

PREPARED FOR
CITY OF SHASTA LAKE



2020 URBAN WATER MANAGEMENT PLAN

FINAL / JUNE 2021

City of Shasta Lake

2020 URBAN WATER MANAGEMENT PLAN

CONTACT SHEET

Date plan submitted to the Department of Water Resources: 06/30/2021

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The Water supplier is a: **City**

The Water supplier is a: **Retailer**

Utility services provided by the water supplier include: **Water, Wastewater**



City of Shasta Lake

2020 URBAN WATER MANAGEMENT PLAN

FINAL | June 2021

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Abbreviations

°F	degrees Fahrenheit
AB	Assembly Bill
ACID	Anderson-Cottonwood Irrigation District
AF	acre-feet
AFY	acre-feet per year
ADU	Accessory Dwelling Unit
AWWA	American Water Works Association
BMP	best management practice
BVWD	Bella Vista Water District
Caltrans	California Department of Transportation
Carollo	Carollo Engineers, Inc.
CCR	California Code of Regulations
CCR	Consumer Confidence Report
CCSD	Centerville Community Services District
CF	cubic feet
CII	commercial, industrial, and institutional
CIMIS	California Irrigation Management Information System
City	City of Shasta Lake
County	Shasta County
CREAT	Climate Resilience Evaluation and Awareness Tool
CVP	Central Valley Project
CWC	California Water Code
CWP	Cold Water Pool
DOF	California Department of Finance
DMM	demand management measure
DRA	drought risk assessment
DWR	California Department of Water Resources
EDD	California Employment Development Department
EIR	Environmental Impact Report
EPA	United States Environmental Protection Agency
ET, ETo	Evapotranspiration
F	Fahrenheit
GHG	greenhouse gas
gpcd	gallons per capita per day
gpm	gallons per minute
GWMP	Groundwater Management Plan

HVAC	heating, ventilation, and air conditioning
I-5	Interstate 5
IRWM	Integrated Regional Water Management
Knauf	Knauf Insulation
kWh	kilowatt hours
MCM	MCM Properties Inc.
MFR	multi-family residential
MG	million gallons
mgd	million gallons per day
NEPA	National Environmental Policy Act
PFAS	Per- and polyfluoroalkyl substances
PRV	pressure reducing valve
RCP	Representative Concentration Pathway
RHNA	Regional Housing Needs Assessment
SB	Senate Bill
SCWA	Shasta County Water Agency
SDAPUD	Shasta Dam Area Public Utility District
SFR	single-family residential
SPI	Sierra Pacific Industries
USBR	United States Bureau of Reclamation
UV	ultraviolet
UWMP	Urban Water Management Plan
UWMPA	Urban Water Management Planning Act
WSCP	Water Shortage Contingency Plan
WWTP	Wastewater Treatment Plant
WTP	Water Treatment Plant

Chapter 1

INTRODUCTION AND LAY DESCRIPTION

1.1 Lay Description

The City of Shasta Lake (City) is located north of Redding in western Shasta County (County). The City, incorporated in 1993, provides water, sewer, recycled water, storm drain, and electric services to the residents of the City. Water service is provided to all residential, commercial, and industrial customers, and for fire protection services. The City provides recycled water for industrial reuse and irrigation of a portion of the Interstate 5 (I-5). The water service area encompasses the entire City limits. In addition, the City provides water service to a portion of the City of Redding in their Buckeye service area (Summit City Pressure Zone).

The City's surface water supply is Shasta Lake through a combination of a long-term (40 years) contract with the United States Bureau of Reclamation (USBR) and long- and short-term agreements with surrounding agencies and water suppliers. The City's water system consists of approximately 79 miles of active water distribution system pipelines up to 24-inches in diameter, the Fisherman's Point Water Treatment Plant (WTP), 9 storage tanks (8 treated water, 1 raw water), 2 intertie booster pump stations, 1 raw water booster pump station, 15 pressure reducing valve (PRV) stations, and 9 pressure zones.

In 2020, the average annual population was estimated to be 10,626. The population is anticipated to increase to 13,627 by the year 2045, based on an average annual growth rate of 1.0 percent.

Water demands served by the City are primarily residential, including single-family residential (SFR) and multi-family residential (MFR), commercial, industrial, and institutional (CII), and landscape irrigation. All connections in the City are metered. The total demand in 2020 was approximately 2,215 acre-feet (AF). Residential demands account for 1,497 AF (68 percent) of the total demand, while CII demands account for 419 AF (19 percent) and landscape demands account for 102 AF (5 percent). The remaining balance is attributed to unbilled consumption and water loss of 132 AF (6 percent) and USBR potable use of 31 AF (1 percent). Based on the growth rate of 1.0 percent, demands under normal conditions are anticipated to be 3,282 AF by the year 2045 with passive conservation.

The per capita water demand was 186 gallons per capita per day (gpcd) in 2020. Although the City was able to meet the 2020 target of 215 gpcd, the year 2020 did not represent a typical year due to the impacts of the COVID-19 pandemic. However, since the 2020 per capita demand of 186 gpcd was below the 2020 goal, adjustments for extraordinary events were not made.

Supply availability was reviewed under a single-dry year and five-consecutive-year drought. In addition, a drought risk assessment (DRA) from 2021 through 2025 found that there is sufficient supply to meet projected demands within the next five years.

The City's Water Shortage Contingency Plan (WSCP) was also updated to address the latest requirements set forth by California Department of Water Resources (DWR) for drought

planning. The WSCP now includes six stages response actions for demand reduction, supply augmentation, operational changes, and mandatory prohibitions to address shortage levels.

1.2 Background and Purpose

The California Water Code (CWC) requires urban water suppliers within the state to prepare and adopt an Urban Water Management Plan (UWMP) for submission to DWR. The UWMP, which must be filed every five years, must satisfy the requirements of the Urban Water Management Planning Act (UWMPA) of 1983, including amendments that have been made to the Act. The UWMPA requires urban water suppliers servicing 3,000 or more connections, or supplying more than 3,000 AF of water annually, to prepare a UWMP.

The purpose of the UWMP is to maintain efficient use of urban water supplies, continue to promote conservation programs and policies, ensure that sufficient water supplies are available for future beneficial use, and provide a mechanism for response during water drought conditions. This document, which was prepared in compliance with the CWC, and as set forth in the 2020 Urban Water Management Plan Guidebook for Urban Water Suppliers (March 2021) established by the DWR, constitutes the City 2020 UWMP.

This 2020 UWMP was prepared in compliance with the UWMPA (CWC §10610 et seq.) and the Water Conservation Bill of 2009 (Senate Bill [SB] X7-7) by Carollo Engineers, Inc. (Carollo). Contact information for the City and Carollo is included in the Contact Sheet provided at the beginning of this document.

The City recognizes the importance of maintaining a high-quality reliable water supply. Although water is a renewable resource, it is limited. A long-term reliable supply of water is essential to protect the local and state economy. The main focus for the City is to provide high quality water, maximize the efficient use of water, and promote conservation.

1.2.1 Previous Urban Water Management Plan

The City previously prepared an UWMP in 2015, which was approved and adopted on August 16, 2016. Following adoption, the 2015 UWMP was submitted to and formally approved by the DWR. The 2020 UWMP report serves as an update to the 2015 UWMP and pulls extensively from that report.

1.3 Urban Water Management Planning and the California Water Code

The CWC sections applicable to UWMPs are summarized in the sections below.

1.3.1 Urban Water Management Planning Act

In 1983, State Assembly Bill (AB) 797 modified the CWC Division 6 by creating the UWMPA. Several amendments to the original UWMPA, which were introduced since 1983, have increased the data requirements and planning elements to be included in the UWMPs.

Initial amendments to the UWMPA required that total projected water use be compared to water supply sources over the next 20 years, in 5-year increments. DWR guidelines also suggest projecting through a 25-year planning horizon to maintain a 20-year timeframe until the next UWMP update has been completed.

Other amendments require that UWMPs include provisions for recycled water use, demand management measures (DMMs), and a WSCP. The UWMPA requires a WSCP which meets the

specifications set forth therein. Recycled water was added in the reporting requirements for water usage and figures prominently in the requirements for evaluation of alternative water supplies, when future projections predict the need for additional water supplies. Each urban water purveyor must coordinate the preparation of the WSCP with other urban water purveyors in the area, to the extent practicable. Water suppliers must also describe their water DMMs that are being implemented or are scheduled for implementation.

In addition to the UWMPA and its amendments, there are several other regulations that are related to the content of the UWMP. In summary, the key relevant regulations are:

- AB 1420: Requires implementation of DMMs/best management practices (BMPs) and meeting the 20-by-2020 targets to qualify for water management grants or loans.
- AB 1420: Requires a plan to quantify and report on distribution system water loss.
- AB 1420: Provides for water use projections to display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans, when that information is available and applicable to an urban water supplier.
- AB 1465: Requires water suppliers to describe opportunities related to recycled water use and stormwater recapture to offset potable water use.
- Amendments SB 610 (Costa, 2001) and AB 901 (Daucher, 2001): Require counties and cities to consider information relating to the availability of water to supply new large developments by mandating the preparation of further water supply planning (Daucher) and Water Supply Assessments (Costa).
- SB 1087: Requires water suppliers to report SFR and MFR projected water use for lower income areas separately.
- Amendment SB 318 (Alpert, 2004): Requires the UWMP to describe the opportunities for development of desalinated water, including but not limited to, ocean water, brackish water, and groundwater, as long-term supply.
- AB 105 (Wiggins, 2004): Requires urban water suppliers to submit their UWMPs to the California State Library.
- SB X7-7: Requires development and use of new methodologies for reporting population growth estimates, base per capita use, and water conservation. An agency can choose from four methods to establish their interim (2015) and year 2020 water conservation targets.
- AB 2067: Requires water suppliers to provide narratives of water DMMs.
- SB 1036: Provides for an urban water supplier to include certain energy-related information, including, but not limited to, and estimate of the amount of energy used to extract or divert water supplies.
- AB 2409: Requires urban water suppliers to analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains separately from swimming pools and spas.

1.3.2 New Requirements to the Water Code since the 2015 UWMPs

The major new requirements to the CWC since 2015 UWMPs are summarized in Table 1-1.

Table 1-1: Applicable Changes to the Water Codes since 2015 UWMPs

Topic	Summary
Five Consecutive Dry-Year Water Reliability Assessment	The Legislature modified the dry-year water reliability planning from a “multiyear” time period to a “drought lasting five consecutive water years” designation.
DRA	The DRA requires a Supplier to assess water supply reliability over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for five consecutive dry years.
Seismic Risk	Requires Suppliers to specifically address seismic risk to various water system facilities and to have a mitigation plan.
Energy Use	Requires Suppliers to include readily obtainable information on estimated amounts of energy for their water supply extraction, treatment, distribution, storage, conveyance, and other water uses.
Water Loss Reporting for Five Years	The Water Code added the requirement to include the past five years of water loss audit reports as part of this UWMP.
WSCP	New requirements are more prescriptive than previous versions.
Groundwater Supplies Coordination	Water Code now requires Suppliers’ 2020 UWMPs to be consistent with Groundwater Sustainability Plans, in areas where those plans have been completed by Groundwater Sustainability Agencies.
Lay Description	Suppliers to include a lay description of the fundamental determinations of the UWMP, especially regarding water service reliability, challenges ahead, and strategies for managing reliability risks. This section of the UWMP could be viewed as a go-to synopsis for new staff, new governing members, customers, and the media, and it can ensure a consistent representation of the Supplier’s detailed analysis.

1.3.3 Water Conservation Act of 2009 (SB X7-7)

Beginning in 2016, retail water suppliers are required to comply with the water conservation requirements in SB X7-7 in order to be eligible for State water grants or loans. Refer to Chapter 5 for detailed information on SB X7-7.

1.4 Report Organization

This UWMP contains ten chapters, followed by appendices that provide supporting documentation for the information presented in the report. The chapters are briefly described below:

- Chapter 1 – Introduction and Lay Description. This chapter presents a lay description and the purpose of this UWMP stressing the importance and extent of the water management planning efforts.
- Chapter 2 – Plan Preparation. This chapter provides information on the process for developing the UWMP as well as coordination efforts with appropriate local agencies

and discusses the measures used to solicit public participation during the development of the UWMP.

- Chapter 3 – System Description. This chapter presents a description of the water purveyor's service area and its characteristics including climate, population, and other demographic factors.
- Chapter 4 – Water Use Characterization. This chapter presents a description of the water purveyor's current and projected water uses within the service area in five-year increments.
- Chapter 5 – SBX7-7 Baselines, Targets, and 2020 Compliance. This chapter presents information on the water purveyor's compliance with the 2020 per-capita water conservation mandate. Demonstrate that the 2020 target adopted in the 2015 UWMP was met in 2020. This chapter provides analyses and calculations associated with the water conservation target pursuant to SB X7-7.
- Chapter 6 – Water Supply Characterization. This chapter presents a description of the water purveyor's current and projected potable and non-potable water supply sources including information on the usage of surface water, groundwater, imported water and an overview of usage of recycled water. This chapter includes information on the water purveyor's future considerations of a recycled water system.
- Chapter 7 – Water Service Reliability and Drought Risk Assessment. This chapter presents the reliability of the water purveyor's water system. This includes a discussion on future water reliability. In addition, there is an analysis of supply availability in a normal, single dry year and in five consecutive dry years. This chapter also includes the DRA.
- Chapter 8 – Water Shortage Contingency Plan. This chapter includes an urban water shortage contingency analysis that includes stages of action to be undertaken in the event of water supply shortages; prohibitions consumption reduction methods and penalties; actions to be taken during a catastrophic interruption of service; and a mechanism for measuring water use reduction.
- Chapter 9 – Demand Management Measures. This chapter communicates the water purveyor's efforts to promote conservation and to reduce demand. The chapter includes narratives on each DMM.
- Chapter 10 – Plan Adoption, Submittal, and Implementation. This chapter describes the steps taken to adopt, submit, and implement the UWMP and make it publicly available.

Chapter 2

PLAN PREPARATION

This section includes specific information on how the UWMP was developed, including efforts in coordination and outreach.

2.1 Basis for Plan Preparation

CWC 10617 requires that urban water suppliers with 3,000 or more service connections or supplying 3,000 or more AF of water per year prepare an UWMP every five years.

10617 "Urban water supplier" means a supplier, either publicly, or privately owned, 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 annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems...

2.1.1 Public Water Systems

California Health and Safety Code 116275 (h) "Public Water System" means a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.

To demonstrate the basis of reporting, the Public Water Systems services by the City are listed in Table 2-1. As listed in Table 2-1, the City served 1 public water system with a total of 3,897 connections and a total of 2,215 acre-feet per year (AFY) in year 2020.

Submittal 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 *
<i>Add additional rows as needed</i>			
CA4510006	City of Shasta Lake	3,897	2,215
TOTAL		3,897	2,215
* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.			
NOTES: Units of measure in this UWMP are acre-feet (AF). Source: Large Water System 2020 Annual Report to the Drinking Water Program for Year Ending December 31, 2020, 2020 AWWA Water Audit.			

2.2 Individual Planning and Compliance

This UWMP reports solely on the City service area, as shown in Table 2-2. The City has notified and coordinated with appropriate regional agencies and constituents.

Submittal Table 2-2: Plan Identification		
Select Only One	Type of Plan	Name of RUWMP or Regional Alliance if applicable (select from drop down list)
<input checked="" type="checkbox"/>	Individual UWMP	
<input type="checkbox"/>	Water Supplier is also a member of a RUWMP	
<input type="checkbox"/>	Water Supplier is also a member of a Regional Alliance	
<input type="checkbox"/>	Regional Urban Water Management Plan (RUWMP)	
NOTES:		

2.3 Calendar Year and Units of Measure

CWC 1608.20 (a) (1) Urban retail water suppliers...may determine the targets on a fiscal year or calendar year basis.

The City is reporting on a calendar year basis and therefore, 2020 data includes the months of January to December 2020. Table 2-3 indicates the City type of reporting year, and the units of measure for reporting water volumes throughout the 2020 UWMP.

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
<input type="checkbox"/>	Supplier is a wholesaler
<input checked="" type="checkbox"/>	Supplier is a retailer
Fiscal or Calendar Year (select one)	
<input checked="" type="checkbox"/>	UWMP Tables are in calendar years
<input type="checkbox"/>	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP * (select from drop down)	
Unit	AF
* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.	
NOTES:	

2.4 Coordination and Outreach

The UWMPA requires that the UWMP identify the water agency’s coordination with appropriate nearby agencies.

The City coordinated its efforts with relevant agencies and parties to ensure that the data and issues discussed in the plan are presented accurately.

2.4.1 Wholesale and Retail Coordination

Retail agencies that receive a water supply from one or more wholesalers are required to provide wholesalers with projected water demand from that source, in five-year increments for 20 years.

The City does not purchase or receive potable water from a wholesaler. Therefore, Table 2-4 has been left blank.

Submittal 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
<i>Add additional rows as needed</i>
NOTES:

2.4.2 Coordination with Other Agencies and the Community

10620 (d)(2) Each urban water supplier shall 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.

10642. Each urban water supplier shall encourage the 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...

The City solicited participation from other agencies, organizations, and the community for the preparation of the 2020 UWMP. Table 2-5 summarizes how the UWMP preparation was coordinated.

Table 2-5: Coordination with Appropriate Agencies								
Coordinating Agencies	Participated in Developing the Plan	Notified of UWMP Update	Commented on the Draft	Attended Public Meetings	Was Contacted for Assistance	Was Sent a Copy of the Draft Plan	Was Sent a Notice of Intention to Adopt	Not Involved No Information
City of Shasta Lake – City Manager	✓	✓		✓		✓		
City of Shasta Lake – Development Services	✓	✓		✓		✓		

Table 2-5: Coordination with Appropriate Agencies

Coordinating Agencies	Participated in Developing the Plan	Notified of UWMP Update	Commented on the Draft	Attended Public Meetings	Was Contacted for Assistance	Was Sent a Copy of the Draft Plan	Was Sent a Notice of Intention to Adopt	Not Involved No Information
City of Shasta Lake – Public Works Department	✓	✓		✓		✓		
City of Shasta Lake – Finance Department		✓		✓		✓		
City of Shasta Lake – Wastewater Utility	✓	✓		✓		✓		
City of Shasta Lake – Water Utility	✓	✓		✓		✓		
Anderson-Cottonwood Irrigation District (ACID)		✓				✓	✓	
Bella Vista Water District (BVWD)		✓				✓	✓	
Shasta County Water Agency (SCWA)		✓				✓	✓	
City of Redding		✓				✓	✓	
Department of Water Resources (DWR)								
United States Bureau of Reclamation (USBR)		✓				✓	✓	
County of Shasta		✓				✓	✓	
General Public (Website and Publication/ Posting)		✓				✓	✓	

2.4.3 Notice to Cities and Counties

CWC 10621 (b) requires that agencies notify cities and counties to which they serve water that the City’s UWMP is being updated and reviewed.

10621(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify a 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.

The City provided formal written notification to USBR, the County, SCWA, City of Redding, ACID, and BVWD that the City’s UWMP was being updated. In accordance with the UWMPA, this notification was provided at least 60 days prior to the public hearing of the plan. Electronic

copies of the final UWMP will be provided to the USBR, County, SCWA, City of Redding, ACID, and BVWD no later than 30 days after its submission to DWR. Appendix A contains copies of outreach documents.

Notices were published informing interested parties that the draft 2020 UWMP was available for review. Pursuant to California Code Section 6066, a notification of the time and place of the public hearing was published in the local newspaper on June 1, 2021, and June 8, 2021. A notice was also posted on the City's website (www.cityofshastalake.org). Copies of these notifications are included in Appendix A.

The Final Draft 2020 UWMP was presented on June 15, 2021, for adoption by resolution following a public hearing. This hearing provided an opportunity for the City's customers, residents, and employees to learn and ask questions about the current and future water supply of the City. A copy of the associated documentation is included in Appendix A.

Chapter 3

SYSTEM DESCRIPTION

The UWMPA requires that the UWMP include a thorough description of the water system, service area, and various aspects of the area served including climate, population, and other demographic factors.

10631. (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

3.1 General Description

The City is located north of Redding in western Shasta County. The City is located along the I-5 corridor, south of Shasta Lake and the Shasta Dam. The closest neighboring communities are Bella Vista, Redding, and Shasta to the south, Lakehead and Mountain Gate to the north, and French Gulch to the west.

The City is located within the upper Churn Creek, Stillwater Creek, and Moody Creek watersheds. The developed areas of the City are gently rolling with numerous small creeks tributary to the three major watersheds. The elevation of the southern portion of the City is less variable, which then becomes hilly with steep slopes towards the northern boundary. The northern portion of the City is generally undeveloped land. Elevations in the City range from a high of about 1,280 feet above sea level at the northern ridge to a low of about 670 feet at the southern boundary. The majority of the community lies between the intermediate elevations of 800 and 900 feet (Water Management Plan 2011 Criteria, April 2014).

The City, incorporated in 1993, provides water, sewer, recycled water, storm drain, and electric services to the residents of the City. Water service is provided to all residential, commercial, and industrial customers, and for fire protection services. The City provides recycled water for industrial reuse and irrigation of a portion of I-5.

The City limits comprise 10.8 square miles. The water service area encompasses the entire City limits. In addition, the City provides water service to a portion of the City of Redding in their Buckeye service area (Summit City Pressure Zone), as described in Section 6.8.2.3. The total water service area is 11.0 square miles. Figure 3-1 shows the City limits, water service area, and the main distribution system components (large diameter pipelines and water tanks). The WTP is located outside of City limits, north of Fisherman's Point adjacent to Shasta Dam.

