AND inactive service connections:	+ ?	8	3,342	
Service connection density:	?		103	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: + ? 8 57.8 psi

COST DATA

Total annual cost of operating water system:	+ ?	8	$2,310,000	$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	6	$4.02	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	5		$/Million gallons

☑ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 68 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Variable production cost (applied to Real Losses)

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

WAS v5.0

American Water Works Association.
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Water Audit Report for: Cloverdale
Reporting Year: 2015 | 1/2015 - 12/2015

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 68 out of 100 ***

System Attributes:

	Apparent Losses:	17.131	MG/Yr
+	Real Losses:	26.029	MG/Yr
=	Water Losses:	43.160	MG/Yr
?	Unavoidable Annual Real Losses (UARL):	14.26	MG/Yr
	Annual cost of Apparent Losses:	$92,064	
	Annual cost of Real Losses:		Valued at Customer Retail Unit Cost

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	13.8%	
	Non-revenue water as percent by cost of operating system:	11.0%	Real Losses valued at Customer Retail Unit Cost
Operational Efficiency:	Apparent Losses per service connection per day:	14.04	gallons/connection/day
	Real Losses per service connection per day:	21.34	gallons/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per psi pressure:	0.37	gallons/connection/day/psi
	From Above, Real Losses = Current Annual Real Losses (CARL):	26.03	million gallons/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	1.82	

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline

AWWA Free Water Audit Software:
User Comments

WAS v5.0

American Water Works Association.
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Use this worksheet to add comments or notes to explain how an input value was calculated, or to document the sources of the information used.

General Comment:	

Audit Item	Comment
Volume from own sources:	Volume of well water entering WTP provided on a monthly basis.
Vol. from own sources: Master meter error adjustment:	Data provided on monthly basis.
Water imported:	n/a
Water imported: master meter error adjustment:	n/a
Water exported:	n/a
Water exported: master meter error adjustment:	n/a
Billed metered:	From billing records. Water meters are manually read once a month.
Billed unmetered:	None
Unbilled metered:	None
Unbilled unmetered:	Default used (1.25%)

Audit Item	Comment
Unauthorized consumption:	Default used (0.25%)
Customer metering inaccuracies:	Customer meters are cited as having up to a 5% error by the manufacturer, this value was used in lieu of meter test data.
Systematic data handling errors:	Default used (0.25%)
Length of mains:	32.3 miles of sewer pipe from most recent Sewer Master Plan, sewer system is updated in a CAD file.
Number of active AND inactive service connections:	From billing records.
Average length of customer service line:	City is only responsible for the water main to the water meter, which is located at the edge of the property.
Average operating pressure:	Average operating pressure varies by zone, but 60psi taken as approxiamte average. Zone 1 (67% of demand) pressures have a range of approximately 35 psi-65 psi, Zone 2 (13% of demand) range from approximately 120 psi -140 psi with a very small portion of the zone (top of Vista View) much lower in the 35-40 psi range, Zone 3 (20% of demand)ranges from approximately 140 psi-165 psi. average pressure = 0.67*50psi + 0.13*130psi + 0.2*37psi = 57.8 psi
Total annual cost of operating water system:	
Customer retail unit cost (applied to Apparent Losses):	
Variable production cost (applied to Real Losses):	

AWWA Free Water Audit Software: Water Balance

WAS v5.0

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Water Audit Report for:	Cloverdale
Reporting Year:	2015 — 1/2015 - 12/2015
Data Validity Score:	68

Own Sources (Adjusted for known errors) *342.643*

Water Imported *0.000*

Water Supplied *342.643*

Water Exported *0.000*

Billed Water Exported

Authorized Consumption *299.483*

- **Billed Authorized Consumption** *295.200*
  - **Billed Metered Consumption (water exported is removed)** *295.200*
  - **Billed Unmetered Consumption** *0.000*
- **Unbilled Authorized Consumption** *4.283*
  - **Unbilled Metered Consumption** *0.000*
  - **Unbilled Unmetered Consumption** *4.283*

Revenue Water 295.200

Non-Revenue Water (NRW) *47.443*

Water Losses *43.160*

- **Apparent Losses** *17.131*
  - **Unauthorized Consumption** *0.857*
  - **Customer Metering Inaccuracies** *15.537*
  - **Systematic Data Handling Errors** *0.738*
- **Real Losses** *26.029*
  - **Leakage on Transmission and/or Distribution Mains** *Not broken down*
  - **Leakage and Overflows at Utility's Storage Tanks** *Not broken down*
  - **Leakage on Service Connections** *Not broken down*

AWWA Free Water Audit Software:
Dashboard

WAS v5.0

American Water Works Association.
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The graphic below is a visual representation of the Water Balance with bar heights propotional to the volume of the audit components

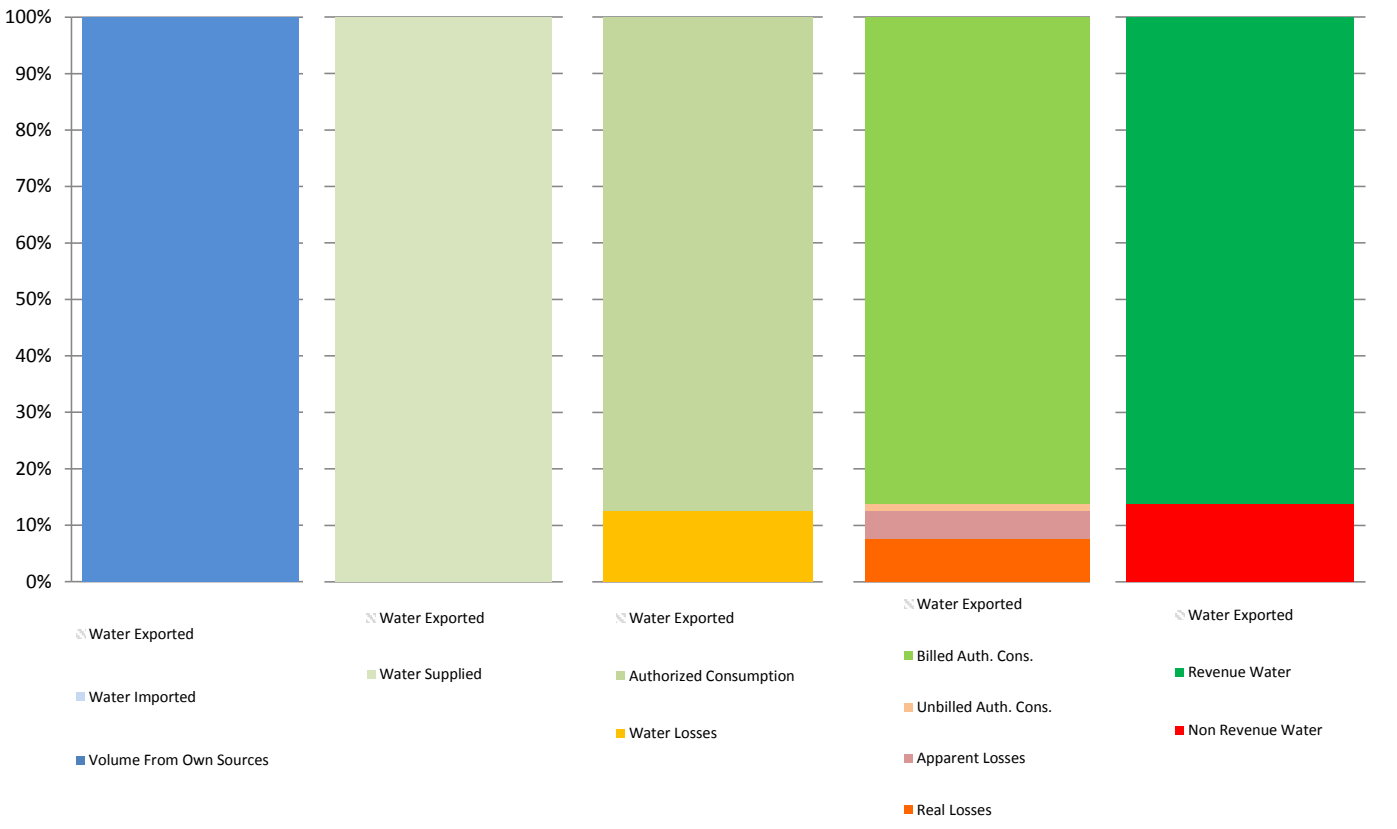
Water Audit Report for: **Cloverdale**

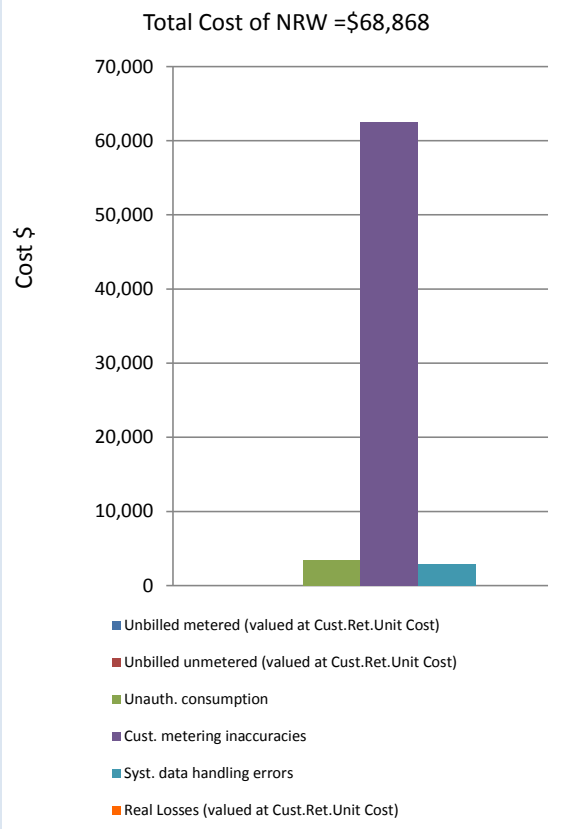
Reporting Year: **2015** | **1/2015 - 12/2015**

Data Validity Score: **68**

○ Show me the VOLUME of Non-Revenue Water

◉ Show me the COST of Non-Revenue Water





Appendix E - Water Savings City Ordinance and Water Code Sections

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Chapter 13.05
CONSERVATION OF WATER SUPPLY

Sections:

13.05.010 Purpose and authority.
13.05.020 Definitions.
13.05.030 Suspension of new connections to the city's water system.
13.05.040 Waste of water prohibited.
13.05.050 Prohibition of nonessential use of water—Declaration of water emergency (Stage 1, Stage 2 and Stage 3).
13.05.060 Signs on lands supplied from private sources or supplied with recycled water.
13.05.070 Use of sprinklers conditional.
13.05.080 Variances.
13.05.090 Enforcement and fees.

13.05.010 Purpose and authority.

The purpose of this chapter is to conserve the water supply of the city for the greatest public benefit with particular regard to public health, fire protection and domestic use, to conserve water by reducing waste, and to the extent necessary upon declaration of a water shortage emergency condition, to reduce water use fairly and equitably. This chapter is adopted pursuant to state law including Water Code Sections 350 to and including 358 and Sections 31026 to and including 31029. (Ord. 691-2014 § 2 (part), 2014)

13.05.020 Definitions.

The terms used in this chapter shall have the following meanings:

A. Approvals Needed for Development. These include all the approvals needed for development including through approval of the building permit.

B. Blatant Noncompliance. If, during a water shortage emergency, it is evident to the city manager through billed water use or observation of the water waste at the property that the customer is obviously or blatantly not complying with the water use restrictions in effect.

C. "Corresponding billing period" means a similar billing period occurring in a prior designated year to which current water use is compared for the purpose of determining the percent reduction in use.

D. "Drip system" means an irrigation system downstream of a reduced pressure device fitted with drip emitters, bubblers or low pressure micro-jet sprayers.

E. "ETo" means evapotranspiration demand reported as reference evapotranspiration for each California Irrigation Management Information System (CIMIS) weather station located in Sonoma and Marin Counties. (Local ETo data is available on the CIMIS website: http://www.cimis.water.ca.gov/cimis/welcome.jsp.)

F. "ETo adjustment factor" means a factor to multiply times ETo to determine the appropriate amount of sprinkler water to apply to turf grass, garden, landscaped area, trees or shrubs while rationing is in effect. The amount of water to apply is found by multiplying the area of landscape to be irrigated (square feet) times the appropriate ETo adjustment factor (see percentage in Section 13.05.070(C)) times ETo (inches

for a given period of time—typically three to seven days) times 7.48/12 to convert to gallons.

G. “Healthcare and public safety use” means use of water by customers whose principal purpose is to provide health services to the public (such as hospitals, clinics, invalid and senior care facilities and homes, and doctor, dentist, optometrist and chiropractor offices, etc.) or which provide vital public safety services (such as police stations, jails, fire stations, utility services, etc.). Not included in this class are office buildings that provide solely administration services (such as health insurance organizations, etc.) or landscaping uses at any healthcare or public safety site.

H. “Irrigation only use” means water use downstream of a city owned billing meter whose principal purpose and design is to serve irrigation use.

I. “Overall rationing requirement” means the percent reduction in overall withdrawals from the water system determined by the city council to be necessary in order to achieve and to safely survive a declared water shortage emergency.

J. “Run-time” means the duration in minutes, either programmed or set, for each valve controlled by an irrigation system clock (controller) or manually operated.

K. “Shop unit” means a type of residential unit which is separately metered and which involves a dwelling unit that is incorporated into the premises of a business—sometimes also referred to as a shop house or live/work unit.

L. Sprinklers. As used in this chapter, the term “sprinklers” means an irrigation sprinkler connected to a hose, irrigation sprinklers connected to an in-ground pipe system and soaker hoses or porous pipelines operating off of normal service pressure.

M. “Violation reconnection fee” means two hundred percent of the reconnection fee.

N. “Water conservation coordinator” is the city engineer or designee. (Ord. 691-2014 § 2 (part), 2014)

13.05.030 Suspension of new connections to the city’s water system.

A. From the effective date the city council, by resolution, declares the existence of a water shortage emergency, the city council shall have the discretion to also declare a suspension on new or enlarged connection to the city’s water system. The city council shall have the discretion to implement such suspension by resolution either at the time the water shortage emergency is declared by the city council, or any time by resolution while the water shortage emergency is still in place. The city council shall also have the discretion to end such suspension period by resolution at any time.

