City of Arcata
Urban Water Management Plan 2020

Completed: June 2021

Table of Contents

List of Acronyms

AFY	Acre-Feet per Year
AMWS	Arcata Marsh and Wildlife Sanctuary
AWWA	American Water Works Association
AWWTP	Arcata Wastewater Treatment Plant
CII	Commercial, Industrial, and Institutional
CIMIS	California Irrigation Management Information System
CWC	California Water Code
DDW	Division of Drinking Water (SWRCB)
DOF	California Department of Finance
DWR	California Department of Water Resources
EDD	Employment Development Department
GIS	Geographic Information System
GPCD	Gallons per Capita Day
IPR	Indirect Potable Reuse
JCWD	Jacoby Creek Water District
MCSD	McKinleyville Community Services District
MG	Million Gallons
MGD	Million Gallons per Day
MGY	Million Gallons per Year
NOAA	National Oceanic and Atmospheric Administration
PWS	Public Water System
RCEA	Redwood Coast Energy Authority
RUWMP	Regional Urban Water Management Plan
SCADA	Supervisory Control and Data Acquisition
SWRCB	State Water Resources Control Board
WSCP	Water Shortage Contingency Plan

List of Appendices

Chapter 1 Introduction and Overview

The City of Arcata 2020 Urban Water Management Plan (UWMP) has been prepared in accordance with the California Urban Water Management Planning Act of 1983 (AB 797) as amended, including amendments made per the Water Conservation Act of 2009 (SB X7-7). The objective of an UWMP is to document an urban water supplier's water supplies, demands, and conservation efforts. This UWMP contains information required by California Water Code (CWC), Division 6, Parts 2.55 and 2.6.

The data used for preparing this report comes primarily from City of Arcata (City) Finance Department billing records and water system statistics reported annually to the Department of Water Resources (DWR) and State Water Resources Control Board (SWRCB). Figures relating to climate were obtained from the National Oceanic and Atmospheric Administration (NOAA) and the California Irrigation Management Information System (CIMIS). Current and projected population figures were calculated using City of Arcata Geographical Information System (GIS) data, U.S. Census Bureau data, and DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use Methodology 2. DWR's 2020 Urban Water Management Plans Guidebook for Urban Water Suppliers was used to develop this UWMP.

2020 UWMP Standardized Tables (Final), supplied by DWR, were used to report 2020 UWMP data via the Water Use Efficiency data online submittal tool. Modified versions of the standardized tables are used within this report. Modifications were limited to excluding blank and/or not applicable information, and formatting changes.

The checklist of specific UWMP requirements provided by DWR in the 2020 UWMP Guidebook for Urban Water Suppliers was utilized to assist DWR in review of the City of Arcata 2020 Urban Water Management Plan. UWMP Checklist Arranged by Subject is included as Appendix A.

Lay Description

The primary source of drinking water for the City is water purchased from Humboldt Bay Municipal Water District (HBMWD). HBMWD draws source water from wells below the bed of the Mad River northeast of Arcata. The water-bearing ground below the river is an aquifer. The wells, called Ranney Wells, draw water from the sands and gravel of the aquifer at depths of 60 to 90 feet, thereby providing a natural filtration process. The water that HBMWD provides to its customers, both domestic and industrial, ultimately comes from the Ruth Lake Reservoir and the Mad River watershed located below R.W. Matthews Dam at Ruth, CA. The reservoir was designed for a safe yield of 75 MGD per year, using the 1923-24 drought of record (HBMWD Water Storage Contingency Plan). The District delivers potable water to seven municipalities via its Domestic Water System which is capable of supplying approximately 20 million gallons per day (MGD) of treated drinking water. Current production of treated drinking water by HBMWD for municipal purposes averages approximately 10 MGD (HBMWD Water Storage Contingency Plan).

The City has a Right to 1,186 million gallons per year (MGY) and in 2020 used approximately 50% of this volume. Demand projections for the City for the next 25 years indicate that in 2045 the city will use approximately 63% of the water right volume. HBMWD's Water Storage Contingency Plan indicates that even during a long-term drought (5 consecutive years), inflow volumes into Ruth Reservoir during the winter months will be adequate to meet the water needs of the City and other municipal customers, even without enacting water conservation measures.

A secondary source of drinking water for the City is Heindon Well. Heindon Well has not been in use since it was taken offline in 2016 for conservation purposes and facility rehabilitation. Under normal conditions and after a groundwater well rehabilitation project planned after 2020, the City anticipates that it may utilize 100 percent of the safe yield for Heindon Groundwater Well.

Chapter 2 Plan Preparation

2.1 Basis for Preparing an UWMP

CWC 10617 defines an "urban water supplier" as a public or privately owned supplier, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet per year. Urban water suppliers are required to complete an UWMP and update the plan at least every five years, on or before December 31, in years ending in five and zero, except that the 2020 UWMP shall be updated and submitted by July 1, 2021 (CWC 10621).

The City provides water for, and manages two Public Water Systems (PWS); the City of Arcata (PWS#1210001) and the Jacoby Creek Water District (JCWD) (PWS#1210021); collectively referred to as the Service Area. In 2020, the City water system had an average of 6,225 service connections and is thus required to prepare an UWMP (Table 2-1). The JCWD does not meet the definition of an urban water supplier, and is not required to prepare an UWMP; however, due to the contiguous nature of the two water systems and the need for thorough and reliable local water planning, data from both systems are combined for the purposes of this report.

Table 2-1 Retail Only: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 (million gallons)
1210001	City of Arcata	6,225	443
1210021	Jacoby Creek Water District	330	22
	TOTAL	6,555	464

2.2 Regional Planning

The UWMP was developed in cooperation with HBMWD, the regional wholesaler, and with other Public Water Systems (PWS) who are also municipal customers of HBMWD. Each municipal customer shared resources and information to ensure compatible individual plans that provide a planning document for individual communities and if needed, could be merged to review regional needs. Coordinating agencies included the City of Eureka, McKinleyville Community Services District, HCSD and HBMWD.

2.3 Individual or Regional Planning and Compliance

The City and other local agencies formed a workgroup to ensure individually prepared UWMPs are comparable and compatible. Each agency dedicated to preparing their individual UWMP in a similar format to allow for ease of comparison on a regional scale. It was determined that each individual agency was in compliance with SBX7-7 and a regional approach to compliance was not necessary (Table 2-2).

2.4 Reporting Years and Units of Measure

The 2020 UWMP is reported on a calendar year basis, consistent with previously prepared plans. Water volume is reported throughout the 2020 UWMP in million gallons (MG). These reporting units enable the City to compare water demand, water goals, and conservation figures to operational data and with other regional suppliers. (Table 2-3).

Table 2-2: Plan Identification

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance *if applicable*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

Table 2-3: Agency Identification

Type of Supplier	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
Units of measure used in UWMP *	
Unit	MG
**** Units of measure remain consistent throughout the UWMP***	

2.5 Coordination and Outreach

The City provided notice to the JCWD, HBMWD, McKinleyville Community Services District and Humboldt County on its intent to review and update its UWMP as required in CWC Section 10642 on March 17, 2021 (Table 10-1). Retail agencies, such as the City, are required to provide their wholesaler with projected water demand from the wholesaler for the next 20 years, in five year increments. Water demand projections for the next 20 years have been provided to HBMWD (Table 2-4). Copies of the aforementioned communications are provided in Appendix B.

Table 2-4: Retail: Water Supplier Information Exchange

The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
Humboldt Bay Municipal Water District

Chapter 3 System Description

3.1 General Description

Arcata, incorporated in 1903, is located on the Northern California coast, 275 miles north of San Francisco. It is in the west-central portion of Humboldt County, six miles north of the City of Eureka, the County seat. Arcata is situated on the north end of Arcata Bay, which is part of Humboldt Bay, the second largest marine embayment in California. The City is situated on a coastal terrace, the lower portions of Fickle Ridge and the west portions of the Arcata Bottoms, between Arcata Bay and the Mad River.

Arcata has a mix of residential, commercial, industrial, institutional, and agricultural water users. Distinct neighborhoods within the City are dominated by residential dwellings and served by a variety of commercial businesses and educational institutions. Industrial areas dominate in the southern and northeast portions of the City. Humboldt State University, located within walking distance of downtown, is a major water user, employer, and regional educational center. Agricultural areas exist primarily to the west of city limits, with some agricultural parcels being served by city water. A detailed land use map is included in Appendix C.

The City of Arcata General Plan cites a low anticipated population growth, to about 20,000 persons, by the year 2020. Further, the General Plan states, "the majority of the City's growth has been, and is planned to be, located within the present City boundary, and concentrated around the downtown area, existing neighborhood commercial centers, and Humboldt State University. Growth is directed to these areas because they have existing urban services and infrastructure. There are currently about 6,300 students enrolled at Humboldt State University, with maximum enrollment limited to 8,500 (full time equivalents) students. This potential enrollment increase will also impact the size and characteristics of the City." The City of Arcata General Plan is available online at https://www.cityofarcata.org/160/General-Plan.

City policies encourage "infill"; focusing development efforts on existing residential zoned lands within the City and minimizing development pressures on Arcata's agricultural lands. The City encourages efficient land use by allowing flexibility and land-trust opportunities in planned residential developments. Arcata is primarily a residential and university community. Residential developments are increasing in density as a result of a rapid rise in land values. The current coastal zone, resource constraints, and greenbelt will continue to limit outward expansion. Land policies and zoning encourage small businesses, tourism and light manufacturing. Arcata's primary industrial site, Aldergrove Industrial Park, has limited parcels available for development. The City is continuing to plan for the development of a second redevelopment area, South I Street, located south of downtown which will primarily consist of commercial connections.

There are currently four large development projects that are under construction, have been permitted, or are in-process planning applications. One project is located in downtown Arcata while the other three are located north of downtown, in the neighborhoods west of Humboldt State University and are mostly multi-family residential in nature, with one health care facility and one residential care facility. Collectively, these developments will bring a total of 136 units of mostly affordable and income restricted housing, and 100 residential "care" units to Arcata.

Through contractual agreement, the City sells water directly to JCWD customers, maintains and repairs the JCWD distribution system, and fulfills regulatory requirements for the JCWD. Water is delivered through direct transfer at the Jacoby Creek Water District boundary, located near the southeast city limit. The District extends approximately four miles southeast providing service to portions of the community of Bayside. The JCWD encompasses approximately 899 acres with a total of 323 single-family water connections and 7 commercial and institutional connections, making this one of the lowest density population areas in the Service Area.

3.2 Service Area Boundary Map

The City provides water to two Public Water Systems; the City of Arcata (PWS#1210001) and the Jacoby Creek Water District (PWS#1210021); collectively referred to as the Service Area. A Service Area boundary map is included in Appendix D.

3.3 Service Area Climate

Local weather is characterized by moderate temperatures, frequent fog, and moderate to heavy precipitation in the form of rain. Ninety-five percent of the mean annual precipitation of 39.43 inches falls between October and May. Mean annual temperature is 52.7°F, with a yearly mean range of 48.2°F to 58.0°F. Prevailing winds are from the northwest in the summer and the southwest during the winter. Arcata is in the coastal plains heavy fog belt, characterized by the lowest evapotranspiration rate in California. Figure 1 summarizes local evapotranspiration, precipitation, and temperature data for the region.

Figure 1: Evapotranspiration, Precipitation and Temperature Data for Eureka WSO City, California

Month	Monthly Average Evapotranspiration (inches/month)	Mean Precipitation (inches)	Mean Temperature (Fahrenheit)
January	0.92	6.72	47.9
February	1.39	5.31	48.9
March	2.91	5.45	49.2
April	3.33	3.09	50.4
May	4.08	1.67	53.2
June	4.96	0.68	55.7
July	4.92	0.15	57.1
August	4.20	0.32	58.0
September	3.04	0.73	57.1
October	2.42	2.67	54.6
November	1.30	5.61	51.3
December	0.93	7.03	48.2
Climate data provided by Western Regional Climate Center and the National Oceanic and Atmospheric Administration under the U.S. Department of Commerce. Rainfall and temperature data are for the period from December 1886 to June 2016. Evapotranspiration data provided by and California Irrigation Management Information System (CIMIS) operated by the Office of Water Use Efficiency under the Department of Water Resources.			

3.4 Service Area Population and Demographics

The Service Area population for 2020 was determined by multiplying the actual number of residential connections in 2020 by 3.46 persons per connection (persons per connection calculated for 2010 was

utilized because 2020 U.S. Census data was not available at the time of this report). A detailed discussion of how Service Area population was calculated is included in Appendix E. Population projections for the 2020 UWMP planning period were developed by calculating the actual average annual change in residential connections between 2015 and 2020 (based on service and report records) and projecting out to the year 2045. Population was determined by multiplying the projected number of residential connections by 3.46 persons per connection (Appendix F).

The Service Area population in 2020 is estimated at 20,095. This population is projected to increase at a slow and steady rate of 0.81% per year. By the year 2045 the Service Area population is anticipated to increase to 24,572 (Table 3-1).

Table 3-1 Retail: Population - Current and Projected

Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	20,095	20,920	21,779	22,673	23,603	24,572

Chapter 4 System Water Use

4.1 Recycled versus Potable and Raw Water Demand

The City provides potable water to the customers in the Service Area. Raw water and recycled water are not sold to customers.

Recycled water, in the form of non-potable reuse is produced and used at the Arcata Wastewater Treatment Facility (AWTF). As part of treatment plant design, a portion of secondary treated wastewater is discharged for additional treatment to the Arcata Marsh and Wildlife Sanctuary. By definition this step of the wastewater treatment process is classified as recycled water in the form of non-potable re-use. Despite meeting the definition of recycled water, recycled water is not included in actual or projected system water use presented in this chapter (Tables 4-1 and 4-2) because the level of treatment when discharged for re-use at the Arcata Marsh and Wildlife Sanctuary is neither recycled water (potable re-use) nor raw water, and because wastewater treatment permit restrictions would not allow for discharge to the Arcata Marsh and Wildlife Sanctuary to be augmented by raw or potable water. Recycled water is addressed comprehensively in Chapter 6.

4.2 Water Uses by Sector

Actual water demands (Table 4-1) are based on City Finance Department water account billing records. Billing records allow water accounts to be categorized into one of six water use sectors: (1) single-family residential, (2) multi-family residential, (3) commercial, (4) industrial, (5) institutional/governmental, and (6) system losses. Single family residences are defined as all residential connections with a one-inch meter or less and two situs points or less. Multi-family residential is defined as multiple dwelling units contained in one building or several buildings within a complex. Commercial is defined as a water use that provides or distributes a product or service. Industrial is defined as a water use that is used primarily for manufacturing or processing of materials. Institutional/Governmental accounts are attributable to schools/educational facilities. System losses were analyzed for the 2020 calendar year using American Water Works Association water audit software (see Section *4.3 Distribution System Water Losses*). Losses reported in Table 4-1account for real losses, defined as physical water losses from the water system. The "other" category is used to account for authorized, unbilled water used for municipal purposes such as street sweeping, municipal operations and landscape management in public spaces, and firefighting.

Table 4-1 Retail: Demand for Potable and Raw Water – Actual

Use Type	2020 Actual		
	Additional Description	Level of Treatment When Delivered	Volume
Single Family		Drinking Water	198
Multi-Family		Drinking Water	86
Commercial		Drinking Water	71
Industrial		Drinking Water	21
Institutional/Governmental	schools only	Drinking Water	30
Sales/Transfers/Exchanges to other Suppliers	Jacoby Creek Water District	Drinking Water	22
Other	unbilled authorized consumption (estimated)	Drinking Water	36
Losses	real losses	Drinking Water	119
		TOTAL	583

The 2020 actual water demand (Table 4-1) and the average number of accounts for each sector in 2020 was used as the basis for demand projections through 2045. Several years of water account billing data (2010-2020) were used to analyze growth trends in each water sector. Additionally, population and economic forecasts from Humboldt County, the California Department of Transportation and the Employment Development Department (EDD) were referenced for insight into anticipated future water use sector growth trends. Projected water demands discussed below are summarized in Tables 4-2. Detailed demand projection calculations are presented in Appendix G.

The average annual growth rate for single-family and multi-family residential accounts was 0.88% between 2015 and 2020. Single-family and multi-family account growth was combined for this period because a change in the definition of single family and multi-family residential connections was put into place in 2019. This change in definition moved many accounts from multi-family to single family residential and did not allow for an accurate calculation of growth rates during this period. By applying a 0.88% growth rate to the number of residential accounts in 2020 and projecting outwards, the anticipated number of residential water use sector accounts through the year 2045 is projected to be approximately 7,100 connections. The number of connections times 3.458 persons per connection is approximately equal to the projected population for 2045. Application of an average annual water use per account, based on sector use per connection in 2020, results in a projected residential demand of 418.7 million gallons by 2045.

The same calculations were made for commercial, industrial, and institutional/governmental water sectors with water sector specific growth rates. The projected growth rate for the commercial water sector is 1.8 percent. This is based on the actual average annual growth rate for the commercial sector between 2015 and 2020. The projected growth rate is higher than the EDD predictions for wholesale, retail and hospitality annual average percent change for 2018-2028 (projected at 0.63 percent) in order to make a conservative prediction of future growth in this sector (i.e. predicting higher volume use over time). Based on a 1.8 percent average annual growth rate, commercial sector water demand is anticipated to be over 112 million gallons per year by 2045.

Projected growth rates for the industrial sector vary widely by agency. The General Plan does not anticipate any new large-scale employers although it does anticipate an increase in small-scale manufacturing. A 2.0 percent growth rate was selected for the industrial sector based on the actual industrial sector average annual

growth rate for 2015-2020. Based on a 2.0 percent average annual growth rate industrial sector water demand is anticipated to reach 33.9 million gallons per year by 2045.

The number of institutional/governmental accounts and water use growth rates have been slowly increasing since 2010. This may be due, in large part, to an increased student population at Humboldt State University and expansion of campus facilities including additional campus housing and playing fields. Economic forecasts for the north coast region through the year 2028 (EDD) estimate that educational services, health care and social assistance sectors will increase at a rate of 13 percent per year. This number disagrees with the actual annual growth rate the City is currently experiencing (for 2015-2020) likely because most of the growth in this sector has and will occur around the primary health-care center of the region in the nearby city of Eureka. The calculated 1.9 percent growth rate from 2015-2020 is similar to the growth rates of 1.6 percent for 2010-2015 and 1.7 percent for 2010-2020 and is likely a good prediction of the future growth of this sector in Arcata. Based on a 1.9 percent average annual growth rate, institutional sector water demand is anticipated to exceed 48.4 million gallons per year by 2045.

The "Other" category is used to account for authorized, unbilled water used for municipal purposes such as street sweeping, municipal operations and landscape management in public spaces, and firefighting. In September of 2020 the "Other" category was reclassified as "Commercial" as required by the California Department of Water Resources and the City began billing for these municipal needs. Because this category was billed separately for most of 2020 it is reported separately in Table 4-1. This change is reflected in demand projections by adding this water use to the "Commercial" category starting in 2025 (Table 4-2). Projected water use for this category is expected to remain relatively consistent throughout the 2020 UWMP planning period.

In 2020, water was lost at a rate of approximately 0.02 MG per account per year. This rate of loss was applied to the projected number of accounts for the reporting period. Projected annual water loss in 2045 is in excess of 151 MG per year. During the water audit process, the City identified several potential sources of real and apparent water loss savings, including meter inaccuracies, potential unmetered accounts, and metered unbilled accounts. The City is dedicated to taking steps to classify real and apparent water losses and to making improvements to accounting, billing, metering, and distribution practices to reduce apparent loss. However, at this time, the City is unable to determine the actual water savings these actions will realize. Therefore, the City has opted to present the worse-case scenario of projected losses if water loss trends continue without remedial action.

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

Use Type	Additional Description	Projected Water Use				
		2025	2030	2035	2040	2045 (opt)
Single Family		266	277	289	301	313
Multi-Family		90	94	98	102	106
Commercial		114	122	130	139	148
Industrial		23	25	28	31	34
Institutional/Governmental	schools only	33	36	40	44	48
Losses	real loss	125	131	137	144	151
TOTAL		651	685	721	759	800

Change in potable water demand is anticipated to increase 37 percent between 2020 and 2045; an increase from 583 million gallons per year in 2020 up to 800 million gallons per year in 2045 (Table 4-3). A discussion of recycled water is presented in *Section 6.5 Wastewater and Recycled Water*.

Table 4-3 Retail: Total Water Demands

	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable	583	651	685	721	759	800
Recycled Water Demand	0	0	0	0	0	0
TOTAL WATER USE	583	651	685	721	759	800

4.3 Distribution System Water Losses

CWC 10631 introduces a new required element to the UWMP. Distribution system water losses for the preceding 5 years are required to be quantified and reported. Distribution system water losses are defined as the physical water losses from the water distribution system, including storage facilities, up to the point of customer consumption. American Water Works Association (AWWA) Free Water Audit Software version 6.0 was used to calculate real water loss for the 2020 calendar year, to identify potential areas where water may be recovered, and to project future water loss.

In 2020, the City purchased 583 million gallons of potable water. Authorized use accounted for nearly 464 million gallons. The volume of water loss was approximately 119 MG in 2020 (Table 4-1 and Table 4-4). This volume includes real (i.e. leaks and other physical water losses) and apparent losses (i.e. meter inaccuracy and data handling errors). The volume of water loss in Table 4-4 for 2016-2019 includes water loss data from both systems. 2020 includes water loss data from the City of Arcata only.

Table 4-4 Retail: 12 Month Water Loss Audit Reporting

Reporting Period Start Date	Volume of Water Loss [1]
01/2016	96
01/2017	137
01/2018	156
01/2019	116
01/2020	119

[1] *Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*

The resulting 2016-2020 reporting worksheets and water balance worksheets from the AWWA free water audit software is included in Appendix H.

4.4 Estimating Future Water Savings

Future water savings were not included in demand projections (Table 4-2) for the 2020 UWMP (Table 4-5).

Actual water use in the Service Area is well below statewide and regional baseline water use targets. Residential water use in 2020 is estimated at 84 gallons per person per day. In response to Emergency Water Conservation Resolution 2015-0032, adopted by the SWRCB in May 2015, the City was required to reduce potable water production by four percent. Despite Arcata's reputation for being a "green" community this goal proved difficult to meet because per capita water use was already very low. It is generally thought that Arcatans were already limiting water use to that needed for basic needs and it was difficult to achieve further reductions through change in water use habits. As such, it is not expected that any code, ordinance, or regulation will have a significant effect on water use habits in the City. Although future water savings are not quantified in this report it should be noted that some degree of future water savings will be achieved through the natural replacement of appliances, conservation efforts undertaken by the City, and new landscape and building standards which, by design, require new construction to be more water efficient than previous construction.

4.5 Water Use for Lower Income Households

In order to keep pace with the Regional Housing Needs Allocation, the City's 2019 Housing Element https://www.cityofarcata.org/862/Housing-Element cites the need for properly zoned area to allow for the development of 610 housing units during the Housing Element planning period (2019-2027), with 39 percent (237-units) of those units allocated to very low-income and low-income households. The quantified objectives summary presented in the 2019 Housing Element estimates that over its 8-year planning period, the City projects the construction of 348 new low-income to moderate-income housing units, rehabilitation of 36 low-income housing units, and preservation of 135 low-income housing units. Estimated projected water use for lower-income housing units is not anticipated to be significantly different than average residential water use in the Service Area. Expected water use for low-income households was included in projected water demands in that a portion of the projected single-family and multi-family growth includes lower-income housing development (Table 4-5).

Table 4-5 Retail Only: Inclusion in Water Use Projections

Are Future Water Savings Included in Projections?	No
Are Lower Income Residential Demands Included In Projections?	Yes

4.6 Climate Change

As discussed in Section 4.4, water use demand in Arcata is generally much lower than seen statewide, and dramatically lower than in other areas of the state. with warmer climates. More often than not, outdoor irrigation in the Service Area is limited to the "dry season", typically June through September (Figure 2). California's Fourth Climate Change Assessment for the North Coast Region (August 2018) found that model predictions of annual precipitation for the region fall within the historical variation, but trend towards slightly higher (2-16%) precipitation across the region by the end of the century. The report also concludes that "relatively low water demands of municipal users relative to supplies (DWR 2015), and absence of critically over-drafted groundwater basins (DWR 2016a), suggests that communities are not highly vulnerable to drought." The 2020 UWMP does not attempt to quantify the effects of climate change on

water demand due to stable, if not slightly increased precipitation predictions, low drought risk, and relatively low water demand in the Service Area.

The effects of climate change on water supply reliability are discussed in more detail in Sections 7.2-7.5.

Chapter 5 SB X7-7 Baselines and Targets

5.1 Overview & Terminology

The Water Conservation Act of 2009, otherwise known as SB X7-7, set a statewide goal of reducing urban water use by 20 percent by the year 2020. In 2010, each urban water supplier was required to calculate its baseline water use, in gallons per capita day (GPCD), establish an interim target for 2015, and define a 2020 target. In the 2020 UWMP urban water suppliers are required to demonstrate compliance with the 2020 target. Compliance is demonstrated to the state through completion and submittal of the SB X7-7 Verification Form (Appendix I).

5.2 Updating Calculations from the 2010 UWMP

In part, the City used population projections published by the Department of Finance (DOF) as the basis for determining baseline year population in the 2010 UWMP. Since that time, DWR determined that significant discrepancies (approximately 3 percent, but was as high as nine percent for some cities) existed between DOF projected population in 2010 and the 2010 census population.

Urban water suppliers that based 2010 UWMP population data on DOF projections were required to update their baseline population estimates in the 2015 UWMP with data from the 2010 U.S. Census. In the 2015 UWMP the City recalculated its baseline year populations and baseline water use, which subsequently affected the 2015 interim target and the 2020 target.

5.3 Baseline Periods

An urban water supplier is required to calculate and report baseline water use for two periods; a 10 or 15-year period to establish baseline water use and a 5-year period for target confirmation. In 2015, an urban water supplier had the option to change the years previously selected for each baseline period because of changes to its population which may have affected baseline and target GPCD values. The City elected to maintain a 10-year baseline period of 2001-2010 and a 5-year baseline period of 2006-2010 for target confirmation.

5.4 Service Area Population

Service Area population for each baseline year and 2020 were calculated as previously described in section 3.4. Compared to the 2010 UWMP, there was a slight decrease in the calculated population for each of the baseline years, with the largest relative percent difference calculated in 2010 at negative 2.3 percent. 2020 compliance year population estimates are summarized in Appendix I, SB X7-7 Table 3.

5.5 Gross Water Use

Gross water use is defined as the total volume of water entering the distribution system of an urban water supplier over a calendar year excluding recycled water, the net volume placed into long-term storage, the volume conveyed to another urban water supplier, and the volume delivered for agricultural use. There is no potable recycled water used in the Service Area, no long-term storage, no water conveyed to another urban water supplier outside of the Service Area, and no water tracked as delivered for agricultural use. Therefore, all water entering the City's distribution system is included in gross water use calculations.

Gross water use is determined from meter data from each water supply entering the distribution system. Gross water use for 2020 is presented in Appendix I, SB X7-7 Table 4, SB X7-7 Table 4-A, and SBX7-7 Table 5.

5.6 Baseline Daily per Capita Water Use

Baseline daily per capita water use, reported as GPCD or gallons per capita day, is the quotient of gross water use divided by the Service Area population and number of days in a calendar year. GPCD for each baseline year is calculated, the average of which serves as the baseline GPCD. In the 2010 UWMP baseline daily per capita water use for the Service Area was reported as 119 GPCD. This figure was revised in the 2015 UWMP to 122 GPCD. Baseline daily per capita water use for 2020 are presented in Appendix I, SBX7-7 Table 5 and SB X7-7 Table 9.

5.7 2015 and 2020 Targets

The City elected to maintain use of Methodology 3 (95 percent of Hydrologic Regional Target) from the "20 x 2020 Plan" (CWC 10608.20 (b)(3)) to calculate water use targets for the Service Area. One hundred percent of the Service Area lies within the North Coast Hydrologic Region. The 20 x 2020 Plan established a regional target of 137 GPCD for the North Coast Hydrologic Region. Methodology 3 defines the 2020 target for an urban retail supplier as 95 percent of the 2020 regional target or 130 GPCD (95 percent of 137 GPCD).

The 5-year baseline is used to define the maximum 2020 target (2020 target confirmation) for an urban water supplier. The 5-year baseline for the Service Area is 118 GPCD. The maximum 2020 target for an urban water supplier may not exceed 95 percent of the 5-year baseline GPCD. Therefore, the maximum 2020 target for the Service Area is 113 GPCD (95 percent of 118 GPCD).

The confirmed 2020 target is based on the target method. The City elected to continue using Methodology 3. When the 5-year baseline is less than the 2020 regional target, the water supplier's 2020 target is established at 95 percent of the 5-year baseline. Therefore, the 2020 target for the Service Area is confirmed at 113 GPCD (up from 110 GPCD reported in the 2010 UWMP) which is summarized in Table 5-1 below.

Table 5-1: Baselines and Targets Summary

Baseline Period	Start Year	End Year	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	2001	2010	122	113
5 Year	2006	2010	118	
All values are reported in Gallons per Capita per Day (GPCD)				

5.8 2015 Compliance Daily per Capita Water Use

Compliance with meeting the 2020 Target is assessed based on actual 2020 daily per capita water use. Adjustments to 2020 gross water use is allowed to account for differences in evapotranspiration and rainfall, and substantial changes to commercial, industrial, and institutional water uses. No adjustments were made to the 2020 gross water use for the Service Area (Table 5-2). Actual daily per capita water use for the Service Area in 2020 was 84 GPCD, well below the 2020 target (Table 5-2; Appendix I, SB X7-7 Table 9).