3.1.1 Description of Transmission, Treatment, and Distribution Facilities

In 1945, the City water system began with the establishment of the Shasta Dam Area Public Utility District (SDAPUD) that was organized to serve the unincorporated communities of Central Valley, Summit City, Project City, and Pine Grove. A long-term (40 years) water contract

was signed in 1948 with the USBR. In 1954, the USBR replaced transmission piping and increased pump capacity and storage at the Reclamation Dam facilities. At the same time, piping was extended to serve the area then known as the Buckeye County Water District (City of Redding).

In 1966, SDAPUD constructed a 2.0 million gallon per day (mgd) filtration plant approximately one mile northwest of Central Valley, just above Toyon Government Camp. Capacity improvements to this plant occurred over the next 24 years until 1990, when a new treatment plant at Fisherman's Point replaced the old facility. Additional improvements to the distribution and storage facilities were implemented by the SDAPUD until 1993, at which time; the City was incorporated and acquired control of the water system from SDAPUD (Water Management Plan 2011 Criteria, April 2014).

The City water supply is surface water diverted from Shasta Lake. The diversion point is at the face of Shasta Dam, where there are two intakes (750 and 950 feet above sea level). Raw water is pumped to the Fisherman's Point WTP via the USBR Raw Water Pumping Station located at the base of Shasta Dam.

The Fisherman's Point WTP is capable of treating and distributing a maximum of approximately 9.72 mgd and consists of filtration (Micro-Floc Trident) and disinfection with chlorine. The distribution system includes approximately 79 miles of pipelines consisting of steel, cast iron, asbestos cement, and polyvinyl chloride piping. Most of the steel piping is pre-1960 vintage with a large portion of smaller diameter mains (less than 5-inch) being installed prior to 1950. There is approximately 42,240 feet of undersized steel pipe over 50 years old that is in need of replacement (Water Management Plan 2011 Criteria, April 2014). The City's water system consists of approximately 79 miles of active water distribution system pipelines up to 24-inches in diameter, the Fisherman's Point WTP, 9 storage tanks (8 treated water, 1 raw water), 2 intertie booster pump stations, 1 raw water booster pump station, 15 PRV stations, and 9 pressure zones.

3.2 Service Area Climate

10631(a). A plan shall... Describe the service area of the supplier, including ... climate...

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning... while accounting for impacts of climate change.

The City's service area climate is characterized by hot dry summers and mild winters. Average monthly evapotranspiration (ETo) rates, rainfall, and temperature are summarized in Table 3-0.

Table 3-0: Climate Characteristics

Month	Standard Monthly Average ETo ⁽¹⁾ (inches)	Monthly Average Rainfall ⁽²⁾ (inches)	Monthly Average Temperature ⁽²⁾ degrees Fahrenheit (°F)	
			Minimum	Maximum
January	1.16	11.12	38.9	52.5
February	1.99	10.05	41.0	56.7
March	2.89	8.74	43.0	61.3
April	4.53	4.37	47.7	68.5
May	6.25	2.58	54.8	77.5
June	8.18	1.30	62.2	86.0
July	8.35	0.20	68.3	95.2
August	6.97	0.40	66.6	93.7
September	5.39	1.05	62.3	87.8
October	4.12	3.40	54.4	75.2
November	2.13	7.86	45.6	60.5
December	1.22	10.74	40.1	53.1
Annual	53.17	61.82	52.1	72.3

NOTES:

- (1) Source: California Irrigation Management Information System (CIMIS) Station 224 Shasta College. Represents monthly average ETo from January 2016 to December 2020.
- (2) Source: Western Regional Climate Center Shasta Dam (048135). Represents monthly average from January 1943 to June 10, 2016.

As shown in Table 3-0, the City service area's average monthly temperature ranges from about 52.1 to 72.3 °F. Average annual values of ETo and precipitation are 53.17 inches and 61.82 inches, respectively. Records show that the average monthly precipitation ranges from 0.2 inches to 11.12 inches with most of the precipitation typically occurring from November through March.

3.3 Service Area Population and Demographics

10631(a). Describe the service area of the supplier, including current and projected population... The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

This section summarizes historical, current, and projected population trends in the City. Population projections are essential to the planning process and form the basis for most planning decisions, yet projecting future growth is far from an exact science given the complex set of variables that can affect the rate of growth. Typically, projections are developed by taking past patterns and combining them with assumptions regarding the future to obtain an estimate of future growth rates. These projections serve to provide the City insight on the type and quantity of future growth as well as guidance regarding future planning activities; therefore, such planning activities can only be as effective as the ability to anticipate population growth.

3.3.1 Service Area Population

The population of the City increased from approximately 100 people in 1938 to 2,600 people in 1945 due to the construction of Shasta Dam. After incorporation of the City in 1993, the California Department of Finance (DOF) extrapolated the population of the City from 1990 census data as 8,783 people. The population increased to 9,008 in 2000 (Census 2000) and to 10,164 in 2010 (Census 2010). Figure 3-2 shows the historical population based on information gathered from the DOF. The DOF estimates population each year based on the number of building permits issued, residential units destroyed, requests for new electrical connections, etc.

Selecting a population growth rate for this UWMP update is challenging due to impacts from the recession and the differing expected growth rates reported for the area. The City’s General Plan (1999) projected buildout to 2050 based on an average growth rate of 1.58 percent. The 2009-2014 Housing Element expected a 0.5 percent growth rate and reported that the growth rate from 2000 through 2009 was 1.37 percent.

In early 2014, a draft Environmental Impact Report (EIR) was published for the Mountain Gate at Shasta project that estimated a slow to moderate annual average growth rate of the City between 0.5 and 1.0 percent through 2023 based on the trends of the last 10 years and the recent economic recession. Based on this information, a growth rate of 1.0 percent annually was utilized to project the population through 2040 in the 2015 UWMP and through 2045 in the 2020 UWMP5. The current and projected population for the City is contained in Table 3-1.

Submittal Table 3-1 Retail: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045(opt)
	10,626	11,168	11,738	12,336	12,966	13,627
NOTES: 2020 population is per SB X7-7 Method for Population Finances 1 (Department of Finance [DOF] Table E-5). Projected populations assume 1% annual population growth.						

The historical population is shown in Figure 3-2.

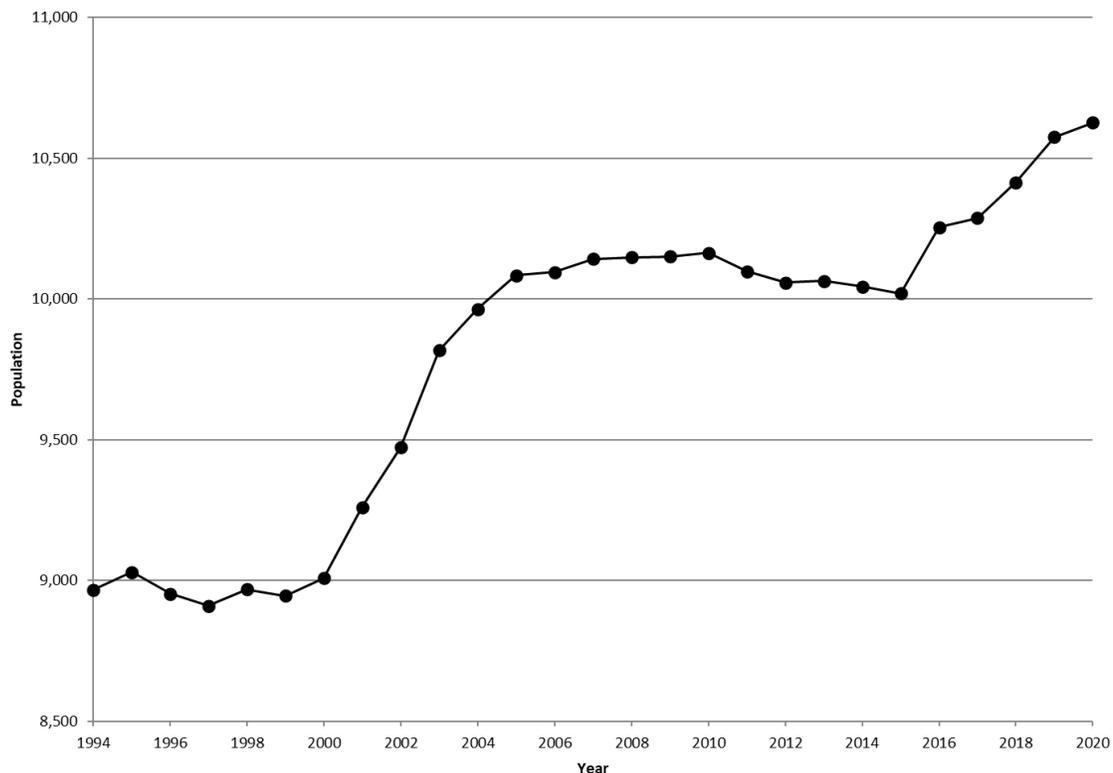


Figure 3-2 Historical Population

3.3.2 Other Social, Economic and Demographic Factors

10631. Describe the service area of the supplier, including... other social, economic and demographic factors affecting the supplier’s water management planning.

This section summarizes and analyzes demographic information from the 2010 Census and currently available information from 2020. Analyzing demographic data can yield important information about possible shifts in demand for City water service.

According to the 2010 Census, the total population was 10,164 and the number of housing units was 4,209. The median age in the City was 38.8 with 78.6 percent of the population over 16 years of age (2010 Census). The population was split 49.9 to 50.1 percent male to female, respectively (2010 Census).

Table 4-C.4 of the SB X7-7 Compliance Form (Appendix C) shows that the California Median Household Income in 2020 was \$75,235. The median household income for the City from 2015-2019 in 2019 dollars was \$48,902, or 65 percent of the statewide average (US Census Bureau QuickFacts). This defines the entire incorporated area of the City as a Disadvantaged Community.

The California Employment Development Department (EDD) reported a 7.3 percent unemployment rate for 2015 and a 10.2 percent unemployment rate for 2020.

3.4 Land Uses within Service Area

10631(a). The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities...

The City's existing General Plan was adopted in June 1999. The City is in the process of completing a comprehensive General Plan update. The Land Use Element in the General Plan sets forth the City's policies for guiding local development. The land uses within the service area is shown in Figure 3-3.

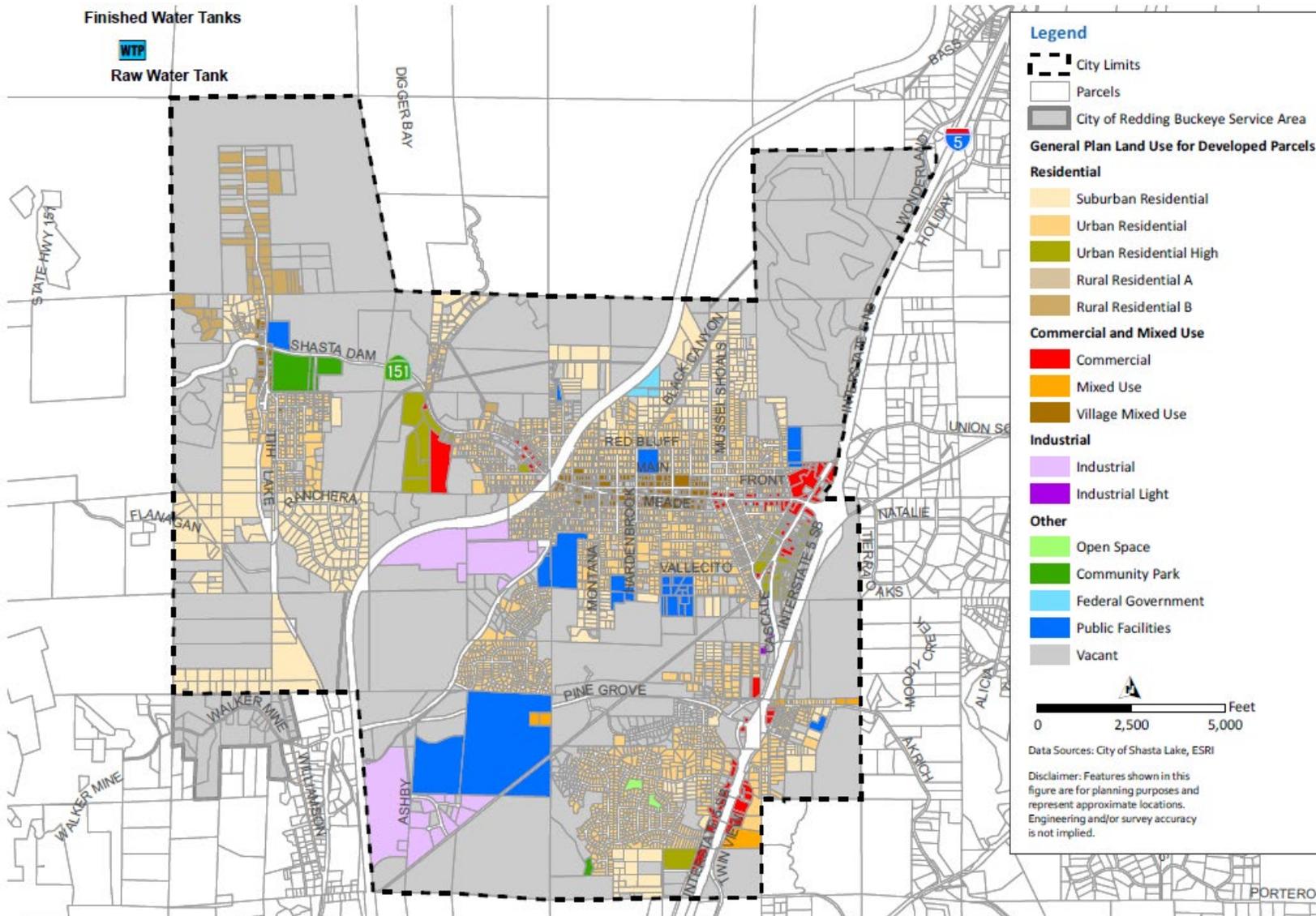


Figure 3-3 Land Uses within Service Area

3.5 Climate Change

Climate change mitigation and adaptation efforts are being implemented as part of the 2020 UWMP Guidebook update. Projected climate change trends for California include increasing temperature and increasing precipitation as rainfall rather than snow. Water suppliers are now having to assess local climate challenges and plan for vulnerabilities within their systems. As these risks are identified, methods of adaption and mitigation can be employed to increase sustainability of water resources.

In the past decade, there has been a significant increase in tools and models to help identify potential impacts of climate change. The various resources differ in the information available in each service area, scenario assumptions, and parameters potentially impacted by climate change. The following tools were evaluated for this UWMP and are described in further detail in the sections below:

- Climate Resilience Evaluation and Awareness Tool (CREAT).
- Cal-Adapt Extended Drought Scenarios Tool.
- Cal-Adapt Wildfire Tool.

3.5.1 EPA Climate Resilience Evaluation and Awareness Tool

The United States Environmental Protection Agency (EPA) created an online resource called CREAT to assist water agencies in preparing for potential future impacts on their systems caused by climate change. This tool utilizes model simulation to estimate changes in temperature, precipitation, storms, extreme heat, and sea level rise. For the purposes of this UWMP, the Cal-Adapt tool was used, which is consistent with the tool presented by DWR.

3.5.2 Cal-Adapt Extended Drought Scenarios Tools

Cal-Adapt is an online resource created by the State of California's scientific and research community to provide visualization tools and high-quality data regarding climate change at a local level. This resource allows the user to explore charts, maps, data, and projected climate variables for the State of California, and is a key recommendation of the 2009 California Climate Adaptation Strategy and the California DWR. All projections generated include two possible climate outcomes; one scenario where greenhouse gas (GHG) emissions peak near year 2040 and decline beyond 2040 (medium, Representative Concentration Pathway [RCP] 4.5), and another in which GHG emissions continue to rise throughout the 21st century (high, RCP 8.5). The tool allows the user to search by watershed, grid, counties, census tracts, and incorporated and census designated places. Thus, this tool was used to evaluate the impacts of climate change within the City's service area using the medium, RCP 4.5, and high, RCP 8.5, GHG emission scenarios.

The Extended Drought tool was used to evaluate early- and late-century variable climate impacts for the City watershed over a 20-year drought including 5 years prior and 4 years following. This two-decade extended drought period is often referred to as a "mega-drought." The results, which include minimum and maximum temperature, precipitation, ETo, and runoff, are summarized in Table 3-2.

Table 3-1: Extended Drought Scenario Projections

Parameter	Observed Historical (1961 - 1990)	Early-Century (2023 - 2042)	Late-Century (2051 - 2070)
Maximum Temperature (°F)	73.8	78.2	81.6
Minimum Temperature (°F)	50.0	53.6	57.0
Precipitation (inch)	45.9	36.6	36.6
Evapotranspiration (inch)	26.0	24.5	25.0
Runoff (inch)	8.9	6.2	6.1
Snow Water Equivalent (inch)	11.7	2.3	0.8
NOTES: (1) Retrieved using Cal-Adapt Extended Drought tool.			

The projected increase in maximum temperature from historical years to late-century is 7.8°F (10.6 percent), whereas the projected increase in minimum temperature is 7.0°F (14.0 percent). Precipitation is projected to decrease by 9.3 inches by late-century (20.3 percent) and ET by 1.0 inches (3.8 percent). Runoff is projected to decrease by 2.8 inches (31.5 percent) and snow water equivalent by 10.9 inches (93.2 percent).

3.5.3 Cal-Adapt Wildfire

The Cal-Adapt Wildfire tool utilizes four models identified by the California Climate Action Team as priority models contributing to the 2018 California Fourth Climate Change Assessment. The models listed below describe the scenarios used in area burned wildfire projections.

- Warm/dry scenario (HadGEM2-ES).
- Cooler/wetter scenario (CNRM-CM5).
- Average scenario (CanESM2).
- A scenario that is unlike the first three models, the “complement” scenario (MIROC5).

The model projections generated include the same two possible climate outcomes: RCP 4.5 and RCP 8.5. Time periods for the wildfire analysis include historical (1961-1990), mid-century (2035-2064), and end of the century (2051-2070). The population growth scenario for the City service area was identified as central, or median. Summary statistics of all four priority models under medium and high RCP conditions are below in Table 3-3.

Table 3-2: Summary of Projected Wildfire Area Burned

Parameter	Observed Historical (1961 - 1990)	Mid-Century (2035 - 2064)	End of the Century (2051 - 2070)
RCP 4.5 Conditions			
Minimum Area Burned (hectares)	22.0	6.0	31.0
Average Area Burned (hectares)	286.6	278.8	310.0
Maximum Area Burned (hectares)	2,067.0	3,039.0	2,343.0

Table 3-2: Summary of Projected Wildfire Area Burned			
Parameter	Observed Historical (1961 - 1990)	Mid-Century (2035 - 2064)	End of the Century (2051 - 2070)
RCP 8.5 Conditions			
Minimum Area Burned (hectares)	30.0	19.0	82.0
Average Area Burned (hectares)	284.5	297.4	533.0
Maximum Area Burned (hectares)	2,042.0	1,870.0	3,267.0
NOTES: (1) Retrieved using Cal-Adapt Wildfire tool.			

Based on these statistics, the probability of wildfires in the City watershed is anticipated to be fairly steady, while the average area burned is anticipated to increase under both the RCP 4.5 and RCP 8.5 conditions.

Chapter 4

WATER USE CHARACTERIZATION

The UWMPA requires that the UWMP identify the quantity of water supplied to the agency's customers including a breakdown by user classification. This section describes the water system demands and water demand projections.

4.1 Non-Potable Versus Potable Water Use

This chapter covers potable and raw water demand. Recycled water is addressed comprehensively in Chapter 6.

4.2 Past, Current, and Projected Water Use by Sector

10631(d). (1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following...

(2). The water use projections shall be in the same five-year increments described in subdivision (a).

(4)(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following: (i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections. (ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

Water demands served by the City are primarily residential, including SFR and MFR, CII, and landscape irrigation. All connections in the City are metered.

The following water use sectors and associated metered deliveries, as shown in Table 4-0, were reported in the 2015 UWMP.

Table 4-0: 2015 Water Deliveries	
Use Type	Metered Volume
SFR	1,059
MFR	66
Commercial/Institutional	130
Industrial	186
Landscape	44
Agricultural Irrigation	0
Losses	132
Total	1,617
NOTES: Units of measure in this UWMP are AF. Source: Large Water Systems 2015 Annual Report to the Drinking Water Program for Year Ending December 31, 2015.	

The City classifies meters (2020) into the following categories: 3,700 residential (includes SFR and MFR), 174 CII, and 23 landscape irrigation meters. The actual demands for potable and non-potable water are presented in Table 4-1 for the 2020 calendar year.

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable ¹ Water - Actual			
Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume ²
Add additional rows as needed			
Single Family		Drinking Water	1,341
Multi-Family		Drinking Water	156
Commercial	Includes Institutional	Drinking Water	130
Industrial		Drinking Water	289
Landscape		Drinking Water	102
Agricultural irrigation		Drinking Water	0
Other	USBR potable use	Drinking Water	31
Losses		Drinking Water	166
TOTAL			2,215
¹ Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4. ² Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.			
NOTES: Units of measure in this UWMP are acre-feet (AF). Source: Source: Large Water System 2020 Annual Report to the Drinking Water Program for Year Ending December 31, 2020.			

Table 4-2 contains the projected potable and raw water demands from 2025 through 2045. The demand projections are based on the City selected 15-year baseline water use. To project the number of connections per customer sector, it was assumed that the number of connections will grow consistently with the projected water demands; this is based on the relative distribution of customer types, accounts, and water use reported for 2020. However, the customer sector water deliveries in Table 4-2 are only general estimates of projected use and may vary significantly based on future development and water conservation measures taken by each customer sector. Ultimately, the implementation, magnitude, and type of future development will determine the distribution of water use per customer sector.