B. During any period of time that the council declares a suspension on new connections (“suspension period”), as described in subsection A of this section, no new or enlarged connections shall be made to the city’s water system except the following:

1. Connection of fire hydrants.

2. Connection of property previously supplied with water from a private water source (such as a well or spring) upon submittal and approval of the city engineer of evidence that the private source has failed or dried up or has otherwise been impaired by a drought or water shortage event to such a degree that the source no longer can meet minimal potable water needs of the applicant.

3. During Stage 1, new connection of property for which the applicant has obtained all approvals required for development, except potable water supply, and agrees to defer installation of turf landscaping until after the suspension period.

4. During Stages 2 and 3, if the overall mandatory rationing requirement is less than twenty-five percent, connection of property for which the applicant has obtained all approvals required for development, except potable water supply, and agrees to defer installation of turf landscaping until after the suspension period.

5. During Stages 2 and 3, if the overall mandatory rationing requirement is equal to or greater than twenty-five percent, connection of property for which the applicant: has obtained all approvals required for development except potable water supply; agrees to defer installation of turf landscaping until after the suspension period; and either retrofits good quality water conservation fixtures and devices (1.28 gallon per flush toilets, two and one-half gallon per minute shower heads and one and one-half gallon per minute faucet aerators for kitchen sinks and lavatories) in five existing single-family detached dwelling units served by the city, or pays the city one thousand five hundred dollars per equivalent single-family detached dwelling unit for which water service is being applied. These payments shall be used by the city to help fund its expanded water conservation program efforts during the suspension period. If an applicant chooses the retrofit option and a selected home already has some water conserving fixtures, applicant shall install conservation fixtures in additional dwellings as determined necessary by the city's water conservation coordinator.

C. During the suspension period, applications for water service will be processed only if the applicant acknowledges in writing that such processing shall be at the risk and expense of the applicant and that if the application is approved in accordance with the city's regulations, such approval shall confer no right upon the applicant or anyone else until the suspension period has expired, and that the applicant releases the city from all claims of damage arising out of or in any manner connected with the suspension of connections.

D. Upon the termination of the suspension period, the city will make connections to its water system in accordance with its regulations and the terms of connection agreements for all said applications approved during the suspension period. The water supply then available to the city will be apportioned equitably among all the customers then being served by the city without discrimination against services approved during the suspension period.

E. Nothing herein shall prohibit or restrict any modification, relocation or replacement of a connection to the city's system if the city engineer determines that the demand upon the city's water supply will not be increased thereby. (Ord. 696-2014 § 1, 2014: Ord. 691-2014 § 2 (part), 2014)

13.05.040 Waste of water prohibited.

A. No water furnished by the city shall be wasted. Waste of water includes, but is not limited to, the following:

1. Washing of sidewalks, walkways, driveways, parking lots and other hard-surfaced areas by direct hosing.

2. Escape of water through breaks or leaks within the customer's plumbing or private distribution system for any substantial period of time within which such break or leak should reasonably have

been discovered and corrected. It shall be presumed that a period of seventy-two hours after the customer discovers such a break or leak or receives notice from the city is a reasonable time within which to correct such break or leak or, as a minimum, to stop the flow of water from such break or leak.

3. Irrigation in a manner or to an extent which allows excessive runoff of water or unreasonable overspray of the areas being watered. Every customer is deemed to have his or her water system under control at all times, to know the manner and extent of his or her water use and any run-off, and to employ available alternatives to apply irrigation water in a reasonably efficient manner.

4. Washing cars, boats, trailers or other vehicles and machinery directly with a hose not equipped with a shutoff nozzle.

5. Water for nonrecycling decorative water fountains.

6. Water for single pass evaporative cooling systems for air conditioning in all connections installed after January 22, 2014, unless required for health or safety reasons.

7. Water for new nonrecirculating conveyor car wash systems.

8. Water for new nonrecirculating industrial clothes wash systems.

B. Waste of water shall also include failure to put to reasonable beneficial use any water withdrawn from the city's water system as determined by the city engineer. (Ord. 691-2014 § 2 (part), 2014)

13.05.050 Prohibition of nonessential use of water—Declaration of water emergency (Stage 1, Stage 2 and Stage 3).

A. No water furnished by the city shall be used for any purpose declared to be nonessential by this chapter. The restrictions in this section shall not apply to use of recycled wastewater furnished by a government agency.

Stage 1 Water Shortage Emergency Measures—Introductory Stage (Voluntary Reduction).

B. At any and all times that a Stage 1 water shortage emergency condition is declared to exist by the city council, all customers are asked to voluntarily reduce consumption of water furnished by the city by the overall reduction amount established by resolution for Stage 1, and all customers of the city are requested to:

1. Apply irrigation water only during the evening and early morning hours to reduce evaporation losses.

2. Inspect all irrigation systems, repair leaks and adjust spray heads to provide optimum coverage and eliminate avoidable over-spray.

3. For irrigation valves controlling water applied to turf grass, vary the minutes of run-time consistent with fluctuations in weather.

4. Reduce minutes of run-time for each irrigation cycle if water begins to run off to gutters and ditches before the irrigation cycle is completed.

5. Become informed about and strictly adhere to the city's water waste prohibitions (refer to Section 13.05.040).

6. Utilize water conservation incentive, rebate and giveaway programs to replace water guzzling plumbing fixtures and appliances with water efficient models.

7. Take advantage of the free information available from the city on how to use water efficiently, read a water meter, repair ordinary leaks and how to apply water efficiently to the landscape.

C. At any and all times that a water shortage emergency condition of Stage 1 or greater is declared to exist by the city council, the following uses are declared to be nonessential:

1. Refilling a swimming pool drained after the date on which the initial water shortage emergency condition was originally declared to exist.

2. Water escaping from a broken pipe or leak once discovered and after passage of a reasonable amount of time to determine how to shut off the water.

3. Noncommercial washing of motor vehicles, trailers and boats except from a bucket with use of a hose equipped with a shutoff nozzle for a quick rinse.

Stage 2 Water Shortage Emergency Measures—Mandatory Rationing—Community Cooperation Method.

D. At the time of declaration of a Stage 2 or greater water shortage emergency, an overall mandatory rationing requirement for customers to collectively meet shall be established. In determining compliance, the city shall rely on water production records comparing current production trends to trends that would normally be expected to occur. Individual customers who can conserve more than the mandatory conservation requirements established by this chapter are requested and strongly encouraged to do so voluntarily in order to help those customers who would incur economic hardship in order to meet the rationing level.

E. At any and all times that a water shortage emergency condition of Stage 2 or greater is declared to exist by the city council, the following additional uses are declared to be nonessential:

1. Any residential use (excluding irrigation only use) in excess of that resulting from application of the mandatory residential rationing requirement established by the Cloverdale city council.

2. Any irrigation only use in excess of that resulting from application of the mandatory irrigation rationing requirement established by the Cloverdale city council.

3. Any nonresidential use (excluding irrigation only use and healthcare and public safety use) in excess of that resulting from application of the overall mandatory rationing requirement established by the Cloverdale city council.

4. Any water used for healthcare and public safety (excluding irrigation only use) in excess of the minimum amount required to adequately provide for healthcare and public safety.

5. Any use of water from a fire hydrant except for fighting fires, human consumption, stock water, essential flushing and cleanup purposes and water used for construction needs. If the overall mandatory rationing requirement is equal to or greater than twenty-five percent, a permit issued by

the city engineer shall be required for all hydrant use except for water used for fighting fires or for other emergency use deemed essential by the fire chief.

6. Watering of any existing turf grass, ornamental plant, garden, landscaped area, trees, shrubs or other plants except from a hand-held hose or container or drip irrigation system except as provided in Section 13.05.070.

7. Watering of new turf grass or replacement turf grass. If the overall mandatory rationing requirement is equal to or greater than twenty-five percent, this restriction is extended and applies to watering of any new landscape or replacement landscape except in cases where the replacement landscapes will use less water than the original landscape.

8. Initial filling of any swimming pool for which approval of a construction permit issued by the city was made after the date on which the initial water shortage emergency condition was originally declared to exist.

9. Use for service of drinking water at any restaurant, cafe, cafeteria or other public place where food is sold, served or offered for sale, unless expressly requested by a patron.

F. Except in cases of blatant noncompliance, as determined by the city manager, individual billing records will generally not be used during Stage 2 to determine compliance with the provisions of subsections (E)(1), (2), (3) and (4) of this section, it being assumed that customers will cooperate to do the best that they can to individually meet or exceed the overall mandatory rationing requirement. Violations of nonessential uses that come to the attention of the finance manager, however, will be enforced pursuant to the provisions of Section 13.05.090.

Stage 3 Water Shortage Emergency Measures—Mandatory Rationing—Allotment Method.

G. From and after the date that the Cloverdale city council declares that a Stage 3 water shortage emergency exists, water use in excess of the following allotments established for each meter is in addition declared to be nonessential:

1. Residential meters serving single-family detached homes including mother-in-law or second units that are served by the same meter: sixty-five gallons per capita per day times the number of permanent occupants. Permanent occupants shall be a whole number. Babies, children, adults and senior citizens whose principal place of residence is in the dwelling in question shall each count as one occupant. In determining the number of permanent occupants, the city shall rely upon data it has acquired from the customer or other sources. Provided sufficient time is available, the city will attempt to canvass customers to obtain current data on permanent household occupants.

2. Residential meters serving multiple units: any use in excess of that resulting from application of the mandatory residential rationing requirement established by the Cloverdale city council.

3. Irrigation only meters: any use in excess of that resulting from application of the mandatory irrigation rationing requirement established by the Cloverdale city council.

4. Meters serving any nonresidential use (excluding irrigation only metered use and healthcare and public safety use): any use in excess of that resulting from application of the overall mandatory rationing requirement established by the Cloverdale city council.

5. Meters serving water used for healthcare and public safety (excluding irrigation only use): any use in excess of the minimum amount required to adequately provide for healthcare and public safety.

6. Meters serving mixed uses: an allotment to be determined by the city engineer based upon the criteria contained in subsections (G)(1) through (5) of this section.

H. Any customer exceeding their allotment, based on metered billing records, shall be billed and required to pay a penalty established by the Cloverdale city council by resolution at the time the Stage 3 water shortage emergency is declared. This penalty charge shall be waived for the first bill received after Stage 3 is implemented and shall terminate the day the Stage 3 water shortage emergency period ends.

I. If a connection to the city's system was not in existence or used in the year established for determination of the mandatory rationing requirement, the city will estimate use in such year based on other historic records and/or water use by customers having similar end uses.

J. The city manager, in consultation with the city engineer, may increase or decrease the allotment for any customer if he or she determines that special circumstances exist and that to do so would better achieve equity in allocation of available water or better meet health and safety concerns. (Ord. 696-2014 § 2, 2014: Ord. 691-2014 § 2 (part), 2014)

13.05.060 Signs on lands supplied from private sources or supplied with recycled water.

The owner or occupant of any land within the water service area of the city that is supplied with recycled wastewater or water from a source not owned or operated by the city (such as a well, spring or legal surface diversion) which is used to irrigate landscape which is visible to the general public will be requested to post and maintain in a conspicuous place thereon a sign furnished by the city giving public notice of the private supply. (Ord. 691-2014 § 2 (part), 2014)

13.05.070 Use of sprinklers conditional.

A. Any customer of the city may use sprinklers to apply water furnished by the city to irrigate any turf grass, garden, landscaped area, trees or shrubs provided said application is properly controlled and performed in a nonwasteful and efficient manner confined to the nighttime hours of seven p.m. and nine a.m. of the next day. In the event low pressure micro-jet sprayers are present in a drip system, irrigation by the valve(s) controlling same shall also be confined to the nighttime hours noted above.

B. The amount of water normally applied for landscape irrigation shall not exceed eighty percent (or such percent as specified by resolution). This condition shall not apply to residential customers if Stage 3 allotments are implemented.

C. In determining the amount of water to apply to turf grass, customers are encouraged to use the following formula:

Applied water for turf grass (gallons) =	Area of turf grass (square feet)
	x ETo (inches for a given period of time—typically 3 to 7 days)

x ETo adjustment factor of 0.64

x conversion factor of 0.62

The ETo adjustment factor is based on the assumption that overall irrigation efficiency is sixty-five percent and that the crop coefficient for turf grass is 0.8. Use of this formula to determine applied water will yield the appropriate amount of water to apply while rationing is in effect.

D. In determining the amount of water to apply to landscaped areas containing a mixture of trees and shrubs, customers are encouraged to use the following formula:

Applied water for mixed trees and shrubs (gallons) =	Area of landscape (square feet)
	x ETo (inches for a given period of time—typically 3 to 7 days)
	x ETo adjustment factor of 0.48
	x conversion factor of 0.62

The ETo adjustment factor is based on the assumption that overall irrigation efficiency is sixty-five percent and that the crop coefficient for mixed trees and shrubs is 0.6. Use of this formula to determine applied water will yield the appropriate amount of water to apply while rationing is in effect.

E. Water applied by sprinklers shall be applied in short enough cycles to avoid run-off to gutters and drains.

F. During any water shortage emergency period, use of water by sprinklers is a privilege and permission to use water in this way may be withdrawn if it comes to the attention of the city engineer that such use by a given customer is wasteful or in excess of the amount determined in subsection B of this section. A common result of wasteful application of water by sprinklers is evidence of runoff to a gutter. (Ord. 696-2014 § 3, 2014; Ord. 691-2014 § 2 (part), 2014)

13.05.080 Variances.

A. Any customer of the city may make written application for a variance. Applications shall be addressed to:

Utility Billing

City of Cloverdale

124 N. Cloverdale Boulevard

Cloverdale, CA 95425

Said application shall describe in detail why applicant believes a variance is justified. The city manager, in consultation with the city engineer, may grant a variance to permit a use of water otherwise prohibited by this chapter, if he or she determines that failure to do so would cause:

1. An emergency condition affecting the health, sanitation, fire protection or safety of the applicant or public; or

2. An unnecessary and undue hardship on the applicant or the public, including but not limited to adverse economic impacts, such as loss of production or jobs.

B. The decision of the city manager to deny an application for variance under this section may be appealed to the city council by submitting a written appeal to the city within fifteen calendar days of the date of the decision. Variances granted by the city council shall be prepared in writing and contain any conditions imposed by the city council in granting said variance. The city council may require the variance be recorded at applicant's expense. (Ord. 691-2014 § 2 (part), 2014)

13.05.090 Enforcement and fees.

A. During Stage 2 or 3, should the finance manager become aware of any violation of any provision of this chapter, the following enforcement procedure shall be undertaken:

1. For the first such violation, the customer shall be given a warning, generally by phone or directly in person by a city employee, or by leaving a door tag notice informing the customer of the problem and asking that it be corrected.