Table 5-2: 2020 Compliance

2020 GPCD			2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD*		
84	0	84	113	Yes
All values reported in Gallons per Capita per Day (GPCD)				

Chapter 6 System Supplies

Portions of Chapter 6 addressing surface water, existing and planned sources of water, and climate change impacts to water supply were provided by HBMWD, the regional wholesaler.

6.1 Purchased or Imported

The Service Area has one primary water source, one secondary groundwater source, and distribution system interconnections designed to provide additional means of taking water into the distribution system. The primary water source is water purchased from HBMWD and delivered to the Alliance Transfer Station. The City-owned Heindon Well is available as an auxiliary domestic water source. Water is delivered through 91 miles of water distribution mains and storage tanks located through an area encompassing approximately ten square miles.

HBMWD provides water to municipal customers throughout the northern Humboldt Bay area. To reduce the likelihood of water outage to any one municipal customer due to emergency conditions (i.e. natural disaster, mainline break, etc.) several interconnections were constructed between HBMWD and its municipal customers. In 2014, two interconnections were constructed; one between the City of Eureka and Arcata's distribution system, and a second between McKinleyville Community Services District (MCSD) and Arcata. In 2015, an additional interconnection was completed between HBMWD and Arcata at the Aldergrove Intertie.

The Wymore Intertie connecting MCSD and Arcata's distribution system includes a long stretch of main line with no customer use. A 5/8-inch, metered bypass was installed at the main meter to allow a small volume to continuously flow through the interconnection to prevent stagnation and maintain chlorine residual in this portion of main line. The Aldergrove intertie is used periodically to prevent stagnation and maintain chlorine residual at the intertie station. The volume of water introduced through the Wymore intertie and Aldergrove intertie in 2020 was 1.1 percent and less than one-half percent of gross water use for the year, respectively.

6.2 Groundwater

The City of Arcata invested in a groundwater source in the late 1990's to diversify its water supply and better prepare the Service Area during emergencies. The investment in a groundwater supply was not in response to supply limits or increased demand. At this time there are no plans to develop additional groundwater resources because existing water resources are adequate to meet the needs of the Service Area.

Heindon Well pumps groundwater from Groundwater Basin 1-8.01 Mad River Groundwater Basin, Mad River Lowland Sub-basin. The basin is located in the coastal floodplain which stretches from the Freshwater Fault north to the Mad River and to the elevated terrace to the East. The Mad River Floodplain is composed of alluvium underlain by the Hookton Formation. Groundwater in the basin is characterized as magnesium-calcium bicarbonate and calcium-magnesium bicarbonate type waters with high iron concentrations and high localized concentrations of manganese, fluoride, and phosphorus (California's Groundwater Bulletin 118, DWR). Samples collected in 2014 at Heindon Well showed that the groundwater quality produced is within the limits set by primary and secondary drinking water standards.

Site investigations undertaken by the City in 1999 and 2004 identified two distinct aquifers and concluded that pumping operations in the lower aquifer, where the supply well is screened, do not affect the upper aquifer. The results of the 2004 study indicate that water supplies in the lower and upper aquifers are stable

and yield in the lower aquifer is sufficient to continuously supply 0.5 million gallons per day (MGD) without depleting the aquifer. The 2004 study also concluded that development of an additional well, at a pumping rate of 0.5 MGD, would be successful from the lower aquifer, pending further modeling. The City has not adopted a groundwater management plan for this basin. There are no known basin adjudications for this basin nor has it been identified as a basin in need of protection from overdraft.

Pumping from Heindon Groundwater Well began in 1999 to augment the general water supply and better prepare the Service Area during emergencies; although use of the groundwater well was sporadic from 1999-2002. In July of 2002 the City began pumping continuously from the groundwater well at a rate of approximately 0.5 MGD. From 2005 to 2015 the average pumping rate decreased to approximately 0.35 MGD. The decrease in pumping volume was not due to limitations in the volume available for pumping, rather, it is thought that the decline in pumping volume was due to decreased pump yield. There was no water produced at Heindon Groundwater Well between January 2007 and May 2008 due to equipment failure. Heindon Groundwater Well was turned off in January 2015 in response to the SWRCB Emergency Water Conservation Resolution 2015-0032 requiring urban water suppliers to reduce water production by a defined amount as compared to the baseline year and remained offline for the duration of the 2020 reporting period. In order to qualify for the four percent reduction tier, the City committed to eliminating groundwater pumping for the duration of the conservation period. Under normal conditions and after a groundwater well rehabilitation project planned after 2020, the City anticipates that it may utilize 100 percent of the safe yield for Heindon Groundwater Well.

6.3 Surface Water

Water entering the Service Area distribution system at the Alliance Road Transfer Station, Aldergrove Intertie Station, and the Wymore Road Intertie is produced by HBMWD. The source of water distributed by HBMWD is the Mad River. The R.W. Mathews Dam, located in Trinity County, impounds water to form Ruth Lake Reservoir (Figure 2 and Figure 3). The Mad River flows from Trinity County into Humboldt County where water is diverted at HBMWD's Essex pumping facility located approximately 75 miles downstream from the dam. HBMWD does not purchase or import water from any other source.

At HBMWD's Essex Operations Center located just northeast of Arcata, municipal water is pumped from the aquifer beneath the Mad River by four Ranney wells (Figure 4).

Figure 2: Map of R.W. Mathews Dam and Ruth Lake Reservoir

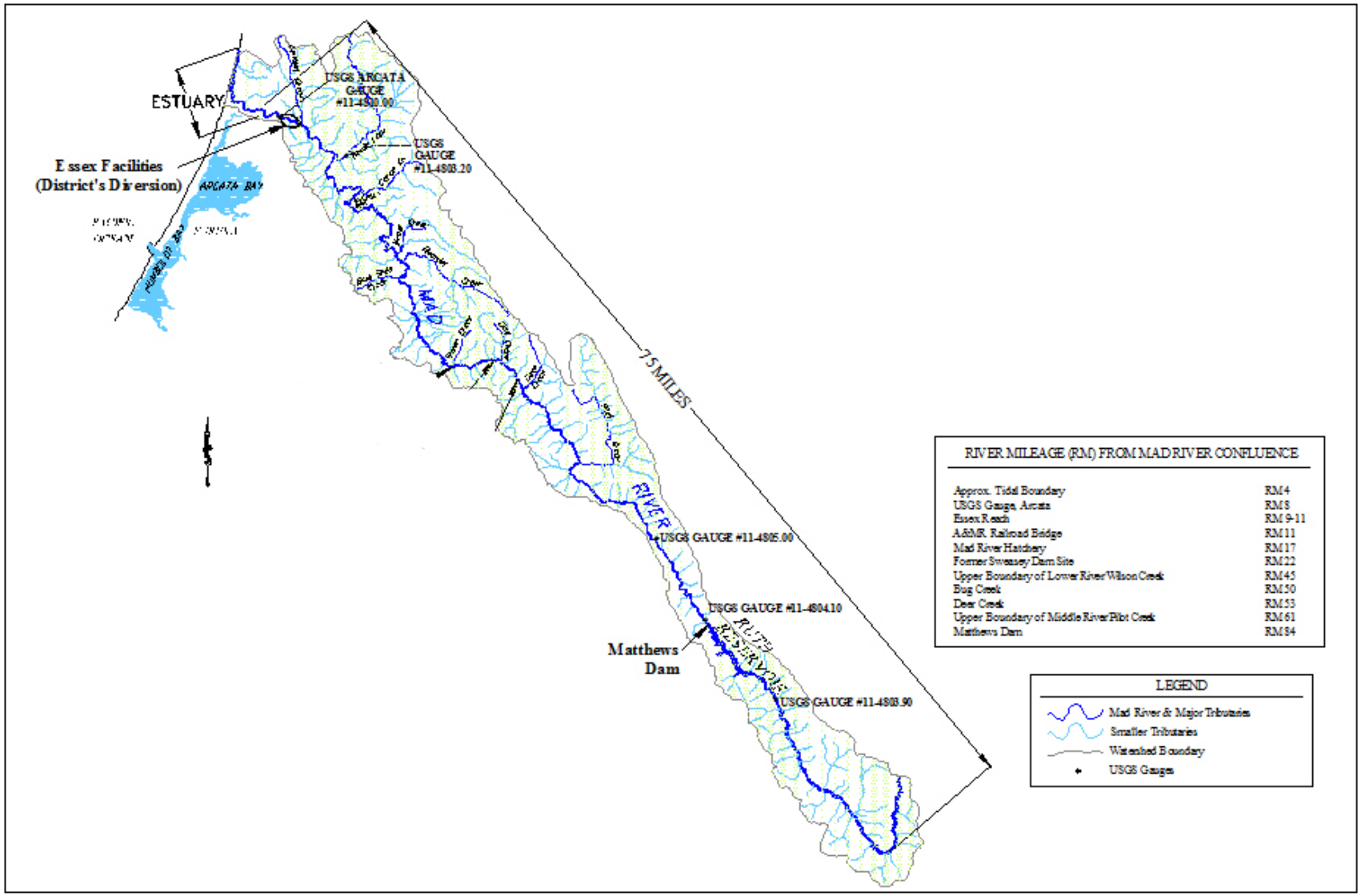


Figure 3: R.W. Matthews Dam and Ruth Reservoir

Figure 4: Ranney well along Mad River

These Ranney wells are situated within the riverbed at depths ranging from approximately 60 to 90 feet. The water that is pumped by the Ranney wells is continually recharged by surface water from the Mad River, a portion of which is released from Ruth Reservoir pursuant to HBMWD's water rights permits. HBMWD has appropriative water rights permits from the SWRCB through the year 2029 for surface water storage and diversion. These are Permit No. 11714 and Permit No. 11715, respectively.

HBMWD's industrial water system is separate and distinct from its domestic water system. From the early 1960s to the 1990s, HBMWD provided untreated surface water to two industrial customers (pulp mills). This industrial water system is capable of supplying 60 MGD of untreated water. However, one of the larger pulp mills closed down in the 1990s and the last pulp mill unexpectedly ceased operation in 2009. With no existing industrial customer, the HBMWD has an opportunity to support future water supply needs.

6.4 Stormwater

Stormwater is not used as a source of system water supply for the Service Area.

6.5 Wastewater and Recycled Water

The City of Arcata owns and operates the wastewater collection, treatment, and disposal facilities that collect and treat wastewater from approximately 60 percent of the Service Area. Wastewater is conveyed from the area within city limits, a portion of the JCWD, and from the Fieldbrook-Glendale Community Services District to the Arcata Wastewater Treatment Facility. In 2020 the City collected over 513 MG of wastewater (Table 6-2).

Table 6-1 Retail: Wastewater Collected Within the Service Area in 2020

60	Percentage of 2020 service area 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 from UWMP Service Area 2020	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 Arcata	Metered	513	City of Arcata	Arcata Wastewater Treatment Facility	Yes	No
Total Wastewater Collected from Service Area in 2020:		513				
NOTES: Collection system covers approximately 60 percent of the Service Area, by acreage. Volume of wastewater collected from UWMP Service Area in 2020 is the metered wastewater treatment facility influent and includes volumes attributable to inflow and infiltration.						

The Arcata Wastewater Treatment Facility has primary treatment facilities (i.e., headworks, grit removal, primary clarifier, and digester); a series of oxidation ponds and treatment marshes to provide equivalent to secondary treatment; followed by polishing marshes (secondary treatment) at the Arcata Marsh and Wildlife Sanctuary (AMWS).

AMWS is internationally renowned as an innovative wastewater treatment technology, consisting of three treatment wetlands in series. Arcata Wastewater Treatment Facility discharges equivalent to secondary treated wastewater to AMWS at discharge location Outfall-002. Although classified as receiving water, AMWS is a constructed wetland, designed to provide additional wastewater treatment and beneficial uses. Effluent from AMWS is pumped back to the Arcata Wastewater Treatment Facility for disinfection before final disposal at Outfall-001 at Humboldt Bay.

CWC Section 13050(n) defines recycled water as "water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource". Treated municipal wastewater must meet two requirements to be classified as recycled water for reporting in the UWMP; (1) it must be reused beneficially in a manner consisted with recycled water criteria in Title 22 of the California Code of Regulations and, (2) it must be reused in accordance with a National Pollution Discharge Elimination System permit, Waste Discharge Requirements, or water recycling requirements issued by a Regional Water Quality Control Board. Beneficial use includes Natural

Systems/Restoration and is defined in part as "any water provided to a designated wildlife area, whether included as part of a wastewater facilities treatment process or an independent area." Based on these criteria, discharges to Outfall-002/AMWS are categorized as recycled water (Table 6-3). Although discussed here to demonstrate that recycled water is utilized in the Service Area, recycled water is not used for direct or indirect potable reuse, and recycled water use was excluded for purposes of demand projections and setting and meeting per capita water use targets (Table 6-4). Although it serves as a wildlife sanctuary and provides for several beneficial uses, AMWS is primarily a wastewater treatment unit and in no foreseeable future would potable water, or direct potable reuse water be used to support the beneficial uses of the treatment unit.

In 2020, 625 MG of secondary, disinfected wastewater was discharged to Humboldt Bay at Outfall-001, 63 MG more than was conveyed to the treatment plant through the collection system (Table 6-3). The difference in volume between treatment facility influent and treatment facility effluent can be attributed to rainfall (volume gained) on approximately 100 acres of natural treatment units. In 2020, 385 MG of secondary treated wastewater was discharged to AMWS for treatment and beneficial reuse. The volume of wastewater discharged to AMWS for further treatment and beneficial reuse is expected to increase up to 657 MG by 2025 without any further increases into the foreseeable future. The increase in discharge to AMWS is planned as part of wastewater treatment facility upgrades. Facilities and equipment will be designed to flow up to 5.9 million gallons per day of treated wastewater through AMWS although the actual volume may be less depending on the amount of rainfall captured on AMWS treatment units.

Current and projected water recycled water use at the AMWS is not reported in Table 6-4. Discharge to the AMWS is regulated under NPDES permit and is restricted to discharges of equivalent to secondary treated wastewater. Under no foreseeable circumstances will raw or treated potable water be used as a source of supplemental water for the AMWS. Therefore, the volume of recycled water used at the AMWS is not included in the Demand Totals (Table 4-3 and Table 7-2).

Table 6-2 Retail: Wastewater Treatment and Discharge within Service Area in 2020

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number	Method of Disposal *Drop down list*	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Arcata Wastewater Treatment Plant	Outfall-001	Humboldt Bay	NPDES No.CA0022713Order No. R1-2019-0006	Bay or estuary outfall	Yes	Secondary, Disinfected - 23	576	576	0	0	0
Arcata Wastewater Treatment Plant	Outfall-002	Arcata Marsh and Wildlife Sanctuary	NPDES No.CA0022713Order No. R1-2019-0006	Wetlands	Yes	Secondary, Disinfected - 23	385	0	385	0	0
						Total	961	576	385	0	0

NOTES: Arcata Wastewater Treatment Facility influent flow was 513 MG in 2020; an additional 63 MG entered the treatment system as rainfall catchment. Immediately upstream of Outfall-001, the flow splits and a portion of the flow is diverted to the Arcata Marsh and Wildlife Sanctuary via Outfall-002 for further treatment (385 MG in 2020). The volume discharged to Arcata Marsh and Wildlife Sanctuary returns to the Arcata Wastewater Treatment Facility for final discharge to Humboldt Bay at Outfall-001. In total, 576 MG was discharged to Humboldt Bay, 385 MG of which was treated through the Arcata Marsh and Wildlife Sanctuary.

Table 6-3 Retail: 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.

In the 2010 UWMP the City projected that 100 percent of treated wastewater would flow through AMWS as recycled water prior to final discharge into Humboldt Bay by the year 2015. A treatment capacity study conducted in conjunction with planned wastewater treatment plant upgrades showed that AMWS may not be able to function as an efficient treatment system at this flow rate. In 2015, treatment plant upgrades were still in the planning phase. In 2020, the facility was nearing completion of upgrade project design. The 2020 actual use is well below the projected 2020 use because of continued delays in treatment plant upgrades (Table 6-5). In 2020, 40 percent of treated wastewater was recycled through AMWS.

Table 6-4 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual

Beneficial Use Type	2015 Projection for 2020	2020 Actual Use
Agricultural irrigation		
Landscape irrigation (exc golf courses)		
Golf course irrigation		
Commercial use		
Industrial use		
Geothermal and other energy production		
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat	675	385
Groundwater recharge (IPR)		
Reservoir water augmentation (IPR)		
Direct potable reuse		
Other (Description Required)		
Total	675	385

NOTE: See section 6.5 for full discussion on recycled water. Recycled water is utilized in the Service Area for direct beneficial uses at the Arcata Marsh and Wildlife Sanctuary. Recycled water use was excluded for purposes of demand projections and setting and meeting per capita water use targets. Although it serves as a wildlife sanctuary and provides for several beneficial uses, Arcata Marsh and Wildlife Sanctuary is primarily a wastewater treatment unit and in no foreseeable future would potable water, or direct potable reuse water be used to support the beneficial uses of the treatment unit.

Plans for future recycled water use are limited to increasing the volume of wastewater treated through AMWS. By 2023, the flow to AMWS is expected to increase by 290 MG per year. Additional water recycling opportunities, in particular reuse for agricultural and landscape irrigation are discussed in concept but would be highly dependent on demand and funding possibilities. At this time these additional recycling opportunities have not been explored in enough detail to project an implementation year or expected increase in recycled water use (Table 6-6).

Table 6-5 Retail: Methods to Expand Future Recycled Water Use

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Pump Station Updgrades	To support increased flow through AMWS	2023	290
		Total	290

6.6 Desalinated Water Opportunities

The Humboldt Bay Region has placed considerable investment into a regional system to provide water from the Mad River through HBMWD. This source has ample capacity to meet the region's growth demands. An impediment to desalination along Humboldt Bay is the need for an ocean discharge point to dispose of the brine generated through the process. Given the nature of Humboldt Bay and the active shellfish growing industry within Humboldt Bay, such permitting would be difficult. There are no plans to investigate opportunities for desalination within the planning horizon of the 2020 UWMP.

6.7 Exchanges or Transfers

The Humboldt Bay Region has placed considerable investment into a regional system to provide water from the Mad River through HBMWD. This source has ample capacity to meet the region's growth demands. Infrastructure (i.e. interconnections) exist which would allow for water exchanges or transfers however, the purpose of these interconnections is to ensure a reliable water supply in the event of a catastrophic event by providing an alternate route of delivery. There are no plans for exchange or transfer opportunities within the planning horizon of the 2020 UWMP.

6.8 Future Water Projects

There are no legal, environmental, water quality, or climatic factors resulting in an inconsistent water supply in the Service Area. The Mad River water source has been very consistent and adequate water rights exist to meet demand projections for the planning period of the 2020 UWMP. There is no need to examine replacement of this primary water source. Short-term water interruption would most likely result from a loss of power or facility failure due to a catastrophic event(s); HBMWD and its regional retail partners have reduced the likelihood of water supply interruption through construction of several interconnections throughout the regional system to allow for multiple routes of water delivery throughout the region. Several scenarios are addressed within the City's Vulnerability Assessment Plan and the Emergency Response Plan. The City of Arcata has no future water supply projects to meet projected water supply needs.

Table 6-6 Retail: 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.

6.9 Summary of Existing and Planned Sources of Water

HBMWD has appropriative water rights permits from the SWRCB through the year 2029 for surface water storage and diversion. Permit No. 11714 allows HBMWD to store up to 15,650 million gallons per year (MGY) at Ruth Lake to be collected "from October 1 of each year to April 30 of the succeeding year." Permit No. 11715 allows HBMWD to directly divert up to 75 MGD at the Essex facilities. Both permits combined allow a total maximum annual diversion and use up to 43,022 MG. This represents 8.8 percent of the average annual runoff (312,515 MGY) of the Mad River Basin for the period from 1963 to 2015 (average annual runoff data provided by the United States Geological Survey at Gage Station 1148100 on the Mad River near Arcata, CA). During the last five years (2016-2020), HBMWD has diverted an average of 2,704 MGY for domestic consumption, which represents only 0.9 percent of the average annual runoff of the Mad River Basin and only 10 percent of the permitted maximum annual diversion.

Arcata has a peak rate allocation of 3.25 MGD from HBMWD. In 2020, the City utilized 615 MG, or 52 percent of its allocation (Table 6-8). In 2045, when projected demand is anticipated to be nearly 800 MG the City will be utilizing less than 70 percent of its peak rate allocation. Studies at Heindon Groundwater Well indicate that the City can safely withdrawal 0.5 MGD from the groundwater basin. In 2015, due to

emergency water conservation restrictions implemented by the SWRCB, the City utilized 1 percent of the safe yield and has utilized zero percent of the safe yield from 2016-2020. Under normal conditions and after a groundwater well rehabilitation project planned after 2020, the City anticipates that it may utilize 100 percent of the safe yield for Heindon Groundwater Well.

Table 6-7 Retail: Water Supplies – Actual

Water Supply	Additional Detail on Water Supply	2020		
		Actual Volume	Water Quality Drop Down List	Total Right or Safe Yield
Purchased or Imported Water	Produced and purchased from HBMWD	608	Drinking Water	1,186
Purchased or Imported Water	Produced by HBMWD. Purchased through McKinleyville CSD at Wymore intertie	7	Drinking Water	
Groundwater (not desalinated)	Mad River Groundwater Basin No. 1-8.01	0	Drinking Water	183
	Total	615		1,369
NOTES: Volume of water purchased throught the Wymore Intertie is less than 2 percent of total volume into the system. Water is purchased through this interconnection primarily to keep water in the line from stagnating.				

The reliable nature of the regional water supply allows the City to conclude that the reasonably available volume is equal to the City's peak rate allocation or total right and that this will continue to be the case throughout the planning horizon (Table 6-9). Studies at Heindon Groundwater Well indicate that the City can safely withdrawal 0.5 MGD from the groundwater basin, therefore the reasonably available volume is equal to the safe yield.

Table 6-8 Retail: Water Supplies – Projected

Water Supply	Projected Water Supply									
	2025		2030		2035		2040		2045	
	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield
Purchased or Imported Water	1,186	1,186	1,186	1,186	1,186	1,186	1,186	1,186	1,186	1,186
Groundwater (not desalinated)	183	183	183	183	183	183	183	183	183	183
Total	1,369	1,369	1,369	1,369	1,369	1,369	1,369	1,369	3,414	1,369

6.10 Climate Change Impacts to Supply

Watersheds in Humboldt and Trinity Counties receive high annual rainfall. The climate of the lower Mad River watershed is influenced by the coastal atmosphere and averages 40 inches of rain per year between the months of October through April. Further inland, rain is predominant during these winter months up to 3,000 feet, with snow above 4,000 feet.

HBMWD completed the Integrated Regional Water Management Climate Change Vulnerability Assessment. In regards to Section II of the Climate Change Vulnerability Assessment, Water Supply:

- A portion of the water supply comes from snow melt in the Mad River Watershed.
- The water supply does not rely on water diverted from the Delta or coastal aquifers. The main source of supply is from the Mad River in Trinity and Humboldt Counties and Ruth Lake in Trinity County.
- HBMWD will not have difficulty in storing carryover supply surpluses from year to year. Ruth Reservoir currently has a capacity of 15,650 MG.
- The communities served by HBMWD have not faced a drought in the past during which there was a failure to meet local water demands.
- The HBMWD does not have any invasive species management issues at any facilities, along conveyance structures, or in habitat areas.

HBMWD did not experience a water shortage at any time during the most recent statewide drought (2012-2015.) HBMWD's Ruth Reservoir filled to capacity each and every year of the four-year drought. Due to the full reservoir and reduced demands (loss of two large industrial customers), HBMWD is not experiencing any water shortage, and has sufficient water supply to carry it through multiple drought years.

6.11 Energy Use and Intensity

The City is responsible for potable water distribution in the service area. It manages and maintains 12 water booster pump stations and 16 water storage tanks, located throughout 4 interconnected pressure zones. The total energy consumed to distribute drinking water in 2020 was 211,870 kWh while the energy intensity was 345.1 kWh/MG (Table 6-10). All energy data was collected from PG&E electrical meters that are dedicated to each piece of distribution infrastructure. Assumptions are that all electricity consumed by each meter is directly related to the distribution of potable water to customers.

Table 6-9: 2020 Drinking Water Distribution Energy Use and Intensity

Urban Water Supplier:	*City of Arcata*								
Water Delivery Product									
Retail Potable Deliveries									
Enter Start Date for Reporting Period	1/1/2020		**Urban Water Supplier Operational Control**						
End Date	12/31/2020		**Water Management Process**					**Non-Consequential Hydropower (if applicable)**	
☐ Is upstream embedded in the values reported?									
		Water Volume Units Used	Extract and Divert	Place into Storage	Conveyance	Treatment	Distribution	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process		MG					*614*	*614*		*614*
Energy Consumed (kWh)		*N/A*					*211870*	*211870*		*211870*
Energy Intensity (kWh/vol. converted to MG)		*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*345.1*	*345.1*	*N/A*	*345.1*
Quantity of Self-Generated Renewable Energy									
see narrative	kWh								
Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*									
Metered Data									
Data Quality Narrative:									
All energy data was collected from PG&E electrical meters that are dedicated to each piece of distribution infrastructure. Assumptions are that all electricity consumed by each meter is directly related to the distribution of potable water to customers.									
Narrative:									
The City of Arcata generates renewable energy from solar installations at locations in its distribution system. The data quanitfying the amount of energy produced by these solar installations is not readily available at this time.									

The City maintains a sanitary sewer system comprised of approximately 65 miles of pipe, ranging from 6 inches to 24 inches in diameter, and twelve sewage lift stations. Sewer service is provided to all businesses and residents within the City, as well as some residences located adjacent to City limits, within the City's sphere of influence. The City entirely contains Humboldt State University, which discharges, unmetered, to the City sewer system. Since 1992, the sewer system has received flow from the Fieldbrook Community Services District, up to 71,200 gallons per day. The total energy consumed for wastewater collection, conveyance and treatment in 2020 was 722,009 kWh while the total energy intensity was 433.6 kW/MG (Table 6-11). The energy consumed for collection and conveyance was 87,475 kWh and the energy intensity was 170.5 kWh/MG. The energy consumed for wastewater treatment was 634,534 kWh and the energy intensity was 1101.6 kWh/MG. The energy consumed for discharge was 0.0 kW/h. All energy data was collected from PG&E electrical meters. Assumptions are that all electricity consumed by each meter associated with

Collection/Conveyance infrastructure is directly related to the collection and conveyance of wastewater from domestic and industrial sources to the wastewater treatment plant. The meter associated with Treatment infrastructure is the meter for the entire complex in which the wastewater treatment facility is housed. Based on the activities that occur that are not associated with wastewater treatment it was estimated that 90% of the metered electrical usage from that meter is used for wastewater treatment processes. Discharge is a gravity powered and consumes no energy.

Table 6-10: 2020 Wastewater Collection, Treatment and Discharge Energy Use and Intensity

Urban Water Supplier:	*City of Arcata*				
Enter Start Date for Reporting Period	1/1/2020	**Urban Water Supplier Operational Control**			
End Date	12/31/2020	**Water Management Process**			
☐ Is upstream embedded in the values reported?		Collection / Conveyance	Treatment	Discharge / Distribution	Total
Volume of Water Units Used	MG				
Volume of Wastewater Entering Process (volume units selected above)		*513*	*576*	*576*	*1665*
Wastewater Energy Consumed (kWh)		*87475*	*634534*	*0*	*722009*
Wastewater Energy Intensity (kWh/volume)		*170.5*	*1101.6*	*0.0*	*433.6*
Volume of Recycled Water Entering Process (volume units selected above)					*0*
Recycled Water Energy Consumed (kWh)					*0*
Recycled Water Energy Intensity (kWh/volume converted to MG)		*N/A*	*N/A*	*N/A*	*N/A*

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

see narrative kWh

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

Combination of Estimates and Metered Data

Data Quality Narrative:

All energy data was collected from PG&E electrical meters. Assumptions are that all electriciy consumed by each meter associated with Collection/Conveyance infrastructure is directly related to the collection and conveyance of wastewater from domestic and industrial sources to the wastewater treatment facility. The meter associated with Treatment infrastructure is the meter for the entire complex in which the wastewater treatment facility is housed. Based on the activities that occur that are not associated with wastewater treatment it was estimated that 90% of the metered electrical usage from that meter is used for wastewater treatment processes.

Narrative:

The City of Arcata generates renewable energy from solar installations at locations in its wastewater system. The data quanitfying the amount of energy produced by these solar installations is not readily available at this time.

Chapter 7 Water Supply Reliability Assessment

Portions of Chapter 7 addressing water supply reliability were provided by HBMWD. Water supply reliability is discussed on a regional basis due to the nature of the relationship between Arcata, HBMWD, and other municipal customers reliant upon HBMWD as a primary water source. Heindon Groundwater Well is not included in the discussion of water supply reliability as its main purpose is to provide redundancy and supplemental volume to the main water supply.