Submittal Table 4-2 Retail: Use for Potable and Non-Potable ¹ Water - Projected						
Use Type <u>Drop down list</u> May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	Projected Water Use ² <i>Report To the Extent that Records are Available</i>				
		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
Single Family		1,628	1,711	1,799	1,890	1,987
Multi-Family		189	199	209	220	231
Commercial	Includes Institutional	158	166	174	183	193
Industrial		351	369	388	407	428
Landscape		124	130	137	144	151
Agricultural irrigation		0	0	0	0	0
Other	USBR potable use	38	40	42	44	46
Losses		202	212	223	234	246
TOTAL		2,690	2,827	2,971	3,123	3,282
¹ Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4. ² Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.						
NOTES: Units of measure in this UWMP are acre-feet (AF).						

The City total water demands for potable and raw water, and recycled water demand, based on the figures presented in Table 4-1, Table 4-2, and Table 6-4, are summarized in Table 4-3. The City provides recycled water to several industries and irrigation customers, as described by Chapter 6.

Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable <i>From Tables 4-1R and 4-2 R</i>	2,215	2,690	2,827	2,971	3,123	3,282
Recycled Water Demand ¹ <i>From Table 6-4</i>	95	95	95	95	95	95
Optional Deduction of Recycled Water Put Into Long-Term Storage ²	0	0	0	0	0	0
TOTAL WATER USE	2,310	2,785	2,922	3,066	3,218	3,377
¹ Recycled water demand fields will be blank until Table 6-4 is complete ² Long term storage means water placed into groundwater or surface storage that is not removed from storage in the same year. Supplier <i>may</i> deduct recycled water placed in long-term storage from their reported demand. This value is manually entered into Table 4-3.						
NOTES: Units of measure in this UWMP are acre-feet (AF).						

4.3 Distribution System Water Losses

10631(e)(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(J) Distribution system water loss.....

10631(d)(3)(A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34

Distribution system water losses ("real" losses) are the physical water losses from the water distribution system and the supplier's storage facilities, up to the point of customer consumption. The City's distribution system losses are quantified using the American Water Works Association (AWWA) Method Guidance "Water Resources Water Audit Manual." The distribution system water loss for the last five years (2016 through 2020 calendar years) is reported in Table 4-4.

Submittal Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss ^{1,2}
01/2016	82
01/2017	136
01/2018	119
01/2019	199
01/2020	166
¹ Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. ² Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3. NOTES: Units of measure in this UWMP are acre-feet (AF).	

As shown in Table 4-4 and reported in the AWWA water audit (Appendix B), the City had approximately 166 AFY of water loss (7.5 percent) in 2020. The state standard was met for each of the last five years of water loss audit reporting.

4.4 Estimating Future Water Savings

"Passive" savings are water savings from codes, standards, ordinances, or transportation and land use plans. As shown in Table 4-5, future water savings are not included in the total water use projections (Table 4-2).

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) <i>Drop down list (y/n)</i>	No
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	
Are Lower Income Residential Demands Included In Projections? <i>Drop down list (y/n)</i>	Yes
NOTES:	

4.5 Water Use for Lower Income Households

The UWMPA requires that the UWMP identify planned low-income housing developments within the agency’s service area and develop demand projections for those units. A lower income

household is defined as one with an income below 80 percent of area median income, adjusted for family size.

10631.1(a). The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

As shown in Table 4-5, lower income household demand projections are included in the total water use projections (Table 4-2 and Table 4-3).

The Regional Housing Needs Assessment (RHNA) is mandated by State Housing Law as part of the periodic process of updating local housing elements of the General Plan. The RHNA for Shasta Lake for the 2018 to 2028 projection period is 238 new housing units, including 28 extremely low-income units, 28 very low-income units, 39 low-income units, 42 moderate-income units, and 101 above moderate-income units. It should also be noted, State legislation in 2017 made Accessory Dwelling Units (ADU) legal in all California cities. Homeowners can decide to build either a detached ADU in their backyard, an attached ADU that is part of a home addition, or an ADU conversion. Although the State has determined ADU's contribute no additional stress on utilities, the addition of another dwelling unit, another family occupant, on a single-family property does impact water usage.

4.6 Climate Change Considerations

As temperature rises, water demands from various types of users will likely increase. Daily heat patterns, such as the duration of daytime heat prior to nighttime cooling, will change the diurnal demand patterns and peaking factors for activities, such as landscaping and other outdoor water use features (e.g., pools, fountains, open water bodies), due to increased ET values. The altered climate patterns in California creating hotter days and longer heat waves will increase customer water use and evaporative water losses. Extended drought periods are expected to become both more frequent, and more severe, which could lead to reduced rainfall and snowpack.

The combination of a long-term reduction in water supply availability with a long-term increase in water demand and higher summer demand peaks will increase pressure on the City to meet demands. Technology and devices to increase monitoring through the distribution system will help the City prepare for, and respond to, changes in supply and demand due to climate change. Creating redundancy through backup systems, the addition of pipes to connect dead ends or areas only served by one main line or water source, will help the City achieve efficiencies required in the face of climate change considerations. Getting localized, region specific data on climate change forecasts and impacts would also help the City for planning purposes.

The City's service area is predicted to have declining precipitation and increasing temperatures. The increasing temperatures may change demand levels and patterns. Continued reduction in per capita demand with water conservation will become more challenging as BMP saturation levels climb. It can be concluded that climate change will likely put more strain on the City's ability to meet demands long-term. If per capita water demand were to increase with temperature, or the population were to increase at a higher rate, or surface water supplies were to drop due to extended droughts, or water availability were to be impacted due to wildfires, the effects could have serious and devastating consequences.

Chapter 5

SB X7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE

The UWMPA requires that the UWMP identify the baseline water demand, urban water use target, and interim urban water use target for the City. In the 2015 UWMP, these water use targets were determined per the DWR Methodologies. The daily per capita water use, expressed in gpcd, is the total water use within the service area divided by the population. These targets are necessary to judge compliance with the 2020 use reductions set forth in the Water Conservation Bill of 2009 (SB X7-7).

The purpose of this section in the 2020 UWMP is to determine whether the City has met the 20 percent conservation mandate. All SB X7-7 forms are included in Appendix C.

5.1 2015 UWMP Baseline and Targets

A supplier may update the baseline and target water use if there were changes to their distribution area. The City's distribution area has not changed since 2015. Therefore, the baseline and target gpcd values from the 2015 UWMP are utilized in this UWMP to determine compliance with the 2020 target.

In the 2015 UWMP, a 15-year baseline and a 5-year baseline were calculated to establish the minimum criteria for the City water use reduction targets. A summary of the 2008 total and recycled water deliveries, 15-year baseline range (1996 to 2010), and 5-year baseline range (2006 to 2010) is included in Table 1 of the SB X7-7 Verification Forms (Appendix C).

5.2 Service Area Population

10608.20. (e) An urban retail water supplier shall include in its urban water management plan due in 2010... the baseline per capita water use... along with the bases for determining those estimates, including references to supporting data.

(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

10644. (a)(2) The plan... shall include any standardized forms, tables or displays specified by the department.

The City service area boundaries overlap by 100 percent with the boundaries of the City limits; therefore, the DOF methodology for population estimates is used as shown in Table 2 of the SB X7-7 Verification and Compliance Forms (Appendix C).

Service area population is reported for each year in the baseline periods as well as 2015 in Table 3 of the SB X7-7 Verification Form (Appendix C). The City used the 2010 and 2020 census data, the DOF values for baseline years prior to 2001, and Housing Element values for 2001 to 2009. For

the 2015 UWMP update, the DOF values for 2001 to 2009 were used instead of the Housing Element values to maintain consistency for the population methodology. Note that the DOF population values for 2001 to 2009 are lower than the Housing Element values. For the 2020 UWMP update, the DOF value for was used. Service area population is reported for 2020, the compliance year, in Table 3 of the SB X7-7 Compliance Form (Appendix C).

5.3 Gross Water Use

10608.12 (g) "Gross Water Use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

- (1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier*
- (2) The net volume of water that the urban retail water supplier places into long term storage*
- (3) The volume of water the urban retail water supplier conveys for use by another urban water supplier*
- (4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.*

"Gross Water Use" is the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier with certain acceptable exclusions. Gross water use is reported for each year in the baseline periods as well as 2015 and 2020, the compliance year, in Table 4 of the SB X7-7 Verification and Compliance Forms (Appendix C). The annual gross water values are the "total amount of potable water" reporting in the Annual Reports to the Drinking Water Program. These values do not account for losses at the WTP or in the distribution system.

As shown in Table 4-C.4 of the SB X7-7 Verification and Compliance Forms (Appendix C), the City is eligible for process water deductible exclusion. However, the City is not subtracting process water from their gross water use.

5.4 Baseline Daily Per Capita Water Use

The baseline daily per capita water use in each of the baseline years is calculated in Table 5 of the SB X7-7 Verification Form (Appendix C) by dividing annual gross water use by annual service area population. The average baseline daily per capita water use is summarized in Table 6 of the SB X7-7 Verification Form (Appendix C) for the 15-year baseline, 5-year baseline, and 2015. The average baseline daily per capita water use is summarized in Table 5 of the SB X7-7 Compliance Form (Appendix C) for the 2020 compliance year.

5.5 Baselines and Targets Summary

As mentioned above, a supplier may update the baseline and target water use if there were changes to their distribution area. The City's distribution area has not changed since 2015. Therefore, the baseline and target gpcd values from the 2015 UWMP are utilized in this UWMP to determine compliance with the 2020 target.

Based on the water use targets calculated in 2015, the City water use target for 2020 is 215 gpcd. Based on the 15-year baseline of 267 gpcd, the 2015 interim water use target was 241 gpcd. The 2020 target was determined using Method 4. According to the DWR guidelines, the 2020 target

is valid since it is less than the target confirmation criteria of 246 gpcd. In order to meet the confirmation criteria, the 2020 target must fall below 95 percent of the 5-year baseline, which for the City is 246 gpcd.

A summary of the various baselines and the confirmed 2020 target are summarized in Table 5-1. Refer to Table 7 and Table 8 of the SB X7-7 Verification Form (Appendix C) for more information on the calculation method and a summary of the targets.

Submittal Table 5-1 Baselines and Targets Summary From SB X7-7 Verification Form <i>Retail Supplier or Regional Alliance Only</i>				
Baseline Period	Start Year *	End Year *	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	1996	2010	267	215
5 Year	2006	2010	259	
<i>*All cells in this table should be populated manually from the supplier's SBX7-7 Verification Form and reported in Gallons per Capita per Day (GPCD)</i>				
NOTES:				

5.6 2020 Compliance Daily Per Capita Water Use

10608.12(e) "Compliance daily per-capita water use" means the gross water use during the final year of the reporting period...

10608.20 (e) An urban retail water supplier shall include in its urban water management plan due in 2010 . . . compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

Compliance daily per-capita water use means the gross water use during the final year of the reporting period. Water suppliers are required to calculate their actual 2020 water use (2020 calendar year) and evaluate whether their per capita 2020 target use was met. Refer to Table 5-2 and SB X7-7 Compliance Form Table 9 (Appendix C) for 2020 compliance.

Submittal Table 5-2: 2020 Compliance From SB X7-7 2020 Compliance Form <i>Retail Supplier or Regional Alliance Only</i>				
2020 GPCD			2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD* <i>(Adjusted if applicable)</i>		
186	0	186	215	YES
<i>*All cells in this table should be populated manually from the supplier's SBX7-7 2020 Compliance Form and reported in Gallons per Capita per Day (GPCD)</i>				
NOTES:				

The City met the 2020 target (215 gpcd) in the year 2020 (186 gpcd). If the City can maintain water consumption rates, it will maintain conservation goals. However, if consumption rates begin to rise, the City must implement additional conservation measures. In all of its conservation programs, the City will avoid placing a disproportionate burden on any customer sector.

Although the City was able to meet the 2020 target, the year 2020 did not represent a typical year due to the impacts of the COVID-19 pandemic. However, since the 2020 per capita demand of 186 gpcd was below the 2020 goal, adjustments for extraordinary events were not made in Table 5-2.

Chapter 6

WATER SUPPLY CHARACTERIZATION

The UWMPA requires that the UWMP include a description of the agency's existing and future water supply sources for the next 20 years. The description of water supplies must include detailed information on surface water, groundwater, the groundwater basin, potential opportunities for desalination of groundwater and seawater, and detailed information on the agency's imported water.

6.1 Water Supply Overview

The City's water supply is Shasta Lake through a combination of a long-term (40 years) contract with the USBR and long- and short-term agreements with surrounding agencies and water suppliers. Water contracts and agreements are included in Appendix D. Table 6-0 summarizes the annual entitlement under each contract/agreement. Each contract/agreement is detailed separately below.

Table 6-0: Active Water Supply Contracts and Agreements				
Water Supplier	Agreement Type	AFY	Source	Term
USBR	Purchase	4,430 ^(1,2)	CVP	40 Years
SCWA	Purchase	50 ⁽²⁾	CVP	Annual
McConnell Foundation	Purchase	Varies	CVP	Annual
CCSD	Purchase	Varies	CVP	Annual
MCM	Transfer	325 ⁽³⁾	CVP	39 Years
ACID	Transfer	2,000 ⁽⁴⁾	CVP	5 Years
NOTES: 1. Contract 4,430 AF. Includes original contract (4,400 AF) plus the 30 AF reallocated from the Summit City Pressure Zone Agreement with the City of Redding. 2. During drought conditions, a percent reduction is applied to the historical average of the City's actual water usage over the prior three water years. 3. Transfer has not been approved due to Cold Water Pool (CWP) issues. 4. 1,500 AF is take or pay. 5. CCSD = Centerville Community Services District; CVP = Central Valley Project; MCM = MCM Properties Inc.				

6.2 Purchased or Imported Water

6.2.1 United States Bureau of Reclamation Contract

The City entered into a long-term contract with the USBR (Contract No. 4-7-20-W1134-LTR1) that authorizes the City to divert from Shasta Lake a specified quantity of the water supply created by the CVP. The contract was entered into in March 2005 and allows the City to divert up to 4,430 AFY, which includes the original contract of 4,400 AF plus the 30 AF reallocated from the Summit City Pressure Zone Agreement with the City of Redding, from Shasta Lake for

municipal and industrial purposes. Per the Water Infrastructure Improvement for the Nation Act of 2016 (WIIN Act), the City's long term water contract, the WIIN Conversion Contract Amendment, was finalized in June 2020 and does not carry an expiration date.

Provisions in the contract allow for the renewal of the contract for successive periods and to increase or decrease the quantity of water available to the City. The City is required under the contract to prepare and implement a water conservation program for all water diverted from the USBR sources. This program must be submitted to USBR for approval every five years. The 2015 UWMP was submitted to USBR for review and approval to satisfy this requirement. Upon completion, this UWMP will be submitted to USBR for review.

The contract states that USBR will use all reasonable means to prevent shortages in the quantity of water available to the City. However, the contract also states that no liability shall accrue against the United States if shortages occur due to drought or other causes, which are beyond the control of the United States. During drought conditions, CVP diversions can be cut back significantly, as was the case in 1992 when they were reduced by 50 percent in the region. The percent reduction is applied to the historical average of the City's actual water usage over the prior three water years.

Currently the City only uses about 60 percent of the USBR allocation during an average year. However, during drought years, this allocation can be reduced drastically. The USBR water year is from March to February of the following year. In 2016, 2017, and 2019, the allocation was 100 percent (4,430 AF). In 2018 and 2020, the allocation was 75 percent based on the average water usage over the prior three years, resulting in approximately 1,817 AF available to the City in the 2018 water year and 1,536 AF available to the City in the 2020 water year.

6.2.2 Shasta County Water Agency Contract

On March 3, 1998, the City entered into a contract with the SCWA to purchase 50 AF of CVP water per year. SCWA has a contract with the USBR (Contract No. 14-06-2003367A) to receive water from Shasta Lake and Whiskeytown Lake. SCWA approves the 50 AF on an annual basis. On March 13, 2013, the City requested SCWA permanently assign 50 AF to the City under a long-term agreement. The City is currently in the process of finalizing a permanent transfer agreement with the USBR. The SCWA water year is from March to February of the following year. In 2016, 2017, and 2019, the allocation was 100 percent (50 AF). In 2018 and 2020, the allocation was 75 percent (37.5 AF).

6.2.3 McConnell Foundation Purchase Agreement

The City has entered into short-term annual purchase agreements with the McConnell Foundation since 2001. The McConnell Foundation has a USBR contract to receive 5,100 AF of CVP water each year. The City requests to purchase water from the McConnell Foundation when needed to make up for the reduction in water supply. The City has used the McConnell agreements to supplement its supply during USBR restrictions on Shasta Lake diversions. In Shasta County, the only unrestricted water contractor not impacted by the CWP issues is the McConnell Foundation. The City purchased 1,266 AF of supplemental water for the 2016 water year (May 2016 - February 2017). In 2017 and 2019, the City did not purchase any water. In 2018, the City purchased 275 AF of supplemental water. The City purchased 500 AF of supplemental water for the 2020 water year (March 2020 - February 2021).

6.2.4 Centerville Community Services District Purchase Agreement

From 2002 to 2004, the City purchased 240 AF of CVP water annually from the CCSD. In February 2016, the City purchased 65 AF of supplemental water. In 2017-2020 water years, the City did not purchase any water from CCSD.

6.3 Groundwater

The City is located north of the Redding Groundwater Basin (identified as Groundwater Basin Number 5-6.04 by DWR) which contains the main water-bearing geologic units in the northern Sacramento Valley. The Redding Groundwater Basin is an unadjudicated basin. The geology underlying the City is characterized mainly by dense, relatively un-fractured meta-volcanic rock (Copley greenstone). Wells completed in the Copley greenstone generally have very low yields (less than 10 gallons per minute [gpm]). Less dense, probably more highly fractured black shale, the Kennett formation underlies the northeastern corner of the City. Wells of record completed in the Kennett formation within the City have similar or slightly higher yields than those completed in the Copley greenstone.

Chico formation rocks underlie the extreme south portion of the City. The Chico formation generally has poor water quality, and wells completed in this area of the City generally have low yields. A small area of Red Bluff formation occurs in the southeastern corner of the City.

Most wells of record within the City have very low yields (less than 10 gpm). The highest yielding wells near the City are those of the Mountain Gate Community Services District (two wells that average 200 gpm each).

The area with the best potential groundwater yield within the City's sphere of influence is the northeastern corner. This area appears to have a similar geologic setting to that of the Mountain Gate Community Services District well area. The Kennett formation has been mapped in that area, and there appears to be at least two fracture zones running through the area. Geologic conditions may not match exactly those of the Mountain Gate area, however, and it cannot be stated with certainty that yields similar to those at Mountain Gate can be obtained.

DWR Bulletin 118, "California's Groundwater" contains a detailed description of the Redding Basin and its characteristics and conditions. Based upon the water balance provided in Bulletin 118, groundwater outflows exceed groundwater inflows by approximately 4,800 AFY, suggesting a basin overdraft situation may exist.

The DWR does not identify the Redding Groundwater Basin as being over drafted nor expected to become over drafted. The purposes of the GWMP are to avoid or minimize conditions that adversely affect groundwater availability and quality in the GWMP area and to develop a management program that addresses data collection and protects and enables reasonable use of the groundwater resources of the Redding Basin.

As shown in Table 6-1, the City does not operate groundwater wells within the City limits for water supply. The 1998 Master Water Plan determined it was not feasible to obtain any significant water supply from groundwater wells inside the City limits.

6.6.1 Recycled Water Coordination

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.

The City owns and operates the Wastewater Treatment Plant (WWTP) that collects and treats all wastewater within the service area. Therefore, the City coordinates recycled water use within the service area and does not rely on an outside facility or agency.

6.6.2 Wastewater Collection, Treatment Systems, and Disposal

10633. (a) (Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

The City manages wastewater collection and treatment within the City limits. All of the wastewater flows from the City are collected and treated at the City's WWTP. The wastewater collection system consists of approximately 270,000 feet of gravity sewer line, 7 raw sewage lift stations, and 18,000 feet of force mains.

The WWTP was upgraded in 2020 to an average dry weather flow capacity of 1.3 mgd and a peak wet weather capacity of 5.0 mgd. The upgraded plant was designed to meet Title 22 requirements for three existing reclaimed water customers (see Section 6.6.4). No expansion of reclaimed water usage is anticipated in the future. All treated effluent that is not used by the three reclaimed water customers is discharged to Churn Creek.

The WWTP provides advanced secondary treatment of wastewater. The treatment system consists of screening, three-train aeration, secondary clarification, cloth media filtration, and ultraviolet (UV) disinfection. A combined 8 million gallons (MG) of emergency retention storage is available for excess influent flow or partially treated wastewater. All treated effluent that is not used by the three reclaimed water customers is discharged to Churn Creek.

Sludge processing consists of an aerobic digestion and sludge storage basins. The sludge storage basins provide storage for stabilized solids during the wet weather periods and serve as drying beds during the warm summer months. Dried sludge is hauled to a landfill for disposal.

The 2020 wastewater flows from the City's service area is summarized in Table 6-2. As shown in Table 6-2, the City contributed nearly 836 AFY of wastewater flow into the WWTP in 2020.

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020						
<input type="checkbox"/> There is no wastewater collection system. The supplier will not complete the table below.						
Percentage of 2020 service area covered by wastewater collection system <i>(optional)</i>						
Percentage of 2020 service area population covered by wastewater collection system <i>(optional)</i>						
Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? <i>Drop Down List</i>	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? <i>Drop Down List</i>	Is WWTP Operation Contracted to a Third Party? <i>(optional) Drop Down List</i>
City of Shasta Lake	Metered	836	City of Shasta Lake	Wastewater Treatment Facility	Yes	No
Total Wastewater Collected from Service Area in 2020:		836				
<i>* Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3 .</i>						
NOTES: Units of measure in this UWMP are acre-feet (AF).						