2. If the violation continues or is repeated, a certified letter shall be mailed to the customer who receives the water bill. Said letter shall describe the violation and request that it be corrected, cured and abated immediately or within such specified time as the finance manager determines is reasonable under the circumstances. Said letter shall state the consequences of noncompliance with the request.

3. If the violation continues, the finance manager may impose any penalty established by the city council under a resolution declaring a water emergency, pursue enforcement action pursuant to Chapters 1.10 through 1.15, or order disconnection of the service where the violation occurs.

B. Before reconnection of a service, the customer must stop the violation, pay all past due charges on the account, and pay a violation reconnection fee.

C. If, during the suspension period, a water service is disconnected two or more times because of violation of this chapter, a flow restriction device may be installed by the city before service is reconnected. Furthermore, the customer must stop the violation, pay all past due charges on the account and pay a second violation reconnection fee. If a flow restriction device is installed, the city shall remove the same after expiration of the suspension period.

D. It shall be unlawful for any customer to willfully tamper with or in any way modify or attempt to modify a city meter or anything within the city's meter box. Violation shall result in customer being charged a meter tampering fee plus the cost of labor and materials to remedy any damage caused to the city's equipment as a result of such tampering.

E. Anyone who willfully takes water from the city water system without the city's permission or who willfully tampers with or causes damage to any city meter or water system appurtenance is liable to the city in the sum of time and materials, plus citation for code violation, as a civil penalty, for each subsequent act during the suspension period. This sum shall be recoverable by civil suit in a court of competent jurisdiction. This section does not limit the city's right to recover the cost of any city water taken without the city's permission.

F. All customer fees required by this section shall be set by a resolution of the city. (Ord. 691-2014 § 2 (part), 2014)

The Cloverdale Municipal Code is current through Ordinance 697-2014, passed January 28, 2015.
Disclaimer: The City Clerk's Office has the official version of the Cloverdale Municipal Code. Users should contact the City Clerk's Office for ordinances passed subsequent to the ordinance cited above.

ORDINANCE NO. 674-2010

AN ORDINANCE OF THE CITY OF CLOVERDALE ADDING WATER EFFICIENT LANDSCAPE TO TITLE 15, CHAPTER 15.30 OF THE CLOVERDALE MUNICIPAL CODE

The City Council of the City of Cloverdale does hereby ordain as follows:

Water Efficient Landscape, is hereby added to Title 15, Chapter 15.30 of the Cloverdale Municipal Code as follows:

Section 15.30.010 Purpose and Findings

(A) The State Legislature has found:

(1) That the waters of the state are of limited supply and are subject to ever increasing demands;

(2) That the continuation of California's economic prosperity is dependent on the availability of adequate supplies of water for future uses;

(3) That it is the policy of the State to promote the conservation and efficient use of water and to prevent the waste of this valuable resource;

(4) That landscapes are essential to the quality of life in California by providing areas for active and passive recreation and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development; and

(5) That landscape design, installation, maintenance and management can and should be water efficient; and

(6) That Section 2 of Article X of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served and the right does not and shall not extend to waste or unreasonable method of use.

(B) Consistent with these legislative findings, the purpose of this ordinance is to protect local water supplies through the implementation of a whole systems approach to design, construction, installation and maintenance of the landscape resulting in water conserving climate-appropriate landscapes, improved water quality and the minimization of natural resource inputs.

Section 15.30.020 Applicability

(A) After January 1, 2010, this ordinance shall apply to all of the following landscape projects:

(1) All new construction and rehabilitated landscapes for public agency projects and private development projects requiring a building permit, plan check or design review with a landscape area of 2,500 square feet or more.

(2) Approved projects which have not yet been submitted for initial plan check of improvement plans and which involve new construction or rehabilitation of landscape areas of 2,500 square feet or greater in area.

(B) This ordinance does not apply to:

(1) Registered local, state or federal historical landscape areas;

(2) Ecological restoration or mined land reclamation projects that do not require a permanent irrigation system;

(3) Plant collections, as part of botanical gardens and arboretums open to the public.

Section 15.30.030 Definitions

The terms used in this ordinance have the meaning set forth below:

1. *Backflow Prevention Device* means an approved device installed to City standards which will prevent backflow or back-siphonage into the City's potable water system.
2. *Booster Pump* means a pump used where the normal water system pressure is low and needs to be increased.
3. *Check Valve* means a valve located under a sprinkler head or other location in the irrigation system that holds water in the system and prevents drainage from sprinkler heads when the irrigation system is off.
4. *Common Interest Development* means community apartment projects, condominium projects, planned developments, and stock cooperatives per California Civil Code Section 1351.
5. *Compost* means the product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth. Compost contains plant nutrients and has the unique ability to improve the chemical, physical, and biological characteristics of soils.
6. *Ecological Restoration Project* means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.
7. *Effective Precipitation* means the portion of total precipitation which becomes available for plant growth and that is used by the plants.
8. *Emitter* means a drip irrigation fittings emission device that delivers water slowly from the system to the soil.
9. *ET Adjustment Factor* means a factor of 0.7, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape.
10. *Evapotranspiration rate* means the quantity of water loss to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues) during a specified time, usually expressed in inches of water per unit of time.
11. *Flow Rate* means the rate at which water flows through pipes, valves, and emission devices; measured in gallons per minute, gallons per hour, or cubic feet per second.
12. *Hardscapes* means any durable material (pervious and non-pervious).
13. *Head to Head Coverage* means full spray coverage from one sprinkler head to the next.
14. *High-Flow Sensor* means a device for sensing the rate of fluid flow.
15. *High-Water-Use Plants* means turf, annuals, container plantings, and other plants recognized as high-water-use by the *Water Use Classification of Landscape Species* document (http://www.owue.water.ca.gov/docs/wucols00.pdf), as it currently exists or may be amended in the future.
16. *Hydrozone* means a portion of the landscaped area having plants with similar water needs that are served by a valve or set of valves with the same schedule.
17. *Infiltration Rate* means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

18. *Invasive Plant Species* means species of plants not historically found in California and/or that spread outside cultivated areas and can damage environmental or economic resources as determined by the California Invasive Plant Council (www.cal-ipc.org).
19. *Irrigation Efficiency (IE)* means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of this ordinance is 0.71.
20. *Irrigation Meter* means a separate meter that measures the amount of water used for items such as lawns, washing exterior surfaces, washing vehicles, filling pools, etc.
21. *Isolation Valves* means valves used to isolate a portion of the piping system.
22. *Landscaped Area* means the entire parcel less the building footprint, driveways, and non-irrigated portions of parking lots, hardscapes-such as decks and patios, and other non-porous areas. Water features are included in the calculation of the landscaped area. Areas dedicated to edible plants, such as orchards or vegetable gardens are not included. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).
23. *Lateral Line* means non-pressurized pipe that is located downstream of an irrigation valve (class 200 or equivalent is not acceptable).
24. *Low-Head Drainage* means water that flows out of the system after the valve turns off due to elevation changes within the system.
25. *Low-Water-Use Plants* means Mediterranean region and California native trees, shrubs and groundcovers such as rosemary, juniper, most native oaks, and other plants recognized as low-water-use by the Water Use Classification of Landscape Species document (http://www.owue.water.ca.gov/docs/wucols00.pdf), as it currently exists or may be amended in the future.
26. *Main Line* means the pressurized pipeline that delivers water from the water source to the valve or outlet.
27. *Maximum Applied Water Allowance (MAWA)* means for design purposes, the upper limit of annual applied water for the established landscaped. It is based upon the area's reference evapotranspiration, the ET adjustment factor, and the size of the landscape area.
28. *Microclimate* means the climate of a small, specific area that may contrast with the climate of the overall landscape area due to factors such as wind, sun exposure, plant density or proximity to reflective surfaces.
29. *Mined-Land Reclamation Projects* means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.
30. *Moderate Water Use Plants* means ornamental trees, shrubs, ground covers, and other plants recognized as moderate-water-use by the Water Use Classification of Landscape Species document (http://www.owue.water.ca.gov/docs/wucols00.pdf), as it currently exists or maybe amended in the future.
31. *Mulch* means any organic material such as leaves, bark, straw, compost or inorganic mineral materials such as rocks, gravel, and decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature and preventing soil erosion.
32. *Operating Pressure* means the pressure at which the parts of an irrigation system are designed by the manufacturer to operate, usually indicated at the base of the sprinkler.
33. *Overhead Irrigation* means those systems that deliver water through the air (e.g., pop-ups, impulse sprinklers, spray heads, rotors, micro-sprays, etc).

34. *Overspray* means any irrigation water which is delivered beyond the landscaped target area; wetting pavements, walks, structures, or other non-landscaped areas.
35. *Pervious* means any surface or material that allows the passage of water through the material and into the underlying soil.
36. *Plant Factor* means a factor that, when multiplied by reference evapotranspiration (ETo), estimates the amount of water used by plants. Plant factors cited in this ordinance are derived from the Department of Water Resources 2000 publication "*Water Use Classification of Landscape Species*".
37. *Point of Connection* means the point at which an irrigation system taps into the main water supply line.
38. *Point Source Irrigation* means any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.
39. *Precipitation Rate* means the rate of application of water measured in inches per hour.
40. *Pressure Regulation* means a device or valve that automatically reduces the pressure in a pipe.
41. *Project Applicant* means the individual or entity submitting a Landscape Documentation Package, to request a permit, plan check or design review from the local agency. A project applicant may be the property owner or his or her designee.
42. *Rain Sensor* means an irrigation system component which automatically shuts off and suspends the irrigation system when it rains.
43. *Recreational Area* means areas dedicated to active play or recreation such as sports fields, school yards, picnic grounds, golf courses, or other areas with intense foot traffic where turf provides a playing surface.
44. *Recycled Water* means tertiary treated water, which results from the treatment of wastewater, and which conforms to the definition of disinfected tertiary recycled water in accordance with state law. Recycled water is suitable for non-potable direct beneficial uses such as landscape irrigation and water features.
45. *Reference Evapotranspiration (ETo)* means a standard measurement of environmental parameters which affect the water use of plants and is an estimate of the evapotranspiration of a large field of four to seven-inch tall, cool-season turf grass that is well watered.
46. *Rehabilitated Landscape* means any re-landscaping project that requires a building or grading permit, plan check or design review.
47. *Runoff* means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape area.
48. *Soils Laboratory Report* means the analysis of a soil sample to determine nutrient content, composition and other characteristics, including contaminants.
49. *Special Landscape Area (SLA)* means an area of the landscape dedicated solely to edible plants, areas irrigated with recycled water, water features using recycled water and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.
50. *Sprinkler Head* means a device that delivers water to the landscape through a spray nozzle.
51. *Static Water Pressure* means the pipeline or municipal water supply pressure when water is not flowing.
52. *Station* means an area served by one valve or by a set of valves that operate simultaneously.
53. *Submeter* means a separate meter that is located on the private side of the water system and is plumbed to measure all water that flows only through the irrigation system. This

meter is to be used by the owner to monitor irrigation water use and will not be read by the City..

54. *Swing Joint* means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.
55. *Valve* means a device used to control the flow of water in the irrigation system.
56. *Valve Manifold* means a one-piece manifold for use in a sprinkler valve assembly that includes an intake pipe having a water inlet and a plurality of ports adapted for fluid connection to inlets.
57. *Water Feature* means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscape area.
58. *Weather Based or Sensor Based Irrigation Control Technology* means an irrigation controller that uses local or historical weather data and site specific landscape parameters to estimate or measure depletion of available plant soil moisture in order to operate an irrigation system, and make irrigation schedule adjustments, including run times and required cycles, throughout the irrigation season without human intervention.
59. *WUCOLS* means the Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2000.

Section 15.30.040 Landscape Design Plan

For each landscape project subject to this chapter, applicants shall submit a landscape design plan in accordance with the following:

(1) Amendments, Mulching and Soil Conditioning

(a) A minimum of 8" of non-mechanically compacted soil shall be available for water absorption and root growth in planted areas.

(b) Incorporation of compost or natural fertilizer into the soil to a minimum depth of 8" at a minimum rate of 6 cubic yards per 1,000 square feet or per specific amendment recommendations from a soils laboratory report.

(c) A minimum 3" layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers or direct seeding applications.

(2) Plants

(a) Selected plants shall not cause the Estimated Water Use to exceed the Maximum Applied Water Allowance (see calculation in Appendix A).

(b) Plants with similar water use needs shall be grouped together in distinct hydrozones and where irrigation is required, the distinct hydrozones shall be irrigated with separate valves.

(c) Low and moderate water use plants can be mixed, but the entire hydrozone will be classified as moderate water use for MAWA calculations.

(d) High water use plants shall not be mixed with low or moderate water use plants.

(e) All non-turf plants shall be selected, spaced and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site.

(f) Turf shall not be planted in the following conditions:
(i) slopes exceeding 10%
(ii) Planting areas 8 feet wide or less
(iii) Street medians, traffic islands, planter strips or bulbouts of any size.

(g) Invasive plants as listed by the California Invasive Plant Council are prohibited.

(3) Water Features

(a) Recirculating water systems shall be used for water features.

(b) Recycled water shall be used when available onsite.

Section 15.30.050 Irrigation Design Plan

For each landscape project subject to this chapter applicants shall submit an irrigation design plan that is designed and installed to meet irrigation efficiency criteria as described in Appendix A (MAWA) and in accordance with the following:

(1) Dedicated irrigation meter or submeter must be specified.

(2) Irrigation systems with meters 1 ½" or greater require a high-flow sensor that can detect high flow conditions and have the capabilities to shut off the system.

(3) Isolation valves shall be installed at the point of connection and before each valve or valve manifold.

(4) Weather-based or other sensor based self-adjusting irrigation controllers shall be required.

(5) Rain sensors shall be installed for each irrigation controller.

(6) Pressure regulation and/or booster pumps shall be installed so that all components of the irrigation system operate at the manufacturer's recommended optimal pressure.

(7) Irrigation system shall be designed to prevent runoff or overspray onto non-targeted areas.

(8) Point source irrigation is required where plant height at maturity will affect the uniformity of an overhead system and for narrow or irregularly shaped areas less than 8 feet in width in any direction.

(9) A minimum 24" setback of overhead irrigation is required where turf is directly adjacent to a continuous hardspace that flows into the curb and gutter. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line, or other low flow non-spray technology. The setback area may be planted or unplanted. The surfacing of the setback may be mulch, gravel, or other porous material.