7.1 Constraints on Water Sources

As discussed in the Chapter 6, HBMWD' supply at Ruth Lake Reservoir is in excess of municipal and industrial demand. Water from Ruth Lake flows down the Mad River and is pumped at the Essex Operations Center. This source of water has been very consistent and there is no need to replace or supplement this water source during the planning period of this report.

7.1.1 Water Quality

Drinking water delivered by HBMWD is drawn from wells located in the Mad River. These wells draw water from the sands and gravel of the aquifer located under the riverbed. The gravel and sands through which the water is drawn provides a natural filtration process which yields high quality water. Results from ongoing water monitoring and testing indicate that HBMWD's water quality is very high and meets safe drinking water regulatory standards, as has consistently been the case over the years.

Historically, turbidity is the only water quality issue occasionally encountered by HBMWD. Generally, turbidity in the source water has been very low and meets the turbidity standards set by the drinking water regulatory standards. However, during or following severe winter storm events, turbidity in the source water could rise beyond the standards set by drinking water regulations. In the late 1990s, an extremely heavy "El Nino" rainy season caused a prolonged series of storms that raised turbidity in the source water to such a level that regulatory officials became concerned that it could potentially interfere with the disinfection process, and therefore, pose a threat to public health. In 1997, the State directed all of the Public Water Systems in the Humboldt Bay area (HBMWD and its wholesale municipal customers) to address the wintertime turbidity issue and to meet the turbidity standards established by drinking water regulation. HBMWD initiated a process with its seven municipal customers to determine the most cost effective way to meet the State's requirement. The solution was to design and construct a regional Turbidity Reduction Facility (TRF). The TRF was completed in April 2003 and now operates during the winter storm season to reduce higher turbidities in accordance with drinking water standards.

As ongoing water monitoring and testing indicates, HBMWD's water quality has been and continues to be very high and with the turbidity issue taken care of by the TRF, HBMWD does not foresee any current or projected water supply impacts resulting from water quality.

7.2 Reliability by Type of Year

HBMWD has permitted rights to store 15,650 MGY of Mad River water at Ruth Reservoir and divert 27,371 MGY of water at Essex to supply its wholesale and retail customers. The highest projected total water demand for the HBMWD's wholesale customers in 2040 is 3,617 MGY (Table 7-2), which is approximately 14 percent of the permitted water supply. With this in mind, the following sections provide data for each of the following water year types: normal, single dry, and multi-dry. Supply and demand comparisons for each water year type are also discussed.

Table 7-1 Wholesale: Basis of Water Year Data

Year Type	Base Year	Available Supplies if Year Type Repeats	
		☐	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location:
		☑	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year	1989	321082	100%
Single-Dry Year	1977	35553	11%
Consecutive Dry Years 1st Year	1990	186326	58%
Consecutive Dry Years 2nd Year	1991	121002	38%
Consecutive Dry Years 3rd Year	1992	92149	29%
Consecutive Dry Years 4th Year	1993	382892	119%
Consecutive Dry Years 5th Year	1994	141738	44%
NOTES: Average Year volume chosen based on average annual Mad River watershed discharges from 1963-2020.			

Quantification of Arcata's available supplies is not compatible with Table 7-1 and is provided in Section 6.9 Summary of Existing and Planned Sources of Water.

7.2.1 Normal Water Year

During a normal water year, the Ruth Lake area receives an average 65.42 inches of rainfall, approximately 56,372 MG of water flow into the reservoir via the Mad River. The average runoff for the watershed near HBMWD's diversion facilities at Essex is 312,514 MGY (USGS Gage Station 1148100 on the Mad River near Arcata, CA). The Water Year ending in 1989 is considered an average water year because the average runoff for the watershed that year was 321,082 MGY, which is closest to the average annual runoff for the watershed as provided (Table 7-1).

Table 7-2 shows the wholesale normal year supply and demand comparison for HBMWD. During a normal water year, the Ruth Lake Reservoir and Mad River watershed have enough supply to meet HBMWD's maximum permitted diversion of 27,035 MGY. Table 7-2 also shows the retail normal year supply and demand comparison for the Service Area. During a normal water year, the Service Area's peak rate allocation (supply total) is adequate to meet Service Area demand.

Table 7-2 Wholesale & Retail: Normal Year Supply and Demand Comparison

Wholesale	2025	2030	2035	2040	2045 *(Opt)*
Supply totals	27,371	27,371	27,371	27,371	0
Demand totals	3,286	3,393	3,503	3,617	0
Difference	24,085	23,978	23,868	23,754	0
Retail	**2025**	**2030**	**2035**	**2040**	**2045**
Supply totals	1,369	1,369	1,369	1,369	1,369
Demand totals	651	685	721	759	800
Difference	718	684	648	610	569

7.2.2 Single Dry Water Year

The water year ending in 1977 was the driest on record for the watershed contributing to HBMWD's supply, far drier than any other. Rainfall in the Ruth area was 29 inches, or 41percent of normal (69.8 inches). Flow into the reservoir was 8,472 MGY (15 percent of normal). The runoff for the watershed measured near the HBMWD's diversion facilities was 35,553 MGY (11 percent of normal) (Table 7-1). The average reservoir volume for the water year was 6,843 MG, which is 44 percent of capacity and 51 percent of normal. The reservoir was drawn down to 4,236 MG (27 percent of capacity) at the end of the water year.

Fall storms arrived in November 1977 and quickly refilled the reservoir. The 1977 water year was severely dry throughout the entire state of California and was a very exceptional year in HBMWD's history:

- In 52 years of record, it was the only year in which rainfall was less than 50 percent of normal.
- It is the only year in which the reservoir was not filled to capacity.
- Total flows into the reservoir via the Mad River were half the value of the next driest year (2001).
- Runoff for the watershed and average reservoir volume were each 60 percent of the next driest year.

Single dry year supply data is based on the 1977 water year with a watershed runoff of volume of 35,553 MGY, which exceeds HBMWD's permitted water supply of 27,371 MGY. Therefore, HBMWD had 27,371 MGY of water available during a single dry year, as it does during a normal water year. HBMWD has sufficient supply to meet municipal demand (peak rate allocation), even in a critical single dry water year situation (Table 7-3).

Table 7-3 Wholesale & Retail: Single Dry Year Supply and Demand Comparison

Wholesale	2025	2030	2035	2040	2045 (Opt)
Supply totals	27,371	27,371	27,371	27,371	
Demand totals	3,286	3,393	3,503	3,617	
Difference	24,085	23,978	23,868	23,754	0
Retail	2025	2030	2035	2040	2045
Supply totals	1,369	1,369	1,369	1,369	1,369
Demand totals	651	685	721	759	800
Difference	718	684	648	610	569

7.2.3 Multiple Dry Water Years

The five water years between October 1990 and September 1994 represent the driest multiple years on record for HBMWD (Table 7-1):

- Rainfall for this period averaged 49 inches per year (70 percent of normal).
- The driest year of the multi-year period was the 1992 water year with 37 inches (53 percent of normal).
- Flow into Ruth Lake via the Mad River averaged 20,854 MGY (37 percent of normal).
- Despite the diminished rainfall and runoff, rainfall was more than sufficient to refill the reservoir each year.
- Reservoir volume during this period averaged 12,728 MG which is 81 percent of capacity and 95 percent of normal.

Runoff volumes for the watershed above the HBMWD's diversion facilities for the multi-year period were five water years were:

- 1990: 186,326 MGY (60 percent of normal).
- 1991: 120,988 MGY (39 percent of normal).
- 1992: (driest water year of the five): 92,149 MGY (29 percent of normal).
- 1993: 382,892 MGY (119% of normal).
- 1994: 141,738 MGY (44% of normal).

7.3 Supply and Demand Assessment

Table 7-4 projects the multiple dry water year supply amounts in comparison to projected demands for through year 2040 for HBMWD and the Service Area. Watershed runoff data from the five consecutive water years mentioned above were used, attributing 186,326 MGY (first year), 120,988 MGY (second year), 92,149 MGY (third year), 382,892 MGY (fourth year) and 141,738 (fifth year). As these supply amounts are larger than HBMWD's maximum permitted supply amount of 27,371 MGY, HBMWD is able to maintain its water supply during these consecutive dry water years. Table 7-4 shows the HBMWD's water supply projections for multiple dry water years as its permitted amount of 27,371 MGY for 2025 through 2045. The data shows that the HBMWD has more than enough water supply to meet demand, even during multiple dry water years. Likewise, the Service Area anticipates having its entire peak rate allocation

available during multiple dry years since there are no projected shortfalls in the supply available to HBMWD.

Table 7-4 Wholesale & Retail: Multiple Dry Years Supply and Demand Comparison

Wholesale		2025	2030	2035	2040	2045 (Opt)
First year	Supply totals	27,371	27,371	27,371	27,371	
	Demand totals	3,286	3,393	3,503	3,617	
	Difference	24,085	23,978	23,868	23,754	
Second year	Supply totals	27,371	27,371	27,371	27,371	
	Demand totals	3,286	3,393	3,503	3,617	
	Difference	24,085	23,978	23,868	23,754	
Third year	Supply totals	27,371	27,371	27,371	27,371	
	Demand totals	3,286	3,393	3,503	3,617	
	Difference	24,085	23,978	23,868	23,754	
Fourth year	Supply totals	27,371	27,371	27,371	27,371	
	Demand totals	3,286	3,393	3,503	3,617	
	Difference	24,085	23,978	23,868	23,754	
Fifth year	Supply totals	27,371	27,371	27,371	27,371	
	Demand totals	3,286	3,393	3,503	3,617	
	Difference	24,085	23,978	23,868	23,754	
Retail		**2025**	**2030**	**2035**	**2040**	**2045**
First year	Supply totals	1,369	1,369	1,369	1,369	1,369
	Demand totals	651	685	721	759	800
	Difference	718	684	648	610	569
Second year	Supply totals	1,369	1,369	1,369	1,369	1,369
	Demand totals	651	685	721	759	800
	Difference	718	684	648	610	569
Third year	Supply totals	1,369	1,369	1,369	1,369	1,369
	Demand totals	651	685	721	759	800
	Difference	718	684	648	610	569
Fourth year	Supply totals	1,369	1,369	1,369	1,369	1,369
	Demand totals	651	685	721	759	800
	Difference	718	684	648	610	569
Fifth year	Supply totals	1,369	1,369	1,369	1,369	1,369
	Demand totals	651	685	721	759	800
	Difference	718	684	648	610	569

7.4 Regional Supply Reliability

Throughout the years, there have been studies that refer to HBMWD's water source and its reliability. Bechtel Corporation was retained in the 1950s to perform various water supply studies and to complete the design and specifications for the original regional water system. During this time, Bechtel completed a detailed operations study of the reservoir storage to determine the safe yield of the original project pursuant to the HBMWD's downstream diversion requirements and the requirements in HBMWD's water rights permits. The study was done on the basis of a 75 MGD average annual diversion rate at Essex. Existing prior water rights downstream of Ruth Lake were incorporated into the study. Bechtel confirmed the safe yield of the reservoir at 75 MG, assuming the driest period of record studied (1923-1924). Bechtel reported "The Mad River Development will utilize the available supply and by storage regulation make this supply available for year-round diversion at Essex. The firm supply made available at Essex is measured by the amount of water the HBMWD can divert under its permits in the driest year on record 1923-1924." *(*Reference: *Engineering Report on Mad River Development, Bechtel Corporation, October 1960)*

Subsequent to the Bechtel study, DWR calculated the safe yield of Ruth Lake Reservoir to be very close to what Bechtel had determined *(Reference: Bulletin No. 142-1, North Coastal Hydrographic Area).* The State also used the 1923-24 drought period in its determination.

Hydrological conditions were supported by subsequent studies by DWR, the U.S. Army Corps of Engineers, Bechtel Corporation, and Winzler and Kelly Engineering. In a study by DWR titled "Office Report on Preliminary Investigation of Mad River," DWR acknowledges that the Ruth Lake area where HBMWD keeps its storage supply has "heavy and frequent precipitation." DWR also said in the report that the mean seasonal runoff of the Mad River as measured at Arcata at the time (1958) was 750,000 AFY (acre-feet per year) (244,388 MGY), which is exceeds HBMWD's permitted 27,371 MGY and the actual projected water demands from its customers as shown in Table 7-4.

The U.S. Army Corps of Engineers also discusses the mean seasonal runoff of the Mad River in their 1968 report titled, "Interim Review Report for Water Resources Development, Mad River, California." The report states that the variation in annual runoff has ranged from a low of 280,000 AFY (26,068 MGY) in the lowest year recorded at the time, to a high of 1,746,000 AFY (568,936 MGY) in the year of the highest runoff recorded at the time. It also states that the minimum five-year average annual runoff was 650,000 AFY (211,803MGY). These average annual runoff amounts show that HBMWD has ample supply to support its customer demands. The report also describes the local climate in that it is typical of coastal areas of California with a large percentage of the rainfall occurring during major storms during the winter months of November through March. It reports that the average annual precipitation over the basin ranges from about 40 inches along the coastal plains to more than 70 inches in the central part of the basin, with an estimated basin average of approximately 63 inches.

In 1977, Winzler and Kelly Engineering conducted a drought deficiency analysis of R.W. Matthews Dam with then current data (including the drought of 1977) and determined the safe yield to be approximately 67 MGD, 8 MGD less than projected by Bechtel. Although the safe yield projected by Winzler and Kelly was less than the one projected by Bechtel Corporation, it far exceeds HBMWD's current and projected demands from its wholesale customers (Table 7-4).

Results from the described studies are supported by HBMWD's historical data, which shows that, on average, Ruth Lake begins the water year on with approximately 10,101 MG of water (64 percent of capacity). Most rainfall in the area occurs between November and April. In every year except one since

1969, there has been at least one large storm during this period, bringing 3 to 9 inches of rain over a seven-day period. This is almost always sufficient to fill the reservoir to capacity. There has only been one water year (1976/77) in which the reservoir was not filled to capacity. The average reservoir volume on May 1 (the end of the usual rainy season) is approximately 15,543 MG, over 99 percent of capacity. Storage allows HBMWD to supplement low flows until the rains begin again in the fall. Seasonal or climatic shortages are only likely to occur after two consecutive rainy winter seasons with severely reduced rainfall and runoff (well below 50 percent of normal). This has not happened in the history of HBMWD.

7.5 Drought Risk Assessment

As previously noted, during multiple drought years, Ruth Reservoir has filled to capacity. The only year the reservoir did not fill was water year 1977. Fall storms arrived in November 1977 and quickly refilled the reservoir. During the 1977 water year, watershed runoff was 35,553 MGY. This amount is more than the District's permitted water supply of 27,372 MGY. For the Drought Risk Assessment, HBMWD assumed decreased rainfall due to climate change and that the reservoir will not fill and steadily decreases dramatically over five years beginning with a low watershed runoff of 26,068 MGY. As noted, the lowest in the District's history was 35,553 MGY. These numbers used are actually lower than the five-year consecutive drought numbers. In the unlikely event that this scenario was to occur, there is still ample supply for all the District's customers.

Table 7-5 Retail: Five-Year Drought Risk Assessment Tables

2021	Total
Total Water Use	626
Total Supplies	1,369
Surplus/Shortfall w/o WSCP Action	743
2022	**Total**
Total Water Use	632
Total Supplies	1,369
Surplus/Shortfall w/o WSCP Action	737
2023	**Total**
Total Water Use	638
Total Supplies	1,369
Surplus/Shortfall w/o WSCP Action	731
2024	**Total**
Total Water Use	645
Total Supplies	1,369
Surplus/Shortfall w/o WSCP Action	724
2025	**Total**
Total Water Use	651
Total Supplies	1,369
Surplus/Shortfall w/o WSCP Action	718

Chapter 8 Water Shortage Contingency Planning

Portions of this chapter were provided by HBMWD.

HBMWD delivers potable water to seven municipalities in the northern Humboldt Bay Region. As the primary source of potable water for the region it is imperative that HBMWD and municipal customers work cooperatively to implement an effective Water Shortage Contingency Plan (WSCP). Municipal customers purchase water from HBMWD under long-term contract. The contract specifically asserts HBMWD's authority to suspend water delivery requirements of the contract if HBMWD's Board of Directors declares that an actual or potential water shortage exists, or if all wholesale customers of HBMWD mutually agree to implement HBMWD's WSCP. Due to the contractual nature of the relationship between the City and HBMWD, and the dependence on HBMWD as a primary source of potable water, the City abides by the conditions set forth in HBMWD's WSCP. HBMWD's Water Shortage Contingency Plan Update is included in its entirety in Appendix J.

The HBMWD's WSCP identifies stages of action based on Ruth Lake reservoir levels and sets maximum use targets for its municipal customers for each stage of action. HBMWD does not have the ability to impose use restriction or other requirements directly on municipal customers. As such, the City retains responsibility for control of allotments provided under the provisions of HBMWD's WSCP. In the event that that HBMWD's WSCP is triggered, the City will adopt, by resolution, specific actions or prohibitions to meet the supply reduction target identified in each action stage.

Coordination in implementing HBMWD's WSCP is assured through the activation of a Water Task Force. This task force would be convened as necessary to address drought conditions or other significant events which could result in a supply shortfall. It is composed of representatives of HBMWD and each of its municipal and industrial (if any) customers. The committee's responsibilities include:

1. Review the status of the water supply and forecasts.
2. Recommend specific actions in accordance with this plan and each entity's own water shortage plan.
3. Assure that priority of allocations meets legal requirements of consistency and non-discrimination.
4. Coordinate media releases and public announcements.
5. Coordinate interaction with regulatory agencies such as the California Department of Water Resources, Fish and Wildlife, and State Water Resources Control Board.
6. Review and make recommendations about requests for waivers from or exceptions to, actions taken pursuant to this plan.

8.1 Stages of Action

There are five defined drought action stages corresponding to six shortage levels (Table 8-1). These stages may be implemented with or without a formal declaration of a water emergency by HBMWD's Board of Directors. In the event circumstances merit or require a declaration of a water shortage emergency, it is the intent of HBMWD to rely on this plan to provide the primary framework to deal with such an emergency. The triggers attached to each stage are not intended to be absolute. Circumstances not currently foreseeable may dictate moving to a higher action stage before the trigger levels for that stage are reached. Conversely, action stage implementation may be postponed or suspended if there is sufficient natural flow in the river to meet downstream needs. Action stages will be terminated, in consultation with the Water Task Force, as

rain, runoff, and reservoir levels permit. The City may implement any stage of action independent of HBMWD due to conditions within the Service Area which may affect water supply availability.

Table 8-1 Retail: Stages of Water Shortage Contingency Plan

Submittal Table 8-1 Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions**
1	Up to 10%	Action Stage 1: Domestic reduction: 0% (10 MGD delivered). Industrial reduction: 0% (40 MGD deliverd) . Total Supply Reduction: 0 MGD (50 MGD delivered)
2	Up to 20%	Action Stage 2: Domestic reduction: 5% (9.5 MGD deliverd). Industrial reduction: 5% (38 MGD delivered). Total Supply Reduction: 2.5 MGD (47.5 MGD delivered)
3	Up to 30%	Action Stage 3: Domestic reduction: 10% (9 MGD delivered). Industrial reduction: 50% (20 MGD delivered). Total Supply Reduction: 21 MGD (29 MGD delivered)
4	Up to 40%	Action Stage 4: Domestic reduction: 20% (8 MGD delivered). Industrial reduction: 70% (12 MGD delivered). Total Supply Reduction: 30 MGD (20 MGD delivered)
5	Up to 50%	Action Stage 5: Domestic reduction: 30% (7 MGD delivered). Industrial reduction: 95% (2 MGD delivered). Total Supply Reduction: 41 MGD (9 MGD delivered)
6	>50%	Action Stage 5: Domestic reduction: 30-50% (5-7 MGD delivered). Industrial reduction: 95% (limited to amounts required for human consumption, sanitation and fire protection). Total Supply Reduction: Minimum reduction of 41 MGD (maximum of 9 MGD delivered)

Stage 1 – Controlled Release from Storage

If the reservoir level is within the Stage 1 boundaries, only the amount of water needed for instream flow dedication and water supply purposes will be released from the reservoir. Under Stage 1 conditions, neither domestic nor industrial users face supply reduction. Stage 1 may be implemented independent of HBMWD due to conditions within the Service Area which may affect water supply availability.

Implementation of Stage 1 conditions will not trigger any immediate end use prohibitions on City customers. The City will participate on the Water Task Force and begin preparing for implementation of higher stages of action, if necessary.

Stage 2 – Optimizing Available Supply

Consideration to implement Stage 2 will be triggered when the storage in Ruth Lake falls below the 75 MGD operating curve (Appendix I). Other triggers to be considered for entering into the Stage 2 requirements include damage to the system by flood, earthquake, or other system failures; and accidental or intentional toxic spills in the supply. The Water Task Force will review the trigger data and make recommendations regarding actual implementation of Stage 2. Stage 2 actions may be implemented independent of HBMWD due to conditions within the Service Area which may affect water supply availability.

Under Stage 2 conditions, HBMWD may impose up to a 5 percent reduction in potable water supply to the City. Likewise, the City may independently trigger Stage 2 to implement actions to achieve up to a 5 percent reduction in water use. Entering Stage 2 means that awareness needs to be raised through the implementation of public outreach and education campaigns, and potentially voluntary conservation measures. Under these conditions, the City would take steps to reduce water used for municipal operations. If not already operating at the safe yield, the City would consider operating Heindon Groundwater Well at the safe yield volume to reduce the impact of HBMWD imposed volume reductions to the City's water supply.

Stage 3 – General Reduction

Consideration to implement Stage 3 will be triggered when the storage in Ruth Lake falls below the 50 MGD operating curve (Appendix I). The Water Task Force will review the trigger data and make recommendations regarding actual implementation of Stage 3. Stage 3 actions may be implemented independent of HBMWD due to conditions within the Service Area which may affect water supply availability.

Under Stage 3 conditions, HBMWD may impose up to a 10 percent reduction in potable water supply to the City. The City may independently trigger Stage 3 to implement actions to achieve up to a 10 percent reduction in water use. Entering Stage 3 means that specific end-use prohibitions and restrictions will be implemented through adoption of a water shortage emergency resolution.

Stage 4 – Usage Allocations

Consideration to implement Stage 4 will be triggered when the storage in Ruth Lake falls below the 30 MGD operating curve (Appendix I). The Water Task Force will review the trigger data and provide input regarding actual implementation of Stage 4. Stage 4 actions may be implemented independent of HBMWD due to conditions within the Service Area which may affect water supply availability. Stage 4 will be implemented by the City when there is a 50 percent reduction in water supply.

Under Stage 4 conditions, HBMWD will require all municipal customers to reduce usage by 20 percent. Likewise, the City may independently trigger Stage 4 to implement actions to achieve up to a 20 percent reduction in water use. Entering Stage 4 means that more restrictive specific end-use prohibitions and restrictions will be implemented through adoption of a water shortage emergency resolution. The City may consider increased patrols and enforcement under Stage 4.

Stage 5 – Rationing

Consideration to implement Stage 5 will be triggered when the storage in Ruth Lake falls below the 20 MGD operating curve (Appendix I). The Water Task Force will review the trigger data and provide input

regarding the actual implementation of Stage 5. Stage 5 actions may be implemented independent of HBMWD due to conditions within the Service Area which may affect water supply availability.

Under Stage 5 conditions, HBMWD will require all municipal customers to reduce usage by 30 percent. Likewise, the City may independently trigger Stage 5 to implement actions to achieve up to a 30 percent reduction in water use. Entering Stage 5 means that the most restrictive specific end-use prohibitions and restrictions will be implemented through adoption of a water shortage emergency resolution. The City will increase patrols and enforcement under Stage 5.

Should storage in Ruth Lake fall below 50 percent while in Stage 5, HBMWD will increase the domestic reduction requirement in the range from 30 percent to 50 percent. Municipal and retail customer use will be reassessed on a bi-weekly basis and may be adjusted as determined by the rate of use of available supply and weather conditions.

8.2 Prohibitions on End Uses

The City will implement specific end use restrictions and prohibitions, based on the stage of action triggered, to achieve the water use reduction identified in the stage of action. End use prohibitions shall be determined in part, based on current conditions, recommendations of the Water Task Force, and historic water use data and trends. Table 8-2 demonstrates the demand reduction actions that will be considered for shortage levels 2-6. Demand reduction actions listed in Table 8-2 are for general guidance purposes only. Entering a specific stage does not necessarily require all listed demand reduction actions to be implemented, nor does entering a lower stage prevent a demand reduction action listed under a higher stage from being implemented.

Table 8-2 Retail Only: Demand Reduction Actions

Submittal Table 8-2: Demand Reduction Actions			
Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Penalty, Charge, or Other Enforcement?
2	Landscape - Other landscape restriction or prohibition	1.00%	Yes
2	Pools and Spas - Require covers for pools and spas	0.80%	Yes
2	Water Features - Restrict water use for decorative water features, such as fountains	0.80%	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	0.80%	Yes
2	Other - Require automatic shut of hoses	0.80%	Yes
2	Other - Prohibit use of potable water for washing hard surfaces	0.80%	Yes
3	Landscape - Restrict or prohibit runoff from landscape irrigation	1.00%	Yes
3	Landscape - Limit landscape irrigation to specific times	1.00%	Yes
3	Landscape - Limit landscape irrigation to specific days	0.75%	Yes
3	Expand Public Information Campaign	0.75%	Yes
3	Increase Water Waste Patrols	0.75%	Yes
3	Decrease Line Flushing	0.75%	Yes
4	Landscape - Prohibit certain types of landscape irrigation	7.00%	Yes
4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	3.00%	Yes
5/6	Landscape - Prohibit all landscape irrigation	3.00%	Yes
5/6	CII - Commercial kitchens required to use pre-rinse spray valves	1.00%	Yes
5/6	CII - Restaurants may only serve water upon request	1.00%	Yes
5/6	CII - Lodging establishment must offer opt out of linen service	1.00%	Yes
5/6	CII - Other CII restriction or prohibition	1.00%	Yes
5/6	Moratorium or Net Zero Demand Increase on New Connections	1.00%	Yes
5/6	Other - Prohibit use of potable water for construction and dust control	2.00%	Yes
NOTES: The City of Arcata does not have the ability to impose use restriction or other requirements directly on customers in the JCWD residing outside of the city boundary. The JCWD Board of Directors will be notified of all planned reductions and may be called upon to implement similar end use prohibitions for customers in the JCWD.			

8.3 Penalties, Charges, Other Enforcement of Prohibitions

Table 8-2 demonstrates the end use restrictions and prohibitions that will be considered for mandatory penalties, charges or other enforcement action. The City will take an escalating enforcement response approach to violations of end use prohibitions including education and outreach, issuing a verbal and/or written warning, penalty assessment, and finally water service termination (on a case by case basis).

8.4 Supply Augmentation

In HBMWD's WSCP it was determined that if the next five years were as dry as the driest five-year period on record (1990-1994) the minimum available supply would be greater than the full reservoir level of 15,651 MG for each year. The City has a contractual peak rate allocation of 3.25 MGD with HBMWD. Since data provided by HBMWD indicates that the minimum water supply available to HBMWD customers for the next five years exceeds the full reservoir level for each year, there are no anticipated restrictions on available water supply for HBMWD and the City can rely on having its full peak rate allocation available for the 2020 planning period. Due to the aforementioned factors and a lack of other easily available sources of potable water, the City does not have plans for supply augmentation.

8.5 Determining Water Shortage Reductions

The City has water meters in place at all of the interconnection locations and at Heindon Groundwater Well, and telemetry equipment which provides data on storage tank levels throughout the distribution system. To determine the actual reductions in use of water during a water shortage the City will use its Supervisory Control and Data Acquisition (SCADA) system and daily meter reads to monitor distribution to its customers on a daily basis. In the event of a power outage, the City has auxiliary power generators as standby sources of power. Therefore, the SCADA system will continue operating during power outages. In the event that the SCADA system is inoperable, the City will continue to monitor water distribution by manually reading all transfer location water meters and water storage levels on a daily basis. Water shortage reductions will be determined by comparing post-drought consumption rates to pre-drought consumption rates for the same period.

8.6 Revenue and Expenditure Impacts

In 2020, the City altered its rate structure, shifting from a complex multi-tiered structure to a single volumetric rate aligned with cost of service and Proposition 218 requirements. This equalizes volume charges for all customer classes and all water use. This new rate structure caused rates to go up for some customers and down for others as the rates are recalibrated. This modification was made because the former rate structure was complex, did not accurately reflect the cost of service and to align with requirements set forth in Proposition 218. Customers in the JCWD are billed on an independent rate structure with a single rate for all connection types. As water use in the Service Area decreases through both voluntary and mandatory reductions, so does the total revenue that the City collects. Base rate charges will remain consistent, providing reliable revenue to the water system. Revenue decreases resulting from water use reduction is difficult to quantify due to factors which must be accounted for when determining consumption generated revenue including structured rate increases and changing consumption habits.

With less water distributed there will be less revenue generated. However, cost to maintain treatment and distribution systems will remain fairly consistent. Long-term water shortage conditions may contribute significantly to budget shortfalls.

8.7 Resolution or Ordinance

The City will enact, by resolution, the City's Water Shortage Contingency Plan. A copy of the City's draft Water Shortage Emergency Resolution to implement the City's Water Shortage Contingency Plan is attached as Appendix K.