6.6.3 Wastewater Treatment and Discharge within Service Area

Discharge is allowed from two discharge locations. Discharge Point 001 (Monitoring Location EFF-001) discharges water directly from the end of the WWTP to Churn Creek. Discharge Point 002 (Monitoring Location EFF-002) discharges water from the reclaimed reservoir to Churn Creek downstream from EFF-001. The reclaimed reservoir was taken out of service at the end of October 2020. Effluent discharged to Churn Creek is UV disinfected.

In 2020, the WWTP received an average annual flow of approximately 836 AF or approximately 0.74 mgd. As the WWTP was designed to meet Title 22 requirements, all of the flow discharged meets recycled water standards.

Table 6-3 identifies the volume of treated wastewater either recycled or disposed of within the service area.

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020											
<input type="checkbox"/> No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.											
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number (optional) ²	Method of Disposal <i>Drop down list</i>	Does This Plant Treat Wastewater Generated Outside the Service Area? <i>Drop down list</i>	Treatment Level <i>Drop down list</i>	2020 volumes ¹				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
City of Shasta Lake Wastewater Treatment Facility	EFF-001, EFF-002	Churn Creek		River or creek outfall	No	Tertiary	849	754	95	0	0
Total							849	754	95	0	0
¹ Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3. ² If the Wastewater Discharge ID Number is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CIWQSReportServlet?inCommand=reset&reportName=RegulatedFacility											
NOTES: Units of measure in this UWMP are acre-feet (AF). Refer to Table 6-4 for current and projected recycled water use within service area.											

6.6.4 Recycled Water System Description

10633. (c) A description of the recycled water currently being used in the supplier’s service area, including, but not limited to, the type, place, and quantity of use.

The City's WWTP produces disinfected tertiary recycled water per the recycled water criteria defined by the Division of Drinking Water (formerly the California Department of Public Health) under California Administrative Code, Division 4, Title 22, California Code of Regulations (CCR). The City provides recycled water to three users.

6.6.5 Recycled Water Beneficial Uses

6.6.5.1 Current and Planned Uses of Recycled Water

10633. (b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) 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 pursuant to this subdivision.

The City provides recycled water to Sierra Pacific Industries (SPI), Knauf Insulation (Knauf), and the California Department of Transportation (Caltrans). SPI utilizes the recycled water for soaking log decks for fire prevention, Knauf for landscape and turf irrigation, and Caltrans for irrigation of the Shasta Dam Boulevard interchange on I-5.

The current and projected recycled water uses are summarized in Table 6-4. The projected recycled water volumes are based on current agreements, which may be revised in the future.

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area										
<input type="checkbox"/> Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.										
Name of Supplier Producing (Treating) the Recycled Water:		City of Shasta Lake Wastewater Treatment Facility								
Name of Supplier Operating the Recycled Water Distribution System:		City of Shasta Lake Wastewater Treatment Facility								
Supplemental Water Added in 2020 (volume) <i>Include units</i>										
Source of 2020 Supplemental Water										
Beneficial Use Type <i>Insert additional rows if needed.</i>	Potential Beneficial Uses of Recycled Water (Describe)	Amount of Potential Uses of Recycled Water (Quantity) <i>Include volume units¹</i>	General Description of 2020 Uses	Level of Treatment <i>Drop down list</i>	2020 ¹	2025 ¹	2030 ¹	2035 ¹	2040 ¹	2045 ¹ (opt)
Agricultural irrigation					0	0	0	0	0	0
Landscape irrigation (exc golf courses)	Caltrans		1-5 landscape irrigation	Tertiary	27	27	27	27	27	27
Golf course irrigation					0	0	0	0	0	0
Commercial use	Knauf		Landscape and turf irrigation	Tertiary	29	29	29	29	29	29
Industrial use	SPI		Soaking log decks for fire prevention	Tertiary	39	39	39	39	39	39
Geothermal and other energy production					0	0	0	0	0	0
Seawater intrusion barrier					0	0	0	0	0	0
Recreational impoundment					0	0	0	0	0	0
Wetlands or wildlife habitat					0	0	0	0	0	0
Groundwater recharge (IPR)					0	0	0	0	0	0
Reservoir water augmentation (IPR)					0	0	0	0	0	0
Direct potable reuse					0	0	0	0	0	0
Other (Description Required)					0	0	0	0	0	0
Total:					95	95	95	95	95	95
2020 Internal Reuse										
¹ Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.										
NOTES: Units of measure in this UWMP are acre-feet (AF).										

6.6.5.2 Planned Versus Actual Use of Recycled Water

The recycled water use projection for 2020 from the 2015 UWMP is compared to the 2020 actual use in Table 6-5.

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual		
<input type="checkbox"/>	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below. If recycled water was not used in 2020, and was not predicted to be in 2015, then check the box and do not complete the table.	
Beneficial Use Type	2015 Projection for 2020 ¹	2020 Actual Use ¹
<i>Insert additional rows as needed.</i>		
Agricultural irrigation	0	0
Landscape irrigation (exc golf courses)	21	27
Golf course irrigation	0	0
Commercial use	35	29
Industrial use	80	39
Geothermal and other energy production	0	0
Seawater intrusion barrier	0	0
Recreational impoundment	0	0
Wetlands or wildlife habitat	0	0
Groundwater recharge (IPR)	0	0
Reservoir water augmentation (IPR)	0	0
Direct potable reuse	0	0
Other (Description Required)	0	0
Total	136	95
¹ Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.		
NOTE: Units of measure in this UWMP are acre-feet (AF).		

6.6.6 Actions to Encourage and Optimize Future Recycled Water Use

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier... and shall include the following:

(g) A plan for optimizing the use of recycled water in the supplier’s service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

The rate for recycled water is currently \$0.172 per 100 cubic feet (CF) compared to \$2.44 minimum per 100 CF for potable water. This provides a financial incentive to the existing reclaimed water customers.

Due to the design of the upgraded WWTP and the elimination of the former 400 AF reclaimed water storage reservoir, the City cannot accommodate any future users in excess of the three existing reclaimed water customers. As shown in Table 6-6, the City does not anticipate expansion of reclaimed water usage in the future.

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
<input checked="" type="checkbox"/>	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use *
<i>Add additional rows as needed</i>			
Total			0
*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.			
NOTES:			

6.7 Desalinated Water Opportunities

10631(d). Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

The UWMPA requires that the UWMP address the opportunities for development of desalinated water, including ocean water, brackish water, and groundwater.

At the present time, the City does not foresee any opportunities for the use of desalinated water, including ocean water, brackish ocean water, and brackish groundwater, as a long-term supply since the City is not located near the coast or a brackish groundwater source.

6.8 Exchanges or Transfers

10631(d). Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

The UWMPA requires the UWMP to address the opportunities for development of short or long-term transfer or exchange opportunities.

6.8.1 Exchanges

Water exchanges entail water being delivered by one water user to another water user, with the receiving water user providing water in return at a specified time or when the conditions of the parties' agreements are met. The City does not have any planned or potential water exchanges.

6.8.2 Transfers

Water transfers entail a temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer, sale, lease, or exchange of water or water rights.

The City has two long-term transfer agreements. The City does not currently have any new transfer opportunities identified.

6.8.2.1 MCM Properties Transfer Agreement

The City has a long-term transfer agreement with MCM for 325 AF of CVP water. The agreement is effective from March 1, 2006 to February 28, 2045. MCM sells and transfers the water under

USBR contract 7827A for diversion of CVP water from the Sacramento River. If supply is available, the City may request an additional 132 AF annually. The City has first right to this water if MCM determines water is available. The City would divert this water at Shasta Lake. This transfer agreement was put on hold due to CWP issues that were identified from a National Environmental Policy Act (NEPA) compliance analysis of the transfer proposal.

On February 28, 2008, the USBR required an environmental review for the proposed MCM transfer following a Temperature Impact Analysis. MCM withdrawals are on the Sacramento River whereas the transferred water would be through Shasta Lake. The USBR indicated that withdrawal of water from Shasta Lake would potentially affect downstream river temperatures through impacts to the CWP and result in detrimental impacts to fish. Therefore, this transfer has not been approved due to the CWP issues. The City has not received water from MCM to date.

In 2017, the City completed follow-up hydraulic modeling involving the withdrawal of additional water from Shasta Dam to support the City's request for approval of the MCM long-term transfer agreement. This modeling work proved, under every withdrawal scenario, that the City's withdrawal of water at the current intake locations within Shasta Dam had no effect on the Shasta Lake CWP or Sacramento River temperatures and that USBR's 2007/2008 modeling effort was in error by orders of magnitude. On August 21, 2017, these results were sent to USBR, along with a request for full approval of the existing long-term water transfer agreement between the City and MCM. Despite issuing a Finding of No Significant Impact in response to the City's request, USBR has not approved the MCM transfer agreement to date.

6.8.2.2 Anderson-Cottonwood Irrigation District Transfer Agreement

The City has a long-term transfer agreement with the ACID for up to 2,000 AF of CVP water of which 1,500 AF is take or pay. The City must pay ACID an administrative fee for the 1,500 AF of water annually, whether transferred or not, unless ACID can sell it to another buyer. The agreement is effective from April 24, 2008 to February 28, 2045. ACID sells and transfers the water under USBR contract 3346A-R-1 for diversion of CVP water from the Sacramento River. This transfer is available to the City between April 1 and October 31. The City would divert this water at Shasta Lake. This supply is subject to constraints discussed above with the USBR contract. As of April 18, 2014, ACID's USBR supply was cut by 25 percent.

Subsequent to the MCM transfer being put on hold, the ACID transfer was also put on hold due to CWP issues. The USBR approved 140 AF of the ACID transfer in 2008 after the Temperature Impact Analysis.

In 2017, the City completed follow-up hydraulic modeling involving the withdrawal of additional water from Shasta Dam to support the City's request for approval of the ACID long-term transfer agreement. This modeling work proved, under every withdrawal scenario, that the City's withdrawal of water at the current intake locations within Shasta Dam had no effect on the Shasta Lake CWP or Sacramento River temperatures and that USBR's 2007/2008 modeling effort was in error by orders of magnitude. On August 21, 2017, these results were sent to USBR, along with a request for full approval of the existing long-term water transfer agreements between the City and ACID.

In 2019, USBR issued a Finding of No Significant Impact in response to the City's request; however, despite this environmental finding and the City's request for long-term approval of the transfer, the City was granted only short-term approval of the transfer agreement. This approval

will expire in October 2023. As a result of this approval, the City purchased and used 1,500 AF in 2020. The City is currently in the process of negotiating approval through 2045 with the USBR.

6.8.3 Emergency Interties

The City has emergency inter-ties with the City of Redding and BVWD in which transfers of water can be made.

6.8.3.1 City of Redding

The City has a purchase agreement with the City of Redding to receive up to 224 AF per year of groundwater. The most recent agreement was effective August 7, 2007. The agreement can be renewed in one-year terms. The City has not purchased groundwater from the City of Redding since 2005.

6.8.3.2 Bella Vista Water District

The City has a purchase agreement with the BVWD to receive up to 250 AF per year of CVP water at the intertie location that connects their water systems. The intertie with BVWD is a manual connection. This agreement was effective June 28, 2018. The City has not purchased water from the BVWD since 2004.

6.9 Future Water Projects

10631(f)... The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

The UWMPA requires that suppliers describe water supply projects and programs that may be undertaken to meet the projected water demands.

In an effort to withdraw the full transfer amounts from MCM, the City requested DWR Integrated Regional Water Management (IRWM) grant funding for a water supply enhancement project to divert the transferred water through the BVWD's water intake on the Sacramento River, treat the water, and then deliver it to the City via the intertie with the BVWD. The project was to include infrastructure improvements to BVWD's and the City's treatment, pumping, distribution systems, and the existing intertie pump station. In a letter of support from the USBR dated June 11, 2014, it stated that by withdrawing water at the BVWD intake in the Sacramento River, the CWP issues are essentially eliminated as compared to diverting that same volume from Shasta Lake. This project would have allowed the City to withdraw the full transfer amounts from MCM, utilize existing long-term transfer agreements, and ensure a sustainable water supply and reliability for the City. Preliminary modeling and design revealed that the cost to upgrade BVWD's infrastructure alone was greater than 16 million dollars. This project is no longer viable.

In an effort to improve reliability, the City sent a comment letter (September 25, 2013) to the USBR regarding the Draft Environmental Impact Statement for the Shasta Lake Water Resources Investigation (enlargement of Shasta Dam) in which they requested that USBR

dedicate 4,600 AF of the newly impounded water to the City’s base allocation of 4,400 AF, increasing the total long-term allocation to 9,000 AF.

As shown in Table 6-7, there are no expected future water supply projects and programs to increase water supply for average, single-dry, and/or multi-dry years.

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
<input checked="" type="checkbox"/>	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
<input type="checkbox"/>	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
Section 6.9	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type <i>Drop Down List</i>	Expected Increase in Water Supply to Supplier* <i>This may be a range</i>
	<i>Drop Down List (y/n)</i>	<i>If Yes, Supplier Name</i>				
<i>Add additional rows as needed</i>						
*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.						
NOTES:						

6.10 Summary of Existing and Planned Sources of Water

10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following...

(b)(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.

(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency 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. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier’s plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

The actual source and volume of water for the year 2020 is presented in Table 6-8. As shown in Table 6.8, the City's actual supply was approximately 2,038 AFY.

Submittal Table 6-8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2020		
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
Purchased or Imported Water	USBR	0	Other Non-Potable Water	4,430
Purchased or Imported Water	SCWA	38	Other Non-Potable Water	50
Purchased or Imported Water	McConnell Foundation	500	Other Non-Potable Water	Varies
Purchased or Imported Water	CCSD	0	Other Non-Potable Water	Varies
Transfers	ACID	1,500	Other Non-Potable Water	2,000
Total		2,038		6,480
*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.				
NOTES: Units of measure in this UWMP are acre-feet (AF). USBR Total Rights includes original contract (4,400 AF) plus the 30 AF reallocated from the Summit City Pressure Zone Agreement with the City of Redding. The 2020 water year for these agreements is March 2020 through February 2021.				

The projected water supply in 5-year increments is included in Table 6-9. For the City, the available water supply is projected based on estimated future demands.

Submittal Table 6-9 Retail: Water Supplies — Projected											
Water Supply	Additional Detail on Water Supply	Projected Water Supply * Report To the Extent Practicable									
		2025		2030		2035		2040		2045 (opt)	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Purchased or Imported Water	USBR	4,480	4,480	4,480	4,480	4,480	4,480	4,480	4,480	4,480	4,480
Purchased or Imported Water	McConnell Foundation	Varies	Varies	Varies	Varies	Varies	Varies	Varies	Varies	Varies	Varies
Purchased or Imported Water	CCSD	Varies	Varies	Varies	Varies	Varies	Varies	Varies	Varies	Varies	Varies
Transfers	ACID	1,500	2,000	1,500	2,000	1,500	2,000	1,500	2,000	1,500	2,000
Total		5,980	6,480	5,980	6,480	5,980	6,480	5,980	6,480	5,980	6,480
*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.											
NOTES: Units of measure in this UWMP are acre-feet (AF). USBR Total Rights includes original contract (4,400 AF) plus the 30 AF reallocated from the Summit City Pressure Zone Agreement with the City of Redding plus 50 AF reallocated from SCWA.											

6.11 Climate Change Impacts to Supplies

The CWC requires that suppliers consider climate change in their water supply analysis. The potential water supply effects related to climate change are discussed briefly in this section.

The IRWM Climate Change Vulnerability Assessment is included as Appendix E. No vulnerabilities were identified for the category of *Sea Level Rise*. For the category of *Water Demand*, it was noted that there are major industries that require cooling/process water, and that City water use can vary by more than 50 percent seasonally. The City also indicated that water use curtailment measures are effective. For the category of *Water Supply*, the City

indicated that a portion of the water supply is from snowmelt and that the region has faced a drought in the past during which it failed to meet local water demands. Wildfires are a concern in the region, as noted in the *Water Quality* and *Flooding* categories. For the category of *Ecosystem and Habitat Vulnerability*, it was noted that the region relies on aquatic or water-dependent habitats for recreation or other economic activities and has rivers with quantified environmental flow requirements or known water quality/quantity stressors to aquatic life. It was noted that hydropower is a source of electricity in the region in the *Hydropower* category.

Because the City is 100 percent reliant on surface water for its potable water supply, the effects of climate change are best summarized by considering the effects of the region as a whole. These effects will likely include:

- Reduction in snowpack, which is a significant source of water as it melts and feeds the Shasta Lake.
- Increase in intensity and frequency of extreme weather events.
- Effects on surface water levels during droughts.
- General decline in ecosystem health and function.
- Changes to demand levels and patterns due to increasing temperatures.

As scientific understanding of climate change continues to advance, the nature of these impacts and the impact on water supply availability and reliability will be thoroughly studied to identify proper mitigation and adaptation strategies.

One additional consideration for the City is the impact of wildfires on water quality. The wildfire season is typically followed by the rainy season and sometimes heavy precipitation, leading to high levels of sediment in runoff that can severely degrade water quality, such as the increase in turbidity levels. In addition, Per- and polyfluoroalkyl substances (PFAS) is also an emerging contaminant that can be found in firefighting foam that can stay and spread in the environment for decades and become a major contributor to drinking water contamination. With the increasing frequency of wildfires and atmospheric rivers across California, changes in treatment operations and/or treatment processes may be necessary to reliably treat and maintain water service to customers experiencing back-to-back impacts.

Additional details related to climate change data that has been collected using the Cal-Adapt tool are included in Chapter 3.

6.12 Energy Intensity

The 2020 UWMP guidebook requests that water suppliers provide information on the energy required to produce and distribute their water supply. Water energy intensity is the total amount of energy on a per acre-foot basis associated with water management processes occurring within the City's operational control. The City has selected to report its energy intensity using the total utility approach Option B. In 2020, the City produced 2,215 AF of water within its service area. The kilowatt hours (kWh) of energy needed across the City's potable water system is 333,317 kWh. The energy intensity analysis is located in Appendix F. The City's 2020 energy intensity is estimated at 462 kWh/MG.

Chapter 7

WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

The UWMPA requires that the UWMP address the reliability of the agency's water supplies. This includes supplies that are vulnerable to seasonal or climatic variations. In addition, an analysis must be included to address supply availability in a single-dry year and in a five-consecutive-year drought.

10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

7.1 Introduction

The City depends heavily on its long-term contract to purchase water from the USBR for 4,430 AF per year (including the 30 AF reallocated from the Summit City Pressure Zone Agreement with the City of Redding). This contract to take water from Shasta Lake is the City's main source of water. During low rainfall years, the City's allocation can be reduced by up to 75 percent or to the City's public health and safety water supply level, whichever is greater, depending upon the USBR water supply projections. The public health and safety allocation amount for the City is 1,018 AF, calculated based on the USBR's CVP Municipal and Industrial Water Shortage Policy.

For the last few years, the City has purchased supplemental water from the SCWA, the McConnell Foundation, and the CCSD under short-term contracts. The City is currently in the process of finalizing a permanent transfer agreement from SCWA to the City with the USBR. The City also has long-term transfer agreements with MCM, which has not been utilized due to CWP issues identified by the USBR, and ACID.

Table 7-0 contains a summary of factors affecting water supply reliability and that may pose an opportunity for inconsistency in supply. Legal and environmental factors represent supply restrictions that may be imposed due to downstream water temperature, CWP issues, quality, and quantity objectives. Climatic factors represent potential restrictions due to drought conditions.

Table 7-0: Factors Resulting in Inconsistency of Supply

Water Supply Source	Specific Source Name	Limitation Quantification	Legal	Environmental	Water Quality	Climatic	Additional Information
USBR Contract	CVP	Note 1	X	X		X	
SCWA	CVP	Note 1	X	X		X	
McConnell Foundation	CVP	Note 2	X				
CCSD	CVP	Note 2	X	X		X	
ACID	CVP	Note 1	X	X		X	
MCM	CVP	Note 1	X	X		X	

NOTES:

- Quantity dependent on USBR allocations and USBR approval of transfers.
- Quantity based on annual agreement amount.

7.2 Constraints of Water Sources

10631 (b)(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change

There are two aspects of supply reliability that can be considered. The first relates to immediate service needs and is primarily a function of the availability and adequacy of the supply facilities. The second aspect is climate-related and involves the availability of water during mild or severe drought periods.

There are a variety of factors that can affect water supply reliability. The factors that might result in supply reliability issues include water quality and climatic changes.

7.2.1 Water Supply Quality

The UWMPA requires that the UWMP include a discussion of water quality impacts on the reliability of an agency’s water supplies.

The water quality from Shasta Lake is very good. The Lake is most vulnerable to contaminants from recreational activities. Water quality does not have a significant effect on water management strategies or supply reliability due to the high quality of the surface water supply. The City’s drinking water meets all applicable water quality regulations.

The Annual Consumer Confidence Report (CCR) for the City’s service area in year 2020 can be found in Appendix G.

7.2.2 Climate Change

Climate change is likely to add uncertainties to supply planning and future supply availability. The severe and prolonged drought that began in 2012 has been a test of the City's ability to prepare for, and adapt to, the effects of climate change. Considering reductions in per capita use and projected demands, the City continues to balance a cautious optimism with a long-term strategy for sustainable sources of supply.

As stated in Chapter 4, the altered climate patterns in California creating hotter days and longer heat waves will increase customer water use and evaporative water losses. Extended drought periods are expected to become both more frequent, and more severe, which could lead to reduced rainfall and snowpack. Higher temperatures and decreased precipitation will result in drought, making wildfires more frequent, more severe, and harder to fight with less water supplies. Wildfires, followed by flooding, mean more landslides and mudslides, further impacting water supply reliability. Creating defensible space as well as slope stabilization and erosion prevention near critical infrastructure will be important for preserving supplies.