(10) Slopes greater than 15% shall be irrigated with point source or other low-volume irrigation technology.

(11) A single valve shall not irrigate hydrozones that mix high water use plants with moderate or low water use plants.

(12) Trees shall be placed on separate valves except when planted in turf areas.

(13) Sprinkler head, rotors and other emission devices on a valve shall have matched precipitation rates.

(14) Head to head coverage is required unless otherwise directed by the manufacturer's specifications

(15) Swing joints or other riser protection components are required on all risers.

(16) Check valves shall be installed to prevent low-head drainage.

(17) Irrigation services shall require an approved backflow prevention assembly in accordance with City Standards.

Section 15.30.060 Documentation for Compliance

The following documentation is to be presented to the City at each of the three steps of review defined below. This documentation is required for compliance with this policy.

(1) Final Design Review – The following shall be submitted with a Design Review application.

(a) A completed Appendix A, Maximum Applied Water Allowance (MAWA)

(b) A landscape planting design plan that accurately and clearly identifies and depicts:

(i) Recreational areas.

(ii) New and existing trees, shrubs, groundcovers, turf, and any other planting areas.

(iii) Plants by botanical and common names.

(iv) Plant sizes and quantities.

(v) Areas permanently and solely dedicated to edible plants.

(vi) Property lines, new and existing building footprints, streets, driveways, sidewalks and other hardscape features.

(vii) Pools, fountains, and water features, with their respective surface areas.

(viii) Each hydrozone by number, letter or other method.

(ix) Each hydrozone as low, moderate, high water or mixed water use.

(x) Types and quantities of soil amendments used.

(xi) Location and installation details of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater

(xii) Any applicable rain harvesting or catchment technologies.

(xiii) Areas irrigated with recycled water.

(c) A conceptual irrigation design plan or statement which describes irrigation methods and design actions that will be employed to meet the irrigation specifications of this chapter.

(2) Building Permit/Plan Check – The following shall be reviewed and approved prior to a building permit being issued.

(a) Appendix A and the planting design plan as submitted at Step 1 in connection with the Design Review application.

(b) The irrigation plan drawn at the same scale as the planting plan that accurately and clearly identifies and depicts:

(i) Irrigation system point of connection with location and size of separate water meters for irrigation.

(ii) Static water pressure as tested at the point of connection to the public water supply or as derived from nearest fire hydrant. The standard Public Works hydrant pressure testing fee shall apply when city field staff is deployed to obtain necessary hydrant pressures.

(iii) Flow rate (gallons per minute), precipitation rate (inches per hour), and design operating pressure (pressure per square inch) for each station.

(iv) Irrigation system components, e.g. controller, pipe, remote-control valves, sprinklers and other application devices, rain shut-off device, check valves, pressure regulation devices, and backflow prevention devices.

(c) Appendix B, the Hydrozone Table

(d) Where slopes exceed 10%, a grading plan drawn at the same scale as the planting plan that accurately and clearly identifies and depicts:

(i) Finished grades

(ii) Drainage patterns

(iii) Pad elevations

(iv) Spot elevations

(v) Stormwater retention improvements, if applicable

(vi) The grading plan shall contain the following statement: "I have complied with the criteria of the Water Efficient Landscape Ordinance and applied them accordingly for the efficient use of water in the grading design plan" and shall bear the signature of a civil engineer as authorized by law.

(3) Completion of Installation - Upon installation and completion of the landscape, applicant shall submit Appendix C, the Certificate of Completion.

(a) The certificate must be accompanied by an irrigation audit report completed by a certified landscape irrigation auditor that contains the following:

(i) Operating pressure of the irrigation system

(ii) Distribution uniformity of overhead irrigation

(iii) Precipitation rate of overhead irrigation

(iv) Report of any overspray or broken irrigation equipment

(v) Irrigation schedule including:

- Plant establishment irrigation schedule
- Regular irrigation schedule by month including: plant type, root depth, soil type, slope factor, shade factor, irrigation interval (days per week), irrigation runtimes, number of start times per irrigation day, gallons per minute for each valve, precipitation rate, distribution uniformity and monthly estimated water use calculations.

(b) An irrigation maintenance schedule timeline must be attached to the Certificate of Completion that includes: routine inspections, adjustment and

repairs to the irrigation system, aerating and dethatching turf areas, replenishing mulch, fertilizing, pruning, and weeding.

(c) A final inspection shall be performed by City staff (Park and Landscape Main Lead Worker or as designated by the City Manager) to verify compliance with the approved plans. Advanced notice is required for all inspections. Building permit final approval shall not be completed until the landscape inspection is approved. An extension of the building permit to complete landscape and irrigation installation shall be required and must be approved by the building inspector prior to occupancy.

Section 15.30.070 Fees

The City Council shall establish a schedule of fees for the processing of landscape inspections.

Section 15.30.080 Other Provisions

(A) The Planning Director will consider and may allow the substitution of design alternatives and innovation which may equally reduce water consumption for any of these alternatives.

(B) The Planning Director will accept documentation methods, water allowance determination, and landscape and irrigation design requirements of the State of California Model Water Efficient Landscape Ordinance instead of Sections 4 and 5 of these requirements where it can be demonstrated that the State procedure will more effectively address the design requirements of the project.

Section 15.30.090 Provisions for Appeal

The applicant or any affected person may appeal the final decision of staff regarding plan check or final inspection to the City Manger by filing a written notice of appeal with the City Manger's Office within 10 working days of the date of the decision. The applicant must pay the standard Planning schedule appeal fee and include receipt of payment along with the written notice of appeal. The decision of the City Manger shall be final and may not be appealed to the City Council. An appeal regarding plan check must be submitted prior to the installation of the landscape or it will be deemed to have been waived.

Section 15.30.100 Enforcement

Any responsible party (as that term is defined in Municipal Code Section 1.10.030, including, without limitation, any agent, employee, or contractor of the responsible party) violating or contributing to the violation of any section of this ordinance shall be subject to enforcement as provided in Municipal Code Chapters 1.10 through 1.15 and in any other applicable law.

Section 15.30.110 Forms

The following forms (Appendices A, B and C) shall be submitted as outlined in Section 6.

CITY OF
CLOVERDALE

Appendix A

Maximum Applied Water Allowance

Project Name _____

☐ **Maximum Applied Water Allowance** (MAWA)

Calculate the project's Maximum Applied Water Allowance using the following equation:

MAWA = (ETo x 0.62) (0.7 x LA + 0.3 x SLA)

where:

MAWA = Maximum Applied Water Allowance (gallons per year)
ETo = Reference Evapotranspiration (40.7 inches per year for Cloverdale)
0.7 = ET Adjustment Factor
LA = Total Landscape Area, including any Special Landscape Area (square feet)
0.62 = Conversion factor (to gallons per square foot)
SLA = Special Landscape Area (square feet)
0.3 = ET Adjustment Factor for Special Landscape Area (1.0 - 0.7 = 0.3)

Show calculations below.

MAWA = (40.7 x 0.62) (0.7 x _____ + 0.3 x _____)
25.3 X (_____ + _____) = _____ gallons per year

Maximum Applied Water Allowance = _____ gallons per year

☐ **Hydrozone Map**

Attach a hydrozone map to this worksheet. Hydrozones shall be designated by number, letter or other designation.

☐ **Estimated Total Water Use** (ETWU)

Calculate the project's Estimated Total Water Use using the following equation:

$$\textbf{ETWU} = (\text{ETo} \times 0.62)\left[\frac{\sum \text{WU}}{\text{IE}} + \text{SLA}\right]$$

where:

ETWU = Estimated total water use per year (gallons)
ETo = Reference Evapotranspiration (40.7 inches per year in Cloverdale)
0.62 = Conversion factor (to gallons per square foot)
∑WU = Total water use from Water Use by Hydrozone Table (below)
IE = Irrigation efficiency (minimum 0.71)
SLA = Special Landscape Area (square feet)

Show calculations below.

ETWU = (40.8 x 0.62) [_____ / _____ ÷ _____] = _____ gallons per year

Estimated Total Water Use = _____ gallons per year

Appendix B
Hydrozone Table

This worksheet is filled out by the project applicant and is a required element of the Landscape Documentation Package. Please complete the hydrozone table(s) for each hydrozone. Use as many tables as necessary to provide the square footage of landscape area per hydrozone.

Hydrozone*	Zone or Valve	Irrigation Method**	Area (Sq. Ft)	% of Landscape Area
	Total			100%

	Summary Hydrozone Table	
Hydrozone*	**Area (Sq. Ft.)**	**% of Landscape Area**
High Water Use		
Moderate Water Use		
Low Water Use		
	Total =	**100%**

***Hydrozone**
HW = High Water Use Plants
MW = Moderate Water Use Plants
LW = Low Water Use Plants

****Irrigation Method**
MS = Microspray
S = Spray
R = Rotor
B = Bubbler
D = Drip
O = Other

Appendix C
CERTIFICATE OF COMPLETION

This certificate is filled out by the project applicant upon completion of the landscape project.

PART 1 Project Information Sheet

Date		
Project Name		
Name of Project Applicant	Telephone No.	
	Fax No.	
Title	Email Address	
Company	Street Address	
City	State	Zip Code

Property Owner or his/her designee:

Name	Telephone No.	
	Fax No.	
Title	Email Address	
Company	Street Address	
City	State	Zip Code

"I/we certify that I/we have received copies of all the documents within the Landscape Documentation Package and the Certificate of Completion and that it is our responsibility to see that the project is maintained in accordance with the Landscape and Irrigation Maintenance Schedule."

Property Owner Signature Date

PART 2. Landscape Architect and Landscape Contractor/Installer

Landscape Architect Name	Telephone No.	
	Fax No.	
Title	Email Address	
License No. or Certification No.		
Company	Street Address	
City	State	Zip Code

"I/we certify that the work has been completed in accordance with the Ordinance and that the landscape planting and irrigation installation conform to the criteria and specifications of the approved Landscape Documentation package. Additionally, per Section 6 of this Ordinance, a landscape audit and irrigation maintenance schedule have been completed and are attached to this certificate showing that the system meets the efficiency requirements used in the Maximum Applied Water Allowance calculation."

Landscape Architect Signature Date

Landscape Contractor Signature Date

Section 2. Compliance with the California Environmental Quality Act The City Council finds that this Ordinance is not subject to the California Environmental Quality Act ("CEQA") pursuant to Sections 15060(c)(2) (the activity will not result in a direct or reasonably foreseeable indirect physical change in the environment) and 15060(c)(3) (the activity is not a project as defined in Section 15378) of the CEQA Guidelines because it has no potential for resulting in physical change to the environment, directly or indirectly.

Section 3 Severability If any provision, of this Ordinance or the application thereof to any person or circumstances is for any reason held to be invalid or unconstitutional by a decision of any court of competent jurisdiction or preempted by state legislation, such decision or legislation shall not affect the validity of the remaining portions of this Ordinance. The City Council hereby declares that it would have passed this Ordinance and each and every section, subsection, sentence, clause or phrase hereof not declared invalid or unconstitutional without regard to any such decision or preemptive legislation.

Section 4 Effective Date and Publication. This ordinance of the City of Cloverdale shall be effective thirty (30) days after the date of passage. Before the expiration of fifteen (15) days after its passage, this ordinance, or a summary thereof as provided in California Government Code Section 36933, shall be published at least once in a newspaper of general circulation, published and circulated in the City of Cloverdale, along with the names of the members of the City Council voting for and against its passage.

This Ordinance No. 674-2010 was introduced before the City Council of the City of Cloverdale, County of Sonoma, at a regular meeting thereof on the 22nd day of September, 2010, and passed and adopted upon its second reading October 13, 2010 by the following voice vote: (5-ayes, 0-noes).

AYES in favor of:	Council Members Palla, Wolter, Cox, Vice Mayor Raymond and Mayor Russell
NOES:	None
ABSTAIN:	None
ABSENT:	None

Approved: Attested:

Carol Russell, Mayor

Jill Garibaldi, Deputy City Clerk

A certified copy of the full text of the adopted ordinance has been posted at the office of the City Clerk and is available for public inspection

Dated: 9/23/2010 + 10/14/2010
Jill Garibaldi, Deputy City Clerk

Appendix F - SB X7-7 Verification Tables

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SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Million Gallons
**The unit of measure must be consistent with Table 2-3*

SB X7-7 Table-1: Baseline Period Ranges			
Baseline	**Parameter**	**Value**	**Units**
10- to 15-year baseline period	2008 total water deliveries	472.8	Million Gallons
	2008 total volume of delivered recycled water	0	Million Gallons
	2008 recycled water as a percent of total deliveries	0.00%	Percent
	Number of years in baseline period[1]	10	Years
	Year beginning baseline period range	1997	
	Year ending baseline period range[2]	2006	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[3]	2007	

[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period.

[2] The ending year must be between December 31, 2004 and December 31, 2010.

[3] The ending year must be between December 31, 2007 and December 31, 2010.

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☐	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☑	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review

SB X7-7 Table 3: Service Area Population		
Year		Population
10 to 15 Year Baseline Population		
Year 1	1997	5,153
Year 2	1998	5,212
Year 3	1999	6,903
Year 4	2000	7,064
Year 5	2001	7,246
Year 6	2002	7,433
Year 7	2003	8,433
Year 8	2004	8,753
Year 9	2005	8,746
Year 10	2006	8,757
5 Year Baseline Population		
Year 1	2003	8,433
Year 2	2004	8,753
Year 3	2005	8,746
Year 4	2006	8,757
Year 5	2007	8,758
2015 Compliance Year Population		
2015		8,801

SB X7-7 Table 4: Annual Gross Water Use *								
	Baseline Year *Fm SB X7-7 Table 3*	**Volume Into Distribution System** *Fm SB X7-7 Table(s) 4-A*	**Deductions**					**Annual Gross Water Use**
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *Fm SB X7-7 Table 4-B*	Water Delivered for Agricultural Use	Process Water *Fm SB X7-7 Table(s) 4-D*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1997	375	0	0	0	0	0	375
Year 2	1998	374	0	0	0	0	0	374
Year 3	1999	444	0	0	0	0	0	444
Year 4	2000	460	0	0	0	0	0	460
Year 5	2001	473	0	0	0	0	0	473
Year 6	2002	478	0	0	0	0	0	478
Year 7	2003	490	0	0	0	0	0	490
Year 8	2004	529	0	0	0	0	0	529
Year 9	2005	471	0	0	0	0	0	471
Year 10	2006	503	0	0	0	0	0	503
10 - 15 year baseline average gross water use								**460**
5 Year Baseline - Gross Water Use								
Year 1	2003	490	0	0	0	0	0	490
Year 2	2004	529	0	0	0	0	0	529
Year 3	2005	471	0	0	0	0	0	471
Year 4	2006	503	0	0	0	0	0	503
Year 5	2007	500	0	0	0	0	0	500
5 year baseline average gross water use								**498**
2015 Compliance Year - Gross Water Use								
2015		344	0	0	0	0	0	344
* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3								

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)
Complete one table for each source.