8.8 Catastrophic Supply Interruption

The Service Area may be vulnerable to catastrophic supply interruptions due to regional events, events affecting HBMWD facilities, and events affecting City infrastructure. The catastrophic supply interruption

plan for HBMWD is detailed in HBMWD's WSCP. As a regional partner with HBMWD, the City would cooperate with any action or plan implemented by HBMWD in response to a catastrophic event. The City of Arcata Water System Emergency Response Plan provides response procedures for catastrophic supply interruptions such as an earthquake, an act of terrorism, a flood that infiltrates system facilities and sources, a hazardous chemical spill, a storm that damages the power grid, or a mudslide or earth shift that causes failure of transmission or loss of water in the well or transmission line from HBMWD. The Emergency Response Plan also provides response procedures for routine, minor, and significant emergencies. In addition to the Water System Emergency Response Plan the City is currently in the process of developing a Risk and Resiliency Assessment (RRA) in accordance with the America's Water Infrastructure Act of 2018. This assessment is required to be completed by June 30, 2021. After certification of its RRA the City will update its Water System Emergency Response Plan as required under the America's Water Infrastructure Act of 2018. Moving forward, re-certification of both documents will occur every 5 years.

Chapter 9 Demand Management Measures

Water conservation is defined as any action taken to reduce water consumption or loss of available supply for use. Demand management refers to a subset of conservation methods a water supplier may undertake to reduce demand on the water system. The 2010 UWMP required a description of fourteen specified conservation and demand management measures (DMM). CWC was significantly modified in 2014 to simplify, clarify, and update DMM reporting requirements. Rather than reporting on fourteen specific DMMs, an urban water supplier is now required to report on six general DMMs and any other DMM which does not fit in any of the six specific categories.

The Service Area and the surrounding region is one of the few geographic regions in California with a local abundance of water. This has meant that drought, while just as severe climatically, has not led to the same level of supply shortfall experienced in other parts of the State. However, residents are very aware and concerned about the importance of water conservation. The 2020 target water use of 113 GPCD was already being met in the Service Area when the 2010 UWMP was adopted. Through conservation efforts and implementation of DMMs, demand in the Service Area further decreased to 94 GPCD in 2015 and 84 in 2020.

Per capita water use likely benefits from the relatively wet and cool climate. Individual agricultural and landscaping water needs are often provided through precipitation events rather than municipal water. Service Area residents possess a high commitment to environmental stewardship and are active participants in various resource and planning discussions. Many individuals have integrated water conservation as part of their lifestyle without government involvement and are committed to preserving and protecting the natural environment.

The City of Arcata is committed to environmental stewardship. The General Plan clearly states the vision of the community:

> *"We live resourcefully. Sustainability is a way of life. We reduce, reuse, and recycle, continually relearning and redefining as we better understand our local resource base. We are committed to living well, and within Arcata's resource base. Our water, wastewater, energy and land use needs are monitored and adjusted, as we find new ways to minimize consumption. We conserve these resources so they may be enjoyed by the seventh generation."*

9.1 Demand Management Measures for Retail Agencies

9.1.1 Water Waste Prevention Ordinances

Arcata Municipal Code, Title VII -Public Works, Chapter 3-Water, Section 7741 states "no customer shall permit leaks or waste of water. Where water is wastefully or negligently used on a customer's premises, seriously affecting the general service, the Public Works Department may discontinue the service if such conditions are not corrected".

In response to emergency conservation resolution 2015-0032 adopted by the SWRCB the city council adopted Ordinance 1462 (Appendix M) amending Arcata Municipal Code Section at section 7741.5 to implement emergency mandatory water conservation measures. Ordinance 1462 included water conservation measures to prevent the waste and unreasonable use of water and to promote water conservation by prohibiting specific water use activities. Ordinance 1462 expired on February 28, 2016 as

the state emerged from the 2012-2016 drought. It anticipated that a similar measure would be adopted if warranted based on drought, water supply conditions and state mandates.

9.1.2 Metering

CWC 527 requires an urban water supplier that does not receive water from the federal Central Valley Project to install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025. As of the end of 2020, all residential, commercial, industrial, institutional and City water connections are metered and meters are read, at least annually, to account for all water deliveries. The JCWD meter does not produce reliable flow readings during low flow periods and is therefore under counting the volume of water delivered to the JCWD. Actual and projected demands for the JCWD are based on customer meter data. The cost of metering all water connections cannot be fully assessed until there is an accurate count of unmetered connections.

The City has a meter testing replacement program. Meters three-inches and larger are regularly maintained and tested. Residential meters and meters smaller than three-inches are replaced when they are suspected of leaking or misreading. Meter calibration and replacement is an important activity since propeller-type meters underreport usage as they age. Maintaining meter accuracy is an important component of water use accounting and ensures fairness in rates and charges to customers. When a meter is replaced, each meter is cataloged by type and size of meter, and date and location of installation. This information allows the City to more easily identify customers and areas in need of meter replacement. The City will continue to support meter testing and replacement programs through program funding.

9.1.3 Conservation Pricing

The City does not currently have, nor does it have plans to enact conservation pricing. If it is deemed necessary, practicable, and lawful to achieve conservation through monetary incentive, the City would consider declaring a water shortage to trigger a stage of action in the WSCP which allows for monetary fines/penalties for violations of water use restrictions and prohibitions.

9.1.4 Public Education and Outreach

Public education and outreach efforts have been the City's primary focus to reduce demand on the water system. This has been the primary focus, because daily water use data indicate that customers in the service have very little discretionary water use (94 GPCD in 2015, 84 in 2020) and public education and outreach was determined to be the most effective means of reducing water demand. In addition to public education and outreach activities, the City participates in regional public education and outreach events with municipal suppliers in the northern Humboldt Bay region (Northcoast Region Conservation Group (conservation group)). The conservation group, which functions when the region is experiencing drought conditions, consists of representatives from the Cities of Eureka and Arcata, HBMWD, and the Humboldt and McKinleyville Community Services Districts, and was formed with the intention of sharing resources, including the cost of program implementation, and to provide a consistent conservation message throughout the region, which in large part shares the same water supply.

Public education and outreach activities implemented by the City or conservation group include:

- *Water Ads*. The City participated in a water conservation radio ad campaign consisting of 30-second radio ads highlighting different water conservation messages for broadcast on three local radio stations over two six-month periods (May – October) in 2014 and 2015. The City continued to support this outreach activity in 2016 and will evaluate the need for this program in the future based on drought and water supply conditions.

- *Tabling/informational displays at public events*. In 2014 and 2015, the conservation group entered an informational display at the annual Humboldt County Fair. The display consisted of a variety of water education and conservation information (Figure 5). In 2015, the display was awarded the Best of Show award for the adult feature exhibit category. City staff tabled at several Farmer's Market events in 2015 in an effort to provide educational materials about water conservation. In 2016, the conservation group participated in the "Party for the Planet" event at the Sequoia Park Zoo and the annual Humboldt County Fair. The conservation group and the City will continue to identify tabling/informational display opportunities in the community.
- *Water Week*. Arcata City Council proclaimed the first Water Week in May of 2015, in celebration of the beneficial uses of water. This event was held annually during the first week of May from 2015-2019. Water week activities included a youth poster contest, water and wastewater facility tours, a scavenger hunt game with prizes for kids and adults, classroom presentations, and a booth at the Arcata Farmer's Market. Although the event was cancelled in 2020 due COVID-19 restrictions, the City has will continue to support this event in the future.
- *Presentations*. Representatives of the water conservation group prepared a PowerPoint presentation focusing on water conservation for community groups. Presentations were made to local chapters of the Daughters of the American Revolution and Soroptimist International. This outreach activity may be implemented only when the region is experiencing drought conditions or state mandate requires conservation activity.
- *Print ads and conservation materials*. In an effort to comply with the State's emergency water conservation reduction requirement (4 percent reduction required), the City printed a variety of materials for distribution and use throughout the community. In addition to conservation messages printed in local newspapers, the City produced water conservation signs for display around the community, and conservation table-tents for use in local restaurants. The City will continue to evaluate the effectiveness of these activities. These activities are considered to be most effective for targeting specific behavioral changes, such as serving water only upon request in restaurants. This outreach activity may be implemented only when the region is experiencing drought conditions or state mandate requires conservation activity.
- *Promoting state programs*. The City recognizes that California's "Save our Water" program is a valuable free resource for conservation information and materials. The City actively promotes the program by providing links to https://saveourwater.com/ and saveourwaterrebates.com on the City website, Facebook page, and printed materials. The City primarily used graphics from the Save Our Water Toolkit for public education and outreach events. This outreach activity may be implemented only when the region is experiencing drought conditions or state mandate requires conservation activity.

Figure 5: Northcoast Region Water Conservation Group display at the Humboldt County Fair

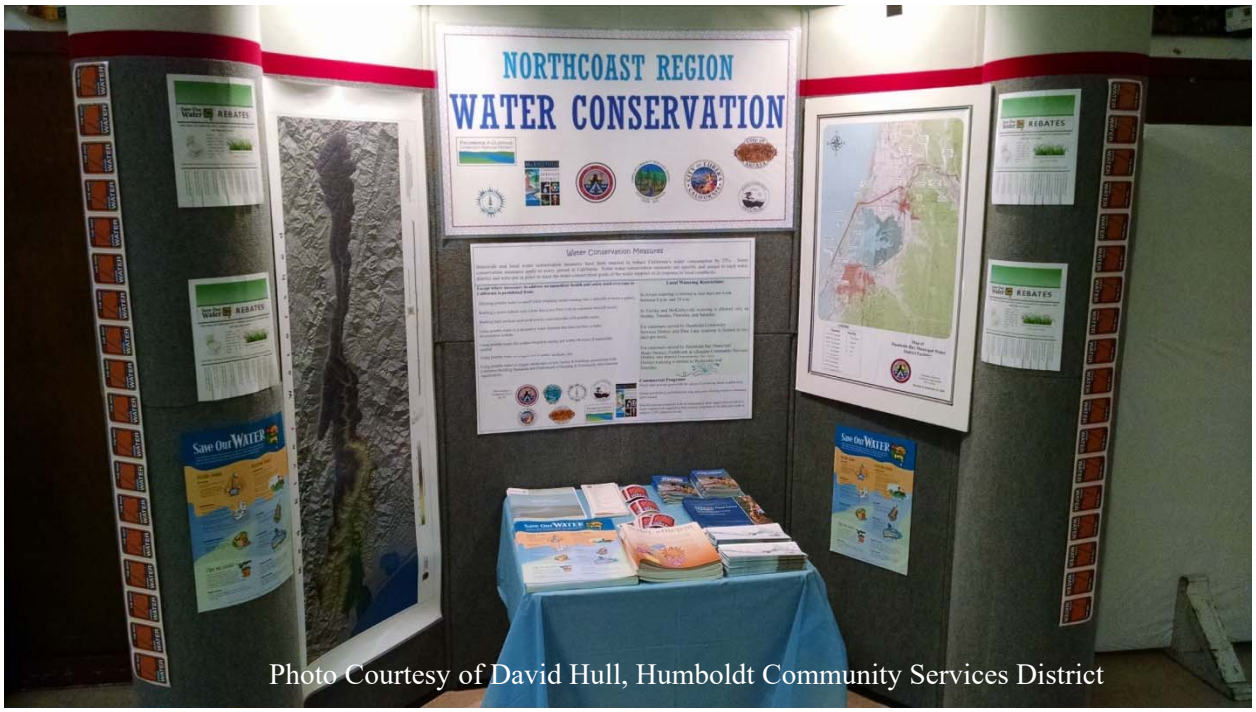


Photo Courtesy of David Hull, Humboldt Community Services District

9.1.5 Programs to Assess and Manage Distribution System Real Loss

Distribution system real loss is defined by the AWWA as "physical water losses from the pressurized system (water mains and customer service connections) and the utility's storage tanks, up to the point of customer consumption. In metered systems this is the customer meter, in unmetered situations this is the first point of consumption (stop tap/tap) within the property. The annual volume lost through all types of leaks, breaks and overflows depends on frequencies, flow rates, and average duration of individual leaks, breaks and overflows".

The City utilized AWWA's Free Water Audit Software to conduct a water audit for the Service Area for calendar year 2020. The results of the water audit are discussed in *Section 4.3 Distribution System Water Losses*. The City will use the results of the audit to prioritize projects which will address distribution system losses (real and apparent). Results of the water audit conducted in 2020 indicate priority should be given to metering issues. This area of concern will largely be addressed through actions discussed in section *9.1.2 Metering*. Other areas of water loss will be addressed as the City continues to place priority on identifying and repairing distribution system and service connection leaks.

The City will conduct a water audit using AWWA free water audit software every year, in conjunction with annual water audit reporting requirements. Results of water audits will be used, in part, to identify real and apparent losses and to prioritize projects to reduce real water loss.

9.1.6 Water Conservation Program Coordination and Staffing Support

Water conservation programming is the responsibility of the City of Arcata Director of Environmental Services. Although overall responsibility resides with the Director, there is a team of management and staff members from multiple departments working together to address water conservation efforts in the Service Area. Staffing support includes department directors, deputy directors, and supervisors from the

Environmental Services and Finance Departments, environmental compliance and environmental programs staff, water treatment and distribution staff, and other Environmental Services Department staff.

The primary focus of water conservation program activities conducted over the past five years has been to prevent water waste. In addition to the DMM activities described in this chapter other water conservation activities were undertaken by the City to identify and address water waste. Other activities included (1) continuous evaluation of City landscape irrigation practices and identification of management strategies to maintain high-use facilities (parks and playing fields) through efficient landscape irrigation; (2) continuous identification of the "Top 100" water consumers in the Service Area and targeted outreach to those customers; (3) continued coordination between water system staff and finance department staff to streamline nomenclature and account classification methods for improved water use tracking by sector; (4) identifying and fixing water leaks; and (5) eliminate water storage tank overflow and leaks.

Water conservation program coordination among staff from various City departments will continue through the planning years of the 2015 UWMP. Emphasis and increased resources for conservation program coordination will be given during periods when action stages of the WSCP are triggered.

Chapter 10 Plan Adoption, Submittal, and Implementation

Appendix M includes a copy of the following documents:

- Notice of public hearing letter to affected water agencies and Humboldt County
- Certificate of publication of legal notice of public hearing
- City of Arcata staff report to Arcata City Council
- Resolution No. 156-55 Adopting The City of Arcata 2020 Urban Water Management Plan
- Cover letter to the California State Library
- Notice of adopted plan availability to affected water agencies and Humboldt County

10.1 Inclusion of all 2020 Data

The 2020 UWMP includes water use and planning data for the entire year of 2020. Water use data for calendar year 2020, planning data (i.e. population and demand projections) and calendar year 2020 water audit data are presented in Appendices E, F, and G.

10.2 Notice of Public Hearing

Notice of public hearing was provided to the JCWD, HBMWD, Humboldt County, and MCSD. (Table 10-1).

Pursuant to Section 6066 of the Government Code Notice of Public Hearing was published in the Mad River Union on June 2, 2021 and June 9, 2021 and was posted at Arcata City Hall. The 2020 UWMP was available for public review at Arcata City Hall and https://www.cityofarcata.org/326/Drinking-Water.

Table 10-1 Retail: Notification to Cities and Counties

City Name	60 Day Notice	Notice of Public Hearing
Jacoby Creek Water District	Yes	Yes
Humboldt Bay Municipal Water District	Yes	Yes
McKinleyville Community Services District	Yes	Yes
County Name	**60 Day Notice**	**Notice of Public Hearing**
Humboldt County	Yes	Yes

10.3 Public Hearing and Adoption

A public meeting was held on June 16, 2021 during a regularly scheduled City Council meeting to receive input on the 2020 UWMP and WSCP. The plans were adopted on June 16, 2021 in Resolution No. 201-59: Resolution to Adopt the City of Arcata Urban Water Management Plan.

10.4 Plan Submittal

The City of Arcata 2020 UWMP plan shall be submitted to DWR within 30-days of adoption and in no case later than July 1, 2021. Submittal of the 2020 UWMP shall be through DWR's Water Use Efficiency data online submittal tool.

10.5 Public Availability

The adopted 2020 UWMP shall be available for public review on the City's website at https://www.cityofarcata.org/326/Drinking-Water. The adopted plan is also available for review at Arcata City Hall, Environmental Services Department, 736 F Street, Arcata, CA 95521. An electronic (CD) or hard-copy of the adopted plan shall be submitted to the California State Library no later than 30-days after adoption. Affected water agencies and Humboldt County shall be notified, by letter, of document availability.

10.6 Amending an Adopted UWMP

Any changes to the 2020 UWMP shall be adopted by the Arcata City Council. All notification, public hearing, adoptions, and submittal requirements shall be followed for an amended plan.

Appendix A

UWMP Checklist Arranged by Subject

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Pages 6-7
x	x	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Pages 6-7
x	x	Section 2.2	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	Page 7

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 2.6	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	Pages 7-8
x	x	Section 2.6.2	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 and contingency plan.	Plan Preparation	Pages 7 and 53-54
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Appendix B

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
	x	Section 2.6	10631(h)	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	NA
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Pages 9-10
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Page 10
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Page 11
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Page 9
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Page 11
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Page 9

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Pages 12-16 & Appendix G
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Page 15 and Appendix H
x	x	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System Water Use	Page 16
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Pages 13-14 and Appendix G
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Page 15
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Page 16
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Page 16

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Pages 18-20 and Appendix I
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Page 20
	x	Section 5.1	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	NA
x		Section 5.2	10608.24(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	NA

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x		Section 5.5	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 if the suppliers base GPCD is at or below 100.	Baselines and Targets	Page 20 and Appendix I
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Page 20 and Appendix I
x	x	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Pages 35-41
x	x	Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.*	System Supplies	Page 32; Pages 35-41

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	NA
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Pages 29-30; & 47
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Pages 21-31
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Pages 21-22; 30
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or 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	Page 22
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Page 21

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2.2	10631(b)(4)(B)	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	Page 22
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Page 22
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Page 22 & 30
x	x	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Pages 29-31
x	x	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Page 29

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2.5	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)	Pages 25-28
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Pages 25-28
x	x	Section 6.2.5	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)	Pages 27-28
x	x	Section 6.2.5	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)	Pages 27-28
x	x	Section 6.2.5	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)	Pages 27-28

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Pages 27-28
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Page 29
x	x	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Pages 25-27
x	x	Section 6.2.8, Section 6.3.7	10631(f)	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 for a period of drought lasting 5 consecutive water years.	System Supplies	Page 29
x	x	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Pages 32-34

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 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	Page 35
x	x	Section 7.2.4	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	Pages 40-41
x	x	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive 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	Pages 37-39
x	x	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Page 41

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Pages 40-41
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Pages 35-41
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Page 41
x	x	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Pages 35-41
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Pages 42-45 & Appendix J

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Pages 35-41
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Pages 42-43 & Appendix J
x	x	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Pages 42-43 & Appendix J
x	x	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Pages 42-43 & Appendix J

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Pages 43-45
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	NA
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Page 47
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Page 46

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Page 47
x	x	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Pages 43-46
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Page 46
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Pages 47-48
x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Pages 43-45 & Appendix J
x	x	Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Pages 43-45 & Appendix J

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Pages 45-46
x	x	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Page 49
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Page 47
x	x	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Page 41
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Page 47
x	x	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Pages 47 & 50

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	Pages 47 & 50
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Pages 47-50
x		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	NA
x	x	Sections 8.12 and 10.4	10635(c)	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 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Page 54

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Page 54
	x	Sections 9.1 and 9.3	10631(e)(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	NA
x		Sections 9.2 and 9.3	10631(e)(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	Page 53
x		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Page 54

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 10.2.1	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. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Appendix M
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Page 54
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Appendix M
x	x	Section 10.2.2	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	Page 54
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Appendix M

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Page 55 and Appendix M
x	x	Section 10.4	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	Appendix M
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Page 55
x	x	Section 10.5	10645(a)	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	Page 54
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency 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	Page 54 & Appendix M

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	NA
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Page 55

Appendix B

Coordination and Outreach Documents

City of ARCATA

736 F Street

Arcata CA 95521

City Manager (707) 822-5953

Police (707) 822-2428

Recreation (707) 822-7091

Community Development (707) 822-5955

Finance (707) 822-5951

Transportation (707) 822-3775

Environmental Services Streets/Utilities (707) 822-5957

Environmental Services Community Services (707) 822-8184

Engineering & Building (707) 825-2128

March 17, 2021

TO: John Friedenbach, Humboldt Bay Municipal Water District
John Ford, Humboldt County Planning Department
Wayne Palmrose, Jacoby Creek Water District
James Henry, McKinleyville Community Services District

Re: Notice Regarding Review of the City of Arcata Urban Water Management Plan

California Water Code (CWC) 10621(b) requires an urban water supplier preparing an Urban Water Management Plan (UWMP) to notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. CWC further requires each urban water supplier to coordinate the preparation of its UWMP with other appropriate area agencies including other water suppliers that share the same water sources, water management agencies, and other relevant public agencies.

This letter is notice to your agency that the City of Arcata is in the process of reviewing and updating its UWMP. As with the 2015 UWMP, the City of Arcata is reviewing and updating its 2020 UWMP in collaboration with Humboldt Bay Municipal Water District, the City of Eureka, Humboldt Community Services District, and McKinleyville Community Services District. If your agency would like to provide input, be involved in the review process, or if you have any questions, please contact me at (707) 825-2148 or rhernandez@cityofarcata.org.

Sincerely,

Rachel Hernandez
Environmental Compliance Officer
City of Arcata

cc: Karen Diemer, City Manager
Mike Clinton, Deputy Director of Environmental Services, Streets & Utilities
Scott Sinnott, Environmental Compliance Technician

From: Scott Sinnott <ssinnott@cityofarcata.org>
Sent: Thursday, May 6, 2021 9:57 AM
To: sobol@hbmwd.com
Subject: City of Arcata Demand Projections-Final Projections

To: Sherrie Sobol

California Water Code (CWC) 10631(j) requires an urban water supplier preparing an Urban Water Management Plan (UWMP) to notify their wholesale supplier with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. This email is to inform Humboldt Bay Municipal Water District of the water demand projections for the City of Arcata for water purchased from Humboldt Bay Municipal Water District through the year 2045.

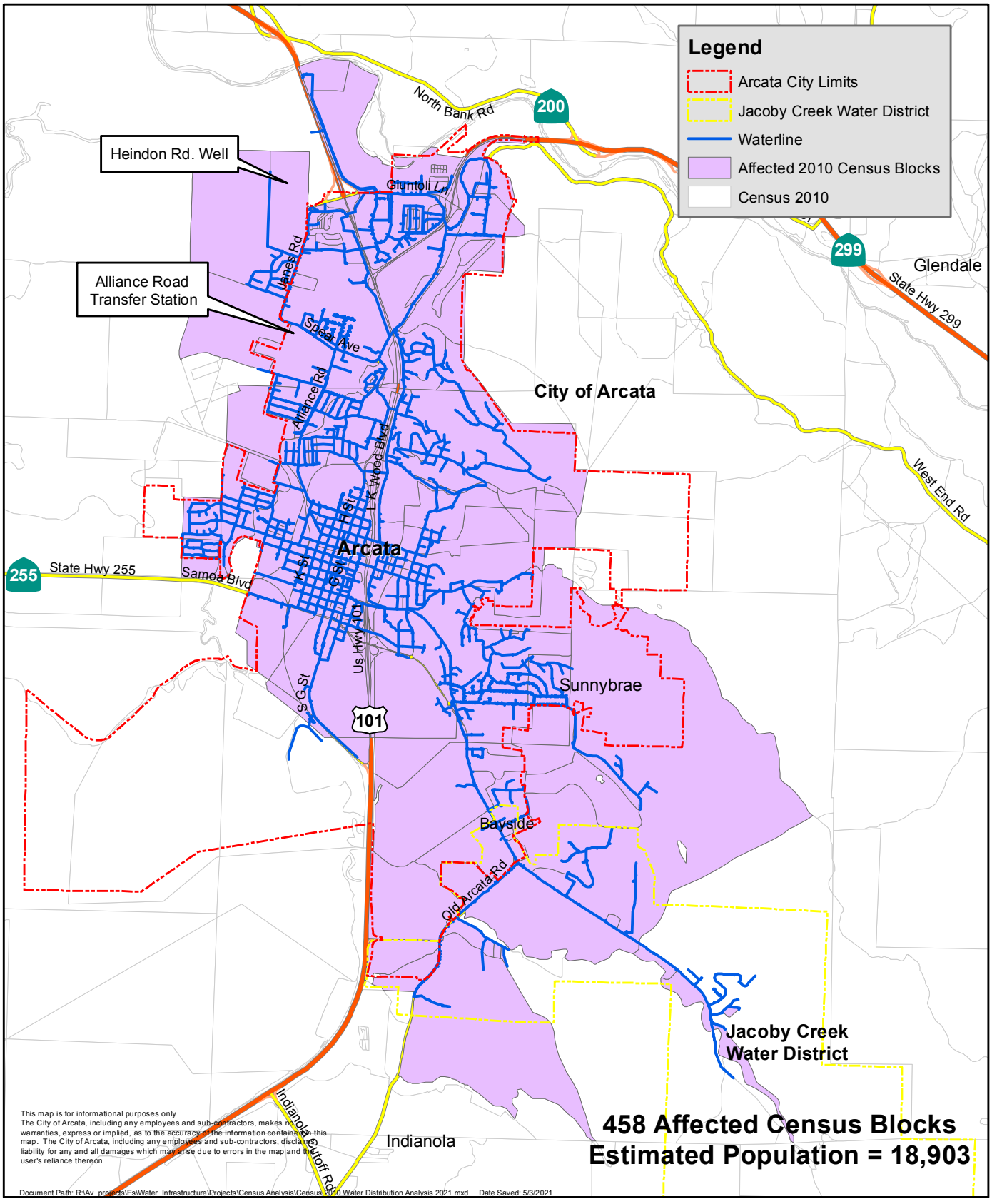
Based on the data presented in the City of Arcata 2020 Urban Water Management Plan the City projects the following demands for potable water from Humboldt Bay Municipal Water District through the year 2045.

	Projected Water Use (Million Gallons)				
Year	2025	2030	2035	2040	2045
Volume	651	685	721	759	800

Scott Sínnott
Environmental Compliance Technician
City of Arcata
736 F Street
Arcata, CA 95521
707-825-2140

Appendix C

General Plan Land Use 2020 Map



City of Arcata
Environmental Services

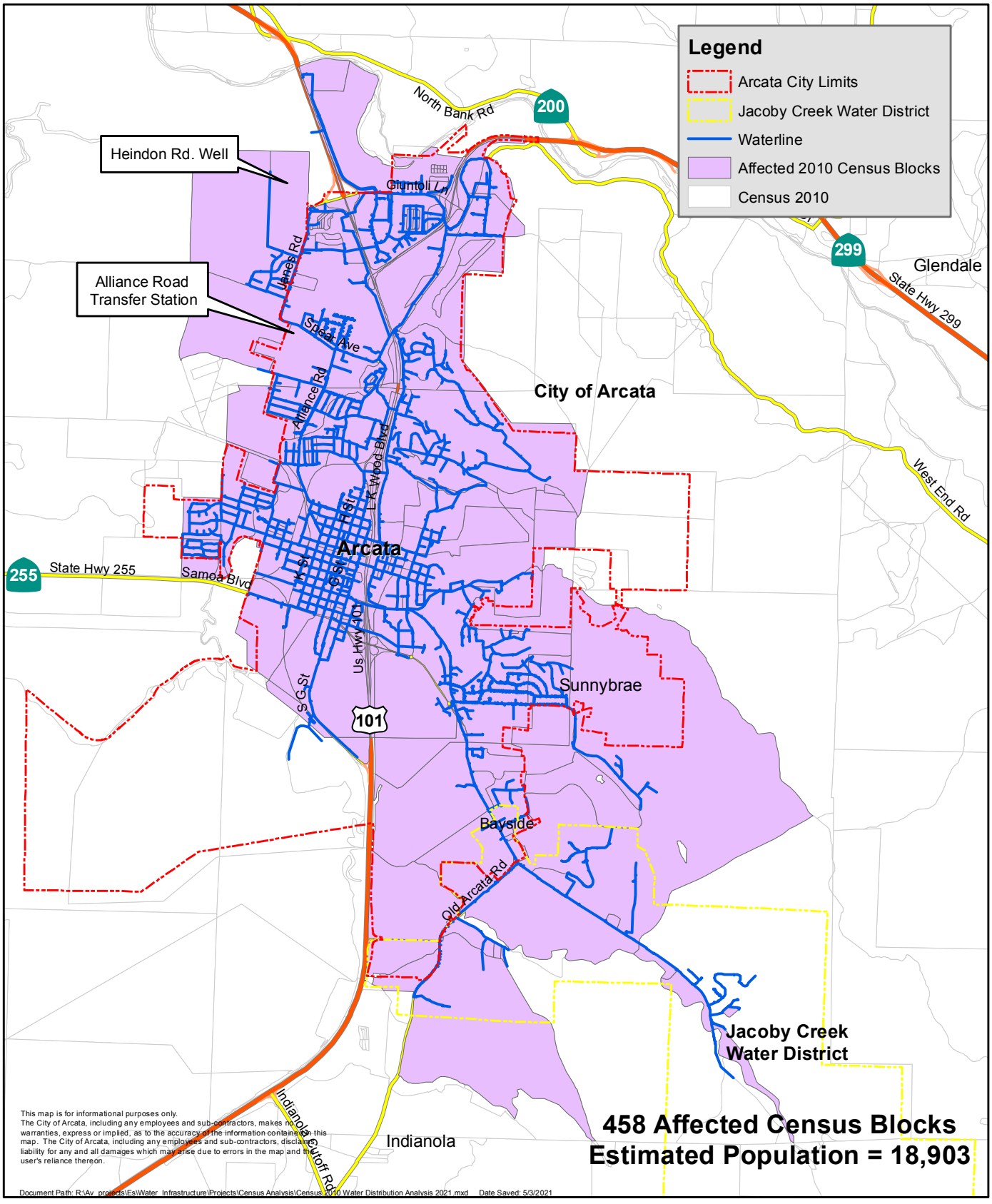
CITY OF ARCATA WATER DISTRIBUTION AREA & AFFECTED 2010 CENSUS BLOCKS

NORTH

0 3,000 Feet

Appendix D

Service Area Boundary Map



City of Arcata
Environmental Services

CITY OF ARCATA WATER DISTRIBUTION AREA & AFFECTED 2010 CENSUS BLOCKS

NORTH

0 3,000 Feet

Appendix E

Population Estimate Discussion

Population estimates for all baseline years, including the 2010 population, were recalculated for the 2015 UWMP due to discrepancies in the method and data used to calculate the population in the previous UWMP, both of which overestimated the Service Area population. The online tool developed by DWR for population estimates and future projections did not provide reliable population data for use in this report because of the mix of urban and rural census blocks in the Service Area and because the Service Area does not match any census designated place. Rather, Service Area population estimates were developed by the City of Arcata GIS Specialist based on 2000 and 2010 U.S. Census Bureau data. The alternate method of population estimate calculation was reviewed and pre-approved for use in the 2015 UWMP on March 30, 2016 by Gwen Huff, DWR. A detailed description of population estimate calculations is included in Appendix E and summarized below.