Efficient use of water is paramount in the City's effort to adapt to climate change. Technology and equipment to appropriately monitor and manage water supplies will be critical. Ensuring that pipes are appropriately sized and upgraded to minimize water loss is equally important. Redundancy in source of supply will provide operational flexibility in the event supplies are interrupted by fire, floods, earthquakes, or drought. Climate change effects such as drought, wildfire, and temperature fluctuations may all contribute to a degradation of water quality over time.

7.2.3 Potential Alternative Sources

Unfortunately, short-term contracts are very insecure from the standpoint of reliability and cost fluctuations. Additionally, the MCM long-term transfer agreement has not been reliable due to CWP issues. Thus, in an effort to withdraw the full transfer amounts from MCM, the City requested the DWR IRWM grant funding for a project to divert the transferred water through the BVWD's water intake on the Sacramento River, treat the water, and then deliver it to the City via the intertie with the BVWD. As reported in Section 6.9, this project is no longer viable.

In addition, the City provided a comment letter to USBR on the Draft Environmental Impact Statement for the Shasta Lake Water Resources Investigation (Enlargement of Shasta Dam). As partial mitigation for the social disruptions, traffic impacts, and revenue losses predicted to result from this project, the City requested USBR dedicate 4,600 AF of the newly impounded water to the City's base allocation of 4,400 AF, increasing the total long-term allocation to 9,000 AF. This would provide a sustainable water supply and reliability for the City.

Without a sustainable and reliable water supply, future growth and industrial/commercial growth could be delayed for the City. The long-term contract amount with USBR is sufficient to meet City demands when allocations are not reduced. The City will continue to evaluate opportunities with surrounding agencies during reduced allocations from the USBR to improve the reliability of the water supply.

7.3 Water Supply Reliability by Type of Year

This section considers the City's water supply reliability during three water scenarios: average year, single-dry year, and five-consecutive-year drought. An average year is also referred to as a "normal" year.

These scenarios are defined as follows:

- Average year: a year, or an averaged range of years, that most closely represents the average water supply available to the City. Generally, a year in the historical sequence that most closely represents median runoff levels and patterns. It is defined as the median runoff over the previous 30 years or more. This median is recalculated every 10 years.
- Single-dry year: the year that represents the lowest water supply available to the City. Generally considered to be the lowest annual runoff for a watershed since the water-year beginning in 1903. Suppliers should determine this for each watershed from which they receive supplies.
- Five-Consecutive-Year Drought: the period that represents the driest five-year historical sequence for the City. Generally considered to be the lowest average runoff for a five-consecutive-year period for a watershed since 1903.

7.3.1 Basis of Water Year Data

Since the City's water supply in future years will come from Shasta Lake, seasonal and climatic changes will impact the availability of water. Historical curtailments in the City's supply occurred during drought years. The specific years identified for average, single-dry, and five-consecutive-year drought presented in Table 7-1 were developed based on historical DWR runoff records for the Sacramento Valley and the availability of City records.

Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)			
Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2019-2020, use 2020	Available Supplies if Year Type Repeats	
		<input type="checkbox"/>	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____
		<input checked="" type="checkbox"/>	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available *	% of Average Supply
Average Year	2004	3369	100%
Single-Dry Year	2015	1679	50%
Consecutive Dry Years 1st Year	2012	2868	85%
Consecutive Dry Years 2nd Year	2013	2610	77%
Consecutive Dry Years 3rd Year	2014	1994	59%
Consecutive Dry Years 4th Year	2015	1679	50%
Consecutive Dry Years 5th Year	2016	1827	54%
Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.			
*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.			
NOTES: Units of measure in this UWMP are acre-feet (AF).			

The City was incorporated in 1993; therefore, accurate water supply records are only available after 1993. The area experienced a severe drought from 1985 to 1992 and from 2007 through 2009. Table 7-1 reflects the more recent 2012 through 2016 drought since accurate water supply records were available. The year 2015 was selected for the single-dry year because the City’s water supply allocation was reduced to 646 AF. Table 7-1 contains the actual water supply that was available for each of the water year types, as a percentage of the average water year that occurred in 2004.

7.4 Water Service Reliability Assessment

10635(a). Every urban water Supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

The projected demand and supplies are compared in 5-year increments in Table 7-2, Table 7-3, and Table 7-4. The demand is based on the total water use from Table 4-3. The supply is based on the reasonably available volume from Table 6-9. The supply is adjusted by the percent of average supply for the year type.

7.4.1 Normal Year

During an average water year, a combined delivery of up to 4,430 AF of water is available to the City under its USBR contract. However, the City typically uses 60 percent of this allotment. Future citywide demands, assuming the City can meet the water use targets, will not exceed the supplies. Table 7-2 provides an estimate of the projected normal year supply and demand totals.

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Opt)
Supply totals (autofill from Table 6-9)	5,980	5,980	5,980	5,980	5,980
Demand totals (autofill from Table 4-3)	2,785	2,922	3,066	3,218	3,377
Difference	3,195	3,058	2,914	2,762	2,603
NOTES: Units of measure in this UWMP are acre-feet (AF).					

7.4.2 Single-Dry Year

During a single-dry year, the USBR allotments can be reduced by 50 percent or more. Table 7-3 provides an estimate of the projected single-dry year supply and demand totals. Demand reductions due to water shortage stage rationing measures are not included in the single-dry year demand estimates.

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Opt)
Supply totals*	2,990	2,990	2,990	2,990	2,990
Demand totals*	2,785	2,922	3,066	3,218	3,377
Difference	205	68	(76)	(228)	(387)
<i>*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.</i>					
NOTES: Units of measure in this UWMP are acre-feet (AF).					

7.4.3 Five-Consecutive-Year Drought

The multiple-dry year supplies were developed based on the DWR Sacramento Valley runoff tables and available water supply data. Table 7-4 provides an estimate of the projected five-consecutive-year drought supply and demand totals. Demand reductions due to water shortage stage rationing measures are not included in the five-consecutive-year drought demand estimates.

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2025*	2030*	2035*	2040*	2045* (Opt)
First year	Supply totals	5,090	5,090	5,090	5,090	5,090
	Demand totals	2,785	2,922	3,066	3,218	3,377
	Difference	2,305	2,168	2,024	1,872	1,713
Second year	Supply totals	4,633	4,633	4,633	4,633	4,633
	Demand totals	2,785	2,922	3,066	3,218	3,377
	Difference	1,848	1,711	1,567	1,415	1,256
Third year	Supply totals	3,539	3,539	3,539	3,539	3,539
	Demand totals	2,785	2,922	3,066	3,218	3,377
	Difference	755	618	473	322	163
Fourth year	Supply totals	2,980	2,980	2,980	2,980	2,980
	Demand totals	2,785	2,922	3,066	3,218	3,377
	Difference	196	58	(86)	(237)	(397)
Fifth year	Supply totals	3,243	3,243	3,243	3,243	3,243
	Demand totals	2,785	2,922	3,066	3,218	3,377
	Difference	458	321	177	25	(134)
Sixth year (optional)	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.						
NOTES: Units of measure in this UWMP are acre-feet (AF).						

7.4.4 Seismic Risk Assessment and Mitigation Plan

The City's Hazard Mitigation Plan includes a seismic risk and vulnerability assessment and is included as an Appendix H. The objective of the seismic risk and vulnerability assessment was to provide the City with an overview of seismic vulnerabilities related to the water system facilities and identify recommendations for the mitigation of those vulnerabilities to minimize system disruption.

7.5 Drought Risk Assessment

10635(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following...

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period. [Emphasis added]

(4) 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.

CWC Section 10635(b) is a new requirement for the 2020 UWMPs where suppliers are required to prepare a DRA with descriptions of data and methods used, basis for the supply shortage conditions, determination of the reliability of sources, and a comparison of the total water supplies and uses during the drought. The DRA will be submitted every five years in addition to conducting an annual water supply and demand assessment. Evaluation for the DRA is based on the five dry years with consideration of climate changes, regulations, and other local criteria. In the event of stressed hydrologic conditions, suppliers will consider management of their water supplies in relation to customer usage, identify potential system vulnerabilities, and provide explanations of assumptions and decisions on which the analysis was based.

A summary of the City's water supply DRA from 2021 through 2025 is summarized in Table 7-5. The supply is based on the USBR's health and safety allocation amount for the City of 1,018 AF. To supplement supply, the City can purchase and transfer water from nearby agencies including SCWA, McConnell Foundation, CCSD, and ACID. Therefore, there is sufficient supply to meet projected demands within the next five years. Use reduction savings are not quantified in Table 7-5 (refer to Table 8-3).

2021		Total
Total Water Use		2,585
Total Supplies		1,018
Surplus/Shortfall w/o WSCP Action		(1,567)
Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit		2,939
WSCP - use reduction savings benefit		0
Revised Surplus/(shortfall)		1,372
Resulting % Use Reduction from WSCP action		0%
2022		
		Total
Total Water Use		2,610
Total Supplies		1,018
Surplus/Shortfall w/o WSCP Action		(1,592)
Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit		2,939
WSCP - use reduction savings benefit		0
Revised Surplus/(shortfall)		1,347
Resulting % Use Reduction from WSCP action		0%
2023		
		Total
Total Water Use		2,637
Total Supplies		1,018
Surplus/Shortfall w/o WSCP Action		(1,619)
Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit		2,939
WSCP - use reduction savings benefit		0
Revised Surplus/(shortfall)		1,320
Resulting % Use Reduction from WSCP action		0%
2024		
		Total
Total Water Use		2,663
Total Supplies		1,018
Surplus/Shortfall w/o WSCP Action		(1,645)
Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit		2,939
WSCP - use reduction savings benefit		0
Revised Surplus/(shortfall)		1,294
Resulting % Use Reduction from WSCP action		0%
2025		
		Total
Total Water Use		2,690
Total Supplies		1,018
Surplus/Shortfall w/o WSCP Action		(1,672)
Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit		2,939
WSCP - use reduction savings benefit		0
Revised Surplus/(shortfall)		1,267
Resulting % Use Reduction from WSCP action		0%

7.6 Regional Supply Reliability

10620 (f) an urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

The City is maximizing the use of local water resources (Shasta Lake) and reducing waste through the implementation of DMMs. The City's efforts help to minimize the need to purchase water from other agencies.

Chapter 8

WATER SHORTAGE CONTINGENCY PLAN

In response to the severe drought of 2012-2016, new legislation in 2018 created a WSCP mandate replacing the water shortage contingency analysis under former law. The new requirements are more prescriptive to have consistency throughout California. The WSCP document is now separate from the UWMP. The adopted WSCP is included in Appendix I. The City's WSCP may be amended as needed without amending this 2020 UWMP.

In the event any provision of this Chapter or the WSCP (Appendix I) conflicts or overlaps with any mandatory State regulation related to water conservation, the most stringent shall apply.

8.1 WSCP Overview

The City's WSCP details the actions to be taken during a reduction in available water supply. These actions are broken up based upon six possible stages of water shortage. Reductions in supply are most frequently associated with drought, but could also be the result of flooding, major fire emergencies, earthquakes, regional power outages, water contamination, and any other situation that could impact the water supply.

The goal of a WSCP is to have a procedure for managing and mitigating shortages allowing the City to respond in an efficient and timely manner. Water shortage response actions include demand reduction, supply augmentation, operational changes, and mandatory prohibitions to address shortage levels. The following sections summarize the City's water shortage stages and the measures employed during each stage, as outlined in the WSCP.

8.2 Stages of Action

The stages of action in response to water supply shortages, including greater than 50 percent reduction in water supply are summarized in Table 8-1. Detailed descriptions of each stage of action are included in the WSCP (Appendix I).

Submittal Table 8-1 Water Shortage Contingency Plan Levels		
Shortage Level	Percent Shortage Range	Shortage Response Actions <i>(Narrative description)</i>
1	Up to 10%	Water Shortage Alert
2	Up to 20%	Moderate Water Shortage
3	Up to 30%	Emergency Water Shortage
4	Up to 40%	Severe Water Shortage
5	Up to 50%	Critical Water Shortage Emergency
6	>50%	Catastrophic interruption of water supplies (1)

NOTES: (1) Including flooding, major fire emergencies, earthquakes, regional power outages, water contamination, and emergencies other than water shortage.

8.3 Demand Reduction

Table 8-2 contains demand reduction actions and the water shortage stage when they are enacted. These prohibitions are detailed in the WSCP (Appendix I).

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions <i>Drop down list</i> <i>These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.</i>	How much is this going to reduce the shortage gap? <i>Include units used (volume type or percentage)</i>	Additional Explanation or Reference <i>(optional)</i>	Penalty, Charge, or Other Enforcement? <i>For Retail Suppliers Only</i> <i>Drop Down List</i>
<i>Add additional rows as needed</i>				
1-6	Landscape - Restrict or prohibit runoff from landscape irrigation	<10%		Yes
1-6	Landscape - Limit landscape irrigation to specific times	<5%		Yes
2-6	Landscape - Limit landscape irrigation to specific days	<5%		Yes
1-6	Landscape - Prohibit certain types of landscape irrigation	<10%		Yes
5-6	Landscape - Prohibit all landscape irrigation	<30%		Yes
1-6	Landscape - Other landscape restriction or prohibition	<5%		Yes
2-6	CII - Restaurants may only serve water upon request	<1%		Yes
3-6	CII - Lodging establishment must offer opt out of linen service	<2%		Yes
1-6	CII - Other CII restriction or prohibition	<5%		Yes
2-6	Water Features - Restrict water use for decorative water features, such as fountains	<5%		Yes
1-6	Pools and Spas - Require covers for pools and spas	<5%		Yes
1-6	Other water feature or swimming pool restriction	<5%		Yes
1-6	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	<5%		Yes
1-6	Other - Require automatic shut of hoses	<5%		Yes
1-6	Other - Prohibit use of potable water for washing hard surfaces	<5%		Yes
1-6	Other - Prohibit use of potable water for construction and dust control	<5%		Yes
5-6	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	<5%		Yes
1-6	Other	<5%		Yes
NOTES:				

On May 9, 2016, the Governor of California issued an Executive Order declaring the following practices be permanently prohibited:

- Hosing off sidewalks, driveways, and other hardscapes.
- Washing automobiles with hoses not equipped with a shut-off nozzle.
- Using non-recirculated water in a fountain or other decorative water feature.
- Watering lawns in a manner that causes runoff, or within 48 hours after measurable precipitation.
- Irrigating ornamental turf on public street medians.

8.4 Supply Augmentation

The UWMPA requires that the UWMP include an urban water shortage contingency analysis that addresses methods to reduce consumption. Table 8-3 contains supply augmentation methods and other actions by water shortage stage.

Submittal Table 8-3: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier <i>Drop down list</i> <i>These are the only categories that will be accepted by the WUEdata online submittal tool</i>	How much is this going to reduce the shortage gap? <i>Include units used (volume type or percentage)</i>	Additional Explanation or Reference <i>(optional)</i>
<i>Add additional rows as needed</i>			
1	Transfers	1500	ACID (1,500 AF)
2-6	Purchases	965	McConnell Foundation (900 AF), CCSD (65 AF)
5-6	Emergency Interties	474	Redding (224 AF), BVWD (250 AF)
1-6	Expand Public Information Campaign	<5%	
1-6	Improve Customer Billing	<5%	
1-6	Increase Frequency of Meter Reading	<5%	
1-6	Offer Water Use Surveys	<5%	Offered at all times.
1-6	Provide Rebates on Plumbing Fixtures and Devices	<5%	Offered at all times.
4	Decrease Line Flushing	<5%	
1-6	Reduce System Water Loss	<1%	
5-6	Moratorium or Net Zero Demand Increase on New Connections	<5%	
4-6	Implement or Modify Drought Rate Structure or Surcharge	<10%	
1	Voluntary Rationing	<5%	
2-6	Mandatory Rationing	<15%	
NOTES: Units of measure in this UWMP are acre-feet (AF).			

Chapter 9

DEMAND MANAGEMENT MEASURES

The UWMPA requires that the UWMP involve a comprehensive discussion of the agency's water conservation measures.

10631 (f)(A)... The narrative shall describe the water demand management measure that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.30.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances

(ii) Metering

(iii) Conservation pricing

(iv) Public education and outreach

(v) Programs to assess and manage distribution system real loss

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measure, if implemented.

This chapter presents details of the DMMs contained in the UWMPA, as well as the City's existing and planned efforts to further develop their water conservation program. The City is committed to water conservation and has implemented several policies and on-going programs that promote and encourage water conservation. In addition, the City has several drought-specific programs that can be implemented if water supplies become limited and the need for more intensive water conservation becomes necessary.

The City's Annual Water Conservation Report summary for 2020 is contained in Appendix J.

The UWMPA was amended in 2014 to streamline DMMs from 14 specific measures to 6 more general requirements and an "other" category. Brief descriptions of the City's current and planned implementation of DMMs are included in the following sections. The UWMPA did not make any changes to the DMM requirements for the 2020 UWMP.

9.1 Water Waste Prevention Ordinances

This DMM involves adoption of an ordinance prohibiting water waste. The City Municipal Code contains the Water Waste Prevention Ordinance (15.10.160) (see Appendix K). This Water Waste Prevention Ordinance is in place at all times and is not dependent upon a water shortage for implementation. See Chapter 8 and the WSCP (Appendix I) for detailed information on stages of action, prohibitions of end uses, and penalties.

9.1.1 Implementation over the Past Five Years

The effectiveness of this DMM can be determined by a decrease in violators. The City issued two warnings based on two submitted violations in 2016.

9.1.2 Planned Implementation

The City will continue to enforce this DMM. The effectiveness of this DMM will be evaluated by monitoring the number of warnings and offenses. If an area is determined to have excessive violations, the City would implement a specific public outreach program informing the public about the Water Waste Prevention Ordinance.

9.2 Metering

Installing water meters and billing for actual water use provides a strong incentive for customers to use less water and equalizes service cost for each customer to their actual use (high water users would pay a more equitable share of the system costs). Water metering can reduce exterior landscape water use and can also achieve a modest reduction in interior water use.

9.2.1 Implementation over the Past Five Years

All of the City customers are metered and are billed volumetrically.

9.2.2 Planned Implementation

The best way to evaluate the effectiveness of metering is periodic review of customer water use.

9.3 Conservation Pricing

Water conservation is encouraged through a pricing system that rewards customers who use less water with financial incentives, while high water users are charged a higher rate. Often this is implemented through a tiered pricing system.

9.3.1 Implementation over the Past Five Years

The City has an increasing-tier water rate schedule. These metered water rates consist of a monthly rate based on meter size, a rate per 100 CF based on usage, and drought surcharges for Stages 1 through 5 (see Appendix L). The drought surcharge for Stage 6 shall be the same as Stage 5.

The City charges a sewer service rate for commercial and industrial customers based on water consumption (see Appendix L).

9.3.2 Planned Implementation

Water rates are approved through fiscal year 2021. The water rates will continue to be in effect until new rates are adopted.

Wastewater rates are approved through fiscal year 2024.

9.4 Public Education and Outreach

Examples for public education and outreach for water demand management can include coordination with other agencies and provision of programs promoting water conservation, speakers for the media or community groups, school education programs, public service announcements, water conservation bill inserts, information booths at public events, websites,

newsletters and newspaper articles, rebates, and daily water use comparisons on customer's bills.

9.4.1 Implementation over the Past Five Years

The City has implemented this DMM through the provision of flyers/brochures to customers, as well as providing bill inserts promoting water conservation, providing information on the City website, conducting a "Water Awareness Week," and providing tours of the WTP and WWTP.

The City also implemented an active school education program in 2014, which includes provision of education materials, instructional assistance, and classroom presentations. In May 2016, the City presented on drought and water conservation to 129 students at Mountain Lakes Middle School. In 2016 through 2019, students at Grand Oaks Elementary School watched a video "10 tips for saving water in the home" during lunch break. Additionally, 400 water conservation coloring books are distributed to children during an annual holiday party organized by the City.

The City also supplies individual items for indoor and outdoor conservation and education in conjunction with water surveys and audits.

Table 9-1 reports the public education and school education program budgets over the past five years.

Year	Public Education Budget	School Education Budget
2016	\$1,000	\$1,000
2017	\$1,000	\$1,000
2018	\$1,000	\$1,000
2019	\$1,000	\$1,000
2020	\$1,000	\$1,000

Public education expenditures can be much higher than the program budgets. The City has spent the majority of the water conservation budget on surveys, audits, and rebates.

9.4.2 Planned Implementation

Public information can be one of the best tools to conserve water. The Water Conservation Coordinator could optimize the program by coordinating additional opportunities for community speakers and special events. Additionally, the Building Department could provide information/coordination during building permit phase for new and older homes. The Water Conservation Coordinator could enhance the school education program by meeting with school principals and educators to promote classroom presentations and field trips. Educational water conservation projects could be undertaken by the Eagle Scouts, City Youth Committee, and other groups to educate children about water conservation.

The City annually collects information on the number of SFR and MFR accounts in the service area, the number offered water surveys, and the number that completed surveys. The City's program began in October 2000, with the intent to target new customers, customers that complain about billing, and customers with unusually high water bills first. The water usage for customers that completed the survey process can be compared to previous years to evaluate

effectiveness. Evaluation of the data collected and contacting more customers would help the City to improve the effectiveness.

9.5 Programs to Assess and Manage Distribution System Real Loss

This DMM focuses on the water distribution system itself, and includes water audits, leak detection, and repair. The first step in a water audit is relatively straightforward, involving comparison of the amount of water produced with the amount of water delivered to customers. The difference is termed “unaccounted water,” which includes actual losses (leaks) in the distribution system, authorized but unmetered use (e.g., hydrant flushing and firefighting), unauthorized water use, and meter error.