Name of Source	Source 1
This water source is:	
☑	The supplier's own water source
☐	A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment * *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1997	374.8		375
Year 2	1998	373.7		374
Year 3	1999	444.2		444
Year 4	2000	459.7		460
Year 5	2001	473.1		473
Year 6	2002	477.5		478
Year 7	2003	489.7		490
Year 8	2004	528.6		529
Year 9	2005	470.8		471
Year 10	2006	503.4		503
5 Year Baseline - Water into Distribution System				
Year 1	2003	489.7		490
Year 2	2004	528.6		529
Year 3	2005	470.8		471
Year 4	2006	503.4		503
Year 5	2007	499.9		500
2015 Compliance Year - Water into Distribution System				
2015		**343.5**		344

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1997	5,153	375	199
Year 2	1998	5,212	374	196
Year 3	1999	6,903	444	176
Year 4	2000	7,064	460	178
Year 5	2001	7,246	473	179
Year 6	2002	7,433	478	176
Year 7	2003	8,433	490	159
Year 8	2004	8,753	529	165
Year 9	2005	8,746	471	147
Year 10	2006	8,757	503	157
10-15 Year Average Baseline GPCD				**173.5**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	8,433	490	159
Year 2	2004	8,753	529	165
Year 3	2005	8,746	471	147
Year 4	2006	8,757	503	157
Year 5	2007	8,758	500	156
5 Year Average Baseline GPCD				**157**
2015 Compliance Year GPCD				
2015		8,801	344	107

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	173
5 Year Baseline GPCD	157
2015 Compliance Year GPCD	107

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	2020 Target GPCD
173	139

SB X7-7 Table 7-E: Target Method 3				
Agency May Select More Than One as Applicable	Percentage of Service Area in This Hydrological Region	Hydrologic Region	"2020 Plan" Regional Targets	Method 3 Regional Targets (95%)
☑	100%	North Coast	137	130
☐		North Lahontan	173	164
☐		Sacramento River	176	167
☐		San Francisco Bay	131	124
☐		San Joaquin River	174	165
☐		Central Coast	123	117
☐		Tulare Lake	188	179
☐		South Lahontan	170	162
☐		South Coast	149	142
☐		Colorado River	211	200
Target *(If more than one region is selected, this value is calculated.)*				**130**

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target*	Calculated 2020 Target *Fm Appropriate Target Table*	Confirmed 2020 Target
157	149	139	139
** Maximum 2020 Target is 95% of the 5 Year Baseline GPCD*			
NOTES: Calculated 2020 target is from Method 1 (Table 7-A)			

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	2015 Interim Target GPCD
139	173	156

SB X7-7 Table 9: 2015 Compliance								
Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments *(in GPCD)*					2015 GPCD *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015?
		Extraordinary Events	Weather Normalization	Economic Adjustment	TOTAL Adjustments	Adjusted 2015 GPCD		
107	156	*n/a*	*n/a*	*n/a*	0	107	107	YES

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Appendix G - DWR Population Tool Output

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Please print this page to a PDF and include as part of your UWMP submittal.

Confirmation Information

Generated By	Water Supplier Name	Confirmation #	Generated On
Ian Jaffe	Cloverdale City of	7783750236	12/31/2015 2:02:43 PM

Boundary Information

Census Year	Boundary Filename	Internal Boundary ID
1990	Cloverdale_SOI.kml	410
2000	Cloverdale_SOI.kml	410
2010	Cloverdale_SOI.kml	410

Baseline Period Ranges

10 to 15-year baseline period

2008 total water deliveries[1]:	473	Million Gallons (MG)
2008 total volume of delivered recycled water[1]:	0	Million Gallons (MG)
2008 recycled water as a percent of total deliveries:	0.00%	
Number of years in baseline period[2]:	10	
Year beginning baseline period range:	1997	
Year ending baseline period range[3]:	2006	

5-year baseline period

Year beginning baseline period range:	2003
Year ending baseline period range[4]:	2007

[1] The selected units of measure must apply to both the 2008 total water deliveries and the 2008 total volume of delivered recycled water. If the water supplier records use different units of measure for these volumes, the user must make a conversion so that both volumes are in the same units of measure.

[2] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period.

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

Persons per Connection

Year	Census Block Level Total Population	Number of Connections *	Persons per Connection
1990	5,191		2.70
1991	-	-	2.70
1992	-	-	2.70
1993	-	-	2.69
1994	-	-	2.69
1995	-	-	2.69
1996	-	-	2.68
1997	-	-	2.68
1998	-	-	2.68
1999	-	-	2.68
2000	7,064	2643	2.67
2001	-	-	2.67
2002	-	-	2.66
2003	-	-	2.66
2004	-	-	2.66
2005	-	-	2.66
2006	-	-	2.65
2007	-	-	2.65
2008	-	-	2.65
2009	-	-	2.64
2010	8,779	3320	2.64
2015	-	-	2.63

** Number of Connections may be either All Residential Connections (Single Family and Multi-Family combined) or All Service Connections. This will depend on the data available from the water supplier's records, but must remain consistent throughout the table.*

Population Using Persons-Per-Connection

Year		Number of Connections *	Persons per Connection	Total Population
10 to 15 Year Baseline Population Calculations				
Year 1	1997	1922	2.68	5,153
Year 2	1998	1946	2.68	5,212
Year 3	1999	2580	2.68	6,903
Year 4	2000	2643	2.67	7,064
Year 5	2001	2717	2.67	7,246
Year 6	2002	2790	2.66	7,433
Year 7	2003	3169	2.66	8,433
Year 8	2004	3293	2.66	8,753
Year 9	2005	3294	2.66	8,746
Year 10	2006	3302	2.65	8,757
5 Year Baseline Population Calculations				
Year 1	2003	3169	2.66	8,433
Year 2	2004	3293	2.66	8,753
Year 3	2005	3294	2.66	8,746
Year 4	2006	3302	2.65	8,757
Year 5	2007	3306	2.65	8,758
2015 Compliance Year Population Calculations				
2015		3342	2.63	8,801

** Number of Connections may be either All Residential Connections (Single Family and Multi-Family combined) or All Service Connections. This will depend on the data available from the water supplier's records, but must remain consistent throughout the table.*

Hide Print Confirmation

Appendix H - Energy Intensity Documentation

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DRAFT Technical Memorandum

City of Cloverdale 2015 UWMP

Subject:	**Energy Intensity**
Prepared For:	Eric Janzen, City of Cloverdale
Prepared by:	Ian Jaffe, RMC
Reviewed by:	Leslie Dumas, RMC
Date:	February 12, 2016
Reference:	0286-005

1 Introduction

Appendix O, Energy Intensity of the *2015 Urban Water Management Plans Guidebook for Urban Water Suppliers* (DWR, 2016) provides guidance for estimating energy intensity associated with sources of water used (and wastewater treated) by an urban water supplier. While estimating energy intensity (EI) is an optional portion of an Urban Water Management Plan (UWMP), the City of Cloverdale (City) is aware of the importance of understanding its energy usage within its water system and has chosen to estimate EI. The purpose of calculating the City's EI is to:

- Develop a baseline energy use per acre-foot for the water system.
- Aid in identifying energy saving opportunities in the future.
- Allow for comparing energy use among similar agencies.

Water EI is the total amount of energy expended on a per acre-foot (AF) basis to take water from the location the City acquires it to the point of delivery. Thus, the EI would include conveyance, extraction, treatment, placing water in to storage, and distribution. The City's water EI only accounts for the water management processes occurring within its operational control (that is, associated energy usage by agencies prior to the City's point of diversion is not considered in this analysis). The City's wastewater EI accounts for collection, treatment and disposal. This technical memorandum (TM) describes the City's water and wastewater EIs and how they were calculated.

2 Estimating the City's EI

2.1 Cloverdale's Water and Wastewater Systems

Water System

The City receives all of its water supply from shallow wells on the banks of the Russian River. The raw water is treated at the City's nearby water treatment plant (WTP) before being pumped into storage tanks serving one of three different pressure zones around the City. The following water management processes are accounted for in the City's water EI as described in the following sections.

- Pumping of raw water from the Russian River (via shallow wells).
- Conveyance to and treatment of raw water at the City's WTP.
- Storage and delivery of treated water from the WTP.

Wastewater System

The City treats all of its wastewater at its Wastewater Treatment Facility (WWTF). The wastewater is primarily collected via a gravity system, however there is one lift station at Shahan Drive and North Cloverdale Boulevard serving about 50 homes. The collected wastewater is treated at the City's WWTF and then discharged to adjacent infiltration ponds. Because the City does not produce or deliver the recycled water, it is not included in the City's wastewater EI. The following wastewater management processes are accounted for in the City's wastewater EI as described in the following sections.

- Wastewater collection (lift station)
- Treatment of wastewater at the City's WWTF
- Discharge of treated effluent to the infiltration ponds

2.2 Data Collection and Analysis

Energy usage data to extract, treat, and distribute water in the City and for collection, treatment and discharge of its wastewater was gathered from Pacific Gas & Electric (PG&E) meter data for calendar year 2015. In the 2015 UWMP Guidebook and Appendix O, DWR provided three reporting methods for water EIs and one method for wastewater/recycle water EIs with associated tables. The three different water EI methods are described below:

- Water Supply Process Approach, Table O1-A: Report EI by water management operation (aggregated across all supply sources) including extraction, conveyance, placement into storage, treatment and distribution.
- Total Utility Approach, Table O1-B: Report a single EI for all water management operations.
- Multiple Water Delivery Products, Table O1-C: report EI by water management operation and water delivery product (Retail Potable, Retail Non-Potable, Wholesale Potable, Wholesale Non-Potable, Agricultural, Environmental, and Other Deliveries).

The City's energy usage records for the water system is available as a combined value for the extraction and treatment of water and the combined usage for storage and distribution. Therefore, the City utilized Table O-1B for its EI calculations instead of Table O-1A or O1-C, since it is not possible to distinguish between energy used for treatment and conveyance at this time. The monthly energy usage for the two energy usage data points were summed and used as the total energy consumed in Table O1-B. Meter data were allocated to the water management processes as follows:

- Extraction and Treatment: Meter #1009984259 (581,686 kWh in 2015)
- Storage and Distribution: Meter #1009539296, #1009170550, #1009069819, #1005764730, #1009537726 and #1009124234 (227,216 kWh combined in 2015)
- All Water Management Processes: Sum of energy usage from two water meters listed above (808,902 kWh in 2015)

Appendix O of the guidebook describes a single method for calculating the EI for wastewater, splitting out the EI by collection/conveyance, treatment and discharge/distribution. The City's energy usage for wastewater management was available from two meters, one for collection and one for treatment and discharge. In order to fit the data to the methodology, it was assumed that treatment accounted for 99% of the energy usage for the combine treatment/discharge meter. This fraction was considered reasonable as the treated effluent is discharged from the WWTF to the adjacent percolation ponds, a distance of approximately 250 feet, without the use of a pump station, therefor requiring little energy usage

Meter data were allocated to the wastewater management processes as follows:

- Collection: Meter #1005766090(821 kWh in 2015)
- Treatment: 99% of Meter #C28977 (1,078,942 kWh in 2015)
- Discharge: 1% of Meter #C28977 (108,898 kWh in 2015)

2.3 Summary

The most energy intensive management process within the City's water and wastewater systems is the treatment of both streams. The City does not currently generate hydropower or renewable energy within its system, however it does plan on installing solar panels at both of its treatment plants to provide clean energy. Further planning and coordination with a solar vendor is needed to determine the energy that will be produced by solar panels at buildout. The energy usage by water management process for calendar year 2015 is summarized in Table 1.

Table 1: City of Cloverdale EI Summary

Water Management Process	Energy Usage (kWh)	% Total
Extraction and Treatment	581,686	71.9%
Storage and Distribution	227,216	28.1%
Wastewater Management Process	**Energy Usage (kWh)**	**% Total**
Collection	821	0.1%
Treatment and Discharge	1,089,840	99.9%

The total energy usage and volume of water entering the City's water system for calendar year 2015 was 808,902 kWh and 1,054 AFY, respectively, resulting in an EI of 767.5 kWh/AF. The total energy usage and volume of wastewater collected and treated by the City's wastewater system for calendar year 2015 was 1,090,661 kWh and 568 AFY, respectively, resulting in an EI of 1,920 kWh/AF. Tables O1-B and O-2 were completed and are attached to this TM (Attachment A and B).

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Attachment A: Table O1-B

Urban Water Supplier: *City of Cloverdale*

Water Delivery Product (If delivering more than one type of product use Table O-1C)

Retail Potable Deliveries

Table O-1B: Voluntary Energy Intensity - Total Utility Approach			
Enter Start Date for Reporting Period 1/1/2015 End Date 12/31/2015	Urban Water Supplier Operational Control		
	Sum of All Water Management Processes	Non-Consequential Hydropower	
	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (AF)	*1054*	*0*	*1054*
Energy Consumed (kWh)	*808902*	*0*	*808902*
Energy Intensity (kWh/AF)	*767.5*	*0.0*	*767.5*

Quantity of Self-Generated Renewable Energy

0 kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

Metered Data

Data Quality Narrative:

Energy usage and water production was provided on a monthly basis. The City's energy usage breaks down the water management process by extraction/treatment and storage/conveyance/distribution. These values were summed and used as the total engery consumed.