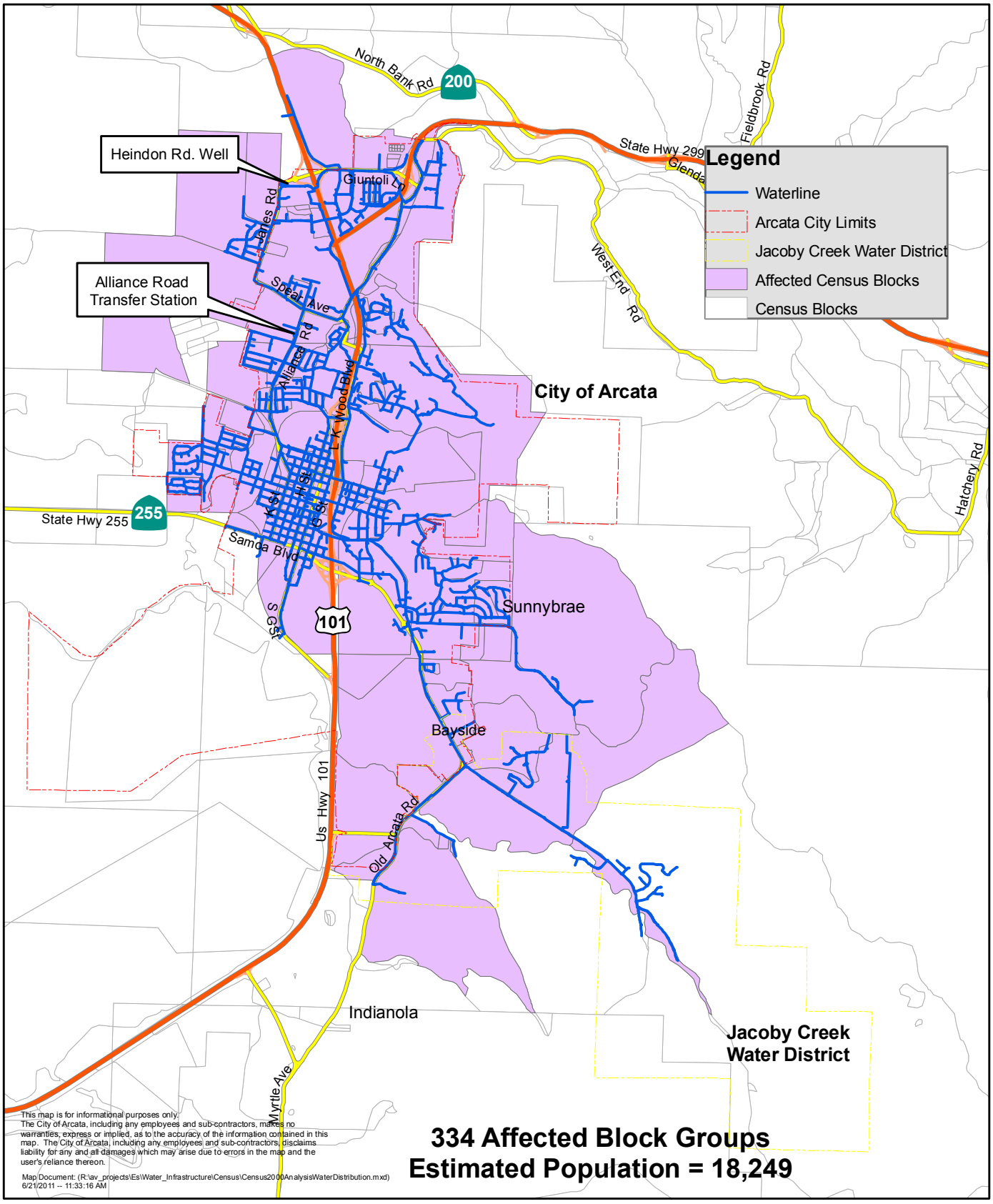
Service Area population estimates for the years 2000 and 2010 were developed by the City with U.S. Census Bureau data as well as with guidance from Methodology 2 described in Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use. The City used GIS to identify all census blocks within or touching the Service Area boundary. Census blocks that were entirely within the Service Area boundary were counted in the population. Census blocks which intersect the Service Area boundary were examined in closer detail. If fifty percent or more of the population in a census block was served by the Service Area, then the population from the census block was added to the Service Area population. If less than fifty percent of the population in the census block was served by the Service Area, the entire population from the census block was excluded from the Service Area population. This methodology resulted in a Service Area population of 18,249 in the year 2000 and a population of 18,903 in 2010 (in the 2010 UWMP these populations were reported as 18,449 and 19,546, respectively).

Population estimates and service records for 2000 and 2010 were used to calculate the average annual change in persons per connection and the average annual change in residential service connections between 2000 and 2010. Population for the remaining baseline years (2001-2009) were subsequently calculated by multiplying the number of residential service connections for a given year by the persons per connection for the same year.

This method and 2010 U.S. Census Bureau block data was used for the 2020 UWMP because 2020 U.S. Census Bureau block data has not been released as of the writing of this report and could not be used to update the Service Area population estimate.

Appendix F
Population Projections

Year	Service Area Population	Number of Service Connections	Persons/ connection	Calculated Growth Rates	Notes
2000	**18,249**	**5,049**	**3.614**		Population derived from 2000 affected census blocks. Number of connections from service & report records. Persons per connection direct calculation.
2001	18,315	5,090	3.598	-0.4418% persons per connection average annual growth rate 2000-2010 0.808% annual average change in number of service connections 2000-2010	Persons/connection derived from the previous year's persons/connection and the average annual growth rate (for persons/connection). Number of connections derived from the previous year's number of connections and the average annual growth rate.
2002	18,382	5,131	3.583		
2003	18,448	5,172	3.567		
2004	18,515	5,214	3.551		
2005	18,582	5,256	3.535		
2006	18,650	5,299	3.520		
2007	18,718	5,342	3.504		
2008	18,785	5,385	3.489		
2009	18,854	5,428	3.473		
2010	**18,930**	**5,474**	**3.458**		Population derived from 2010 affected census blocks. Number of connections from service& report records. Persons per connection direct calculation.
2011	19,010	5,497	3.458		Population derived from actual number of service connections (from service and report records) multiplied by the persons/connection calculated for year 2010.
2012	19,096	5,522	3.458		
2013	19,162	5,541	3.458		
2014	19,193	5,550	3.458		
2015	**19,300**	**5,581**	**3.458**		Population derived from actual number of service connections (from service and report records multiplied by the persons/connection calculated for year 2010.
2016	19,587	5,664	3.458		Population derived from actual number of service connections (from service and report records multiplied by the persons/connection calculated for year 2010.
2017	19,594	5,666	3.458		
2018	19,964	5,773	3.458		
2019	20,116	5,817	3.458		
2020	**20,095**	**5,811**	3.458		
2021	20,258	5,858	3.458	0.81% average annual growth rate of service connections 2015-2020	Number of service connections derived from previous year's number of connections and the average annual growth rate (2015-2020). Population derived from number of service connections multiplied by persons per connection.
2022	20,421	5,905	3.458		
2023	20,586	5,953	3.458		
2024	20,753	6,001	3.458		
2025	**20,920**	**6,049**	3.458		
2026	21,089	6,098	3.458		
2027	21,259	6,148	3.458		
2028	21,431	6,197	3.458		
2029	21,604	6,247	3.458		
2030	**21,779**	**6,298**	3.458		
2031	21,955	6,349	3.458		
2032	22,132	6,400	3.458		
2033	22,311	6,452	3.458		
2034	22,491	6,504	3.458		
2035	**22,673**	**6,556**	3.458		
2036	22,856	6,609	3.458		
2037	23,040	6,663	3.458		
2038	23,226	6,716	3.458		
2039	23,414	6,771	3.458		
2040	**23,603**	**6,825**	3.458		
2041	23,794	6,880	3.458		
2042	23,986	6,936	3.458		
2043	24,180	6,992	3.458		
2044	24,375	7,049	3.458		
2045	**24,572**	**7,105**	3.458		

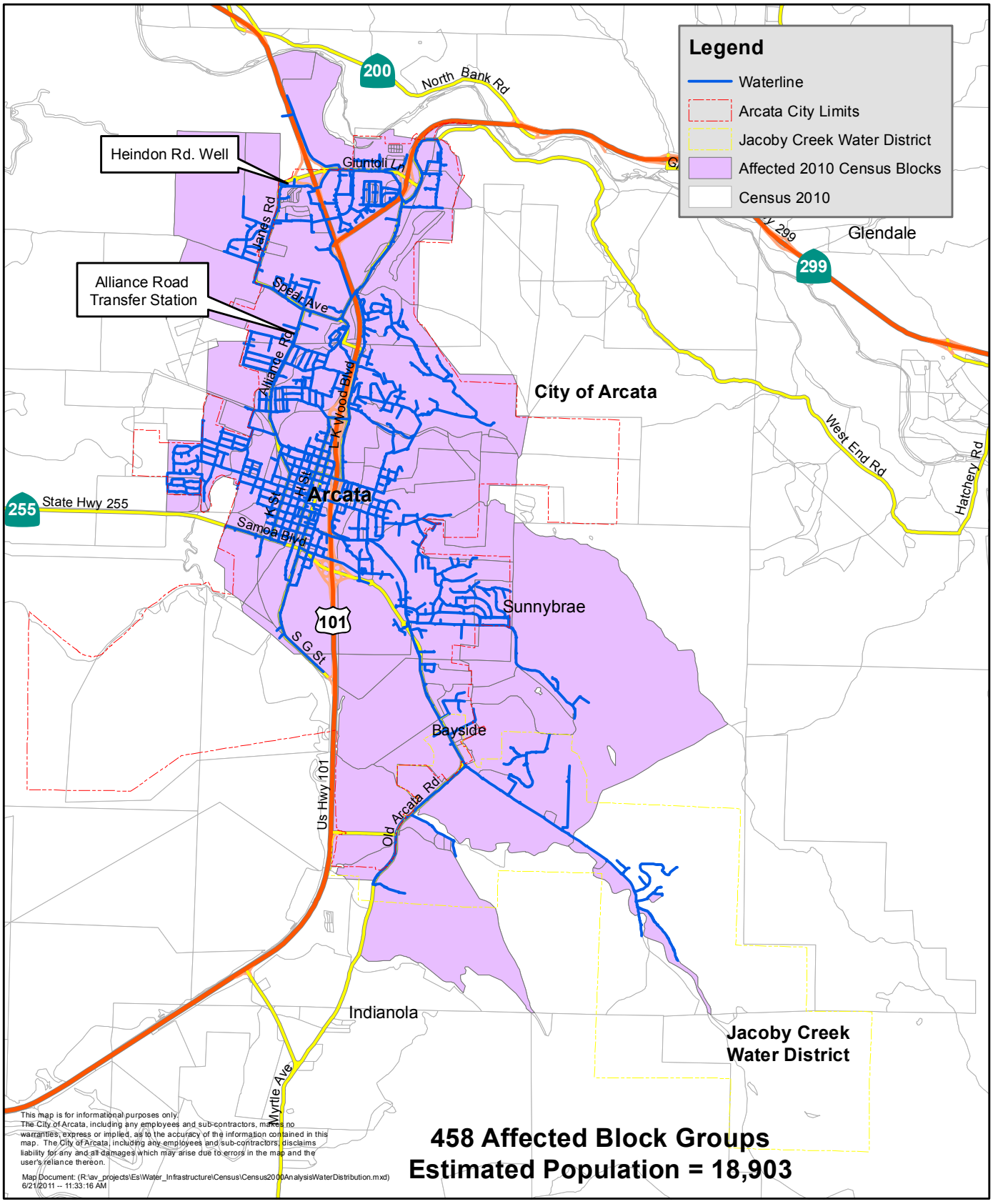


City of Arcata
Environmental Services

CITY OF ARCATA WATER DISTRIBUTION AREA & AFFECTED 2000 CENSUS BLOCKS

NORTH

0 3,000 Feet



City of Arcata
Environmental Services

CITY OF ARCATA WATER DISTRIBUTION AREA & AFFECTED 2010 CENSUS BLOCKS

NORTH

0 3,000 Feet

Appendix G
Water Demand Projections

Sector Use History 2010-2020

2010

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mgallons
Single Family	17.8	21.3	21.8	24.9	34.5	22.2	20.9	18.0	20.0	18.2	20.4	18.5	258.5
Multifamily	9.3	11.2	11.4	13.0	18.1	11.6	11.0	9.4	10.5	9.5	10.7	9.7	135.5
Commercial	6.4	7.6	7.8	8.9	12.3	7.9	7.5	6.4	7.1	6.5	7.3	6.6	92.3
Industrial	1.4	1.6	1.7	1.9	2.6	1.7	1.6	1.4	1.5	1.4	1.6	1.4	19.7
Institutional	1.9	2.2	2.3	2.6	3.6	2.3	2.2	1.9	2.1	1.9	2.1	1.9	27.1

total billed	533.2	
well	131.6	
purchased	591.3	
total into system	723.0	Total Loss
total unaccounted for	189.7	26.20%

2015

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mgallons
Single Family	13.3	16.9	15.2	17.7	17.0	15.8	17.5	11.4	14.0	15.0	14.0	12.3	180.1
Multifamily	10.0	12.6	11.4	13.3	12.7	11.8	13.1	8.5	10.5	11.2	10.5	9.2	134.9
Commercial	8.1	10.3	9.2	10.8	10.4	9.6	10.7	6.9	8.6	9.2	8.5	7.5	109.9
Industrial	1.5	1.9	1.7	2.0	1.9	1.8	1.9	1.3	1.6	1.7	1.6	1.4	20.0
Institutional	4.0	5.1	4.6	5.4	5.1	4.8	5.3	3.5	4.3	4.5	4.2	3.7	54.6

total billed	537.3	
well	2.2	
purchased	660.5	
total into system	662.6	Total Loss
total unaccounted for	125.3	18.90%

2020

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mgallons
Single Family	16.3	18.1	17.0	20.6	18.7	15.9	16.2	14.4	14.9	16.5	13.9	15.0	197.5
Multifamily	7.1	7.9	7.4	9.0	8.2	7.0	7.1	6.3	6.5	7.2	6.1	6.5	86.4
Commercial	5.9	6.5	6.1	7.4	6.7	5.8	5.8	5.2	5.4	6.0	5.0	5.4	71.3
Industrial	1.7	1.9	1.8	2.2	2.0	1.7	1.7	1.5	1.6	1.7	1.5	1.6	20.7
Institutional	2.5	2.8	2.6	3.1	2.9	2.4	2.5	2.2	2.3	2.5	2.1	2.3	30.2

total billed	464.4	
well	0.0	
purchased	615.0	
total into system	615.0	Total Loss
total unaccounted for	150.6	24.5%

Number of Accounts Projected per Sector

Sector	# of Accounts 2010	# of Accounts 2015	# of Accounts 2020	Actual Change in Number of Accounts per Sector (% per year) 2010-2015	Actual Change in Number of Accounts per Sector(% per year) 2015-2020	Actual Change in Number of Accounts per Sector (% per year) 2010-2020	2025	2030	2035	2040	2045
single family	4904	4997	5551	0.4%	2.1%	1.2%	5779	6017	6265	6523	6791
multi-family	570	583	260	0.5%	-16.2%	-7.8%	271	282	293	306	318
commercial	503	571	626	2.5%	1.8%	2.2%	686	751	823	901	987
industrial	62	67	74	1.6%	2.0%	1.8%	82	90	99	110	121
institutional	37	40	44	1.6%	1.9%	1.7%	48	53	58	64	71
Total # of Accounts	6076	6258	6555				6866	7193	7539	7904	8288

For single family and multi-family connections an annual growth rate of 0.81% was used, which is the average annual growth rate of all residential service connections from 2015-2020. For further discussion see **Notes** on the following page.

actual average percent change higlighted in green used for projection calculations

SECTOR USE/ACCOUNT (based on 2020 use)						Demand Projections (based on calculated sector use/account and the anticipated average annual growth rate)				
	# of accounts	Total Volume Used	gallons/ account/ year	Anticipated Average Annual Growth Rate	Basis	2025	2030	2035	2040	2045
single family	5551	255.827	0.0461	0.81%	Average annual growth rate of service connections: 2015-2020	266.4	277.3	288.7	300.6	313.0
multi-family	260	86.411	0.3324	0.81%	Average annual growth rate of service connections: 2015-2020	90.0	93.7	97.5	101.5	105.7
commercial	620	71.273	0.1139	2.2%	Actual Change in Number of Accounts per Sector (% per year) 2010-2020	114.1	121.5	129.7	138.6	148.4
industrial	74	20.733	0.2802	2.0%	Actual Change in Number of Accounts per Sector (% per year) 2015-2020	22.9	25.2	27.9	30.7	33.9
institutional	44	30.171	0.6857	1.9%	Actual Change in Number of Accounts per Sector (% per year) 2015-2020	33.2	36.4	40.0	44.0	48.4
Losses	6555	119.097	0.0182		total number of accounts x loss/account	124.7	130.7	137.0	143.6	150.6

Notes:

For demand projections we opted to use the volume by usage per account and account change calculation for projecting water demand figures.

For single family and multifamily residential connections the growth rate/volume by percentage change is a negative number for nearly all periods analyzed. This is likely due to ongoing changes in the way people use water, conservation efforts, and building and plumbing codes which call for more efficient water use standards. Similar trends hold true for the other sectors, likely for similar reasons.

We used a residential (single and multi-family) growth rate of 0.81%, which is the average annual growth rate of all residential service connections from 2015-2020. This number was used because the way in which multi-family residential accounts were classified was updated between 2015 and 2020. The update skewed the rate of growth for both single family and mulit-family connections, which produced unrealistic estimates of future growth in this area. The number of all residential connections this produces for year 2045 times 3.458 persons/connection is approximately equal to the projected population for 2045.

Economic forcasts for the north coast region (2018-2028 Industry Employment Projections) predict a commercial growth rate of -0.65% to 0.63% for (wholesale + retail trade to wholesale+retail+hospitality). While tourism is an important economic factor the a majority of the water use associated with tourism is likely accounted for in other places (e.g. more commercial restaurants, more home rentals, ect.). Using the Actual Growth Rate of 2.2% calculated for the period of 2010-2020 is a conservative prediction of future growth in this sector (i.e. predicting higher volume use over time).

Economic forcasts for the north coast region (2018-2028 Industry Employment Projections) predict a zero rate of growth (0.0%) for manufacturing. The trend in the City has been a low but steady growth in industry and this is expected to remain steady due to the available industrial parcels, growth in the marijuana industrial zones, ect. The 2.0% Actual Annual Growth Rate for 2015-2020 is likely a high prediction of commercial account growth however, it is likely that new industry will be heavily dependent on water use therefore we want to use a conservative prediction (i.e. predicting higher volume use over time)

Economic forcasts for the northcoast region (2018-2028 Industry Employment Projections) predict an instituational growth rate of 13% for educational service, health care and social assistance. This number disagrees with the actual annual growth rate we are currently experiening (for 2015-2020) likely because most of the growth in this sector has and will occur around the primary health-care center of the region in the nearby city of Eureka. Institutional water use in the city has been extremely high in the past due in part to the expansion of HSU. The 1.9% Growth Rate from 2015-2020 is similar to the growth rates of 1.6% for 2010-2015 and 1.7% for 2010-2020 and is likely a good prediction of the future growth of this sector in Arcata.

Appendix H

2016-2020 Water Audits

AWWA Free Water Audit Software:
Reporting Worksheet

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Arcata (1210001 & 1210021)
Reporting Year: 2016 | 1/2016 - 12/2016

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.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

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

						Pcnt:	Value:	
Volume from own sources:	n/a	0.000	MG/Yr					MG/Yr
Water imported:	5	664.378	MG/Yr	9	-1.00%			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: 671.089 MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	5	520.162	MG/Yr			
Billed unmetered:	n/a	0.000	MG/Yr			
Unbilled metered:	5	12.073	MG/Yr			
Unbilled unmetered:	4	43.109	MG/Yr		43.109	MG/Yr

Unbilled Unmetered volume entered is greater than the recommended default value

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: ? 575.345 MG/Yr

WATER LOSSES (Water Supplied - Authorized Consumption) 95.744 MG/Yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		1.678	MG/Yr	0.25%		MG/Yr

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

Customer metering inaccuracies:	1	5.376	MG/Yr	1.00%	MG/Yr
Systematic data handling errors:		1.300	MG/Yr	0.25%	MG/Yr

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

Apparent Losses: ? 8.354 MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 87.390 MG/Yr

WATER LOSSES: 95.744 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 150.926 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	89.4	miles
Number of active AND inactive service connections:	8	6,373	
Service connection density:		71	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: 2 80.0 psi

COST DATA

Total annual cost of operating water system:	10	$3,028,657	$/Year	
Customer retail unit cost (applied to Apparent Losses):	4	$8.00	$/1000 gallons (US)	
Variable production cost (applied to Real Losses):	9	$1.14	$/Million gallons	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 54 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: Water imported
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.

Water Audit Report for:	City of Arcata (1210001 & 1210021)
Reporting Year:	2016 — 1/2016 - 12/2016
Data Validity Score:	54

Own Sources (Adjusted for known errors)
0.000

Water Imported
671.089

System Input
671.089

Water Exported
0.000

Water Supplied
671.089

Authorized Consumption
575.345

Billed Authorized Consumption
520.162

- **Billed Metered Consumption (water exported is removed)** *520.162*
- **Billed Unmetered Consumption** *0.000*

Unbilled Authorized Consumption
55.182

- **Unbilled Metered Consumption** *12.073*
- **Unbilled Unmetered Consumption** *43.109*

Water Losses
95.744

Apparent Losses
8.354

- **Unauthorized Consumption** *1.678*
- **Customer Metering Inaccuracies** *5.376*
- **Systematic Data Handling Errors** *1.300*

Real Losses
87.390

- **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*

Billed Water Exported

Revenue Water
0.000

Revenue Water
520.162

Non-Revenue Water (NRW)
150.926

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Arcata (1210001 & 1210021)
Reporting Year: 2017 | 1/2017 - 12/2017

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:	n/a	0.000	MG/Yr					MG/Yr
Water imported:	5	670.487	MG/Yr	9	-0.13%			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: 671.360 MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	6	519.071	MG/Yr			
Billed unmetered:	n/a	0.000	MG/Yr			
Unbilled metered:	8	13.042	MG/Yr			
Unbilled unmetered:	4	2.032	MG/Yr		2.032	MG/Yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: 534.145 MG/Yr

WATER LOSSES (Water Supplied - Authorized Consumption) 137.215 MG/Yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:	4	6.964	MG/Yr		6.964	MG/Yr

Unauthorized consumption volume entered is greater than the recommended default value

Customer metering inaccuracies:	4	10.168	MG/Yr	1.88%	MG/Yr
Systematic data handling errors:		1.298	MG/Yr	0.25%	MG/Yr

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

Apparent Losses: 18.429 MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 118.785 MG/Yr

WATER LOSSES: 137.215 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 152.289 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	89.4	miles
Number of active AND inactive service connections:	8	6,408	
Service connection density:		72	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: 2 | 80.0 psi

COST DATA

Total annual cost of operating water system:	10	$2,385,356	$/Year
Customer retail unit cost (applied to Apparent Losses):	4	$6.60	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	9	$526.46	$/Million gallons

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 59 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: Water imported
2: Customer metering inaccuracies
3: Customer retail unit cost (applied to Apparent Losses)

AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.

Water Audit Report for:	City of Arcata (1210001 & 1210021)	
Reporting Year:	2017	1/2/2017 - 12/2017
Data Validity Score:	59	

Own Sources (Adjusted for known errors)
0.000

Water Imported
671.360

System Input
671.360

Water Exported
0.000

Water Supplied
671.360

Authorized Consumption
534.145

Billed Authorized Consumption
519.071

Billed Water Exported
519.071

Billed Metered Consumption (water exported is removed)
519.071

Billed Unmetered Consumption
0.000

Unbilled Authorized Consumption
15.074

Unbilled Metered Consumption
13.042

Unbilled Unmetered Consumption
2.032

Water Losses
137.215

Apparent Losses
18.429

Unauthorized Consumption
6.964

Customer Metering Inaccuracies
10.168

Systematic Data Handling Errors
1.298

Real Losses
118.785

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

Revenue Water
0.000

Revenue Water
519.071

Non-Revenue Water (NRW)
152.289

AWWA Free Water Audit Software:
Reporting Worksheet

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Arcata (1210001)
Reporting Year: 2018 1/2018 - 12/2018

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:	n/a	0.000	MG/Yr						MG/Yr
Water imported:	5	663.600	MG/Yr	1		-0.13%			MG/Yr
Water exported:	1	25.897	MG/Yr	1		-10.00%			MG/Yr

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

WATER SUPPLIED: 635.689 MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	7	461.180	MG/Yr			
Billed unmetered:	n/a	0.000	MG/Yr			
Unbilled metered:	1	12.662	MG/Yr			
Unbilled unmetered:		7.946	MG/Yr	1.25%		MG/Yr

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

AUTHORIZED CONSUMPTION: 481.788 MG/Yr

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

WATER LOSSES (Water Supplied - Authorized Consumption) 153.901 MG/Yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:	4	9.545	MG/Yr		9.545	MG/Yr

Unauthorized consumption volume entered is greater than the recommended default value

Customer metering inaccuracies:	4	9.054	MG/Yr	1.88%		MG/Yr
Systematic data handling errors:		1.153	MG/Yr	0.25%		MG/Yr

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

Apparent Losses: 19.752 MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 134.149 MG/Yr

WATER LOSSES: 153.901 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 174.509 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	84.5	miles
Number of active AND inactive service connections:	8	6,134	
Service connection density:		73	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: 2 80.0 psi

COST DATA

Total annual cost of operating water system:	10	$2,232,658	$/Year	
Customer retail unit cost (applied to Apparent Losses):	4	$7.71	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	9	$1,585.93	$/Million gallons	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 54 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: Water imported
2: Unbilled metered
3: Customer metering inaccuracies

AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.

Water Audit Report for:	City of Arcata (1210001)
Reporting Year:	2018 — 1/2018 - 12/2018
Data Validity Score:	54

		Water Exported 28.774	Billed Water Exported			Revenue Water 28.774
Own Sources (Adjusted for known errors) 0.000	System Input 664.464	Water Supplied 635.689	Authorized Consumption 481.788	Billed Authorized Consumption 461.180	Billed Metered Consumption (water exported is removed) 461.180	Revenue Water 461.180
					Billed Unmetered Consumption 0.000	
				Unbilled Authorized Consumption 20.608	Unbilled Metered Consumption 12.662	Non-Revenue Water (NRW) 174.509
					Unbilled Unmetered Consumption 7.946	
			Water Losses 153.901	Apparent Losses 19.752	Unauthorized Consumption 9.545	
					Customer Metering Inaccuracies 9.054	
					Systematic Data Handling Errors 1.153	
Water Imported 664.464				Real Losses 134.149	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:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: Jacoby Creek Water District (1210021)
Reporting Year: 2018 | 1/2018 - 12/2018

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:	n/a	0.000	MG/Yr						MG/Yr
Water imported:	1	25.897	MG/Yr	1		-10.00%			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: 28.774 MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	7	25.897	MG/Yr			
Billed unmetered:	n/a	0.000	MG/Yr			
Unbilled metered:	n/a	0.000	MG/Yr			
Unbilled unmetered:		0.360	MG/Yr	1.25%		MG/Yr

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

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: 26.257 MG/Yr

WATER LOSSES (Water Supplied - Authorized Consumption) 2.518 MG/Yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:	4	0.509	MG/Yr		0.509	MG/Yr

Unauthorized consumption volume entered is greater than the recommended default value

Customer metering inaccuracies:	4	0.495	MG/Yr	1.88%		MG/Yr
Systematic data handling errors:		0.065	MG/Yr	0.25%		MG/Yr

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

Apparent Losses: 1.069 MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 1.449 MG/Yr

WATER LOSSES: 2.518 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 2.877 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	8.4	miles
Number of active AND inactive service connections:	8	329	
Service connection density:		39	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:	2	80.0	psi

COST DATA

Total annual cost of operating water system:	10	$96,683	$/Year	
Customer retail unit cost (applied to Apparent Losses):	4	$7.71	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	9	$1,585.93	$/Million gallons	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 45 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: Water imported
2: Customer metering inaccuracies
3: Customer retail unit cost (applied to Apparent Losses)

AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.