9.5.1 Implementation over the Past Five Years

The City has completed and submitted results of the AWWA water audits and loss control. The entire City is metered which allows the City to routinely calculate water losses.

When a complaint is lodged regarding a potential water leak, the City takes swift action to identify and repair the given leak as warranted. The number of repaired leaks and estimated length of pipeline surveyed over the past five years is reported in Table 9-2.

Year	Number of Repaired Leaks	Estimated Pipeline Surveyed (miles)
2016	46	30
2017	83	30
2018	32	30
2019	46	30
2020	31	30

9.5.2 Planned Implementation

The best way to evaluate the effectiveness of this program is to compare water production data at the WTP with water consumption from the City’s customers. To improve the effectiveness, the City should continue to review data and identify leaks for repair, perform an annual review of the AWWA audit information to determine if a full-scale system audit is warranted, and perform distribution leak detection when warranted and cost-effective.

9.6 Water Conservation Program Coordination and Staffing Support

This DMM entails designating a Water Conservation Coordinator responsible for managing water conservation efforts, preparing conservation reports, promoting water conservation to agency staff, and evaluating the results of efforts. The Water Conservation Coordinator tasks may include, but are not limited to, monthly tracking of production versus consumption, enforcement of water use restrictions, and implementation of conservation programs.

9.6.1 Implementation over the Past Five Years

As of 2014, the City has a designated Water Conservation Coordinator (Tony Thomasy, tthomasy@cityofshastalake.org) that supervises BMP implementation, evaluates effectiveness,

and communicates program goals to the community. The water conservation program budget over the past five years is reported in Table 9-3.

Year	Program Budget
2016	\$18,000
2017	\$15,000
2018	\$15,000
2019	\$15,000
2020	\$15,000

9.6.2 Planned Implementation

The effectiveness of this DMM is determined by the work performed by the Water Conservation Coordinator. The City should set up performance standards and goals and compare them with the results. The City could educate community volunteers to aid the City in water conservation efforts.

9.7 Other Demand Management Measures

The City will continue to evaluate implementation of new DMMs in the future.

9.7.1 Efficiency and Rebates

The City manages a comprehensive energy efficiency incentive program for residential and commercial customers focusing on peak load reduction and energy conservation. The City's Water Efficiency Rebate and Conservation website has a link to the rebate program and provides water conservation tips.

For residential customers, rebates are offered for the installation of various energy efficiency measures. Typically, a high efficiency washing machine rebate program is offered by the electric provider. Shasta Lake is the energy provider for the service area. For customers, the washer rebate is \$150 per installation if the high efficiency washing machine meets requirements (Energy Star Modified Energy Factor 2.0 or greater, and Water Factor of 6.0 or less) and the hot water is supplied by an electric water heater. Notifying customers of the rebate as a method of increasing the number of water efficient washing machines could improve water conservation within the City. The City additionally offers rebates for water efficient toilets and automatic irrigation controllers.

For commercial customers, rebates are available for upgraded lighting, heating, ventilation, and air conditioning (HVAC) equipment, and in cases where an analysis is performed rebates can be offered for additional equipment that reduces energy use and/or demand.

9.8 Planned Implementation to Achieve Water Use Targets

The City has met their 2020 target of 215 gpcd. If the City can maintain water consumption rates, it will maintain conservation goals.

Chapter 10

PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

The City prepared this 2020 UWMP during the spring and summer of 2021. A completed UWMP checklist is included in Appendix M.

10.1 Inclusion of All 2020 Data

The 2020 UWMPs must include the water use and planning data for the entire year of 2020. The City is reporting on a calendar year basis and therefore, 2020 data includes the months of January to December 2020.

10.2 Notice of Public Hearing

A public hearing was held on June 15, 2021, prior to adoption of the UWMP at City Council Chambers, 4488 Red Bluff Street. Notices were provided to cities and counties, and the public. The public hearing provided an opportunity for the public to provide input to the plan before it is adopted. Additionally, the public hearing provided an opportunity for the City's customers, residents, and employees to learn and ask questions about the current and future water supply of the City.

10.2.1 Notice to Cities and Counties

10621(b) Every urban water supplier required to prepare a plan shall... at least 60 days prior to the public hearing on the plan... 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.

10642... The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area...

The cities and counties to which the City provides water supplies, as shown in Table 10-1, were provided 60-day notification (prior to the public hearing) that the City was in the process of preparing the 2020 UWMP. The 60-day notification letters are included in Appendix A. The cities and counties were provided a notice of public hearing, including the time and location. The notice of public hearing to cities and counties is included in Appendix A.

Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
<i>Add additional rows as needed</i>		
City of Shasta Lake	Yes	Yes
County Name <i>Drop Down List</i>	60 Day Notice	Notice of Public Hearing
<i>Add additional rows as needed</i>		
Shasta County	Yes	Yes
NOTES: Shasta County refers to Shasta County Water Agency and Shasta County Public Works.		

10.2.2 Notice to the Public

10642... Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection... Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code...

The UWMPA requires that the UWMP show the water agency solicited public participation. The notice to the public was included in a local newspaper as prescribed in Government Code 6066. This notice included the time and location of the public hearing, in addition to the location of where the UWMP was available for public inspection. The notice of public hearing to the public is included in Appendix A.

On June 1, 2021, and June 8, 2021, the City placed a notice in the Redding Record Searchlight (local newspaper) stating that its UWMP was being updated and that a public hearing was to be conducted to address comments and concerns from members of the community. The notice stated that a public review period would be scheduled through June 15, 2021.

The Draft 2020 UWMP was available for public inspection at the City of Shasta Lake City Hall, located at 4477 Main Street, Shasta Lake Gateway Library located at 1525 Median Avenue, as well as the City website (www.cityofshastalake.org).

10.2.3 Notice to Agencies and Organizations

The following agencies and organizations were provided notice that the City was in the process of preparing the 2020 UWMP:

- ACID.
- BVWD.

The agencies and organizations were provided 60-day notification (prior to the public hearing) and a notice of public hearing, including the time and location. The 60-Day Notification letters are included in Appendix A and the notice of public hearing are included in Appendix A.

10.3 Public Hearing and Adoption

10642... Prior to adopting a plan, the urban water supplier shall hold a public hearing thereon.

10608.26(a). In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20 for determining its urban water use target.

10642... After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

The plan was adopted by City Council at a public hearing on June 15, 2021. The City Resolution is included in Appendix N. The hearing provided an opportunity for the City's customers, residents, and employees to learn and ask questions about the current and future water supply of the City. At the hearing, the UWMP, water use targets, and conservation implementation plan were discussed.

10.3.1 Adoption

After the public hearing, the 2020 UWMP was adopted as prepared.

10.4 Plan Submittal

The public hearing will be followed by submittal of the UWMP to the California DWR, the California State Library, and Cities and Counties (see Commitment to Distribute in Appendix A).

10.4.1 Submission to DWR

The 2020 UWMP will be submitted to DWR within 30 days of adoption.

10.4.2 Electronic Data Submission

The 2020 UWMP, in addition to tabular data, will be submitted using WUE data submittal tool.

10.4.3 Submission to the California State Library

The 2020 UWMP will be submitted in CD or hardcopy format to the California State Library within 30 days of adoption.

10.4.4 Submission to Cities and Counties

The 2020 UWMP, which includes the WSCP, will be submitted in electronic format to cities and counties within 30 days of adoption.

10.5 Public Availability

Within 30 days of submitting the UWMP to DWR, the adopted UWMP will be available for public review during normal business hours at the locations specified herein.

10.6 Amending and Adopted UWMP

The plan may be updated at any time when the urban water supplier believes significant changes have occurred in population, land use, and/or water sources that may affect the contents of the plan. Copies of amendments or changes to the plan shall be submitted electronically to DWR, the California State Library, and any cities or counties which the City provides water supplies within 30 days of adoption.

Appendix A
OUTREACH DOCUMENTS

March 9, 2021

Anderson-Cottonwood Irrigation District
2810 Silver St.
Anderson, CA 96007

Attention: John Currey

Subject: **Notice of Preparation of the 2020 City of Shasta Lake Urban Water Management Plan**

Dear John:

Pursuant to the requirements of the California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, 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.

This letter is intended to notify your agency that the City of Shasta Lake (City) is in process of preparing the 2020 Urban Water Management Plan (UWMP). Based on the District's current schedule, we expect to have a public review draft of the 2020 UWMP available for review in May 2021, at which point your agency will receive a notification letter that the draft UWMP is available for public review.

If your agency would like to submit comments or provide input to the District in anticipation of the development of the 2020 UWMP, please submit written copies to:

Tony Thomasy
City of Shasta Lake
Water Department Superintendent
P.O. Box 777
Shasta Lake, CA 96019

Sincerely,

CITY OF SHASTA LAKE



Tony Thomasy
Water Department Superintendent

cc: Nicola Fontaine, Carollo Engineers, Inc.

March 9, 2021

Bella Vista Water District
11368 E. Stillwater Way
Redding, CA 96003

Attention: David Coxey

Subject: **Notice of Preparation of the 2020 City of Shasta Lake Urban Water Management Plan**

Dear David:

Pursuant to the requirements of the California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, 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.

This letter is intended to notify your agency that the City of Shasta Lake (City) is in process of preparing the 2020 Urban Water Management Plan (UWMP). Based on the District's current schedule, we expect to have a public review draft of the 2020 UWMP available for review in May 2021, at which point your agency will receive a notification letter that the draft UWMP is available for public review.

If your agency would like to submit comments or provide input to the District in anticipation of the development of the 2020 UWMP, please submit written copies to:

Tony Thomasy
City of Shasta Lake
Water Department Superintendent
P.O. Box 777
Shasta Lake, CA 96019

Sincerely,

CITY OF SHASTA LAKE



Tony Thomasy
Water Department Superintendent

cc: Nicola Fontaine, Carollo Engineers, Inc.

March 9, 2021

City of Redding Public Works Department
PO Box 496071
Redding, CA 96049

Attention: Chuck Aukland

Subject: **Notice of Preparation of the 2020 City of Shasta Lake Urban Water Management Plan**

Dear Chuck:

Pursuant to the requirements of the California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, 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.

This letter is intended to notify your agency that the City of Shasta Lake (City) is in process of preparing the 2020 Urban Water Management Plan (UWMP). Based on the District's current schedule, we expect to have a public review draft of the 2020 UWMP available for review in May 2021, at which point your agency will receive a notification letter that the draft UWMP is available for public review.

If your agency would like to submit comments or provide input to the District in anticipation of the development of the 2020 UWMP, please submit written copies to:

Tony Thomasy
City of Shasta Lake
Water Department Superintendent
P.O. Box 777
Shasta Lake, CA 96019

Sincerely,

CITY OF SHASTA LAKE



Tony Thomasy
Water Department Superintendent

cc: Nicola Fontaine, Carollo Engineers, Inc.

March 9, 2021

Shasta County Public Works
1855 Placer St.
Redding, CA 96001

Attention: Charlene Beard

Subject: **Notice of Preparation of the 2020 City of Shasta Lake Urban Water Management Plan**

Dear Charlene:

Pursuant to the requirements of the California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, 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.

This letter is intended to notify your agency that the City of Shasta Lake (City) is in process of preparing the 2020 Urban Water Management Plan (UWMP). Based on the District's current schedule, we expect to have a public review draft of the 2020 UWMP available for review in May 2021, at which point your agency will receive a notification letter that the draft UWMP is available for public review.

If your agency would like to submit comments or provide input to the District in anticipation of the development of the 2020 UWMP, please submit written copies to:

Tony Thomasy
City of Shasta Lake
Water Department Superintendent
P.O. Box 777
Shasta Lake, CA 96019

Sincerely,

CITY OF SHASTA LAKE



Tony Thomasy
Water Department Superintendent

cc: Nicola Fontaine, Carollo Engineers, Inc.

March 9, 2021

Shasta County Water Agency
1855 Placer St.
Redding, CA 96001

Attention: Pat Minturn

Subject: **Notice of Preparation of the 2020 City of Shasta Lake Urban Water Management Plan**

Dear Pat:

Pursuant to the requirements of the California Water Code, Division 6, Part 2.6 Urban Water Management Planning, Section 10621 (b), every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, 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.

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City of Shasta Lake
Water Department Superintendent
P.O. Box 777
Shasta Lake, CA 96019

Sincerely,

CITY OF SHASTA LAKE



Tony Thomasy
Water Department Superintendent

cc: Nicola Fontaine, Carollo Engineers, Inc.

March 9, 2021

U.S. Bureau of Reclamation
16349 Shasta Dam Blvd.
Shasta Lake, CA 96019

Attention: Don Bader

Subject: **Notice of Preparation of the 2020 City of Shasta Lake Urban Water Management Plan**

Dear Don:

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City of Shasta Lake
Water Department Superintendent
P.O. Box 777
Shasta Lake, CA 96019

Sincerely,

CITY OF SHASTA LAKE



Tony Thomasy
Water Department Superintendent

cc: Nicola Fontaine, Carollo Engineers, Inc.

May 25, 2021

Anderson-Cottonwood Irrigation District
2810 Silver St.
Anderson, CA 96007

Attention: John Currey

Subject: **Public Hearing Notice**

Dear John:

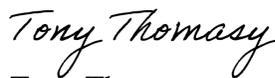
Pursuant to the California Water Code section 10642, the City Council of the City of Shasta Lake will conduct a Public Hearing to take testimony regarding the adoption of the Water Shortage Contingency Plan (WSCP) and updated Urban Water Management Plan (UWMP) for the City of Shasta Lake. The hearing is scheduled for June 15, 2021 at 6 pm or as soon thereafter as possible on the following in the council chambers at the Council Chambers 4488 Red Bluff Street, Shasta Lake. A copy of the WSCP and UWMP can be reviewed by visiting the City's web site at www.cityofshastalake.org. Interested persons are invited to attend. In compliance with the ADA, if you need assistance to participate in this meeting, you should contact the City Clerk at 275-7407. Notification 72 hours prior to the meeting will enable the City to make reasonable arrangements to assure accessibility to this meeting. Council Chambers are handicapped accessible.

For questions concerning the document, please contact Tony Thomasy, City of Shasta Lake:
Email: tthomasy@cityofshastalake.org
Phone: (530)-275-7488

Written comments are requested by the close of business on June 11, 2021. Send to:
Urban Water Management Plan
c/o Tony Thomasy
City of Shasta Lake
4477 Main St.
Shasta Lake, CA 96019

Sincerely,

CITY OF SHASTA LAKE



Tony Thomasy
Water Department Superintendent

cc: Nicola Fontaine, Carollo Engineers, Inc.

May 25, 2021

Bella Vista Water District
11368 E. Stillwater Way
Redding, CA 96003

Attention: David Coxey

Subject: **Public Hearing Notice**

Dear David:

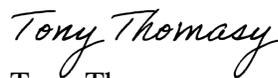
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c/o Tony Thomasy
City of Shasta Lake
4477 Main St.
Shasta Lake, CA 96019

Sincerely,

CITY OF SHASTA LAKE



Tony Thomasy
Water Department Superintendent

cc: Nicola Fontaine, Carollo Engineers, Inc.

May 25, 2021

City of Redding Public Works Department
PO Box 496071
Redding, CA 96049

Attention: Chuck Aukland

Subject: **Public Hearing Notice**

Dear Chuck:

Pursuant to the California Water Code section 10642, the City Council of the City of Shasta Lake will conduct a Public Hearing to take testimony regarding the adoption of the Water Shortage Contingency Plan (WSCP) and updated Urban Water Management Plan (UWMP) for the City of Shasta Lake. The hearing is scheduled for June 15, 2021 at 6 pm or as soon thereafter as possible on the following in the council chambers at the Council Chambers 4488 Red Bluff Street, Shasta Lake. A copy of the WSCP and UWMP can be reviewed by visiting the City's web site at www.cityofshastalake.org. Interested persons are invited to attend. In compliance with the ADA, if you need assistance to participate in this meeting, you should contact the City Clerk at 275-7407. Notification 72 hours prior to the meeting will enable the City to make reasonable arrangements to assure accessibility to this meeting. Council Chambers are handicapped accessible.

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Urban Water Management Plan
c/o Tony Thomasy
City of Shasta Lake
4477 Main St.
Shasta Lake, CA 96019

Sincerely,

CITY OF SHASTA LAKE



Tony Thomasy
Water Department Superintendent

cc: Nicola Fontaine, Carollo Engineers, Inc.

May 25, 2021

Shasta County Public Works
1855 Placer St.
Redding, CA 96001

Attention: Charlene Beard

Subject: **Public Hearing Notice**

Dear Eric:

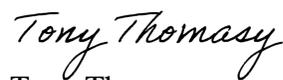
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Urban Water Management Plan
c/o Tony Thomasy
City of Shasta Lake
4477 Main St.
Shasta Lake, CA 96019

Sincerely,

CITY OF SHASTA LAKE



Tony Thomasy
Water Department Superintendent

cc: Nicola Fontaine, Carollo Engineers, Inc.

May 25, 2021

Shasta County Water Agency
1855 Placer St.
Redding, CA 96001

Attention: Pat Minturn

Subject: **Public Hearing Notice**

Dear Pat:

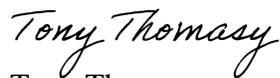
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c/o Tony Thomasy
City of Shasta Lake
4477 Main St.
Shasta Lake, CA 96019

Sincerely,

CITY OF SHASTA LAKE



Tony Thomasy
Water Department Superintendent

cc: Nicola Fontaine, Carollo Engineers, Inc.

May 25, 2021

U.S. Bureau of Reclamation
16349 Shasta Dam Blvd.
Shasta Lake, CA 96019

Attention: Don Bader

Subject: **Public Hearing Notice**

Dear Don:

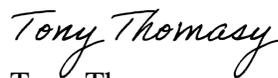
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c/o Tony Thomasy
City of Shasta Lake
4477 Main. St
Shasta Lake, CA 96019

Sincerely,

CITY OF SHASTA LAKE



Tony Thomasy
Water Department Superintendent

cc: Nicola Fontaine, Carollo Engineers, Inc.



May 18, 2021

Redding Record SearchLight
Attn: Jenny Espino
1101 Twin View Boulevard
Redding, California 96003

Dear Editor:

Please publish the enclosed notices on the date(s) noted below.

June 1, 2021

June 8, 2021

Additionally, please forward a Proof of Publication, together with your invoice, upon completion of the ad. Please direct your invoice to: City of Shasta Lake: Water Treatment Department.

The text of the notice is also being provided via e-mail.

Sincerely,

CITY OF SHASTA LAKE

A handwritten signature in black ink, appearing to read "Tony Thomasy".

Tony Thomasy
Water Department Superintendent

cc: Nicola Fontaine, Carollo Engineers, Inc.

enclosure(s)

PUBLIC HEARING NOTICE

Pursuant to the California Water Code section 10642, the City Council of the City of Shasta Lake will conduct a Public Hearing to take testimony regarding the adoption of the Water Shortage Contingency Plan and updated Urban Water Management Plan for the City of Shasta Lake. The hearing is scheduled for June 15, 2021 at 6 pm or as soon thereafter as possible on the following in the council chambers at the Council Chambers 4488 Red Bluff Street, Shasta Lake.

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A copy of the Water Shortage Contingency Plan and Urban Water Management Plan can be reviewed by visiting the City's web site at www.cityofshastalake.org.

For questions concerning the document, please contact
Tony Thomasy
City of Shasta Lake
P.O Box 777
4477 Main St.
Shasta Lake, CA 96019
Phone: (530)-275-7488

Written comments are requested by the close of business on June 11, 2021.
Send written comments to:
Urban Water Management Plan
c/o Tony Thomasy
City of Shasta Lake
4477 Main St.
Shasta Lake, CA 96019

Record Searchlight

PART OF THE USA TODAY NETWORK

SHASTA LAKE CITY
PO BOX 777
SHASTA LAKE CA 96019-

<u>Account</u>	<u>AD#</u>	<u>Net Amount</u>	<u>Gross Amount</u>	<u>Total Amount</u>	<u>Payment Method</u>	<u>Payment Amount</u>	<u>Amount Due</u>
1210816	0004742918	\$213.00	\$213.00	\$213.00	Invoice	\$0.00	\$213.00

Sales Rep: sbeaton

Order Taker: sbeaton

Order Created 05/18/2021

<u>Product</u>	<u>#</u>	<u>Ins</u>	<u>Column</u>	<u>Lines</u>	<u>Start Date</u>	<u>End Date</u>			
RRS-Redding Record Searchl	0	0	2	1.00	55	06/01/2021	06/08/2021	2.00	4
RRS-Redding.com	0	0	2	1.00	55	06/01/2021	06/08/2021	2.00	4

* ALL TRANSACTIONS CONSIDERED PAID IN FULL UPON CLEARANCE OF FINANCIAL INSTITUTION

Text of Ad: 05/18/2021

PUBLIC HEARING
NOTICE

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Tony Thomasy
City of Shasta Lake
P.O. Box 777
4477 Main St.
Shasta Lake, CA 96019
Phone: (530) 275-7488
Published: June 1, 8, 2021
Ad No.: 4742918

Commitment to Distribute the 2020 Urban Water Management Plan (UWMP)

The documentation currently included in these appendices satisfies California Water Code (CWC) parts 10621(b) and 10642.

Two other sections of the CWC specify UWMP documentation that must take place after the submission of the supplier's UWMP to the California Department of Water Resources (DWR). These parts are as follows:

- Part 10644(a), requiring documentation that within 30 days of submitting the UWMP to DWR, the adopted UWMP has been or will be submitted to the California State Library and any city or county to which the supplier provides water.
- Part 10645, requiring documentation that the supplier will make the UWMP available for public review no later than 30 days after submission to DWR.