Narrative:

Attachment B: Table O-2

Urban Water Supplier: *City of Cloverdale*

Table O-2: Voluntary Energy Intensity - Wastewater & Recycled Water				
Enter Start Date for Reporting Period 1/1/2015 End Date 12/31/2015	Urban Water Supplier Operational Control			
	Water Management Process			
	Collection / Conveyance	Treatment	Discharge / Distribution	Total
Volume of Wastewater Entering Process (AF)	568	568	568	568
Wastewater Energy Consumed (kWh)	821	1078942	10838	1090681
Wastewater Energy Intensity (kWh/AF)	1.4	1900	19	1920
Volume of Recycled Water Entering Process (AF)	0	0	0	0
Recycled Water Energy Consumed (kWh)	0	0	0	0
Recycled Water Energy Intensity (kWh/AF)	0.0	0.0	0.0	0.0

Quantity of Self-Generated Renewable Energy related to recycled water and wastewater operations

kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

Combination of Estimates and Metered Data

Data Quality Narrative:

Energy usage and wastewater management data was provided on a monthly basis. The City's energy usage breaks down the wastewater management process by collection and treatment/discharge. It was assumed that treatment accounted for 99% of the treatment/discharge energy usage, while 1% was reserved for discharge. This split is considered reasonable as the effluent is discharged from the WWTF to adjacent percolation ponds (about 250 feet away) without the use of a pump station.

Narrative:

Appendix I - 2014 Consumer Confidence Report

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2014 Consumer Confidence Report

Water System Name: **City of Cloverdale Water Dept.** Report Date: June 2015

We test the drinking water quality for many constituents as required by state and federal regulations. This report shows the results of our monitoring for the period of January 1 - December 31, 2014 and may include earlier monitoring data.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo ó hable con alguien que lo entienda bien.

Type of water source(s) in use: Wells, Ground water under the influence of surface water

Name & general location of source(s): Wells #3, #4, #6, #7, #8, #11, #13 and #14 are located at or near the Water Treatment Plant at 490 E. First St., Cloverdale, CA 95425

Drinking Water Source Assessment information: Is available at City Hall, 124 Cloverdale Blvd. and the Water Treatment Plant, 490 E. First St. Please call the number listed below for more information.

Time and place of regularly scheduled board meetings for public participation: 2nd and 4th Wednesday of each month At the Cloverdale Performing Arts Center, City Council meetings.

For more information, contact: Alan Hodge, Sr. Water Plant Operator Phone: (707) 894-1781

TERMS USED IN THIS REPORT

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency (USEPA).

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Primary Drinking Water Standards (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Secondary Drinking Water Standards (SDWS): MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect the health at the MCL levels.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Regulatory Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Variances and Exemptions: Department permission to exceed an MCL or not comply with a treatment technique under certain conditions.

N/A, n/a: Not Applicable

ND: not detectable at testing limit

ppm: parts per million or milligrams per liter (mg/L)

ppb: parts per billion or micrograms per liter (µg/L)

ppt: parts per trillion or nanograms per liter (ng/L)

ppq: parts per quadrillion or picogram per liter (pg/L)

pCi/L: picocuries per liter (a measure of radiation)

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- *Microbial contaminants*, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- *Inorganic contaminants*, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- *Pesticides and herbicides*, that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- *Organic chemical contaminants*, including synthetic and volatile organic chemicals, that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
- *Radioactive contaminants*, that can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the USEPA and the California Department of Public Health prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

Tables 1, 2, 3, 4, 5, 7, and 8 list all of the drinking water contaminants that were detected during the most recent sampling for the constituent. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. The Department allows us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data, though representative of the water quality, are more than one year old.

TABLE 1 – SAMPLING RESULTS SHOWING THE DETECTION OF COLIFORM BACTERIA

Microbiological Contaminants	Highest No. of Detections	No. of months in violation	MCL	MCLG	Typical Source of Bacteria
Total Coliform Bacteria	0	0	More than 1 sample in a month with a detection	(0)	Naturally present in the environment
Fecal Coliform or *E. coli*	0	0	A routine sample and a repeat sample detect total coliform and either sample also detects fecal coliform or *E. coli*	(0)	Human and animal fecal waste

TABLE 2 – SAMPLING RESULTS SHOWING THE DETECTION OF LEAD AND COPPER

Lead and Copper	Sample Date	No. of samples collected	90th percentile level detected	No. sites exceeding AL	AL	PHG	Typical Source of Contaminant
Lead (ppb)	9/18/13	20	<0.005	0	15	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper (ppm)	9/18/13	20	0.250	0	1.3	0.3	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

TABLE 3 – SAMPLING RESULTS FOR SODIUM AND HARDNESS

Chemical or Constituent	Sample Date	Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source of Contaminant
Sodium (ppm)	7/30/14	9.5	7.8-9.5	none	none	Salt present in the water and is generally naturally occurring
Hardness (ppm)	7/30/14	159	127-159	none	none	Sum of polyvalent cations present in the water, generally magnesium

						and calcium, and are usually naturally occurring

**Any violation of an MCL or AL is asterisked. Additional information regarding the violation is provided later in this report.*

TABLE 4 – DETECTION OF CONTAMINANTS WITH A PRIMARY DRINKING WATER STANDARD

Chemical or Constituent (and reporting units)	**Sample Date**	**Level Detected**	**Range of Detections**	**MCL [MRDL]**	**PHG (MCLG) [MRDLG]**	**Typical Source of Contaminant**
Aluminum (ppb)	7/30/14	98	98	1,000	600	Erosion of natural deposits; residue from some surface water treatment processes
Gross Alpha Particle Activity (pCi/L)	7/30/14	1.46	-0.58 – 1.46	15	(0)	Erosion of natural deposits
Barium (ppb)	7/30/14	130.0	110.0-130.0	1,000	2,000	Discharge or oil drilling wastes and from metal refineries; erosion of natural deposits
Nitrate (as NO^3) (ppm)	7/30/14	4.9	2.3-4.9	45	45	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Haloacetic Acids (HAA5) (ppb)	Qtly in 2014	24.64	3.8-24.64	80	N/A	By-product of drinking water disinfection
Total Trihalomethanes (TTHM) (ppb)	Qtly in 2014	20.89	7.4-20.89	60	N/A	By-product of drinking water disinfection

TABLE 5 – DETECTION OF CONTAMINANTS WITH A SECONDARY DRINKING WATER STANDARD

Chemical or Constituent (and reporting units)	**Sample Date**	**Level Detected**	**Range of Detections**	**MCL**	**PHG (MCLG)**	**Typical Source of Contaminant**
Aluminum (ppm)	7/30/14	98	98	200	none	Erosion of natural deposits; residue from some surface water treatment processes
Chloride (ppm)	7/30/14	9.5	6.1-9.5	500	none	Run off/leaching from natural deposits; seawater influence
Color (Units)	7/30/14	11	9-11	15	none	Naturally-occurring organic materials
Iron (ppb)	7/30/14	510	200-510	300	none	Leaching from natural deposits; industrial wastes
Magnesium (ppm)	7/30/14	24	15-24	N/A		Leaching from natural deposits
Specific Conductance (µS/cm)	7/30/14	360	290-360	1,600	none	Substances that form ions when in water; seawater influence
Sulfate (ppm)	7/30/14	21	13-21	500	none	Runoff/leaching from natural deposits; industrial wastes
Total Dissolved Solids (ppm)	7/30/14	170	170-210	1,000	none	Runoff/leaching from natural deposits
Turbidity (NTU Units)	7/30/14	3.5	0.14-3.5	5	none	Soil runoff

TABLE 6 – DETECTION OF UNREGULATED CONTAMINANTS

Chemical or Constituent (and reporting units)	**Sample Date**	**Level Detected**	**Range of Detections**	**Notification Level**	**Health Effects Language**
None					

**Any violation of an MCL, MRDL, or TT is asterisked. Additional information regarding the violation is provided later in this report.*

Additional General Information on Drinking Water

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with

HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Lead-Specific Language for Community Water Systems: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Cloverdale Water Dept. is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Summary Information for Violation of a MCL, MRDL, AL, TT, or Monitoring and Reporting Requirement

VIOLATION OF A MCL, MRDL, AL, TT, OR MONITORING AND REPORTING REQUIREMENT				
Violation	**Explanation**	**Duration**	**Actions Taken to Correct the Violation**	**Health Effects Language**
None				

For Water Systems Providing Ground Water as a Source of Drinking Water

TABLE 7 – SAMPLING RESULTS SHOWING FECAL INDICATOR-POSITIVE GROUND WATER SOURCE SAMPLES					
Microbiological Contaminants (complete if fecal-indicator detected)	**Total No. of Detections**	**Sample Dates**	**MCL [MRDL]**	**PHG (MCLG) [MRDLG]**	**Typical Source of Contaminant**
E. coli	7	2014	0	(0)	Human and animal fecal waste
Enterococci	None	N/A	TT	n/a	Human and animal fecal waste
Coliphage	None	N/A	TT	n/a	Human and animal fecal waste

Summary Information for Fecal Indicator-Positive Ground Water Source Samples, Uncorrected Significant Deficiencies, or Ground Water TT

SPECIAL NOTICE OF FECAL INDICATOR-POSITIVE GROUND WATER SOURCE SAMPLE				
None				
SPECIAL NOTICE FOR UNCORRECTED SIGNIFICANT DEFICIENCIES				
None				
VIOLATION OF GROUND WATER TT				
TT Violation	**Explanation**	**Duration**	**Actions Taken to Correct the Violation**	**Health Effects Language**
None				

For Systems Providing Surface Water as a Source of Drinking Water

TABLE 8 - SAMPLING RESULTS SHOWING TREATMENT OF SURFACE WATER SOURCES	
Treatment Technique [(a)] (Type of approved filtration technology used)	Alternative; Adsorption Clarifier & Multi-media polishing filtration
Turbidity Performance Standards [(b)] (that must be met through the water treatment process)	Turbidity of the filtered water must: 1 – Be less than or equal to **0.20** NTU in 95% of measurements in a month. 2 – Not exceed **1.0** NTU for more than eight consecutive hours. 3 – Not exceed **5.0** NTU at any time.
Lowest monthly percentage of samples that met Turbidity Performance Standard No. 1.	100%
Highest single turbidity measurement during the year	0.21
Number of violations of any surface water treatment requirements	None

(a) A required process intended to reduce the level of a contaminant in drinking water.

(b) Turbidity (measured in NTU) is a measurement of the cloudiness of water and is a good indicator of water quality and filtration performance. Turbidity results which meet performance standards are considered to be in compliance with filtration requirements.

** Any violation of a TT is marked with an asterisk. Additional information regarding the violation is provided below.*

Summary Information for Violation of a Surface Water TT

VIOLATION OF A SURFACE WATER TT				
TT Violation	**Explanation**	**Duration**	**Actions Taken to Correct the Violation**	**Health Effects Language**
None				

Summary Information for Operating Under a Variance or Exemption

N/A

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Appendix J - Water Shortage Contingency Plan Resolution

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SAMPLE WATER SHORTAGE CONTINGENCY RESOLUTION

City of Cloverdale

RESOLUTION NO. _____

WHEREAS, the California Legislature enacted Assembly Bill 1lX during the 1991 Extraordinary Session of the California Legislature (an act to amend California Water Code Sections 10620, 10631, and 10652, and to add Section 10656 to the California Water Code, relating to water); and

WHEREAS, AB11X requires that every urban water supplier providing potable water directly to more than 3,000 customers or supplying more than 3,000 acre feet of water to develop a Water Shortage Contingency Plan; and

WHEREAS, AB11X mandates that said Water Shortage Contingency Plan be filed with the California Department of Water Resources by January 31, 1992; and

WHEREAS, The City of Cloverdale is an urban water supplier providing water to more than 3,000 customers, and therefore, has prepared and filed a Water Shortage Contingency Plan, in compliance with requirements of AB11X; and

WHEREAS, The City of Cloverdale (City) obtains water from the Russian River; and

WHEREAS, The City, has determined that a shortage condition exists because the projected available water supply is less than projected system-wide water purchases in the upcoming Supply Year beginning July 1; and

WHEREAS, In 2014 the City updated Chapter 13.05 of the City's municipal code to include three stages of water emergency measures; and

WHEREAS, the City of Cloverdale's 2015 Urban Water Management Plan (UWMP) was approved in June 2016, and includes a Water Shortage Contingency Plan (WSCP) that sets forth three water conservation stages, attached hereto as Exhibit A, designed to reduce overall water usage; and

WHEREAS, public hearings have been conducted regarding the implementation of the City's Water Shortage Contingency Plan;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CLOVERDALE:

1. The Water Shortage Contingency Plan is hereby implemented;

2. The City is hereby authorized (should the need arise) to declare a Water Shortage Emergency and implement the Water Shortage Contingency Plan;

3. The City shall take necessary actions to mitigate the effects on customers of the water shortage while continuing to fulfill its duties as a public utility water company.

I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of _____

_____

(signee)

SAMPLE

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Appendix K - City Council Resolution 055-2015

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CITY OF
CLOVERDALE

MINUTES
REGULAR MEETING OF THE CITY COUNCIL AND
JOINT MEETING OF THE CLOVERDALE COMMUNITY DEVELOPMENT SUCCESSOR AGENCY BOARD OF DIRECTORS

WEDNESDAY, AUGUST 26, 2015

PUBLIC BUSINESS SESSION: 6:30 p.m.
PUBLIC BUSINESS SESSION LOCATION: CLOVERDALE PERFORMING ARTS CENTER, 209 N. CLOVERDALE BLVD., CLOVERDALE, CA 95425

CONVENE PUBLIC BUSINESS SESSION – 6:30 p.m.

OPENING:
- Call to Order: Mayor Cox called the meeting to order at 6:30 p.m.
- Pledge of Allegiance
- Roll Call: Present – Councilmember Palla, Vice Mayor Brigham, Councilmember Russell, Councilmember Wolter, Mayor Cox.
- Report out of Closed Session –Actions Taken: None
- Conflict of Interest Declaration: None
- Agenda Review – Regular Session (Changes and/or Deletions): None

PUBLIC COMMENTS:

Mayor Cox opened the public comment period.

Wayne Diggs, Cloverdale, stated the Clover Springs residents do not want a porta-potty installed in the open space area despite the letter sent by Clover Springs Community Association to the City Manager.

Mayor Cox closed the public comment period.

PROCLAMATIONS / PRESENTATIONS:
1. **Introduction of Leticia Barajas** – Finance Manager Cavallari introduced Ms. Barajas to the Council.
2. **Proclamation Honoring And Remembering Marie Vandagriff** – Mayor Cox read proclamation which will be presented to her family at her funeral.

CONSENT CALENDAR:
3. **Consideration of a Resolution of the City Council of the City of Cloverdale Urging the State of California to Provide New Sustainable Funding for State and Local Transportation Infrastructure**
4. **Annual Adoption of a Resolution to Approve the Ad Valorem 2015/2016 Tax Rate for Inclusion on Property Tax Bills to Fund PERS Retirement Expense**
5. **Consideration of Resolution No. 052-2015 authorizing the destruction of certain records as incorporated as Exhibit "A" of the resolution which is authorized by the City's official record retention schedule adopted in September 2006**

City Manager Cayler pulled item 5, as the referenced Exhibit A was not included in the agenda packet.