Water Audit Report for:	Jacoby Creek Water District (1210021)
Reporting Year:	2018 — 1/2018 - 12/2018
Data Validity Score:	45

Own Sources (Adjusted for known errors)
0.000

Water Imported
28.774

System Input
28.774

Water Exported
0.000

Water Supplied
28.774

Authorized Consumption
26.257

Billed Water Exported

Billed Authorized Consumption
25.897

- Billed Metered Consumption (water exported is removed): *25.897*
- Billed Unmetered Consumption: *0.000*

Unbilled Authorized Consumption
0.360

- Unbilled Metered Consumption: *0.000*
- Unbilled Unmetered Consumption: *0.360*

Water Losses
2.518

Apparent Losses
1.069

- Unauthorized Consumption: *0.509*
- Customer Metering Inaccuracies: *0.495*
- Systematic Data Handling Errors: *0.065*

Real Losses
1.449

- 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*

Revenue Water
0.000

Revenue Water
25.897

Non-Revenue Water (NRW)
2.877

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
\+ Click to add a comment

Water Audit Report for: City of Arcata (1210001)
Reporting Year: 2019 1/1/2019 - 12/2019

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' ---------->

WATER SUPPLIED

	Grading	Volume		Master Meter and Supply Error Adjustments Pcnt:	Value:	
Volume from own sources:	n/a	0.000	MG/Yr			MG/Yr
Water imported:	5	621.092	MG/Yr	-0.13%		MG/Yr
Water exported:	1	23.735	MG/Yr			MG/Yr

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

WATER SUPPLIED: **598.166** MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

	Grading	Volume		Pcnt:	Value:	
Billed metered:	7	463.614	MG/Yr			
Billed unmetered:	n/a	0.000	MG/Yr			
Unbilled metered:	1	13.388	MG/Yr			
Unbilled unmetered:		7.477	MG/Yr	1.25%		MG/Yr

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

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

AUTHORIZED CONSUMPTION: **484.479** MG/Yr

WATER LOSSES (Water Supplied - Authorized Consumption) **113.687** MG/Yr

Apparent Losses

	Grading	Volume		Pcnt:	Value:	
Unauthorized consumption:	4	12.319	MG/Yr		12.319	MG/Yr
Customer metering inaccuracies:	4	6.038	MG/Yr	1.25%		MG/Yr
Systematic data handling errors:		1.159	MG/Yr	0.25%		MG/Yr

Unauthorized consumption volume entered is greater than the recommended default value

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

Apparent Losses: **19.516** MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **94.171** MG/Yr

WATER LOSSES: **113.687** MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: **134.552** MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

	Grading	Value	
Length of mains:	9	84.8	miles
Number of active AND inactive service connections:	8	6,221	
Service connection density:		73	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: 3 64.0 psi

COST DATA

	Grading	Value	
Total annual cost of operating water system:	10	$2,717,800	$/Year
Customer retail unit cost (applied to Apparent Losses):	4	$8.20	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	9	$2,166.18	$/Million gallons

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 55 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: Water imported
2: Unbilled metered
3: Customer metering inaccuracies

AWWA Free Water Audit Software: Water Balance

Water Audit Report for:	City of Arcata (1210001)	
Reporting Year:	2019	1/2019 - 12/2019
Data Validity Score:	55	

<table>
<tr><td rowspan="8">Own Sources
(Adjusted for known errors)
0.000</td><td rowspan="8">System Input
621.901</td><td rowspan="8">Water Supplied
598.166</td><td>Water Exported
23.735</td><td colspan="2">Billed Water Exported</td><td>Revenue Water
23.735</td></tr>
<tr><td rowspan="7"></td><td rowspan="3">Authorized Consumption
484.479</td><td rowspan="2">Billed Authorized Consumption
463.614</td><td>Billed Metered Consumption (water exported is removed)
463.614</td><td rowspan="2">Revenue Water
463.614</td></tr>
<tr><td>Billed Unmetered Consumption
0.000</td></tr>
<tr><td>Unbilled Authorized Consumption
20.866</td><td>Unbilled Metered Consumption
13.388</td><td rowspan="3">Non-Revenue Water (NRW)
134.552</td></tr>
<tr><td rowspan="4">Water Losses
113.687</td><td rowspan="3">Apparent Losses
19.516</td><td>Unbilled Unmetered Consumption
7.477</td></tr>
<tr><td>Unauthorized Consumption
12.319</td></tr>
<tr><td>Customer Metering Inaccuracies
6.038</td></tr>
<tr><td rowspan="2">Water Imported
621.901</td><td>Systematic Data Handling Errors
1.159</td></tr>
<tr><td rowspan="3">Real Losses
94.171</td><td>Leakage on Transmission and/or Distribution Mains
Not broken down</td></tr>
<tr><td>Leakage and Overflows at Utility's Storage Tanks
Not broken down</td></tr>
<tr><td>Leakage on Service Connections
Not broken down</td></tr>
</table>

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
\+ Click to add a comment

Water Audit Report for: Jacoby Creek Water District (1210021)
Reporting Year: 2019 | 1/2019 - 12/2019

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.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

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

				Pcnt:		Value:	
Volume from own sources:	n/a	0.000	MG/Yr				MG/Yr
Water imported:	1	21.362	MG/Yr	-10.00%			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: 23.735 MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	7	21.361748	MG/Yr		
Billed unmetered:	n/a	0.000	MG/Yr		
Unbilled metered:	n/a	0.000	MG/Yr		
Unbilled unmetered:		0.297	MG/Yr	1.25%	MG/Yr

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

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

AUTHORIZED CONSUMPTION: 21.658 MG/Yr

WATER LOSSES (Water Supplied - Authorized Consumption) 2.077 MG/Yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:	4	0.838		0.838	MG/Yr

Unauthorized consumption volume entered is greater than the recommended default value

Customer metering inaccuracies:	4	0.270	MG/Yr	1.25%	MG/Yr
Systematic data handling errors:		0.053	MG/Yr	0.25%	MG/Yr

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

Apparent Losses: 1.162 MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 0.915 MG/Yr

WATER LOSSES: 2.077 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 2.374 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	8.4	miles
Number of active AND inactive service connections:	8	330	
Service connection density:		39	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: 2 | 80.0 psi

COST DATA

Total annual cost of operating water system:	10	$107,943	$/Year
Customer retail unit cost (applied to Apparent Losses):	4	$8.20	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	9	$86.03	$/Million gallons

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 45 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: Water imported
2: Customer metering inaccuracies
3: Customer retail unit cost (applied to Apparent Losses)

AWWA Free Water Audit Software: Water Balance

Water Audit Report for:	**Jacoby Creek Water District (1210021)**
Reporting Year:	**2019** **1/2019 - 12/2019**
Data Validity Score:	**45**

Water Exported
0.000

Billed Water Exported

Revenue Water
0.000

Own Sources
(Adjusted for known errors)
0.000

Water Imported
23.735

System Input
23.735

Water Supplied
23.735

Authorized Consumption
21.658

Billed Authorized Consumption
21.362

Billed Metered Consumption (water exported is removed)
21.362

Billed Unmetered Consumption
0.000

Revenue Water
21.362

Unbilled Authorized Consumption
0.297

Unbilled Metered Consumption
0.000

Unbilled Unmetered Consumption
0.297

Non-Revenue Water (NRW)
2.374

Water Losses
2.077

Apparent Losses
1.162

Unauthorized Consumption
0.838

Customer Metering Inaccuracies
0.270

Systematic Data Handling Errors
0.053

Real Losses
0.915

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: Worksheet

FWAS v6.0

Water Audit Report for: City of Arcata
Audit Year: 2020 | Jan 01 2020 - Dec 31 2020 | Calendar

Click 'n' to add notes
Click 'g' to determine data validity grade

To edit water system info: go to start page

To access definitions, click the input name

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

Water Supplied Error Adjustments

WATER SUPPLIED

choose entry option:

VOS	Volume from Own Sources:	n	g	n/a	0.000	MG/Yr						VOSEA
WI	Water Imported:	n	g	4	615.000	MG/Yr	n	g	3	0.13%	percent	under-registration WIEA
WE	Water Exported:	n	g	1	21.547	MG/Yr	n	g	3	10.00%	percent	under-registration WEEA
	WATER SUPPLIED:				591.859	MG/Yr						

AUTHORIZED CONSUMPTION

choose entry option:

BMAC	Billed Metered:	n	g	5	464.441	MG/Yr		
BUAC	Billed Unmetered:	n	g	n/a	0.000	MG/Yr		
UMAC	Unbilled Metered:	n	g	10	7.161	MG/Yr		
UUAC	Unbilled Unmetered:	n	g	3	1.161	MG/Yr	0.25%	default

Default option selected for Unbilled Unmetered, with automatic data grading of 3

AUTHORIZED CONSUMPTION: 472.763 MG/Yr

WATER LOSSES 119.097 MG/Yr

Apparent Losses

Default option selected for Systematic Data Handling Errors, with automatic data grading of 3

choose entry option:

SDHE	Systematic Data Handling Errors:	n	g	3	1.161	MG/Yr	0.25%	default		
CMI	Customer Metering Inaccuracies:	n	g	7	10.264	MG/Yr	2.13%	percent		under-registration
UC	Unauthorized Consumption:	n	g	6	4.219	MG/Yr		custom	4.219 MG/Yr	

Apparent Losses: 15.643 MG/Yr

Real Losses

Real Losses: 103.454 MG/Yr

WATER LOSSES: 119.097 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 127.419 MG/Yr

SYSTEM DATA

Lm	Length of mains:	n	g	10	85.5	miles	(including fire hydrant lead lengths)
Nc	Number of service connections:	n	g	5	6,224		(active *and* inactive)
	Service connection density:				73	conn./mile main	
	Are customer meters typically located at the curbstop/property line?				Yes		
Lp		n	g	10			

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

AOP	Average Operating Pressure:	n	g	6	61.0	psi	

COST DATA

CRUC	Customer Retail Unit Charge:	n	g	5	$6.37	$/100 cubic feet (ccf)	Total Annual Operating Cost	
VPC	Variable Production Cost:	n	g	8	$2,316.97	$/Million gallons	$2,972,305	$/yr (optional input)

WATER AUDIT DATA VALIDITY TIER:

***** The Water Audit Data Validity Score is in Tier III (51-70). See Dashboard tab for additional outputs. *****

go to dashboard

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

PRIORITY AREAS FOR ATTENTION TO IMPROVE DATA VALIDITY:

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

1: Water Imported (WI)
2: Billed Metered (BMAC)
3: Number of Service Connections (Nc)

KEY PERFORMANCE INDICATOR TARGETS:

OPTIONAL: If targets exist for the operational performance indicators, they can be input below:

Unit Total Losses:		gal/conn/day
Unit Apparent Losses:		gal/conn/day
Unit Real Losses[A]:		gal/conn/day
Unit Real Losses[B]:		gal/mile/day

If entered above by user, targets will display on KPI gauges (see Dashboard)

AWWA Free Water Audit Software
Water Balance

FWAS v6.0

Water Audit Report for: City of Arcata
Audit Year: 2020 — Jan 01 2020 - Dec 31 2020
Data Validity Tier: Tier III (51-70)

		Water Exported (WE) (corrected for known errors) *23.941*	Billed Water Exported			Revenue Water (Exported) *23.941*
Volume from Own Sources (VOS) (corrected for known errors) *0.000*	System Input Volume *615.801*	Water Supplied *591.859*	Authorized Consumption *472.763*	Billed Authorized Consumption *464.441*	Billed Metered Consumption (BMAC) (water exported is removed) *464.441*	Revenue Water *464.441*
					Billed Unmetered Consumption (BUAC) *0.000*	
				Unbilled Authorized Consumption *8.322*	Unbilled Metered Consumption (UMAC) *7.161*	Non-Revenue Water (NRW) *127.419*
					Unbilled Unmetered Consumption (UUAC) *1.161*	
			Water Losses *119.097*	Apparent Losses *15.643*	Systematic Data Handling Errors (SDHE) *1.161*	
					Customer Metering Inaccuracies (CMI) *10.264*	
					Unauthorized Consumption (UC) *4.219*	
Water Imported (WI) (corrected for known errors) *615.801*				Real Losses *103.454*	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*	

Appendix I

SBX 7-7 Submittal Tables

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP*
Million Gallons
**The unit of measure must be consistent throughout the UWMP.*

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population	
☐	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review
NOTES: Method for population estimate described in detail in the City of Arcata 2020 Urban Water Management Plan, Appendix E.	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	20,095

SB X7-7 Table 4: 2020 Gross Water Use							
		2020 Deductions					
Compliance Year 2020	2020 Volume Into Distribution System	Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water	Water Delivered for Agricultural Use	Process Water	2020 Gross Water Use
	614			-		-	**614**

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Humboldt Bay Municipal Water District-Alliance
This water source is *(check one)*:	
☐	The supplier's own water source
☑	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System	Meter Error Adjustment *Optional (+/-)*	Corrected Volume Entering Distribution System
	607	-	607

Name of Source	Wymore Intertie
This water source is *(check one)*:	
☐	The supplier's own water source
☑	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System	Meter Error Adjustment *Optional (+/-)*	Corrected Volume Entering Distribution System
	7		7

NOTES: Wymore intertie serves as a connection to HBMWD, via the McKinleville Services District, and was installed in 2014. It is used as an alternate means of getting water into the system if there is an emergency or loss of other connections with HBMWD. A 5/8-inch metered bypass was installed around the main shut-off valve to allow the water to turn over and maintain a chlorine residual.

Name of Source	Humboldt Bay Municipal Water District- Aldergrove
This water source is *(check one)*:	
☐	The supplier's own water source
☑	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System	Meter Error Adjustment *Optional (+/-)*	Corrected Volume Entering Distribution System
	0		0

NOTES: The Volume Entering Distribution System at Aldergrove was 0.07 MG in 2020. This volume displays as 0 MG due to cell formatting.

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water	**2020 Population**	**2020 GPCD**
614	20,095	**84**

SB X7-7 Table 9: 2020 Compliance							
Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD Enter "0" if Adjustment Not Used			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
84	-	-	-	-	84	113	**YES**

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

Appendix J

2020 Humboldt Bay Municipal Water District Water Shortage Contingency Plan

8 Water Shortage Contingency Planning

8.1 Plan Overview and Coordination

8.1.1 Overview

HBMWD is a regional water wholesaler and is capable of delivering both potable water (through its Domestic Water System) and untreated surface water (through its Industrial Water System).

The District delivers potable water to seven municipalities via its Domestic Water System, who in turn serve the residents, businesses, and industries in the greater Humboldt Bay region. The seven municipalities include the City of Arcata, City of Blue Lake, City of Eureka, Fieldbrook-Glendale CSD, Humboldt CSD, Manila CSD, and McKinleyville CSD. Retail water service is provided to approximately 200 customers who are generally located closer to the District's transmission system than to any other municipal water service. The District's Domestic Water System is capable of supplying approximately 20 million gallons per day (MGD) of treated drinking water. Current production of treated drinking water for municipal purposes averages approximately 10 MGD. This municipal use includes residential, commercial, industrial, and agricultural uses of the water. Per capita water use rates in this region are low and likely benefit greatly from the moderate climate and abundant rainfall, as needs for agriculture and landscaping are often met with rainfall rather than municipal water.

The District's Industrial Water System is separate and distinct from its Domestic Water System and has been used for supplying untreated surface water to industrial customers. This Industrial Water System is capable of supplying 60 MGD of untreated water. The District has delivered untreated water to two large industrial customers (pulp mills) for the majority of the time since the 1960s. However, one of the pulp mills closed in the 1990s, and the remaining pulp mill ceased operation in 2009. With no existing industrial customers, the District has the capability of supporting future water supply needs, which they are currently exploring.

Wholesale water is provided to the District's customers under long-term contracts. These contracts specifically assert the District's right, in accordance with the California Water Code, to suspend the water delivery requirements of the contracts if the District's Board declares that an actual or potential water shortage exists, or if all wholesale customers and the District mutually agree to implement the Water Shortage Contingency Plan (plan). During the 1976-77 drought, which was the only declared water emergency in the history of the District, it was the policy and practice of the District to set maximum use targets for its wholesale municipal customers, allowing them to choose how to meet those targets. Since the wholesale industrial customers could not operate effectively at significantly reduced water consumption levels, they were required to repair leaks and increase the efficiency of their water use. A reservoir capacity was set at which all deliveries to the industrial customers would cease. Fortunately, capacity did not fall to that level. The current plan operates on these principles. The municipalities retain responsibility for control of allotments provided under the provisions of the plan. Any potential wholesale industrial customers will face the reductions outlined in each action stage, and the District's approximately 200 retail customers will be treated in accordance with the action stages of the plan.

The water that HBMWD provides to its customers, both domestic and industrial, ultimately comes from the Ruth Lake Reservoir and the Mad River watershed located below R.W. Matthews Dam at Ruth. The reservoir was designed for a safe yield of 75 MGD per year, using the 1923-24 drought of record. A copy of the applicable sections of the original Bechtel design report is included as Appendix

J. To calculate the safe yield of the reservoir, the Bechtel Study used the "Mad River runoff during the period October 1922 to September 1954...using available short term flow records at the Forest Glen and Arcata gaging stations, supplemented by the long-term records for the Eel River at the Scotia gaging Station." After the 1976-77 drought, which was the only declared water emergency in the history of the District, the safe yield value of 75 MGD came into question and Winzler & Kelly re-evaluated the safe yield of the reservoir based on the '76-'77 drought data. That study came up with a safe yield of 67 MGD of the reservoir. That study was also hampered by the lack of accurate inflow data from above Ruth Lake. The recent drought (2012-2016) caused the District to revisit this safe yield value as further detailed in Section 8.2.

8.1.2 Coordination

Coordination in implementing this Water Shortage Contingency Plan is assured through the activation of the Water Task Force. The first task force was formed in 1977. This task force is convened as necessary to address drought conditions or other significant events which could result in a water supply shortfall. The Task Force is comprised of representatives of the District and each of its wholesale customers. The Water Tack Force's responsibilities include:

1. Review the status of the water supply and forecasts.
2. Recommend specific actions in accordance with this plan and each entity's own water shortage plan.
3. Assure that priority of allocations meets legal requirements of consistency and non-discrimination.
4. Coordinate media releases and public announcements.
5. Coordinate interaction with regulatory agencies such as the California Department of Water Resources, Fish and Wildlife, and California Department of Public Health.
6. Review and make recommendations about requests for waivers from, or exceptions to, actions taken pursuant to this plan.

8.2 Safe Reservoir Yield During a Drought

A Rippl mass diagram can be used to plot the cumulative inflow to the reservoir against time for the drought of record to assist in determining safe yield from the reservoir during an extended drought. The inflow and resulting cumulative storage volume can then be compared to the cumulative storage required for various draft (demand) rates to establish a maximum, constant draft rate that could be achieved over the course of the drought planning period (in this case, five consecutive years of drought).

The development of a Rippl mass diagram for this analysis incorporates the following assumptions:

- The reservoir begins full with 48,030 acre-ft of water on May 17 (based on the drought of record, the time period from May 1976 to November 1977);
- Inflow to the reservoir during the drought of record can be repeated multiple times to extend the 1-year drought to a 5-year planning period;
- The total inflow to the reservoir can be estimated by scaling the inflow at the Zenia Bridge gauge station by a factor equal to the ratio of watershed area contributing to the gauge station site to the watershed area contributing to the reservoir spillway (1.2 or 121 mi^2/93.8 mi^2);

- Evaporative losses can be estimated based on reservoir levels during the drought of record;
- Demand is taken directly from the reservoir (i.e. there are no contributing flows downstream of the reservoir).

The drought of record storage was determined using Equation 1.

$$S_i = S_{i-1} + I \qquad \text{(EQ-1)}$$

where:
S_i = Storage (MG)
i_{1-730} = Time Step (day)
I = Net Inflow (MG)

$$where: I = \left(I_{zenia} * \left(\frac{121mi^2}{93.8mi^2}\right) - Evap\right)$$

Cumulative storage required for draft rates were determined using Equation 2.

$$S_i = S_{i-1} + D \qquad \text{(EQ-2)}$$

where:
S_i = Storage (MG)
i_{1-730} = Time Step (day)
D = Demand (MG)

A maximum allowable constant draft rate of 35.5 MGD over the five-year planning period was calculated based on the drought of record inflow (see Figure 6).

The Rippl diagram shows that a maximum constant draft rate of 35.5 MGD could be achieved (reservoir would never be empty) based on the mass budget during the drought of record. This was determined based on the assumption that the inflow to the reservoir and evaporation volumes from the drought of record could be repeated to achieve a 5-year planning cycle. Inflow for the second through fifth years may overestimate the actual inflow that would occur in this period of the drought. Inflow during the second year of drought may be lower than the first year due to decreased runoff/increased soil uptake over the course of the previous year, and the case could be similar for the subsequent years of the drought. However, this overestimation is likely more than offset by the very conservative assumption that the demand is taken directly from the reservoir with no contribution from the watershed below Ruth Lake.

The maximum constant cumulative draft volume comes within approximately 278 MG of cumulative storage volume in February of the fifth drought year. At this point, approximately 8 days of storage remains at the maximum constant draft rate. This storage volume likely falls below the desired planning volume, and in actuality, conservation measures likely would have been implemented to reduce the constant draft and increase storage.

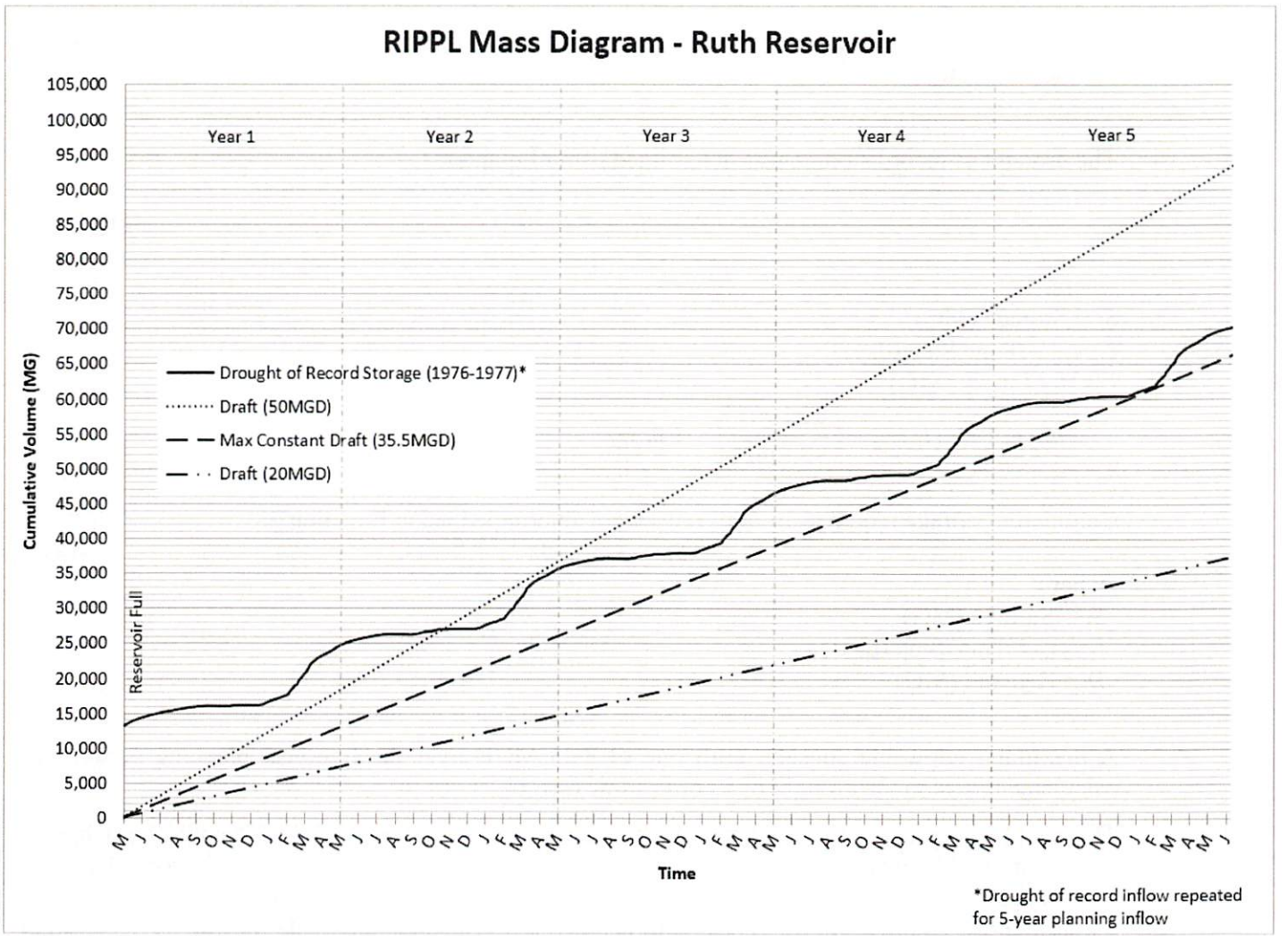


Figure 6. Rippl Mass Diagram

8.3 Stages of Action

There are five defined drought action stages (see Table 8-2). These stages correspond to standardized water shortage levels (up to 10, 20, 30, 40, and 50 percent shortages, and greater than 50 percent shortage). The cross-reference relating the five drought action stages and standardized shortage levels is depicted graphically in Figure 7 – Figure 10. The stages and corresponding reservoir shortage levels vary on a seasonal basis as a result of water use and supply also typically varying on a seasonal basis. These stages may be implemented with or without a formal declaration of a water emergency by the District's Board of Directors. In the event circumstances merit or require a declaration of a water shortage emergency, it is the intent of the District to rely on this plan to provide the primary framework to deal with such an emergency. The triggers attached to each stage are not intended to be absolute. Circumstances not currently foreseeable may dictate moving to a higher action stage before the trigger levels for that stage are reached. Conversely, action stage implementation may be postponed or suspended if there is sufficient natural flow in the river to meet downstream needs. Action stages will be terminated, in consultation with the Water Task Force, as rain, runoff, and lake levels permit.

8.3.1 Stages and Conditions

An analysis was performed to develop reservoir operating curves and establish "action stages" or "trigger levels" that prompt various responses, dependent upon reservoir levels at various times of the year. The analysis established five drought action stages and associated maximum draft rates in the form of an Operating Curve (Figure-Figure 5). This Operating Curve outlines the specific water supply conditions that are applicable to each stage. Stage implementation will occur as a result of the reservoir level at a given time of year, as shown in Figure-Figure 5. For example, if the reservoir storage level was at 25,000 acre-feet in November (up to 50% reservoir shortage), Stage 2 would be implemented.

Portions of water demand that need to be included when considering draft from the reservoir include domestic use, industrial use, and instream flow dedications. The municipalities that HBMWD serves currently use an average of approximately 10 MGD of District water. There are currently no industrial customers; however, there is potential for industrial customers in the future. There is also a minimum of 5 cfs that is to be released from the dam for fish flows. The District's Habitat Conservation Plan and Water Rights permit also establish fish flows that must always be present in the river (see Table 8-1).

Table 8-1: Mad River Flow Requirements for Fish

Period	Flow at Hwy 299 Bridge (cfs)
October 1 – October 15	30
October 16 – October 31	50
November 1 – June 30	75
July 1 – July 31	50
August 1 – August 31	40
September 1 – September 30	30

The flow values given in Table 8-1 are the flows that need to be measured at the Highway 299 bridge near the District's operation facilities at Essex, and they do not necessarily reflect flows that need to be released from the reservoir, as there are contributing flows to the Mad River below the reservoir. Furthermore, flows at the Highway 299 bridge are permitted to be as low as the "natural flow" calculation if that value is lower than those given in Table 8-1. The District will always maintain the minimum of 5 cfs as required, and has historically endeavored to meet the minimum flows as established in Table 8-1 to support healthy fish life. However, it is likely that in the event of a longer-term drought and during periods of the higher conservation Stages being enacted, the District may resort to the natural flow requirement and reduce discharges accordingly.

For the purpose of determining trigger responses, the following assumptions were made:

- The District is operating both its domestic and industrial systems.
- A domestic water delivery of 10 MGD and an industrial water delivery of 40 MGD were used. Although the industrial water system is not currently in use, this assumption accounts for the potential for future industrial water demand. It should also be noted, however, that the Operating Curve is based on total flow released from the reservoir (e.g. in Stage 2, 50 MGD can be released), and this flow can be apportioned based on domestic and industrial water consumption at that point in time.
- Because instream flow dedication requirements vary throughout the year, and can vary depending upon natural flow conditions, these flows were not included. However, flows released from the dam during the various action stages are generally above the flows that are required per Table 8-1.