In order to satisfy these requirements, the City will perform the following actions:

- The City will submit its 2020 UWMP to DWR.
- The City will send a printed or electronic copy of its 2020 UWMP to the California State Library and to the cities and counties within which it provides water. The City will do this within 30 days from filing with DWR.
- The City will make their 2020 UWMP available for public review within 30 days from filing with DWR.

Appendix B
AWWA WATER AUDITS



AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0
American Water Works Association
Copyright © 2014, All Rights Reserved.

?	Click to access definition
+	Click to add a comment

Water Audit Report for: **City of Shasta Lake (CA4510006)**
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: ACRE-FEET 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.

WATER SUPPLIED

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

Volume from own sources:	+ ?	8	1,794.040	acre-ft/yr
Water imported:	+ ?	n/a		acre-ft/yr
Water exported:	+ ?	n/a		acre-ft/yr

Master Meter and Supply Error Adjustments

Pcnt:	Value:	acre-ft/yr
+ ?	4	
+ ?		
+ ?		

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

WATER SUPPLIED: **1,794.040** acre-ft/yr

AUTHORIZED CONSUMPTION

Billed metered:	+ ?	5	1,663.210	acre-ft/yr
Billed unmetered:	+ ?	n/a		acre-ft/yr
Unbilled metered:	+ ?	10	26.010	acre-ft/yr
Unbilled unmetered:	+ ?		22.426	acre-ft/yr

Enter a positive value, otherwise a default percentage of 1.25% (of billed metered) is applied and a grading of 5 is applied but not displayed

AUTHORIZED CONSUMPTION: **1,711.646** acre-ft/yr

Click here: ?
for help using option buttons below

Pcnt:	Value:	acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

WATER LOSSES (Water Supplied - Authorized Consumption)

82.394 acre-ft/yr

Apparent Losses

Unauthorized consumption: + ? **4.485** acre-ft/yr

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

Customer metering inaccuracies:	+ ?	2	0.000	acre-ft/yr
Systematic data handling errors:	+ ?		4.158	acre-ft/yr

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

Apparent Losses: **8.643** acre-ft/yr

Pcnt:	Value:	acre-ft/yr
0.25%		

Pcnt:	Value:	acre-ft/yr
0.25%		

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? **73.751** acre-ft/yr

WATER LOSSES: **82.394** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **130.830** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	10	79.4	miles
Number of <u>active</u> AND <u>inactive</u> service connections:	+ ?		3,717	
Service connection density:	?		47	conn./mile main

Are customer meters typically located at the curbside 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: + ? 5 83.0 psi

COST DATA

Total annual cost of operating water system:	+ ?		\$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?		
Variable production cost (applied to Real Losses):	+ ?		\$/acre-ft

Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

Add a grading value for 4 parameter(s) to enable an audit score to be calculated

PRIORITY AREAS FOR ATTENTION:

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

1: Total annual cost of operating water system

2: Customer retail unit cost (applied to Apparent Losses)

3: Variable production cost (applied to Real Losses)



AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0
American Water Works Association
Copyright © 2014, All Rights Reserved.

?	Click to access definition
+	Click to add a comment

Water Audit Report for: **City of Shasta Lake (CA4510006)**
 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: ACRE-FEET 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.

WATER SUPPLIED

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

Volume from own sources:	+ ?	6	2,036.080	acre-ft/yr
Water imported:	+ ?	n/a		acre-ft/yr
Water exported:	+ ?	n/a		acre-ft/yr

Master Meter and Supply Error Adjustments

Pcnt:	Value:	acre-ft/yr
+ ?	5	
+ ?		
+ ?		

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

WATER SUPPLIED: **2,036.080** acre-ft/yr

AUTHORIZED CONSUMPTION

Billed metered:	+ ?	5	1,862.830	acre-ft/yr
Billed unmetered:	+ ?	n/a		acre-ft/yr
Unbilled metered:	+ ?	10	32.080	acre-ft/yr
Unbilled unmetered:	+ ?	5	5.090	acre-ft/yr

Click here: ?
for help using option buttons below

Pcnt:	Value:	acre-ft/yr
	5.090	

Use buttons to select percentage of water supplied
OR value

AUTHORIZED CONSUMPTION: **1,900.000** acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

136.080 acre-ft/yr

Apparent Losses

Unauthorized consumption: + ? **5.090** acre-ft/yr

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

Customer metering inaccuracies:	+ ?	2	19.141	acre-ft/yr
Systematic data handling errors:	+ ?		4.657	acre-ft/yr

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

Apparent Losses: **28.888** acre-ft/yr

Pcnt:	Value:	acre-ft/yr
0.25%		

1.00%		
0.25%		

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **107.192** acre-ft/yr

WATER LOSSES: **136.080** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **173.250** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	8	79.4	miles
Number of active AND inactive service connections:	+ ?	8	3,752	
Service connection density:	?		47	conn./mile main

Are customer meters typically located at the curbside 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: + ? 4 83.0 psi

COST DATA

Total annual cost of operating water system:	+ ?	10	\$2,955,670	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	9	\$2.18	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	5	\$139.91	\$/acre-ft

Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 63 out of 100 *****

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

PRIORITY AREAS FOR ATTENTION:

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

1: Volume from own sources

2: Customer metering inaccuracies

3: Billed metered



AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0
American Water Works Association
Copyright © 2014, All Rights Reserved.

?	Click to access definition
+	Click to add a comment

Water Audit Report for: **City of Shasta Lake (CA4510006)**
 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: ACRE-FEET 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.

WATER SUPPLIED

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

Volume from own sources:	+	?	7	2,186.280	acre-ft/yr
Water imported:	+	?	3	0.231	acre-ft/yr
Water exported:	+	?	n/a		acre-ft/yr

Master Meter and Supply Error Adjustments

Pcnt:	+	?	5	0.000	acre-ft/yr
Value:	+	?	2	0.000	acre-ft/yr
	+	?	?	0.000	acre-ft/yr

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

WATER SUPPLIED: **2,186.511** acre-ft/yr

AUTHORIZED CONSUMPTION

Billed metered:	+	?	5	1,966.360	acre-ft/yr
Billed unmetered:	+	?	n/a		acre-ft/yr
Unbilled metered:	+	?	10	96.470	acre-ft/yr
Unbilled unmetered:	+	?	5	5.090	acre-ft/yr

Click here: ?
for help using option buttons below

Pcnt:	+	?	?	5.090	acre-ft/yr
-------	---	---	---	-------	------------

Use buttons to select percentage of water supplied
OR value

AUTHORIZED CONSUMPTION: **2,067.920** acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

118.591 acre-ft/yr

Apparent Losses

Unauthorized consumption: **5.466** acre-ft/yr

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

Customer metering inaccuracies:	+	?	2	20.837	acre-ft/yr
Systematic data handling errors:	+	?	?	4.916	acre-ft/yr

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

Apparent Losses: **31.219** acre-ft/yr

Pcnt:	+	?	?	0.25%	acre-ft/yr
-------	---	---	---	-------	------------

Value:	+	?	?	1.00%	acre-ft/yr
	+	?	?	0.25%	acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **87.372** acre-ft/yr

WATER LOSSES: **118.591** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **220.151** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+	?	8	79.4	miles
Number of active AND inactive service connections:	+	?	8	3,752	
Service connection density:	+	?	?	47	conn./mile main

Are customer meters typically located at the curbside 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: + ? 4 83.0 psi

COST DATA

Total annual cost of operating water system:	+	?	10	\$2,949,172	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	9	\$2.49	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+	?	5	\$104.64	\$/acre-ft <input type="checkbox"/> Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 67 out of 100 *****

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

PRIORITY AREAS FOR ATTENTION:

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

1: Volume from own sources

2: Customer metering inaccuracies

3: Billed metered



AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0
American Water Works Association
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?	Click to access definition
+	Click to add a comment

Water Audit Report for: **City of Shasta Lake (CA4510006)**
 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: ACRE-FEET 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.

WATER SUPPLIED

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

Volume from own sources:	+	?	7	2,053.840	acre-ft/yr
Water imported:	+	?	n/a		acre-ft/yr
Water exported:	+	?	n/a		acre-ft/yr

Master Meter and Supply Error Adjustments

Pcnt:	+	?	5		acre-ft/yr
Value:					acre-ft/yr
Pcnt:	+	?			acre-ft/yr
Value:					acre-ft/yr

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

WATER SUPPLIED: **2,053.840** acre-ft/yr

AUTHORIZED CONSUMPTION

Billed metered:	+	?	5	1,804.150	acre-ft/yr
Billed unmetered:	+	?	n/a		acre-ft/yr
Unbilled metered:	+	?	10	45.400	acre-ft/yr
Unbilled unmetered:	+	?	5	5.090	acre-ft/yr

Click here: ?
for help using option buttons below

Pcnt:				5.090	acre-ft/yr
Value:					acre-ft/yr

Use buttons to select percentage of water supplied
OR value

AUTHORIZED CONSUMPTION: **1,854.640** acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

199.200 acre-ft/yr

Apparent Losses

Unauthorized consumption: **5.135** acre-ft/yr

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

Customer metering inaccuracies:	+	?	2	18.682	acre-ft/yr
Systematic data handling errors:	+	?		4.510	acre-ft/yr

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

Apparent Losses: **28.327** acre-ft/yr

Pcnt:	0.25%				acre-ft/yr
Value:					acre-ft/yr

1.00%					acre-ft/yr
0.25%					acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **170.873** acre-ft/yr

WATER LOSSES: **199.200** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **249.690** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+	?	8	79.4	miles
Number of active AND inactive service connections:	+	?	8	4,119	
Service connection density:	?			52	conn./mile main

Are customer meters typically located at the curbside 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: + ? 4 83.0 psi

COST DATA

Total annual cost of operating water system:	+	?	10	\$2,522,388	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	9	\$4.97	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+	?	5	\$117.45	\$/acre-ft

Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 67 out of 100 *****

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

PRIORITY AREAS FOR ATTENTION:

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

1: Volume from own sources

2: Customer metering inaccuracies

3: Billed metered



AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0
American Water Works Association
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?	Click to access definition
+	Click to add a comment

Water Audit Report for: **City of Shasta Lake (CA4510006)**
 Reporting Year: **2020** 1/2020 - 12/2020

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: ACRE-FEET 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.

WATER SUPPLIED

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

Volume from own sources:	+	?	7	2,220.400	acre-ft/yr
Water imported:	+	?	n/a		acre-ft/yr
Water exported:	+	?	n/a		acre-ft/yr

Master Meter and Supply Error Adjustments

Pcnt:	+	?	5	5.551	acre-ft/yr
Value:					acre-ft/yr
Pcnt:	+	?			acre-ft/yr
Value:					acre-ft/yr

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

WATER SUPPLIED: **2,220.400** acre-ft/yr

AUTHORIZED CONSUMPTION

Billed metered:	+	?	5	2,017.790	acre-ft/yr
Billed unmetered:	+	?	n/a		acre-ft/yr
Unbilled metered:	+	?	10	31.110	acre-ft/yr
Unbilled unmetered:	+	?	5	5.551	acre-ft/yr

Click here: ?
for help using option buttons below

Pcnt:	○	●	5.551	acre-ft/yr
-------	---	---	-------	------------

Use buttons to select percentage of water supplied
OR value

AUTHORIZED CONSUMPTION: **2,054.451** acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

165.949 acre-ft/yr

Apparent Losses

Unauthorized consumption:	+	?	5	5.551	acre-ft/yr
---------------------------	---	---	---	-------	------------

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

Customer metering inaccuracies:	+	?	2	20.696	acre-ft/yr
Systematic data handling errors:	+	?		5.044	acre-ft/yr

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

Apparent Losses: **31.291** acre-ft/yr

Pcnt:	○	●	0.25%	acre-ft/yr
-------	---	---	-------	------------

Value:	1.00%	acre-ft/yr
Value:	0.25%	acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **134.658** acre-ft/yr

WATER LOSSES: **165.949** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **202.610** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+	?	8	79.4	miles
Number of active AND inactive service connections:	+	?	8	4,166	
Service connection density:	?			52	conn./mile main

Are customer meters typically located at the curbside 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:	+	?	4	83.0	psi
-----------------------------	---	---	---	------	-----

COST DATA

Total annual cost of operating water system:	+	?	10	\$2,884,310	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	9	\$4.73	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+	?	5	\$143.01	\$/acre-ft

Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 67 out of 100 *****

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

PRIORITY AREAS FOR ATTENTION:

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

1: Volume from own sources

2: Customer metering inaccuracies

3: Billed metered

Appendix C
SB X7-7 VERIFICATION AND COMPLIANCE
FORMS

SB X7-7 Table 0: Units of Measure Used in UWMP*

(select one from the drop down list)

Acre Feet

**The unit of measure must be consistent with Table 2-3*

NOTES:

SB X7-7 Table-1: Baseline Period Ranges			
Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	2,853	Acre Feet
	2008 total volume of delivered recycled water	684	Acre Feet
	2008 recycled water as a percent of total deliveries	23.97%	Percent
	Number of years in baseline period ^{1,2}	15	Years
	Year beginning baseline period range	1996	
	Year ending baseline period range ³	2010	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2006	
	Year ending baseline period range ⁴	2010	
¹ If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period.			
² The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.			
³ The ending year must be between December 31, 2004 and December 31, 2010.			
⁴ The ending year must be between December 31, 2007 and December 31, 2010.			
NOTES:			

SB X7-7 Table 2: Method for Population Estimates**Method Used to Determine Population**
(may check more than one)

<input checked="" type="checkbox"/>	1. Department of Finance (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
<input type="checkbox"/>	2. Persons-per-Connection Method
<input type="checkbox"/>	3. DWR Population Tool
<input type="checkbox"/>	4. Other DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: Service Area Population

Year	Population	
10 to 15 Year Baseline Population		
Year 1	1996	8,953
Year 2	1997	8,910
Year 3	1998	8,968
Year 4	1999	8,946
Year 5	2000	9,008
Year 6	2001	9,260
Year 7	2002	9,472
Year 8	2003	9,818
Year 9	2004	9,964
Year 10	2005	10,084
<i>Year 11</i>	<i>2006</i>	10,095
<i>Year 12</i>	<i>2007</i>	10,142
<i>Year 13</i>	<i>2008</i>	10,148
<i>Year 14</i>	<i>2009</i>	10,151
<i>Year 15</i>	<i>2010</i>	10,164
5 Year Baseline Population		
Year 1	2006	10,095
Year 2	2007	10,142
Year 3	2008	10,148
Year 4	2009	10,151
Year 5	2010	10,164
2015 Compliance Year Population		
2015		10,020
NOTES:		

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Into Distribution System <i>This column will remain blank until SB X7-7 Table 4-A is completed.</i>	Deductions					Annual Gross Water Use
		Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water <i>This column will remain blank until SB X7-7 Table 4-B is completed.</i>	Water Delivered for Agricultural Use	Process Water <i>This column will remain blank until SB X7-7 Table 4-D is completed.</i>	
10 to 15 Year Baseline - Gross Water Use							
Year 1	1996	2,713	54	-	-	-	2,658
Year 2	1997	2,561	47	-	-	-	2,514
Year 3	1998	2,470	43	-	-	-	2,427
Year 4	1999	2,810	55	-	-	-	2,755
Year 5	2000	2,760	56	-	-	-	2,705
Year 6	2001	2,917	58	-	-	-	2,859
Year 7	2002	3,181	140	-	-	-	3,042
Year 8	2003	3,079	57	-	-	-	3,022
Year 9	2004	3,369	16	-	-	-	3,353
Year 10	2005	3,187	48	-	-	-	3,139
Year 11	2006	3,305	29	-	-	-	3,276
Year 12	2007	3,029	28	-	-	-	3,001
Year 13	2008	2,903	31	-	-	-	2,872
Year 14	2009	3,028	37	-	-	-	2,991
Year 15	2010	2,572	22	-	-	-	2,550
10 - 15 year baseline average gross water use							2,878
5 Year Baseline - Gross Water Use							
Year 1	2006	3,305	29	-	-	-	3,276
Year 2	2007	3,029	28	-	-	-	3,001
Year 3	2008	2,903	31	-	-	-	2,872
Year 4	2009	3,028	37	-	-	-	2,991
Year 5	2010	2,572	22	-	-	-	2,550
5 year baseline average gross water use							2,938
2015 Compliance Year - Gross Water Use							
2015	1,679	-	-	-	-	-	1,679
* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3							
NOTES: Units of measure are acre-feet (AF). Source: Large Water System Annual Reports to the Drinking Water Program. Exported water as reported by the City for 2003 and 2005 to 2010.							

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source		Shasta Lake		
This water source is:				
<input type="checkbox"/>		The supplier's own water source		
<input checked="" type="checkbox"/>		A purchased or imported source		
Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Entering Distribution System	Meter Error Adjustment* <i>Optional (+/-)</i>	Corrected Volume Entering Distribution System	
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1996	2,713	-	2,713
Year 2	1997	2,561	-	2,561
Year 3	1998	2,470	-	2,470
Year 4	1999	2,810	-	2,810
Year 5	2000	2,760	-	2,760
Year 6	2001	2,917	-	2,917
Year 7	2002	3,181	-	3,181
Year 8	2003	3,079	-	3,079
Year 9	2004	3,369	-	3,369
Year 10	2005	3,187	-	3,187
Year 11	2006	3,305	-	3,305
Year 12	2007	3,029	-	3,029
Year 13	2008	2,903	-	2,903
Year 14	2009	3,028	-	3,028
Year 15	2010	2,572	-	2,572
5 Year Baseline - Water into Distribution System				
Year 1	2006	3,305	-	3,305
Year 2	2007	3,029	-	3,029
Year 3	2008	2,903	-	2,903
Year 4	2009	3,028	-	3,028
Year 5	2010	2,572	-	2,572
2015 Compliance Year - Water into Distribution System				
2015	1,679	-		1,679
<i>* Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document</i>				
NOTES: Units are acre-feet (AF). Sources: Annual Report to the Drinking Water Program and AWWA Water Audit Wksht.				

SB X7-7 Table 4-B: Indirect Recycled Water Use Deduction (For use only by agencies that are deducting indirect recycled water)

Baseline Year <i>Fm SB X7-7 Table 3</i>	Surface Reservoir Augmentation					Groundwater Recharge			Total Deductible Volume of Indirect Recycled Water Entering the Distribution System
	Volume Discharged from Reservoir for Distribution System Delivery	Percent Recycled Water	Recycled Water Delivered to Treatment Plant	Transmission/ Treatment Loss	Recycled Volume Entering Distribution System from Surface Reservoir Augmentation	Recycled Water Pumped by Utility*	Transmission/ Treatment Losses	Recycled Volume Entering Distribution System from Groundwater Recharge	
10-15 Year Baseline - Indirect Recycled Water Use									
Year 1	1996		-		-			-	-
Year 2	1997		-		-			-	-
Year 3	1998		-		-			-	-
Year 4	1999		-		-			-	-
Year 5	2000		-		-			-	-
Year 6	2001		-		-			-	-
Year 7	2002		-		-			-	-
Year 8	2003		-		-			-	-
Year 9	2004		-		-			-	-
Year 10	2005		-		-			-	-
Year 11	2006		-		-			-	-
Year 12	2007		-		-			-	-
Year 13	2008		-		-			-	-
Year 14	2009		-		-			-	-
Year 15	2010		-		-			-	-
5 Year Baseline - Indirect Recycled Water Use									
Year 1	2006		-		-			-	-
Year 2	2007		-		-			-	-
Year 3	2008		-		-			-	-
Year 4	2009		-		-			-	-
Year 5	2010		-		-			-	-
2015 Compliance - Indirect Recycled Water Use									
2015			-		-			-	-
*Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.									
NOTES:									

SB X7-7 Table 4-C: Process Water Deduction Eligibility

(For use only by agencies that are deducting process water) Choose Only One

<input type="checkbox"/>	Criteria 1- Industrial water use is equal to or greater than 12% of gross water use. Complete SB X7-7 Table 4-C.1
<input type="checkbox"/>	Criteria 2 - Industrial water use is equal to or greater than 15 GPCD. Complete SB X7-7 Table 4-C.2
<input type="checkbox"/>	Criteria 3 - Non-industrial use is equal to or less than 120 GPCD. Complete SB X7-7 Table 4-C.3
<input checked="" type="checkbox"/>	Criteria 4 - Disadvantaged Community. Complete SB x7-7 Table 4-C.4

NOTES:

SB X7-7 Table 4-C.1: Process Water Deduction Eligibility

Criteria 1

Industrial water use is equal to or greater than 12% of gross water use

Baseline Year <i>Fm SB X7-7 Table 3</i>	Gross Water Use Without Process Water Deduction	Industrial Water Use	Percent Industrial Water	Eligible for Exclusion Y/N
10 to 15 Year Baseline - Process Water Deduction Eligibility				
Year 1	1996	2,658	0%	NO
Year 2	1997	2,514	0%	NO
Year 3	1998	2,427	0%	NO
Year 4	1999	2,755	0%	NO
Year 5	2000	2,705	0%	NO
Year 6	2001	2,859	0%	NO
Year 7	2002	3,042	0%	NO
Year 8	2003	3,022	0%	NO
Year 9	2004	3,353	0%	NO
Year 10	2005	3,139	0%	NO
Year 11	2006	3,276	0%	NO
Year 12	2007	3,001	0%	NO
Year 13	2008	2,872	0%	NO
Year 14	2009	2,991	0%	NO
Year 15	2010	2,550	0%	NO
5 Year Baseline - Process Water Deduction Eligibility				
Year 1	2006	3,276	0%	NO
Year 2	2007	3,001	0%	NO
Year 3	2008	2,872	0%	NO
Year 4	2009	2,991	0%	NO
Year 5	2010	2,550	0%	NO
2015 Compliance Year - Process Water Deduction Eligibility				
2015		1,679	0%	NO