LaReva Myles, Cloverdale, requested item 4 be pulled for discussion.

Action: Motion was made by Councilmember Palla and seconded by Councilmember Wolter to approve item #3 of the consent calendar. The motion passed unanimously (5-ayes – Councilmember Palla, Vice Mayor Brigham, Councilmember Russell, Councilmember Wolter, Mayor Cox; 0-noes).

LaReva Myles, Cloverdale, regarding item #4, asked how long the ad valorem tax, originally passed in 1974, will be charged through property taxes.

Finance Manager Cavallari stated the tax was approved in 1974 to fund the retirement program for City employees, so it is in perpetuity.

Vice Mayor Brigham added this ad valorem tax does get adjusted down or up to keep a reserve in that account.

Action: Motion was made by Councilmember Wolter and seconded by Vice Mayor Brigham to approve item #4 of the consent calendar. The motion passed unanimously (5-ayes – Councilmember Palla, Vice Mayor Brigham, Councilmember Russell, Councilmember Wolter, Mayor Cox; 0-noes).

COMMUNICATIONS:

6. Clover Springs letter

City Manager (CM) Cayler presented this item stating the conceptual design he sent out two weeks prior does not include a porta-potty toilet for the open space area. CM Cayler stated the letter received from Clover Springs Community Association was included in the agenda packet as routine correspondence.

Councilmember Palla stated City parks and open space areas are periodically reviewed to make any necessary modifications.

Deborah Hacker, President of the Board of Directors of Clover Springs Community Association spoke regarding the Association's letter, dated August 4, 2015, and the amenities requested in that correspondence.

Mayor Cox opened the public comment period for this item.

Clay Skelton, Cloverdale, stated the letter does not represent the position of the majority of residents.

Kendall Sillers, Cloverdale, stated the letter does not represent the community.

Pete Combs, Cloverdale, supports the letters that came from the Board.

Mayor Cox closed the public comment period for this item.

CM Cayler stated the conceptual drawings will probably come to Council at the second meeting in September and currently there is no port-a-potty and no parking lot.

PUBLIC HEARINGS: None.

NEW BUSINESS:

7. Proposal by Nu Forest Products to prezone and annex approximately 27 acres of land located at 280 Asti Road into the City limits.

ACM/CDD Massey stated the purpose of this item is to inform the City Council that the City has received an application from Nu Forest Products to prezone and annex approximately 27 acres into the City limits. Ms. Massey stated the property is designated General Industrial under the City's General Plan and is planned for annexation, and that the Applicant is to complete a cost/benefit analysis to determine how the cost of services will be provided for upon annexation. Ms. Massey stated Staff is in the process of obtaining proposals from qualified consultants to prepare that cost/benefit analysis

Councilmember Palla commented that this is exciting and he likes that jobs will be brought to Cloverdale.

Councilmember Russell commented that creating local jobs is important to Cloverdale's future and will reduce greenhouse gas emissions and the cost of going to work for many people.

Councilmember Wolter asked for confirmation that this application is for just for the one parcel occupied by Nu Forest and not the adjacent property occupied by All-Coast Forest Products.

ACM/CDD Massey stated the application from Nu Forest is specifically to annex 27 acres that they own and does not include annexation of the All-Coast property, although there are a few small parcels between the existing City limits and the Nu Forest parcels and those parcels will also need to be annexed in order for the property to meet LAFCO's requirements for annexation lands.

Councilmember Wolter added that this was so an island would not be created and asked if there has been anything from All-Coast regarding annexation.

ACM/CDD Massey stated there has been nothing from All-Coast to date.

Mayor Cox added that he agrees with the Councilmembers comments.

Vice Mayor Brigham stated she is also very happy about the whole thing but wonders if the area is still flooding.

Sharmaine Ege, Cloverdale, stated there was excessive rainfall on one afternoon in January and there was flooding on the property, which they are proposing to deal with on their property to reassimilate it into the groundwater and read a letter asking for annexation of their property and explained the products and services they offer.

ACM/CDD Massey pointed out that, in order to help Nu Forest facilitate their timeframe for consolidation into Cloverdale, Staff will be working with County staff at PRMD to review a new proposed building on the site and will do our best to make sure it adheres to our regulations and conforms when we annex it.

Mayor Cox opened and closed the public comment period.

Councilmember Palla asked what the process is to get the property owners of the adjacent parcels that need to be annexed to want to participate in the annexation process.

ACM/CDD Massey stated there will be an outreach process to the neighbors to let them know that the process is being undertaken. Ms. Massey explained that LAFCO does an assessment based on acreage and/or the valuation of the improvements on the parcels to be annexed, takes a poll to see which vote has the presiding authority over it, and then the greater acreage or the greater value dictates the annexation process.

Action: City Council received the information.

8. Update on CDBG-Funded Micro-Enterprise Business Development Program Administered by Community Action Partnership (CAP) of Sonoma County and Request for Direction on Use of Uncontracted Funds.

ACM/CDD Massey presented this item by giving a brief history of the Community Development Block Grant (CDBG) funded programs in Cloverdale and stated the purpose of this item this evening is to provide Council with an update on the status of implementation of the programs and also to receive some direction and feedback from the Council on Fiscal Year 14/15 and Fiscal Year 15/16 CDBG funds allocation, as those two years are not yet contracted for. Ms. Massey gave the floor to members of CAP to conduct a Power Point presentation.

Tim Reese, Executive Director of CAP-Sonoma County, gave a history of CAFE and CAP. Marlyn Garcia, Associate Director of the programs under CAP's Community Economic Center for Success, who is responsible for programs and projects in Cloverdale, shared areas of success and some areas that needed reevaluation. Dr. Susan Cooper shared some of her experiences and observations as the Director of Programs for Community Action Partnership.

Mr. Reese spoke about an invitation-only grant, Jeannie Chaffin, Director of the Office of Community Services, within the Administration for Children and Families (ACF), at the U.S. Department of Health and Human Services, encouraged him to apply for which would bring partners together targeting rural communities that would work with social services and health services and will keep the Council informed on this.

Mayor Cox asked Ms. Garcia to explain what programs the CDBG funding supports.

Ms. Garcia answered only the microbusiness development.

Vice Mayor Brigham asked Mr. Reese to speak more about the grant opportunity he spoke of earlier.

Mr. Reese stated it is bringing health and social services together in a more cooperative manner so that the outcomes are greater and we can see a demonstrable change in health and economic status.

Vice Mayor Brigham asked if this would help seniors.

Mr. Reese stated he did not know specifically but the health and economic status of seniors is a rising concern. The grant, as he understands it doesn't provide a direct service to the client but brings all the providers together to enhance coordination efficiency and demonstrate better outcomes. So, whatever services are offered to the community, I am assuming on the social service side and health side, would be better coordinated through this federal initiative and they would bring in the facilitation and the model and assist the community in coming together for greater outcomes and efficiency.

Vice Mayor Brigham stated if this program could possibly help with low/fixed income seniors, she would be happy to help.

Mr. Reese thanked Vice Mayor Brigham for her comments and stated he would see what they can do in terms of the criteria for this letter of intent how this can be integrated. Mr. Reese stated services for seniors is a growing problem in Sonoma.

Discussion ensued regarding the HUD program being a false hope and the need being far greater than the resources.

Councilmember Wolter stated he is not in favor of spending CDBG monies for educational programs and would like the Council to broaden their selections in the future.
Councilmember Russell stated she finds it frustrating that resources do not get pooled into one "let's get it done" program.

Councilmember Palla asked if there are any new businesses in Cloverdale in the last year as a result of this program.

Ms. Garcia answered not yet.

Councilmember Palla asked if all the services mentioned in the presentation are in Cloverdale.

Ms. Garcia answered that they all the services are in Cloverdale.

Mayor Cox asked if ACM/CDD Massey has direction from Council.

ACM/CDD Massey stated she has received the direction to contract those remaining funds with CAP, as have been allocated for FY 14/15 and 15/16, to continue to provide services for the program, and also to have a broader discussion when it comes to the FY 16/17 application process for Community Development Block Grant Funds, which will be coming up in October or November.

Mayor Cox opened the public comment period:

LaReva Myles, Cloverdale, stated she would not recommend they receive any more CDBG funds because when CAP took over the microbusiness program, the network disappeared – she no longer received any emails about meetings to support program participants, did not see Cloverdale mentioned on the CAP website, and found there was no marketing in Cloverdale. Ms. Myles stated she would like any money that has not already been funded to this organization to be put back into management of the same program under someone who lives in Cloverdale, who understands what is going on in this town and will be able to market and bring people back in to save the program as it was originally conceived by Mr. Cox, Mr. Wagele, and Mr. Cowart.

Mayor Cox closed the public comment period.

Action: City Council received the information and gave direction to Staff.

SUBCOMMITTEE ACTION ITEMS:

Public Works

9. Consideration, by motion order, approving sending a letter to Sonoma County Transit (SCT) requesting that it assume operation of Cloverdale local service Route 68 on January 4th, 2016.

PWD/CE Craig Scott presented this item and introduced Bryan Albee, who gave a brief history of SCT, a background of Cloverdale local Route 68, a history of SCT's relationship with Cloverdale, and some potential changes in timing and routes.

Vice Mayor Brigham stated coordination with local schools is important.

Mr. Albee stated adjustments can be made once there is a better understanding of the needs of Cloverdale students.

Councilmember Palla stated the proposal sounds like a good one and that the Boys and Girls Club needs good transportation to the club to get it reopened.

Councilmember Wolter asked if the bus driver would be from Cloverdale.

Mr. Albee stated the bus will come from Santa Rosa, the work is based on seniority, and there will be two drivers over the course of a week in a three or four month rotation.

Councilmember Russell stated her excitement about linking up with SMART in 2016 and that outreach to paratransit riders and senior citizens in the first few months, particularly through the senior center, will be important because of the personal bus system Cloverdale has had.

Mr. Albee stated the first couple of weeks in Healdsburg were a challenge but by the end of the first month people understood how to read the schedule and where the stops are located.

Mayor Cox added that our ridership is unique in that they are intimately friendly with our driver and echoes the concerns of Councilmember Wolter of desiring a bus driver who is from Cloverdale. Mayor Cox stated his hope that the drivers will help people onto the bus and looks forward to the new situation. Mayor Cox asked if there is any possibility that Sonoma County Transit and Mendocino County Transit can link up so that people from Cloverdale can get to Ukiah.

Mr. Albee stated there is one bus that comes up from Ukiah daily that MTA funds themselves. SCT funds the coast service. Mr. Albee will contact Dan Baxter, their manager, and will let the Council know.

Mayor Cox opened the public comment period.

Jeannie Cox, Cloverdale, asked if there will be outreach to the Spanish speaking community and suggested flyers in Spanish on the bus prior to the switch over on January 4, 2016.

LaReva Myles, Cloverdale, asked if we are thinking ahead to a bus bridge hooking up with Mendocino transit to go north and from the north to the beginning of SMART going south.

Clay Skelton, Cloverdale, asked about ridership and stressed that SCT try adapting to Cloverdale citizens.

Mayor Cox invited Mr. Albee to respond.

Mr. Albee stated the outreach will probably start in October and would appreciate the City providing some contacts for Hispanic and senior outreach.

Councilmember Palla commented that he would like the outreach to include information on the paratransit van and how that is accessed.

Mr. Albee stated the paratransit is next-day service, so if a rider calls at 5:00 today, SCT would have a bus to Cloverdale the following morning. Mr. Albee added that it is a good idea for the outreach to not only talk about the introduction of paratransit and the changes to the local route, but all the transit services that serve Cloverdale.

Action: Motion was made by Councilmember Palla and seconded by Councilmember Russell to approve sending letter to Sonoma County Transit requesting it assume operation of Cloverdale local Route 68 on January 4, 2016. The motion passed unanimously (5-ayes – Councilmember Palla, Vice Mayor Brigham, Councilmember Russell, Councilmember Wolter, Mayor Cox; 0-noes).

10. Consideration of a resolution authorizing the submittal of the Fiscal Year 2015, FAA grant application, acceptance of an allocation of funds and execution of a grant agreement with the California Department of Transportation, Aeronautics Division for an Airport Improvement Program matching grant.

PWD/CE Craig Scott stated this item comes before Council annually for authorization to submit an FAA grant application for maintaining the airport, for security purposes, safety, and capacity. PWD/CE Scott stated this grant provides about $150,000 each year, can be accumulated for up to three years, and provides 90% of project costs with the remainder typically coming from a combination of the City General Fund and State grant money. PWD/CE Scott further stated that, with the strict FAA process of lining up projects, by the time a project comes before the City Council, it is a very mature project. PWD/CE Scott stated the current grant for Fiscal Year 2015 is for the reconstruction of the taxiway, a drainage study, and analysis of the Pavement Conditions Numbers for all runway, taxiway, and apron pavements. PWD/CE Scott explained that there is a time constraint, in that the grant application has an expiration of August 31, 2015, and once the City sends a resolution authorizing acceptance of this grant to the FAA, they will send us an agreement, and our airport consultant will put together a proposal/task order that will need to come back to Council for approval in the next two or three months, as this will amend the agreement we have with our airport consultant that exceeds the City Manager's authorization.

City Manager Cayler stated the Council-requested report from the City Attorney regarding the City's obligations with the FAA regarding the airport is underway and should be delivered next week, which will be an attorney-client privileged document and will be shared with the Council. Mr. Cayler stated he is aware there are concerns related to the timing of the grant application, but if the City does not execute and send in this resolution now it will lose the opportunity for these funds. Mr. Cayler added there will still be time for the City Council to consider options related to the airport. Mr. Cayler stated the worst case scenario would be to lose future Capital Improvement funding through the FAA because they lose faith in the City, but the City would still have obligations to continue to operate the airport without receiving federal money. Mr. Cayler stated the new airport manager is in the audience and the issues of the community, the pilots, and the airport are being addressed.

PWD/CE Scott stated he did submit a revised resolution, as he mistakenly used the template from the state instead of the federal template.

Councilmember Palla clarified that the grant money would not be received until after the Council has reviewed and discussed the findings of the City Attorney's report.

Councilmember Wolter stated his opinion that the Council needs to move forward with this and wants to ensure the City can opt to not accept the funding.