Table 8-2: Drought Triggers Action Table

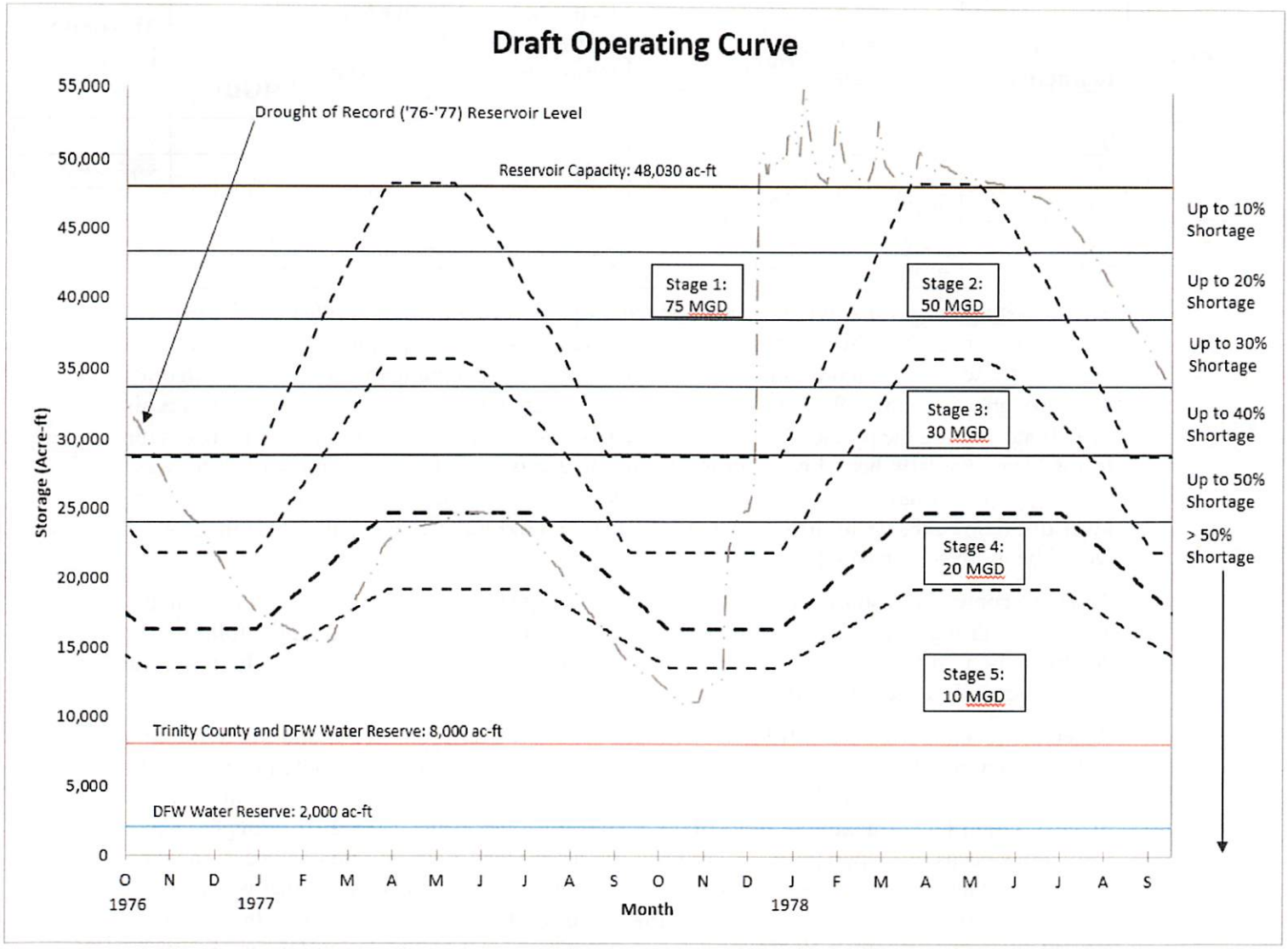
Stage	Domestic Reduction	Industrial Reduction	Total Percent Supply Reduction	Delivered Water (Municipal, MGD)	Delivered Water (Industrial, MGD)	Total Delivered (MGD)	Maximum Draft (MGD)
1	0%	0%	0%	10	40	50	75
2	5%	5%	5%	9.5	38	47.5	50
3	10%	50%	42%	9	20	29	30
4	20%	70%	60%	8	12	20	20
5	30%	95%	82%	7	2	9	10

The operating curves that were established (Figure 10) give maximum draft rates for each of the five different drought action stages. The conservation action boundaries were developed based on these maximum draft rates, the amount of storage remaining over time at a given draft rate, drought of record (1976-1977) inflow, typical evaporation losses, and common reservoir level trends during the period of record (1969-2020). Throughout the period of record, reservoir levels have generally been lowest from October to January, and highest from March to May. The trigger levels have been established to account for these seasonal variations (e.g. a storage level of 30,000 AF, up to 40% reservoir shortage, would be in Stage 1 in November, but it would be in Stage 3 in May).

To give a context of historical trends of Ruth Lake storage levels, the reservoir levels during the 1976-1977 drought are also shown on Figure. The storage during the drought follows the general pattern of the operating curves that have been generated. During the drought, reservoir storage never dropped below 10,800 AF.

Reservoir levels during the 2012-2016 drought are shown on Figure 8, 9, and 10. While the 2012-2016 drought was significant for the State of California, it should be noted that the Ruth Reservoir filled every year during this most recent drought. The reservoir level remained in the Stage 1 action level (maximum draft of 75 MGD) for most of the 2012-2016 drought. There were a few occasions when the reservoir level triggered Stage 2 action, and one occasion when the reservoir level triggered Stage 3 action. The highest drought trigger stage that was reached from 2012-2016 was Stage 3 (maximum draft of 30 MGD, which is well below the District's current average draft rate of 10 MGD). This occurred for a brief period during January-February of 2014, and the reservoir was filled by the end of February 2014.

Figure 7: Ruth Lake operating curves



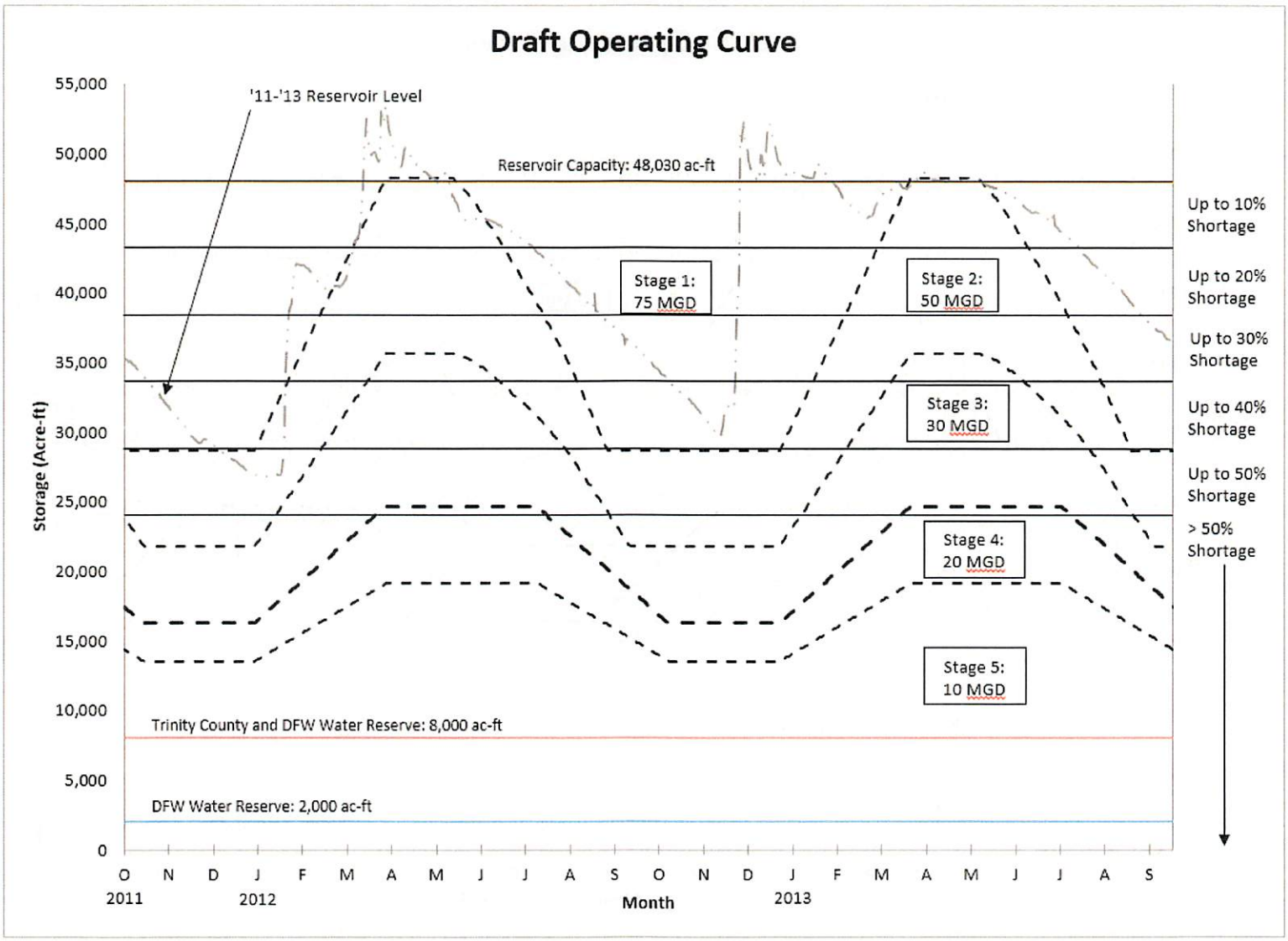


Figure 8: Ruth Lake operating curves with 2011-2013 Reservoir Levels

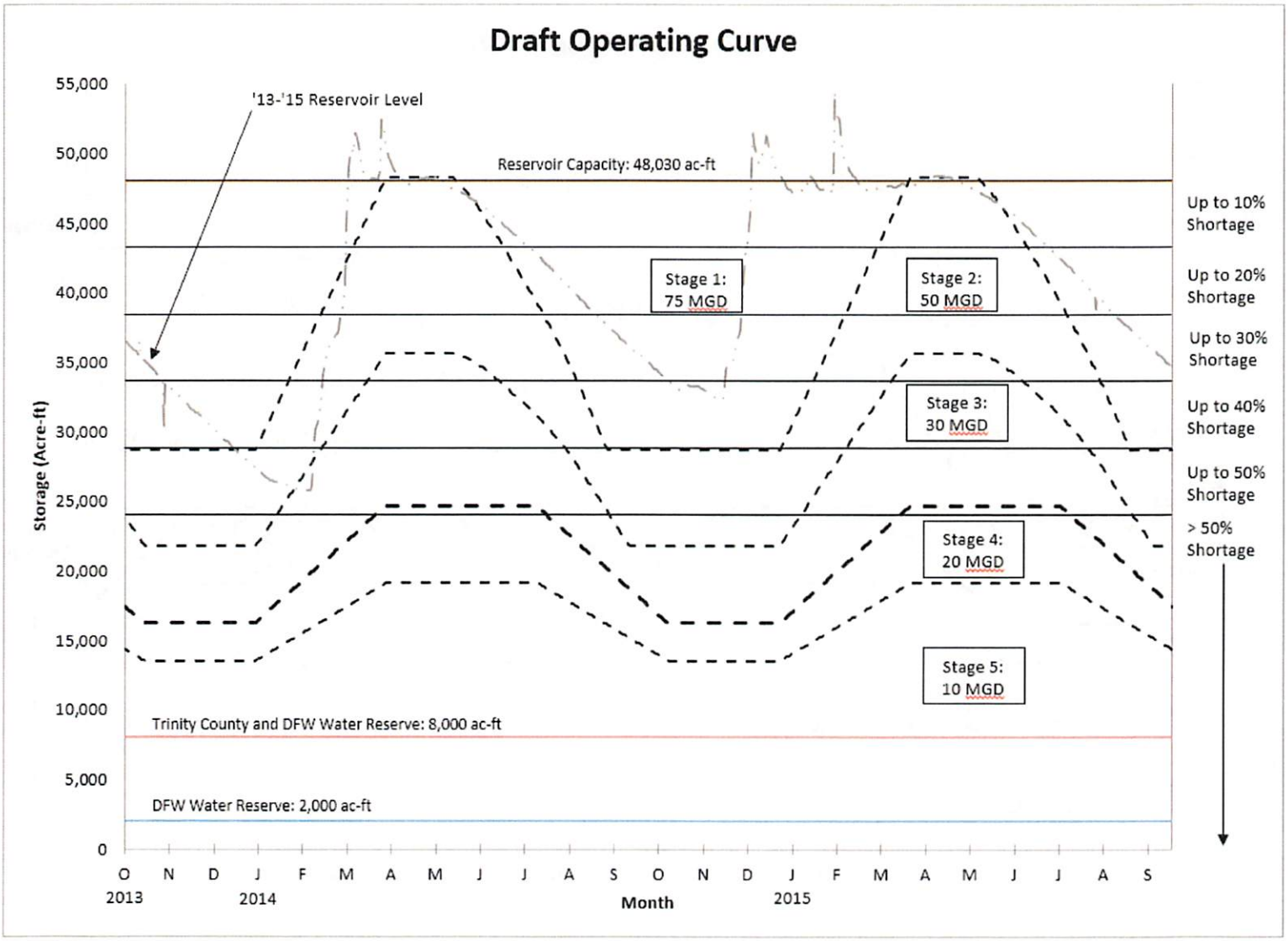


Figure 9: Ruth Lake operating curves with 2013-2015 Reservoir Levels

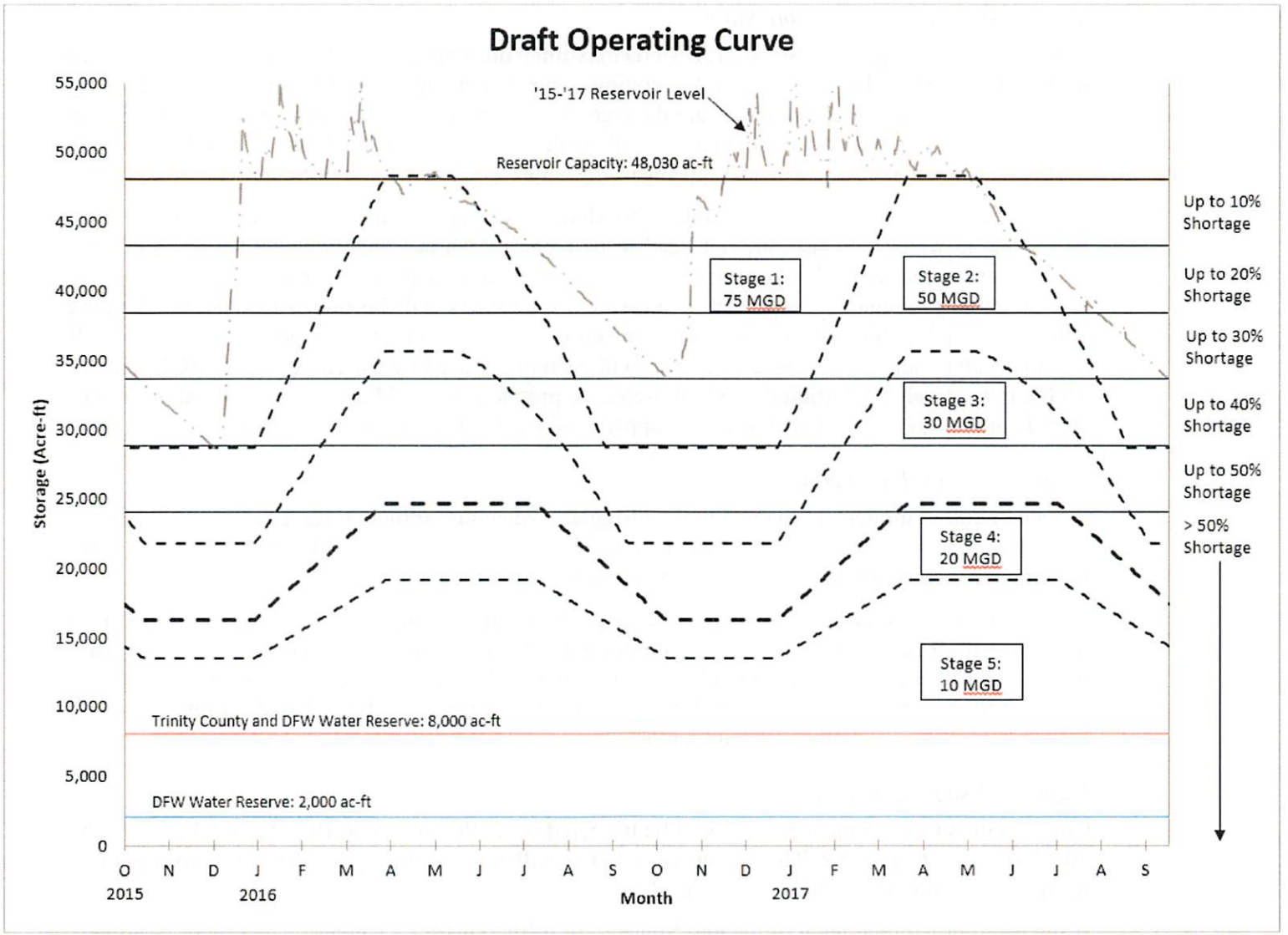


Figure 10: Ruth Lake operating curves with 2015-2017 Reservoir Levels

As the District, through its Water Resource Planning efforts, plans to service wholesale industrial water users in the future, the action stages and conditions are given with the assumption that the District is still operating at normal levels prior to loss of its wholesale industrial customers (i.e. 40 MGD is being supplied to industrial customers, and 10 MGD is being supplied to domestic customers). Without wholesale industrial customers, triggering of these stages would not occur as quickly and may not occur at all. Following is a narrative describing the stages given in Table 8-2 in further detail.

Stage 1 – Controlled Release from Storage

If the reservoir level is within the Stage 1 boundaries, only the amount of water needed for instream flow dedication and water supply purposes will be released from the reservoir.

Stage 2 – Optimizing Available Supply

Consideration to implement Stage 2 (50 MGD maximum draft rate) will be triggered when the storage in Ruth Lake falls below the 75 MGD operating curve. Other triggers to be considered for entering into the Stage 2 requirements include are damage to the system by flood, earthquake, or other system failures; and accidental or intentional toxic spills in the supply. The Water Task Force will review the trigger data and make recommendations regarding actual implementation of Stage 2.

In this stage, the draft rate will be limited to 50 MGD or less. Given current water consumption rates, reductions in water delivery may not need to be made to achieve this; however, entering Stage 2 means that awareness needs to be raised and customers need to begin public outreach and education, and potentially voluntary conservation measures. Customers will be notified of potential future reductions, and public education efforts encouraging water conservation should take place. If required, industrial and domestic deliveries will each be reduced by 5% (down to 38 MGD and 9.5 MGD, respectively). Shutting down hydro-electric production should also be considered, as hydro-electric production is incidental to water supply needs and not justification for releases.

Stage 3 – General Reduction

Consideration to implement Stage 3 will be triggered when the storage in Ruth Lake falls below the 50 MGD operating curve. The Water Task Force will review the trigger data and make recommendations regarding actual implementation of Stage 3.

If the reservoir storage level is within the Stage 3 boundaries, the draft rate will be limited to a maximum draft rate of 30 MGD. Based on current demand, domestic use will be reduced by 10% (down to 9 MGD), and delivery to industrial customers will be reduced by 50% (down to 20 MGD). Changes to the specific reduction will be determined on a biweekly basis based on rate of supply reduction, weather, and other relevant factors.

Stage 4 – Usage Allocations

Consideration to implement Stage 4 will be triggered when the storage in Ruth Lake falls below the 30 MGD operating curve. The Water Task Force will review the trigger data and provide input regarding actual implementation of Stage 4.

If the reservoir storage level drops into Stage 4, all of the District's wholesale and retail customers will be required to reduce usage by the amount necessary to limit consumption to 20 MGD. Domestic use will be reduced by 20% (down to 8 MGD), and industrial deliveries will be reduced by 70% (down to 12 MGD). Furthermore, each wholesale industrial customer will provide certification that water use is being optimized and that wasteful use of water is not occurring. Changes to the specific reduction will be determined on a biweekly basis based on rate of supply reduction, weather, and other relevant factors.

Stage 5 – Rationing

Consideration to implement Stage 5 will be triggered when the storage in Ruth Lake falls below the 20 MGD operating curve. The Water Task Force will review the trigger data and provide input regarding the actual implementation of Stage 5.

If the reservoir storage level reaches Stage 5, the District's wholesale and retail customers will be limited to a total usage of 10 MGD. Wholesale industrial water usage will be limited to the amounts required for human consumption, sanitation, and fire protection. No water will likely be available for

industrial processes. Domestic reduction will be approximately 30%-50%. Municipal and retail customer usage will be reassessed on a bi-weekly basis and may be adjusted as determined by the rate of use of available supply and weather conditions.

8.4 Prohibitions on End Uses

The District does not have the ability to impose use restriction or other requirements directly on end users of the municipal customers' water. Each wholesale customer is responsible for adopting plans to implement the reductions in water use called for by the action stages outlined above. Effectiveness of this plan will be monitored on a daily basis using continuously metered data from Ruth Lake and the metered connections to all wholesale municipal and industrial customers.

8.5 Penalties, Charges, Other Enforcement of Prohibitions

As noted earlier in this plan, each wholesale customer is responsible for adopting plans to implement the reductions in water use called for by the action stages outlined above. Effectiveness of this plan will be monitored on a daily basis using continuously metered data from Ruth Lake and the metered connections to all wholesale municipal and industrial customers.

Table 8-3 shows examples of prohibitions and the stage when those prohibitions become mandatory. These prohibitions assume that the District is operating at normal levels prior to loss of its industrial customers.

Table 8-3: Water Shortage Contingency – Mandatory Prohibitions

Examples of Prohibitions	Stage when Prohibition Becomes Mandatory
Domestic use limited to 9 MGD, and industrial use limited to 20 MGD	3
Domestic use limited to 8 MGD, and industrial use limited to 12 MGD	4
Domestic use limited to 7 MGD, and industrial use limited to only the amounts required for human consumption, sanitation, and fire protection	5

8.6 Consumption Reduction Methods

As previously mentioned, the District does not have the ability to impose use restriction or other requirements directly on end users of the municipal customers' water. Each wholesale customer is responsible for adopting plans to implement the reductions in water use called for by the action stages outlined above. The District will also perform general voluntary water conservation measures in conjunction with its wholesale customers, as well as perform public education efforts to encourage

water conservation. As storage levels in the reservoir drop, the District will work closely with its wholesale customers to attempt to minimize water consumption in the area, as well as minimize their own internal use. However, their internal usage is minimal, but items such as line flushing will be discontinued or kept to a bare minimum as required.

While the District does not have the ability to limit the amount of water its municipal customers deliver, the District does have the ability to limit water delivered to potential industrial customers. Should a drought situation arise where action is required, delivery to industrial customers will be reduced as outlined in Section 8.1. Table 8-4 gives a summary of the consumption reduction methods and the stages when the method will take effect.

Table 8-4: Consumption Reduction Methods

Consumption Reduction Methods	Stage when Method Takes Effect
Release from storage only amount of water needed for in-stream and water supply purposes	1
General voluntary water conservation measures with wholesale customers	2
Public education efforts encouraging water conservation	2
Encourage all wholesale and retail customers to reduce usage. Require industrial customers to reduce usage.	3
Encourage all wholesale and retail customers to reduce usage further. Require industrial customers to further reduce usage.	4
No water for industrial processes and reduce wholesale and retail customer usage up to 50%	5

8.7 Determining Water Shortage Reductions

The District has water meters in place at all of the connections to the systems of each of its seven wholesale municipal customers. There are also meters at every residential connection, and a meter will be installed at any future industrial customer connection. To determine the actual reductions in use of water during a water shortage, the District will use its Supervisory Control and Data Acquisition (SCADA) system to monitor distribution to its customers on a daily basis. In the event of a power outage, the District has two auxiliary power generators as standby power sources. The first generator is a 35kW (kilowatt) generator and the second is a 2MW (megawatt) generator. Therefore, the SCADA system will continue operating during power outages and continue monitoring distribution. Water shortage reductions will be determined by subtracting post-drought consumption rates from pre-drought consumption rates.

8.8 Revenue and Expenditure Impacts

Each wholesale customer must gauge the revenue and expenditure impact of the action stages. The expenditure and revenue impacts on the District are negligible since the wholesale rates are designed to cover costs incurred by the District in producing and distributing the water. With less water to produce, there would be less expense incurred by the District. Therefore, expenditures and revenues for costs directly related to the amount of water produced (e.g. costs for power for pumping) will both decrease as deliveries of water are curtailed. If the shortage were to continue for a prolonged period, the District could reduce staff in order to cut costs as the District would not be producing and distributing water at normal levels. The District also has a reserve account to act as a buffer to cover fixed costs for a short period of time if the District were to need it.

8.9 Resolution or Ordinance

A copy of the District's draft Water Shortage Contingency Resolution for declaring a water shortage emergency and implementing the District's Water Shortage Contingency Plan is attached as Appendix F.

8.10 Catastrophic Supply Interruption

The District's Emergency Operations Plan (EOP) provides the overall response procedures for catastrophic supply interruptions. The EOP further provides specific procedures for power outages and for security incidents. The District's Emergency Action Plan (EAP) provides response procedures for catastrophic supply interruptions involving the R.W. Matthews Dam and Reservoir (Ruth Lake), such as an earthquake. The District's Operations Plan (OP) provides procedures for system failures. Hazardous materials incidents are covered by numerous response plans depending on the nature of the incident. Table 8-5 summarizes possible catastrophe events and the actions that would be taken or plans that would be implemented for each scenario.

Table 8-5: Preparation Actions for a Catastrophe

Possible Catastrophe	Summary of Actions/Plans
Regional Power Outage	Emergency Operations Plan-Power Outage Procedures
System Failure	Operations Plan for Water Supply, Treatment, and Distribution System
Earthquake	Emergency Operations Plan/ Emergency Action Plan (R.W. Matthews Dam at Ruth)
Hazardous Material Spill	Hazardous Materials Response Plans
Acts of Terrorism	Emergency Operations Plan-Security Procedures/ Emergency Action Plan (R.W. Matthews Dam at Ruth)

8.11 Minimum Supply Next Five Years

The three water years between October 1989 and September 1992 represent the driest three-year period recorded for the District:

- Rainfall for this period averaged 42 inches per year (60% of normal).
- Of the three water years, the driest year for rainfall was water year 1990/1991 with 37 inches (53% of normal).
- Flows into Ruth Lake above Zenia averaged 69,000 AFY, or 40% of normal (173,000 AFY).
- The runoff for the watershed above the District's diversion facilities was 371,300 AFY, or 39% of normal (959,071 AFY).
- Despite the diminished rainfall and runoff, rainfall was more than sufficient to refill the reservoir each year.
- Reservoir volume during this period averaged 37,000 AF which is 77% of capacity (48,030 AF) and 90% of normal (41,000 AF).

A plot of reservoir levels over the course of each respective water year from October 1989 through September 1992 is given as Figure 8. This figure shows that even in the three driest consecutive years of record, the reservoir still reached maximum capacity for each of the respective years and generally remained full for months each year. Furthermore, the District was still supplying industrial water during this time, whereas the District is currently only supplying domestic water. Given this, in the event that the next three years are hydrologically the same as the driest three consecutive years of record, the minimum available supply would be greater than the full reservoir level of 48,030 acre-feet for each year, as shown in Table 8-6.

Table 8-6: Minimum Supply Next Five Years

	2021	2022	2023	2024	2025
Available Water Supply	> 48,030 AF	> 48,030 AF	> 48,030 AF	> 48,030 AF	> 48,030 AF

A Rippl mass diagram was generated (Figure 9) using the same assumptions as given in Section 8.2 to plot the cumulative inflow to the reservoir (less evaporation) and various cumulative draft rates. As seen in the figure, a constant draft rate of 38.5 MGD could be achieved if the hydrologic conditions of the drought of record (1976-77) were to be synthetically repeated for a three-year planning period. Current usage is approximately 10 MGD. Therefore, even if the single-year drought of record were repeated for three years, the District would still have a more than adequate water supply to serve its current customers' needs.

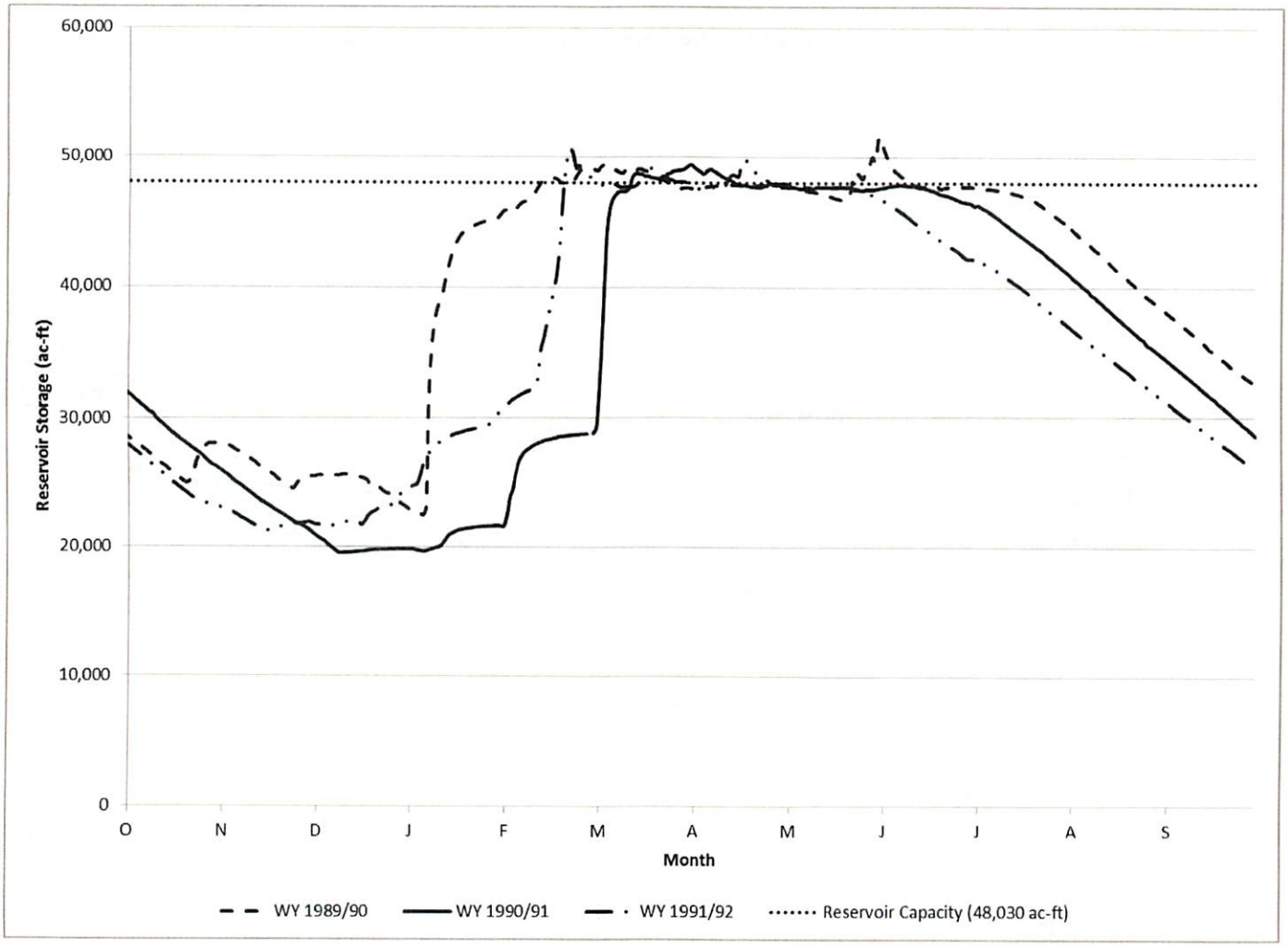


Figure 11: Ruth reservoir water storage levels for the driest three consecutive years of record

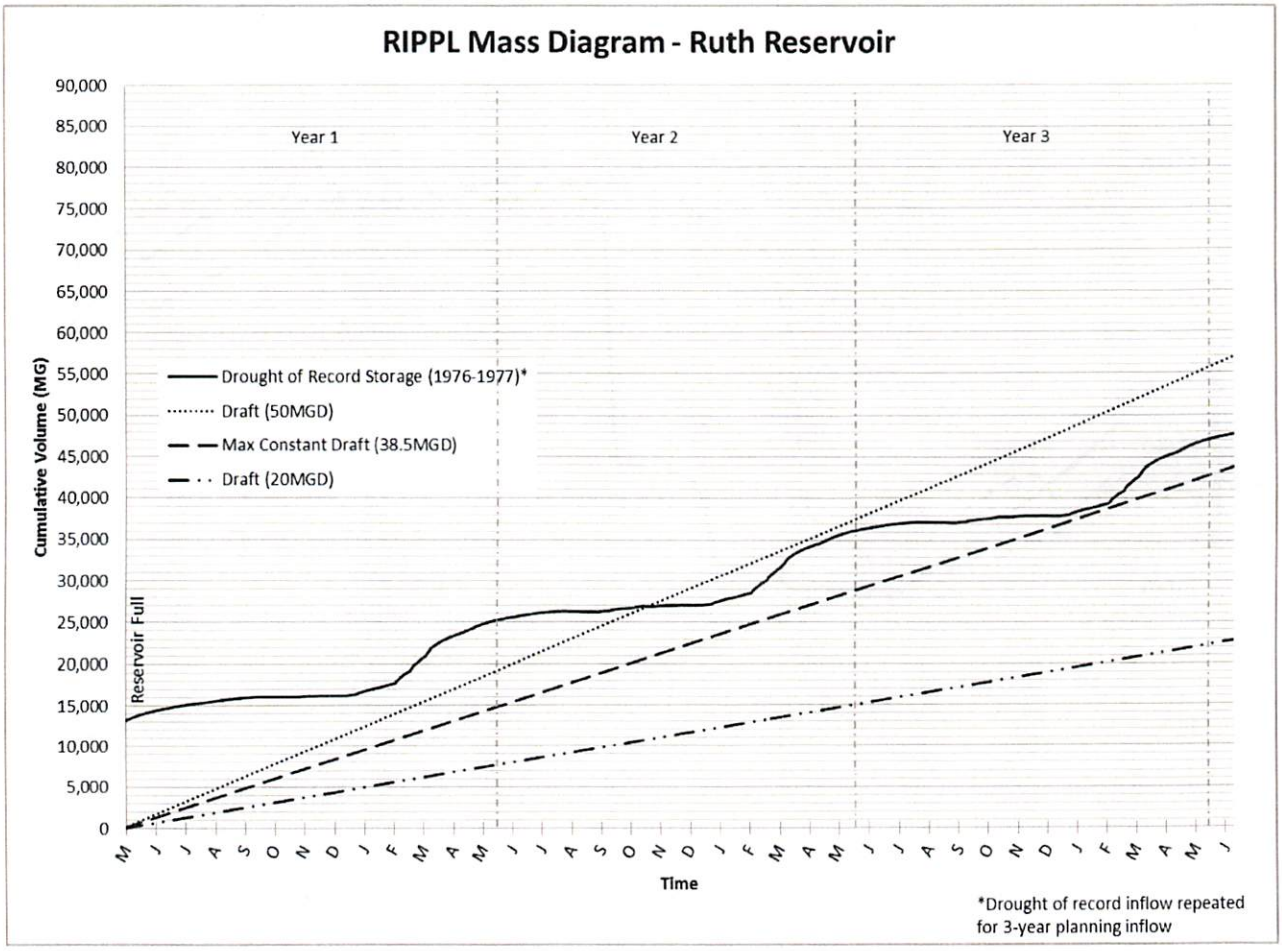


Figure 12: Rippl Mass Diagram with '76-'77 drought hydrologic information repeated for a three-year planning period

Appendix K

Draft Water Shortage Emergency Resolution

Sample Resolution No._____

Resolution of the City Council of the City of Arcata Declaring a Water Shortage Emergency and Implementing the City's Water Shortage Contingency Plan

The City Council of the City of Arcata does hereby resolve as follows:

PURSUANT to California Water Code Section 350 et seq., the City council has conducted duly noticed public hearings to establish the criteria under which a water shortage emergency may be declared.

WHEREAS, the City Council of the City of Arcata finds, determines and declares as follows:

- The City is the water purveyor for the City of Arcata and Jacoby Creek Water District.
- The demand for water services is not expected to lessen.
- When the combined total amount of water supply available to the City from all sources fall at or below the Stage II trigger levels described in the City of Arcata's and Humboldt Bay Municipal Water District's 2015 Urban Water Management Plan, the City will declare a water shortage emergency. The water supply would not be adequate to meet the ordinary demands and requirements of water consumers without depleting the City's water supply to the extent that there may be insufficient water for human consumption, sanitation, fire protection, and environmental requirements. This condition is likely to exist until precipitation and inflow dramatically increases or until water system damage resulting from a disaster are repaired and normal water service is restored.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Arcata hereby finds, determines, declares and concludes that a water shortage emergency condition exists that threatens the adequacy of the water supply, until the water supply is deemed adequate. After the declaration of a water shortage emergency, the City Council will implement the City's Water Shortage Contingency Plan and determine the appropriate Action Stage of the plan to implement.

FURTHERMORE, the City Council shall periodically conduct proceedings to determine additional restrictions and regulations which may be necessary to safeguard the adequacy of the water supply for domestic, sanitation, fire protection, and environmental requirements.

Passed, approved and adopted this_____ day of _____, _____ by the following votes:

Ayes:

Nays:

Absent:

_____ _____

Mayor, City of Arcata City Clerk, City of Arcata

Appendix L

Ordinance 1462 Amending Arcata Municipal Code to Implement Mandatory Water Conservation Measures

ORDINANCE NO. 1462

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ARCATA AMENDING THE ARCATA MUNICIPAL CODE TO IMPLEMENT EMERGENCY MANDATORY WATER CONSERVATION MEASURES

TITLE VII—PUBLIC WORKS
CHAPTER 3—WATER

The City Council of the City of Arcata does ordain as follows:

Section 1: Title VII—Public Works, Chapter 3—Water, of the Arcata Municipal Code is hereby amended by the addition of the following new Section 7741.5 as follows:

SEC. 7741.5 Emergency Water Conservation Requirements.

A. Findings. The City Council for the City of Arcata finds as follows:

1. On January 17, 2014, the Governor issued a proclamation declaring a state of emergency exists in California based on severe drought conditions.

2. On April 25, 2014, the Governor issued a proclamation of a continued state of emergency based on continued drought conditions.

3. On April 1, 2015, based on continued drought conditions, the Governor issued an Executive Order directing the State Water Resources Control Board ("State Board") to develop regulations that impose restrictions on water service suppliers to achieve statewide a 25 percent reduction in potable urban usage through February 28, 2016; to require commercial industrial, and institutional users to implement water efficiency measures; to prohibit irrigation with potable water of ornamental turf in public street medians; and to prohibit irrigation outside newly constructed homes and buildings with potable water that is not delivered by microspray systems.

4. On May 7, 2015, the State Board adopted amendments to prior State Board emergency water conservation regulations to implement the Governor's April 1, 2015 Executive Order ("Emergency Regulation").

5. Pursuant to the Emergency Regulation, the City of Arcata must require its water customers to implement specific statewide water conservation measures, and, additionally, must reduce the City's residential gallons per capita day (R-GPCD) water usage by eight percent (8%) for each month as compared to water usage in the same month of 2013, effective June 1, 2015;

6. This ordinance is intended to implement the State Board's Emergency Regulation and provide notice to the City's water customers about the applicable prohibitions and restrictions that are in effect.

B. Mandatory Water Conservation Measures. To prevent the waste and unreasonable use of water and to promote water conservation, each of the following actions is prohibited, except where necessary to address an immediate health and safety need, to comply with a term or condition in a permit issued by a state or federal agency, or if pursuant to specific water conservation policy adopted by resolution of the City Council:

1. The application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures.

2. The application of potable water to outdoor landscapes and turf during and within 48 hours after measurable rainfall.

3. The application of potable water to outdoor ornamental landscapes and turf more than four days per calendar week except for commercial nurseries.

4. The application of potable water to outdoor landscapes and turf between the hours of 10 a.m. and 6 p.m.

5. The application of potable water to outdoor landscapes and turf by hose; except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or to meet the initial watering requirements of newly planted landscaping and newly seeded lawns.

6. The irrigation with potable water of ornamental turf on public street medians except where necessary to protect trees.

7. The irrigation with potable water of landscapes outside of newly constructed homes and building in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

8. The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

9. The application of potable water to hard surfaces including, but not limited to, driveways, sidewalks, patios, parking lots, streets, or similar surfaces except as necessary by the City for street sweeping and to otherwise protect the public health or safety.

10. The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.

11. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased.

12. The failure of hotel and motel operators to prominently display in each guest room using clear and easily understood language a notice of the option for guests to choose not have towels and linens laundered daily.

Section 2: Severability. If any section, subsection, sentence, clause or phrase of this chapter is for any reason held to be invalid or unconstitutional, the decision shall not affect the validity of the remaining portions of the Chapter. The City Council hereby declares that it would have passed this Chapter, and each section, subsection, sentence, clause and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be declared invalid under law.

Section 3: This ordinance is exempt from the California Environmental Quality Act (CEQA) pursuant to Section 15269(c), specific action necessary to prevent or mitigate an emergency, and Section 15307 of the CEQA Guidelines, California Code of Regulations, Title14, Chapter 3, actions by regulatory agencies for the protection of natural resources.

Section 4: Due to the ongoing statewide drought, there exists a current and immediate threat to the public health, safety, and welfare requiring immediate implementation of the State Board's Emergency Regulation for the immediate preservation of the public peace, health, and safety. Pursuant to Government Code Section 36937(b), this ordinance will take effect immediately upon adoption.

Section 5. This ordinance shall expire without additional action of the City Council on February 28, 2016.

DATE: June 17, 2015

ATTEST: **APPROVED:**

/s/ Bridget Dory
City Clerk, City of Arcata

/s/ Michael Winkler
Mayor, City of Arcata

CLERK'S CERTIFICATE

I hereby certify that the foregoing is a true and correct copy of **Ordinance No. 1462**, passed and adopted at a regular meeting of the City Council of the City of Arcata, County of Humboldt, State of California on the 17th day of June, 2015, by the following vote:

AYES: **WINKLER, PITINO, ORNELAS, PEREIRA, WHEETLEY**

NOES: **NONE**

ABSENT: **NONE**

ABSTENTIONS: **NONE**

/s/ Bridget Dory
City Clerk, City of Arcata

Appendix M

Plan Adoption, Submittal and Implimentation Documents

City of ARCATA
736 F Street, Arcata, CA 95521

City Manager (707) 822-5953
Community Development (707) 822-5955
Environmental Services Streets/Utilities (707) 822-5957
Police (707) 822-2428
Finance (707) 822-5951
Environmental Services Community Services (707) 822-8184
Recreation (707) 822-7091
Transportation (707) 822-3775
Engineering & Building (707) 825-2128

June 2, 2021

To: John Friedenbach, Humboldt Bay Municipal Water District
John Ford, Humboldt County Planning Department
John Wayne Palmrose, Jacoby Creek Water District
James Henry, McKinleyville Community Services District

RE: Notice of Public Meeting-City of Arcata 2020 Urban Water Management Plan

The City of Arcata will hold a public hearing to discuss and approve the Arcata 2020 Urban Water Management Plant (UWMP) on Wednesday, June 16, 2021, at 6:00 p.m. at Arcata City Hall, 736 F Street, Arcata. The public hearing will be scheduled as part of the regular City Council meeting. The 2020 UWMP is available for public review at Arcata City Hall, Environmental Services Department and online at https://www.cityofarcata.org/326/Drinking-Water. Please direct comments or questions to: City of Arcata, Environmental Services Department, Rachel Hernandez, 736 F Street, Arcata, CA, 95521; 707-822-8184; or rhernandez@cityofarcata.org.

Sincerely,

Rachel Hernandez
Environmental Compliance Officer

cc: Emily Sinkhorn, Environmental Services Director
Mike Clinton, Deputy Director of Environmental Services, Streets & Utilities
Scott Sinnott, Environmental Compliance Technician

STATE OF CALIFORNIA
County of Humboldt

MAD RIVER UNION
MADRIVERUNION.COM ❖ (707) 826-7000

PROOF OF PUBLICATION

Proof of Publication of: City of Arcata Hearing for Urban Water Management Plan

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 matter referred to herein. I am the "principal" clerk of the publisher of the MAD RIVER UNION a newspaper of general circulation, published once a week, Wednesdays, in the City of Arcata, county of Humboldt, and which has been adjudged a newspaper of general circulation by the Superior Court of the County of Humboldt, State of California, under the date of Oct. 29, 2013, Court Decree Number CV130613; 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:

Run Dates 6/2, 6/9

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Arcata, Humboldt County, California

this 8 day of June 2021

Signature: [signature]

Kevin Hoover or Jack Durham

(707) 826-7000

This space is for the County Clerk's Filing Stamp

LEGAL NOTICE
CITY OF ARCATA
NOTICE OF PUBLIC MEETING

The City of Arcata will hold a public hearing to discuss and approve the Arcata 2020 Urban Water Management Plant (UWMP) and Water Shortage Contingency Plan (WSCP) on Wednesday, June 16, 2021, at 6:00 p.m. at Arcata City Hall, 736 F Street, Arcata. The public hearing will be scheduled as part of the regular City Council meeting. The UWMP and incorporated WSCP were prepared for the State of California Department of Water Resources in accordance with the California Urban Water Management Planning Act of 1983 (AB 797) (UWMP Act) as amended. This includes amendments made per the Water Conservation Bill of 2009 (SBX7-7) and SB 1420 addressing per capita water use demand and Demand Management Measures. The UWMP will establish the City of Arcata's compliance with California Water Code, Division 6, Part 2.6, for all urban water suppliers who provide municipal water to more than 3,000 customers or supply its customers with more than 3,000 acre-feet of water. The UWMP describes the City's water supplies, water demands, and conservation efforts. The WSCP describes the stages of action and sets maximum use targets in the event of actual or potential water shortage. The purpose of the UWMP is to ensure that adequate water supplies are available to meet existing and future demands over a 20-year planning horizon. The 2020 UWMP is available for public review at Arcata City Hall, Environmental Services Department and online at www.cityofarcata.org/326/Drinking-Water. Please direct comments or questions to:

City of Arcata
Environmental Services Department
Rachel Hernandez
736 F Street, Arcata, CA 95521
707-822-8184
rhernandez@cityofarcata.org

Publication Dates: June 2, 2021 and June 9, 2021
6/2, 6/9

on page 2

STAFF REPORT – CITY COUNCIL MEETING

June 16, 2021

TO: Honorable Mayor and City Council Members

FROM: Emily Sinkhorn, Director of Environmental Services

PREPARER: Emily Sinkhorn, Director of Environmental Services

DATE: May 24, 2021

TITLE: **Public Hearing to Consider Adoption of Resolution No. 201-59 Adopting the City of Arcata 2020 Updated Urban Water Management Plan and Water Shortage Contingency Plan.**

RECOMMENDATION:

It is recommended that the City Council:

1. Conduct a Public Hearing and receive public input on the 2020 Urban Water Management Plan.
2. Conduct a Public Hearing and receive public input on the Water Shortage Contingency Plan.
3. Adopt Resolution No. 201-59 approving the 2020 Urban Water Management Plan.

INTRODUCTION:

The Urban Water Management Planning Act defines an "urban water supplier" as a public or privately owned supplier providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water per year. The Plan requires an urban water supplier to complete an Urban Water Management Plan and update the plan at least every five years. The State Legislature amended the Urban Water Management Planning Act in 2018, requiring suppliers to include a Water Shortage Contingency Plan with specific elements in the Urban Water Management Plan.

BACKGROUND:

The California Legislature enacted Assembly Bill 797 (California Water Code [CWC] Section 10610, *et. seq.*, known as the Urban Water Management Planning Act) in 1984. The Act defines an urban water supplier as a public or privately owned supplier providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water per year. CWC section 10621 requires urban water suppliers to complete an Urban Water Management Plan (UWMP) and update the plan at least every five years, on or before December 31, in years ending in five and zero, except that the 2020 UWMP shall be updated and submitted by July 1, 2021.

The Water Conservation Act of 2009, otherwise known as SB X7-7, set a statewide goal of reducing urban water use by 20 percent by the year 2020. In 2010, each urban water supplier was required to

calculate its baseline water use, in gallons per capita day (GPCD), establish an interim target for 2015, and define a 2020 target. In 2020 UWMP urban water suppliers are required to demonstrate compliance with the 2020 target.

In 2018, the State Legislature modified UWMP laws to require a Water Shortage Contingency Plan (WSCP) with specific elements. The WSCP is a document that provides a Suppler with a structured action plan for dealing with drought or catastrophic water supply shortage. The WSPC includes six standard water shortage levels and appropriate response actions for each shortage level, with a corresponding estimate of the extent the action will address the gap between supplies and demands.

The California Department of Water Resources reviews and approves each plan to ensure conservation and efficient use of water.

DISCUSSION:

The Arcata City Council approved the Urban Water Management Plan 2005 on December 7, 2005, the Urban Water Management Plan 2010 on July 6, 2011, and the Urban Water Management Plan 2015 on May 18, 2016. The City's five-year review is due on July 1, 2021.

There are several revisions in the 2020 UWMP including updates to population estimates, the Water Shortage Contingency Plan, and descriptions of the Demand Management Measures implemented over the past five years. A new required plan element for 2020 is the adoption of a Water Shortage Contingency Plan.

Population estimates were updated in the 2020 UWMP based on the number of new water service connections and the persons per connection estimate utilized in the 2015 UWMP. The Service Area population for 2020 is reported at 20,095, which agrees with population projections in the 2020 General Plan. The UWMP projects population out to 2045 based on anticipated housing growth to 24,572.

CWC 10631 requires distribution system water losses to be quantified and reported in the UWMP. Distribution system water losses are defined as the physical water losses from the water distribution system, including storage facilities, up to the point of customer consumption. Real water loss is reported for the 2020 calendar year, to identify potential areas where water may be recovered, and to project future water loss.

SBX7-7 required all urban water suppliers to calculate and update baseline year per capita water use, a 2015 interim target, and the 2020 target were calculated in the 2010 and 2015 UWMPs, respectively. Updated baseline year daily per capita water use is 122 gallons per capita day (GPCD), the updated 2015 interim target is 118 GPCD, and the updated 2020 target is 113 GPCD.

Compliance with 2020 target is assessed based on actual 2020 daily per capita water use. Actual daily per capita water use for the Service Area in 2020 was 84 GPCD, well below the 2020 target.

Humboldt Bay Municipal Water District, the wholesale supplier, updated its Water Shortage Contingency Plan in 2020. Updates were made to the City's Water Shortage Contingency Plan to reflect the updates made in the wholesale supplier's plan. The Water Shortage Contingency Plan provides guidance for declaring a water shortage independent of the wholesaler and guidance on water use restrictions and prohibitions, consumption reduction methods, and penalties and enforcement under each declared stage of action.

The 2010 UWMP required a description of 14 specified conservation and demand management measures (DMM). CWC was significantly modified in 2014 to simplify, clarify, and update DMM reporting requirements. Rather than reporting on 14 specific DMMs, an urban water supplier is now required to report on six general DMMs and any other DMM that does not fit in any of the six specific categories.

POLICY IMPLICATIONS:

The Urban Water Management Plan provides background data to support the City's General Plan Policy PF1-1: To *Manage the City's potable water resources to ensure adequate quantities for community use, to promote water conservation, to maintain water quality, and not to deplete source supplies.* The City's Water Shortage Contingency Plan is incorporated into the Urban Water Management Plan and sets triggers for declaring a water shortage emergency including implementing stages of action to achieve targeted consumption reductions.

BUDGET/FISCAL IMPACT:

Without an approved Urban Water Management Plan, the City would not be eligible to receive grant or loan funding through the Department of Water Resources (DWR), the State Water Resources Control Board (SWRCB).

RESOLUTION NO. 201-59

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ARCATA ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN

WHEREAS, the California Legislature enacted Assembly Bill 797 (Water Code Section 10610, *et seq.*, known as the Urban Water Management Planning Act) during the 1983/1984 Regular Session, and as amended subsequently, which mandates that every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan (hereinafter "Plan"), the primary objective of which is to plan for the conservation and efficient use of water and prepare a Water Shortage Contingency Plan, the primary objective of which is to provide an action plan for drought or catastrophic water supply shortage; and

WHEREAS, the California Legislature enacted Senate Bill 7 (SBX7-7) in November 2009, which has amended and repealed sections of the Water Code, and mandated that the State of California achieve a 20-percent reduction in urban per capita water use by December 31, 2020, and requires each urban retail water supplier to develop urban water use targets and an interim urban water use target, in accordance with specified requirements; and

WHEREAS, SBX7-7 requires each urban retail water supplier to report compliance with the 20-percent reduction target for 2020 in the 2020 Urban Water Management Plan; and

WHEREAS, the City of Arcata is an urban supplier of water providing water to a population of 20,095; and

WHEREAS, the Plan shall be periodically reviewed at least once every five (5) years, and the City shall make any amendments or changes to its Plan which are indicated by the review; and

WHEREAS, the Plan was adopted on June 16, 2021, after public review and hearing, and filed with the California Department of Water Resources within thirty (30) days of adoption; and

WHEREAS, the City has prepared and circulated for public review a draft 2020 Urban Water Management Plan, and properly noticed a public hearing regarding said Plan was held by the City Council on June 16, 2021.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Arcata as follows:

1. The Urban Water Management Plan and accompanying Water Shortage Contingency Plan is hereby adopted and ordered filed with the City Clerk; the City Manager is hereby authorized and directed to file the 2020 Urban Water Management Plan with the California Department of Water Resources within 30 days after this date; and

2. The City Manager is hereby authorized and directed to implement the Water Conservation Programs set forth in the 2020 Urban Water Management Plan, which include water shortage contingency analysis and recommendations to the City Council regarding necessary procedures,

rules and regulations to carry out effective and equitable water conservation and water recycling programs; and

3. In a water shortage, the Mayor is hereby authorized to declare a Water Shortage Emergency according to the Water Shortage Stages and Triggers indicated in the Plan and implement necessary elements of the Plan; and

4. The City Manager shall recommend to the City Council additional regulations to carry out effective and equitable allocation of water resources.

This resolution shall be effective upon its adoption.

DATED: June 16, 2021

ATTEST: **APPROVED:**

Bridget Dory
City Clerk, City of Arcata

Mayor, City of Arcata

CLERK'S CERTIFICATE

I hereby certify that the foregoing is a true and correct copy of **Resolution No. 201-59** passed and adopted at a regular meeting of the City Council of the City of Arcata, County of Humboldt, State of California, held on the 16th day of June, 2021, by the following vote:

AYES: **PEREIRA, WATSON, GOLDSTEIN, SHAEFER**

NOES: **NONE**

ABSENT: **ATKINS-SALAZAR**

ABSTENTIONS: **NONE**

Bridget Dory
City Clerk, City of Arcata

City of ARCATA

736 F Street, Arcata, CA 95521

City Manager (707) 822-5953
Police (707) 822-2428
Recreation (707) 822-7091
Community Development (707) 822-5955
Finance (707) 822-5951
Transportation (707) 822-3775
Environmental Services Streets/Utilities (707) 822-5957
Environmental Services Community Services (707) 822-8184
Engineering & Building (707) 825-2128

June 28, 2021

FIRST CLASS

To: California State Library
Government Publications Section
P.O. Box 942837
Sacramento, CA 94237-0001
Attention: Coordinator, Urban Water Management Plans

RE: City of Arcata 2020 Urban Water Management Plan

The City of Arcata held a public hearing to discuss and approve the City of Arcata 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) on Wednesday, June 16, 2021. The Arcata City Council adopted the plans unanimously. Pursuant to California Water Code 10644(a) the City of Arcata respectfully submits a copy of the adopted City of Arcata Urban Water Management Plan to the California State Library.

If you have any questions or issues with the enclosed documents, please feel free to contact me at (707) 825-2148 or rhernandez@cityofarcata.org.

Sincerely,

Rachel Hernandez
Environmental Compliance Officer

Enclosure: City of Arcata 2020 Urban Water Management Plan (CD)

City of ARCATA
736 F Street, Arcata, CA 95521

City Manager (707) 822-5953
Police (707) 822-2428
Recreation (707) 822-7091
Community Development (707) 822-5955
Finance (707) 822-5951
Transportation (707) 822-3775
Environmental Services Streets/Utilities (707) 822-5957
Environmental Services Community Services (707) 822-8184
Engineering & Building (707) 825-2128

June 28, 2021

FIRST CLASS

To: Paul Helliker, Humboldt Bay Municipal Water District
Wayne Palmrose, Jacoby Creek Water District
Robert Wall, Interim Humboldt County Planning and Building Director
Greg Orsini, McKinleyville Community Services District

RE: City of Arcata 2020 Urban Water Management Plan

The City of Arcata held a public hearing to discuss and approve the City of Arcata 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) on Wednesday, June 16, 2021. The Arcata City Council adopted the plan unanimously. The City's 2020 UWMP has been finalized and is available at Arcata City Hall, 736 F Street, Arcata CA, online at http://www.cityofarcata.org/documentcenter/, and at the California State Library.

Thank you to your agency and staff for working in collaboration with the City of Arcata and other regional Urban Water Suppliers to develop comprehensive Urban Water Management Plans for our local area. If you have any questions, please feel free to contact me at (707) 825- 2148 or rhernandez@cityofarcata.org.

Sincerely,

Rachel Hernandez
Environmental Compliance Officer

cc: Emily Sinkhorn, Environmental Services Director
Mike Clinton, Deputy Director of Environmental Services, Streets & Utilities
Scott Sinnott, Environmental Compliance Technician