City Manager Cayler stated the decision is whether you are going to start billing the grant. City Manager Cayler recommended, if the City is trying to keep its options open, the continued operation of the airport depends on the City continuing to receive federal funds and the Council has not made a decision related to closure of the airport, which is an important message for the FAA to hear.

City Manager Cayler gave a brief background of the Airport Manager, Michael Morrissey, and introduced him to the Council.

Mayor Cox opened the public comment period for this item.

Jacqueline Amaroli Kennedy, Cloverdale, asked what the project number is.

PWD/CE Scott stated the project number is on the application and is 3-06-0095.

Ms. Kennedy stated it is her understanding that when an airport accepts money from the FAA, it needs to be ADA compliant

Mayor Cox stated it is his understanding that there is an application permit to do the ADA improvements.

ACM/CDD Massey stated that there has been a building permit application submitted by NorCal Skydiving to install certain ADA improvements associated with the lease that the City has approved; however, those improvements are related specifically to NorCal Skydiving's facility not the greater airport.

City Manager Cayler stated that the airport is regularly inspected by the FAA, as well as the California Department of Transportation Aeronautics Division, and, because of the date they were constructed, the facilities at the airport are in compliance.

Jimmy Halliday, Cloverdale, commended the Council's apparent intention to pass the resolution before them.

Patrick Paquette, Cloverdale, spoke of various fees and lease agreements related to the airport.

Councilmember Wolter, through the Mayor, brought up a point of order and suggested Mr. Paquette's questions be written down and have the City get back to him with some answers.

Mr. Paquette requests that his opposition to this grant application be duly noted.

LaReva Myles, Cloverdale, stated the overview given by City Manager Cayler was a good scope of the operation and hopes he continues to keep the public informed.

Clay Skelton, Cloverdale, stated the FAA would not be offering this funding if the taxiway repairs were not needed. Mr. Skelton stated, as a pilot and for safety, he recommends approval of this item. Mr. Skelton added that a taxiway is not a runway, which has different requirements.

Mayor Cox closed the public comment period.

Action: Motion was made by Councilmember Russell, and was seconded by Councilmember Wolter, to adopt Resolution 053-2015 authorizing the submittal of the FY 2015 FAA grant application, acceptance of an allocation of funds and execution of a grant agreement with the California Department of Transportation, Aeronautics Division for an Airport Improvement Program matching grant. The motion passed unanimously (5-ayes – Councilmember Palla, Vice Mayor Brigham, Councilmember Russell, Councilmember Wolter, Mayor Cox; 0-noes).

11. Consider adopting Resolution No. 054-2015 approving Amendment No. 1 to the Design-Build Agreement with ArcSine Engineering for the Water System SCADA Improvements and authorizing the City Manager to execute said amendment.

PWD/CE Scott presented this item stating, upon investigation of the control system at the plant, it was found that the filter control panels were controlling the rest of the plant, instead of having a central command. Mr. Scott stated that, based on the findings of their investigation, this is the time to make improvements to the system to make it a lot easier to program for future changes and improve reliability. Mr. Scott spoke of cost savings and funds already allocated to the water fund that Staff recommends be used for the important improvements.

Mayor Cox opened and closed the public comment period for this item.

Action: Motion was made by Councilmember Russell, and was seconded by Councilmember Palla, to adopt Resolution 054-2015 approving Amendment No. 1 to the Design-Build Agreement with ArcSine Engineering for the Water System SCADA Improvements and authorizing the City Manager to execute said amendment. The motion passed unanimously (5-ayes – Councilmember Palla, Vice Mayor Brigham, Councilmember Russell, Councilmember Wolter, Mayor Cox; 0-noes).

12. Consideration of Resolution 055-2015 committing matching funds in the amount of $17,313 from the water fund for the City's participation in the Proposition 84 Round 3 grant funding and authorizing the City Manager to execute a grant funding agreement with the Sonoma County Water Agency.

PWD/CE Scott presented this item and described the programs to achieve water savings in our community.

Councilmember Palla asked who would perform the water assessment service, how extensive would it be, and what the limitations of the assessment are. Councilmember Palla commented that he would like more information.

PWD/CE Scott stated the program is structured such that the homeowner would be responsible for finding someone that provides the assessment service, having it done, and then submitting for the rebate. The City could assist in that process by making list available of certified, available auditors on the City's website.

Councilmember Palla stated that would be helpful.

Mayor Cox opened and closed the public comment period for this item.

Action: Motion was made by Councilmember Palla, and was seconded by Vice Mayor Brigham, to adopt Resolution 055-2015 committing matching funds in the amount of $17,313 from the water fund for the City's participation in the

Proposition 84 Round 3 grant funding and authorizing the City Manager to execute a grant funding agreement with the Sonoma County Water Agency. The motion passed unanimously (5-ayes – Councilmember Palla, Vice Mayor Brigham, Councilmember Russell, Councilmember Wolter, Mayor Cox; 0-noes).

13. Water update

PWD/CE Scott stated the City is still trending with last year, with 38% below 2013 levels, and is doing really well with keeping the demand low. PWD/CE Scott stated the conservation programs have slowed down with not much activity since the last report, so perhaps more advertising should be done. The City is approximately ten months into the two-year timeline it has to spend the money for the toilet replacement program with $26,244 expended so far, which is 28% of the program.

Mayor Cox opened and closed the public comment period for this item, as there was none.

SUBCOMMITTEE REPORTS: (VERBAL REPORTS: 15 minutes)

- Airport (Chair, Councilmember Russell and Mayor Cox) - Next Meeting: October 6, 2015, location TBD, 8:00 a.m.
- Finance, Administration & Police (Chair, Mayor Cox and Vice Mayor Brigham) - Next Meeting: August 27, 2015, City Hall Conference Room, 2:00 p.m.
- Planning & Community Development (Chair, Councilmember Wolter and Vice Mayor Brigham) - Next Meeting: October 20, 2015, City Hall Conference Room, 4:00 p.m.
- Public Works (Chair, Mayor Cox and Councilmember Russell) - Next Meeting: September 22, 2015, City Hall Conference Room, 10:30 a.m.
- Joint City/Fire District (Chair, Councilmember Palla and Vice Mayor Brigham) - Next Meeting: October 12, 2015, Fire District Headquarters, 5:30 p.m.
- Joint City/School District (Chair, Councilmember Palla and Councilmember Wolter) – Next Meeting: September 21, 2015, City Hall Conference Room, 5:00 p.m.

COUNCIL REPORTS (INCLUDING STUDENT LIAISON): (VERBAL REPORTS: 15 minutes)

Councilmember Russell informed the Council that she is serving on two new ad hoc committees: one is comprised through the SMART board to take a look at various aspects of the new bus system when SMART starts, and the other is a personnel ad hoc, with Vice Chair Pahre and the general manager of SMART to avoid going outside to obtain a human resource expert.

Mayor Cox stated that he, along with Councilmember Wolter, attended a burial today of a close friend and former Planning Commissioner, Larry Eisen, who died five years ago from cancer. Mayor Cox further stated that his wife and family were able to acquire a plot in our Cloverdale Cemetery.

LEGISLATIVE REPORT: None

CITY MANAGER/CITY ATTORNEY REPORT: City Manager Cayler announced the City has received a letter of application from Michael Nixon for City Treasurer position, which means a quorum of the councilmembers need to meet for a special meeting, in the Conference Room at City Hall, next Wednesday at 5:30 p.m. to approve a resolution making this appointment, as the deadline for this appointment is September 4. ACM/CDD Massey will be leading and City Attorney Sanchez is working on the Staff report and resolution.

COUNCIL DIRECTION ON FUTURE AGENDA ITEMS: Vice Mayor Brigham asked for an update on the porta-potty issue at the Plaza. City Manager Cayler stated the porta-potties were moved about 20' to the west.

ADJOURNMENT: Mayor Cox adjourned the meeting at 9:39 p.m. to a special meeting of the City Council and Cloverdale Community Development Successor Agency, Wednesday, September 2, 2015, at 5:30 p.m. (at the City Hall Conference Room 124 N. Cloverdale Blvd., Cloverdale, CA 95425).

These minutes were approved at the December 9, 2015, City Council meeting by the following voice vote (Ayes-5; Noes-0).

Ayes: 5-Councilmember Palla, Vice Mayor Brigham, Councilmember Russell, Councilmember Wolter, and Mayor Cox
Noes: 0
Absent: 0
Recuse: 0

Approved:

Robert M. Cox, Mayor

Attested:

Linda Moore, Deputy City Clerk

Appendix L - Notification Letters

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January 6, 2016

Mr. Grant Davis
Sonoma County Water Agency
404 Aviation Boulevard
Santa Rose, CA 95403

Subject: City of Cloverdale 2015 Urban Water Management Plan Update

Existing state law requires each urban water supplier to prepare and adopt an urban water management plan at least once every 5 years. The City of Cloverdale (City) is currently preparing a 2015 Urban Water Management Plan (UWMP). This is the first time that the City has been required to prepare an UWMP as the number of City water connections has just passed the threshold requirement.

The City's 2015 UWMP will document plans to ensure adequate water supplies to meet existing and future demands for water under a range of water supply conditions, including water shortages. As such and in conformance with California Water Code Division 6, Part 2.6, Section 10621, the City is notifying the county within which the City provides water supplies that the UWMP is being prepared.

We anticipate having a draft plan available for public review in May 2016. The final plan will be submitted to the California Department of Water Resources before July 1, 2016. Please contact me at (707) 894-1728 if you have any questions about the City's UWMP update.

Sincerely,

Eric Jantzen
Engineering Technician
City of Cloverdale

CITY OF
CLOVERDALE

May 2, 2016

Mr. Grant Davis
Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

Subject: City of Cloverdale 2015 Urban Water Management Plan Update

This letter is being provided to you as a follow up to the letter sent to you on January 7, 2016 informing you of the City of Cloverdale's (City) preparation of a 2015 Urban Water Management Plan (UWMP). Notice is hereby given that the City has scheduled a public meeting on May 10, 2016 to discuss the public draft 2015 UWMP. The meeting will be held at 6:00 p.m. in the Cloverdale Performing Arts Center, 209 N. Cloverdale Blvd., Cloverdale, California 95425.

All interested parties are invited to attend the public meeting and present their views. If you are unable to attend the public hearing, you may also submit to the City, by the time the proceedings begin, written comments regarding the subject of the meeting. These comments will be brought to the attention of the Commission and will become part of the official public record. Written comments can be sent to City Council, 124 N. Cloverdale Blvd. PO Box 217, Cloverdale, CA 95425.

A public draft of the 2015 UWMP is available on the City's webpage at www.cloverdale.net (under the "Hear it through the grapevine" section). A hard copy of the document is also available for review at City Hall, (124 N. Cloverdale Blvd., Cloverdale, CA).

Please contact me at (707) 894-1728 if you have any questions about the City's UWMP update.

Sincerely,

Eric Janzen
Engineering Technician
City of Cloverdale

Appendix M - Public Notice of UWMP Hearing

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Hear it Through the Grapevine

City of Cloverdale Urban Water Management Plan - PUBLIC REVIEW

The City of Cloverdale has prepared its very first Urban Water Management Plan. This plan will set the guidelines for how the City will continue to supply clean and healthy water now and in the future. The plan is presented in DRAFT form for public review Read on...

City of Cloverdale News and Information

Posted on: April 19, 2016

City of Cloverdale Urban Water Management Plan - PUBLIC REVIEW

City of Cloverdale Urban Water Management Plan (UWMP) will set the guidelines for how the City will continue to supply clean and healthy water now and in the future. The UWMP is presented here in DRAFT form to allow the public an opportunity to view and comment on the plan.

The State of California requires that all suppliers of drinking water with more than 3,000 connections prepare an UWMP and renew it every 5 years. The City of Cloverdale has grown to a little over 3,000 water service connections and is preparing its very first UWMP.

View the UWMP

Next →

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA,

County of Sonoma

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled manner. I am a principal clerk of the printer of the **Cloverdale Reveille** a newspaper of general circulation, printed and published **Weekly** in the City of Cloverdale, County of Sonoma, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Sonoma, State of California, under the date of **March 3, 1879**, **Case Number 36106**; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates; to-wit:

May 12,

in the year **2016.**

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at **Cloverdale,**

California, this 12 day of May, **2016**

Eileen Matto

This space is for County Clerk's Filing Stamp

Proof of Publication of

NO. 1623
PUBLIC NOTICE
The City of Cloverdale has prepared its very first Urban Water Management Plan. This plan will set the guidelines for how the City will continue to supply clean and healthy water now and in the future. The plan is available for public review right now on the City's website www.cloverdale.net.

PUBLISH: May 12, 2016
Cloverdale Reveille

Appendix N - City Council UWMP Adoption Resolution

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CITY OF CLOVERDALE
CITY COUNCIL
RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CLOVERDALE ADOPTING THE 2015 URBAN WATER MANAGEMENT PLAN.

WHEREAS, the Urban Water Management Planning Act of 1983 (the Act), amended through 2015, requires that an urban water supplier serving 3,000 customers or 3,000 acre-feet per year must prepare an Urban Water Management Plan (Plan) update every five years beginning in 1985; and

WHEREAS, the City of Cloverdale (City), in compliance with the Act, has prepared its first Plan in 2015; and

WHEREAS, the preparation of the Plan has been coordinated with the other public agencies to the extent practicable, and staff has encouraged the active involvement of diverse social, cultural and economic elements of the population within the City's retail water service area during preparation of the Plan; and

WHEREAS, on May 10, 2016 , a Draft Plan was presented to the City Council and a Public Hearing was held during the Council meeting in order to receive public comment on the Draft Plan; and

WHEREAS, minor revisions to the Draft Plan have been made based on public comments received at the Public Hearing and during the public comment period of April 19, 2016 through May 18, 2016; and

WHEREAS, preparation and adoption of Urban Water Management Plans pursuant to the provisions of Section 10652 of the State Water Code is a statutory exemption under CEQA Guidelines Section I 5282(v); and

WHEREAS, a Final 2015 Urban Water Management Plan is today presented to the Council for consideration; and

NOW THEREFORE, BE IT RESOLVED, that the City Council of Cloverdale has reviewed and considered the Final 2015 Plan.

It is hereby certified that the foregoing Resolution No. _____ was duly introduced and adopted by the Cloverdale City Council at a regular meeting held on the 14th day of June, 2016, by the following vote:

AYES in favor: _____

NOES: _____

ABSENT: _____

ABSTAIN: _____

APPROVED:

_____
NAME, Mayor

ATTESTED:

_____
NAME, Deputy City Clerk

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KleinerPark