NOTES:

SB X7-7 Table 4-C.2: Process Water Deduction Eligibility

Criteria 2

Industrial water use is equal to or greater than 15 GPCD

Baseline Year <i>Fm SB X7-7 Table 3</i>	Industrial Water Use	Population	Industrial GPCD	Eligible for Exclusion Y/N
10 to 15 Year Baseline - Process Water Deduction Eligibility				
Year 1	1996		8,953	- NO
Year 2	1997		8,910	- NO
Year 3	1998		8,968	- NO
Year 4	1999		8,946	- NO
Year 5	2000		9,008	- NO
Year 6	2001		9,260	- NO
Year 7	2002		9,472	- NO
Year 8	2003		9,818	- NO
Year 9	2004		9,964	- NO
Year 10	2005		10,084	- NO
<i>Year 11</i>	2006		10,095	- NO
<i>Year 12</i>	2007		10,142	- NO
<i>Year 13</i>	2008		10,148	- NO
<i>Year 14</i>	2009		10,151	- NO
<i>Year 15</i>	2010		10,164	- NO
5 Year Baseline - Process Water Deduction Eligibility				
Year 1	2006		10,095	- NO
Year 2	2007		10,142	- NO
Year 3	2008		10,148	- NO
Year 4	2009		10,151	- NO
Year 5	2010		10,164	- NO
2015 Compliance Year - Process Water Deduction Eligibility				
2015			10,020	- NO

NOTES:

SB X7-7 Table 4-C.3: Process Water Deduction Eligibility

Criteria 3

Non-industrial use is equal to or less than 120 GPCD

Baseline Year <i>Fm SB X7-7 Table 3</i>	Gross Water Use Without Process Water Deduction <i>Fm SB X7-7 Table 4</i>	Industrial Water Use	Non-industrial Water Use	Population <i>Fm SB X7-7 Table 3</i>	Non-Industrial GPCD	Eligible for Exclusion Y/N
---	---	-----------------------------	---------------------------------	--	----------------------------	---

10 to 15 Year Baseline - Process Water Deduction Eligibility

Year 1	1996	2,658		2,658	8,953	265	NO
Year 2	1997	2,514		2,514	8,910	252	NO
Year 3	1998	2,427		2,427	8,968	242	NO
Year 4	1999	2,755		2,755	8,946	275	NO
Year 5	2000	2,705		2,705	9,008	268	NO
Year 6	2001	2,859		2,859	9,260	276	NO
Year 7	2002	3,042		3,042	9,472	287	NO
Year 8	2003	3,022		3,022	9,818	275	NO
Year 9	2004	3,353		3,353	9,964	300	NO
Year 10	2005	3,139		3,139	10,084	278	NO
Year 11	2006	3,276		3,276	10,095	290	NO
Year 12	2007	3,001		3,001	10,142	264	NO
Year 13	2008	2,872		2,872	10,148	253	NO
Year 14	2009	2,991		2,991	10,151	263	NO
Year 15	2010	2,550		2,550	10,164	224	NO

5 Year Baseline - Process Water Deduction Eligibility

Year 1	2006	3,276		3,276	10,095	290	NO
Year 2	2007	3,001		3,001	10,142	264	NO
Year 3	2008	2,872		2,872	10,148	253	NO
Year 4	2009	2,991		2,991	10,151	263	NO
Year 5	2010	2,550		2,550	10,164	224	NO

2015 Compliance Year - Process Water Deduction Eligibility

2015		1,679		1,679	10,020	150	NO
-------------	--	-------	--	-------	--------	-----	----

NOTES:

SB X7-7 Table 4-C.4: Process Water Deduction Eligibility

Criteria 4

Disadvantaged Community. A “Disadvantaged Community” (DAC) is a community with a median household income less than 80 percent of the statewide average.

SELECT ONE

"Disadvantaged Community" status was determined using one of the methods listed below:

- 1. IRWM DAC Mapping tool**
http://www.water.ca.gov/irwm/grants/resources_dac.cfm

If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC.

- 2. 2010 Median Income**

California Median Household Income	Service Area Median Household Income	Percentage of Statewide Average	Eligible for Exclusion? Y/N
2015 Compliance Year - Process Water Deduction Eligibility			
2010	\$60,883	\$43,895	72% YES

NOTES:

SB X7-7 Table 4-D: Process Water Deduction - Volume

Complete a

separate table for each industrial customer with a process water exclusion

Name of Industrial Customer		Industrial Customer 1				
Baseline Year <i>Fm SB X7-7 Table 3</i>	Industrial Customer's Total Water Use	Total Volume Supplied by Water Agency	% of Water Supplied by Water Agency	Customer's Total Process Water Use	Volume of Process Water Eligible for Exclusion for this Customer	
10 to 15 Year Baseline - Process Water Deduction						
Year 1	1996				-	
Year 2	1997				-	
Year 3	1998				-	
Year 4	1999				-	
Year 5	2000				-	
Year 6	2001				-	
Year 7	2002				-	
Year 8	2003				-	
Year 9	2004				-	
Year 10	2005				-	
<i>Year 11</i>	2006				-	
<i>Year 12</i>	2007				-	
<i>Year 13</i>	2008				-	
<i>Year 14</i>	2009				-	
<i>Year 15</i>	2010				-	
5 Year Baseline - Process Water Deduction						
Year 1	2006				-	
Year 2	2007				-	
Year 3	2008				-	
Year 4	2009				-	
Year 5	2010				-	
2015 Compliance Year - Process Water Deduction						
	2015				-	
NOTES:						

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

Baseline Year <i>Fm SB X7-7 Table 3</i>	Service Area Population <i>Fm SB X7-7 Table 3</i>	Annual Gross Water Use <i>Fm SB X7-7 Table 4</i>	Daily Per Capita Water Use (GPCD)	
10 to 15 Year Baseline GPCD				
Year 1	1996	8,953	2,658	265
Year 2	1997	8,910	2,514	252
Year 3	1998	8,968	2,427	242
Year 4	1999	8,946	2,755	275
Year 5	2000	9,008	2,705	268
Year 6	2001	9,260	2,859	276
Year 7	2002	9,472	3,042	287
Year 8	2003	9,818	3,022	275
Year 9	2004	9,964	3,353	300
Year 10	2005	10,084	3,139	278
<i>Year 11</i>	2006	10,095	3,276	290
<i>Year 12</i>	2007	10,142	3,001	264
<i>Year 13</i>	2008	10,148	2,872	253
<i>Year 14</i>	2009	10,151	2,991	263
<i>Year 15</i>	2010	10,164	2,550	224
10-15 Year Average Baseline GPCD			267	
5 Year Baseline GPCD				
Baseline Year <i>Fm SB X7-7 Table 3</i>	Service Area Population <i>Fm SB X7-7 Table 3</i>	Gross Water Use <i>Fm SB X7-7 Table 4</i>	Daily Per Capita Water Use	
Year 1	2006	10,095	3,276	290
Year 2	2007	10,142	3,001	264
Year 3	2008	10,148	2,872	253
Year 4	2009	10,151	2,991	263
Year 5	2010	10,164	2,550	224
5 Year Average Baseline GPCD			259	
2015 Compliance Year GPCD				
2015	10,020	1,679	150	
NOTES: Units of measure are acre-feet (AF).				

SB X7-7 Table 6: Gallons per Capita per Day
Summary From Table SB X7-7 Table 5

10-15 Year Baseline GPCD	267
5 Year Baseline GPCD	259
2015 Compliance Year GPCD	150

NOTES: Units are gallons per capita per day (GPCD).

SB X7-7 Table 7: 2020 Target Method*Select Only One*

Target Method		Supporting Documentation
<input type="checkbox"/>	Method 1	SB X7-7 Table 7A
<input type="checkbox"/>	Method 2	SB X7-7 Tables 7B, 7C, and 7D <i>Contact DWR for these tables</i>
<input type="checkbox"/>	Method 3	SB X7-7 Table 7-E
<input checked="" type="checkbox"/>	Method 4	Method 4 Calculator

NOTES:

SB X7-7 Table 7-A: Target Method 1

20% Reduction

10-15 Year Baseline GPCD	2020 Target GPCD
267	214
NOTES: Units are gallons per capita per day (GPCD).	

Tables for Target Method 2 (SB X7-7 Tables 7-B, 7-C, and 7-D) are not included in the SB X7-7 Verification Form, but are still required for water suppliers using Target Method 2. These water suppliers should contact Gwen Huff at (916) 651-9672 or gwen.huff@water.ca.gov

SB X7-7 Table 7-C: Target Method 2

Target CII Water Use

Tables for Target Method 2 (SB X7-7 Tables 7-B, 7-C, and 7-D) are not included in the SB X7-7 Verification Form, but are still required for water suppliers using Target Method 2. These water suppliers should contact Gwen Huff at (916) 651-9672 or gwen.huff@water.ca.gov

SB X7-7 Table 7-D: Target Method 2 Summary

Tables for Target Method 2 (SB X7-7 Tables 7-B, 7-C, and 7-D) are not included in the SB X7-7 Verification Form, but are still required for water suppliers using Target Method 2. These water suppliers should contact Gwen Huff at (916) 651-9672 or gwen.huff@water.ca.gov

SB X7-7 Table 7-E: Target Method 3

Agency May Select More Than One as Applicable	Percentage of Service Area in This Hydrological Region	Hydrologic Region	"2020 Plan" Regional Targets	Method 3 Regional Targets (95%)
<input type="checkbox"/>		North Coast	137	130
<input type="checkbox"/>		North Lahontan	173	164
<input checked="" type="checkbox"/>	100%	Sacramento River	176	167
<input type="checkbox"/>		San Francisco Bay	131	124
<input type="checkbox"/>		San Joaquin River	174	165
<input type="checkbox"/>		Central Coast	123	117
<input type="checkbox"/>		Tulare Lake	188	179
<input type="checkbox"/>		South Lahontan	170	162
<input type="checkbox"/>		South Coast	149	142
<input type="checkbox"/>		Colorado River	211	200
<p align="center">Target <i>(If more than one region is selected, this value is calculated.)</i></p>				<p align="center">167</p>
<p>NOTES: Units are gallons per capita per day (GPCD).</p>				

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target

5 Year Baseline GPCD <i>From SB X7-7 Table 5</i>	Maximum 2020 Target ¹	Calculated 2020 Target ²	Confirmed 2020 Target
259	246	215	215

¹ Maximum 2020 Target is 95% of the 5 Year Baseline GPCD
 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and
 corresponding tables for agency's calculated target. ² 2020

NOTES: Units are gallons per capita per day (GPCD).

SB X7-7 Table 8: 2015 Interim Target GPCD

Confirmed 2020 Target <i>Fm SB X7-7 Table 7-F</i>	10-15 year Baseline GPCD <i>Fm SB X7-7 Table 5</i>	2015 Interim Target GPCD
215	267	241

NOTES: Units are gallons per capita per day (GPCD).

SB X7-7 Table 9: 2015 Compliance

Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments <i>(in GPCD)</i>					2015 GPCD <i>(Adjusted if applicable)</i>	Did Supplier Achieve Targeted Reduction for 2015?
		Enter "0" if Adjustment Not Used			TOTAL Adjustments	Adjusted 2015 GPCD		
		Extraordinary Events	Weather Normalization	Economic Adjustment				
150	241	<i>From Methodology 8 (Optional)</i>	<i>From Methodology 8 (Optional)</i>	<i>From Methodology 8 (Optional)</i>	-	150	150	YES

NOTES: Units are gallons per capita per day (GPCD).

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP*

(select one from the drop down list)

Acre Feet

**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*

NOTES:

SB X7-7 Table 1 pertains to baselines and targets and is not used in the SB X7-7 2020 Compliance Form.

SB X7-7 Table 2: Method for 2020 Population Estimate

Method Used to Determine 2020 Population
(may check more than one)

<input checked="" type="checkbox"/>	1. Department of Finance (DOF) or American Community Survey (ACS)
<input type="checkbox"/>	2. Persons-per-Connection Method
<input type="checkbox"/>	3. DWR Population Tool
<input type="checkbox"/>	4. Other DWR recommends pre-review

NOTES:

SB X7-7 Table 3: 2020 Service Area Population

2020 Compliance Year Population

2020	10,626
-------------	--------

NOTES:

SB X7-7 Table 4: 2020 Gross Water Use

Compliance Year 2020	2020 Volume Into Distribution System <i>This column will remain blank until SB X7-7 Table 4-A is completed.</i>	2020 Deductions					2020 Gross Water Use
		Exported Water *	Change in Dist. System Storage* (+/-)	Indirect Recycled Water <i>This column will remain blank until SB X7-7 Table 4-B is completed.</i>	Water Delivered for Agricultural Use*	Process Water <i>This column will remain blank until SB X7-7 Table 4-D is completed.</i>	
	2,215	-	-	-	-	-	2,215

* Units of measure (AF, MG , or CCF) must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES: Units of measure are acre-feet (AF).

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 Shasta Lake

This water source is (check one) :

The supplier's own water source

A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System ¹	Meter Error Adjustment ² <i>Optional</i> (+/-)	Corrected Volume Entering Distribution System
	2,215	-	2,215

¹ **Units of measure (AF, MG , or CCF) must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.**

² **Meter**

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

NOTES: Units of measure are acre-feet (AF). Sources: Annual Report to the Drinking Water Program and AWWA Water Audit Worksheet.

SB X7-7 Table 4-B: 2020 Indirect Recycled Water Use Deduction (For use only by agencies that are deducting indirect recycled water)

2020 Compliance Year	2020 Surface Reservoir Augmentation				2020 Groundwater Recharge			Total Deductible Volume of Indirect Recycled Water Entering the Distribution System	
	Volume Discharged from Reservoir for Distribution System Delivery ¹	Percent Recycled Water	Recycled Water Delivered to Treatment Plant	Transmission/Treatment Loss ¹	Recycled Volume Entering Distribution System from Surface Reservoir Augmentation	Recycled Water Pumped by Utility ^{1,2}	Transmission/Treatment Losses ¹		Recycled Volume Entering Distribution System from Groundwater Recharge
			-		-			-	-

¹ Units of measure (AF, MG, or CCF) must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3. ²
 Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C: 2020 Process Water Deduction Eligibility

(For use only by agencies that are deducting process water) Choose Only One

<input type="checkbox"/>	Criteria 1- Industrial water use is equal to or greater than 12% of gross water use. Complete SB X7-7 Table 4-C.1
<input type="checkbox"/>	Criteria 2 - Industrial water use is equal to or greater than 15 GPCD. Complete SB X7-7 Table 4-C.2
<input type="checkbox"/>	Criteria 3 - Non-industrial use is equal to or less than 120 GPCD. Complete SB X7-7 Table 4-C.3
<input checked="" type="checkbox"/>	Criteria 4 - Disadvantaged Community. Complete SB x7-7 Table 4-C.4

NOTES:

Data from this table will not be entered into WUEdata.
 Instead, the entire table will be uploaded to WUEdata as a separate upload in
 Excel format.

SB X7-7 Table 4-C.1: 2020 Process Water Deduction Eligibility *(For use only by agencies that are deducting process water using Criteria 1)*

Criteria 1
 Industrial water use is equal to or greater than 12% of gross water use

2020 Compliance Year	2020 Gross Water Use Without Process Water Deduction	2020 Industrial Water Use	Percent Industrial Water	Eligible for Exclusion Y/N
	2,215		0%	NO

NOTES:

Data from this table will not be entered into WUEdata.
 Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel
 format.

SB X7-7 Table 4-C.2: 2020 Process Water Deduction Eligibility *(For use only by agencies that are deducting process water using Criteria 2)*

Criteria 2
 Industrial water use is equal to or greater than 15 GPCD

2020 Compliance Year	2020 Industrial Water Use	2020 Population	2020 Industrial GPCD	Eligible for Exclusion Y/N
		10,626	-	NO

NOTES:

Data from this table will not be entered into WUEdata.
 Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C.3: 2020 Process Water Deduction Eligibility *(For use only by agencies that are deducting process water using Criteria 3)*

Criteria 3
 Non-industrial use is equal to or less than 120 GPCD

2020 Compliance Year	2020 Gross Water Use Without Process Water Deduction <i>Fm SB X7-7 Table 4</i>	2020 Industrial Water Use	2020 Non-industrial Water Use	2020 Population <i>Fm SB X7-7 Table 3</i>	Non-Industrial GPCD	Eligible for Exclusion Y/N
	2,215		2,215	10,626	186	NO

NOTES:

Data from this table will not be entered into WUEdata.
 Instead, the entire table will be uploaded to WUEdata as a separate upload in
 Excel format.

SB X7-7 Table 4-C.4: 2020 Process Water Deduction Eligibility *(For use only by agencies that are deducting process water using Criteria 4)*

Criteria 4

Disadvantaged Community. A "Disadvantaged Community" (DAC) is a community with a median household income less than 80 percent of the statewide average.

SELECT ONE

"Disadvantaged Community" status was determined using one of the methods listed below:

1. IRWM DAC Mapping tool <https://gis.water.ca.gov/app/dacs/>

If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC.

2. 2020 Median Income

	California Median Household Income*		Service Area Median Household Income	Percentage of Statewide Average	Eligible for Exclusion? Y/N
<input checked="" type="checkbox"/>	2020	\$75,235	\$48,902	65%	YES
*California median household income 2015 -2019 as reported in US Census Bureau QuickFacts.					

NOTES

Data from these tables will not be entered into WUEdata.

Instead,

the entire tables will be uploaded to WUEdata as a separate upload in Excel format.

This table(s) is only for Suppliers that deduct process water from their 2020 gross water use.

SB X7-7 Table 4-D: 2020 Process Water Deduction - Volume

Complete a

separate table for each industrial customer with a process water exclusion

Name of Industrial Customer		<i>Enter Name of Industrial Customer 1</i>			
Compliance Year 2020	Industrial Customer's Total Water Use *	Total Volume Provided by Supplier*	% of Water Provided by Supplier	Customer's Total Process Water Use*	Volume of Process Water Eligible for Exclusion for this Customer
					-

* Units of measure (AF, MG , or CCF) must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)

2020 Gross Water <i>Fm SB X7-7 Table 4</i>	2020 Population <i>Fm</i> <i>SB X7-7 Table 3</i>	2020 GPCD
2,215	10,626	186

NOTES: Units of measure are acre-feet (AF).

SB X 7-7 Table 6 pertains to baselines and targets and is not used in the SB X7-7 2020 Compliance Form.

SB X7-7 Table 7 applies to baseline and target calculations and is not included in the SB X7-7 2020 Compliance Form.

SB X7-7 Table 8 was used for the 2015 Interim Target and is not used in the 2020 UWMP.

SB X7-7 Table 9: 2020 Compliance

Actual 2020 GPCD ¹	Optional Adjustments to 2020 GPCD					2020 Confirmed Target GPCD ^{1,2}	Did Supplier Achieve Targeted Reduction for 2020?
	Enter "0" if Adjustment Not Used			TOTAL Adjustments ¹	Adjusted 2020 GPCD ¹ <i>(Adjusted if applicable)</i>		
	Extraordinary Events ¹	Weather Normalization ¹	Economic Adjustment ¹				
186	-	-	-	-	186	215	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.

NOTES:

Appendix D

WATER CONTRACTS AND AGREEMENTS



United States Department of the Interior

BUREAU OF RECLAMATION
Mid-Pacific Regional Office
2800 Cottage Way
Sacramento, California 95825-1898

IN REPLY
REFER TO:

MAR 07 2005

MP-440
WTR-4.00

City Council
City of Shasta Lake
P. O. Box 777
Shasta Lake, California 96019

Subject: Long-Term Renewal Contract No. 4-07-20-W1134-LTR1 Between the United States and the City of Shasta Lake (City) Providing for Project Water Service From the Shasta Division - Central Valley Project, California

Dear Council Members:

Enclosed is an executed original of the subject contract for your records. This contract is effective March 1, 2005, through February 28, 2045. The Bureau of Reclamation appreciates the effort expended by the City and its representatives relative to this contract.

If there are any questions, please contact Mr. Don Bultema, Supervisory Repayment Specialist, at 530-934-1361 (TDD 530-934-1345).

Sincerely,

Kirk C. Rodgers
Regional Director

Enclosure

cc: Mr. Walt McNeil
280 Hemsted Drive
Redding, California 96003
(w/c encl)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Central Valley Project, California

LONG-TERM RENEWAL CONTRACT BETWEEN THE UNITED STATES
AND
CITY OF SHASTA LAKE
PROVIDING FOR PROJECT WATER SERVICE
FROM SHASTA DIVISION

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Exhibit A – Map of Contractor's Service Area

Exhibit B – Rates and Charges

1 UNITED STATES
2 DEPARTMENT OF THE INTERIOR
3 BUREAU OF RECLAMATION
4 Central Valley Project, California

5 LONG-TERM RENEWAL CONTRACT BETWEEN THE UNITED STATES
6 AND
7 CITY OF SHASTA LAKE
8 PROVIDING FOR PROJECT WATER SERVICE
9 FROM SHASTA DIVISION

10 THIS CONTRACT, made this 25th day of February, 2005, in
11 pursuance generally of the Act of June 17, 1902 (32 Stat. 388), and acts amendatory or
12 supplementary thereto, including, but not limited to, the Acts of August 26, 1937 (50 Stat. 844),
13 as amended and supplemented, August 4, 1939 (53 Stat. 1187), as amended and supplemented,
14 July 2, 1956 (70 Stat. 483), June 21, 1963 (77 Stat. 68), October 12, 1982 (96 Stat. 1263),
15 October 27, 1986 (100 Stat. 3050), as amended, and Title XXXIV of the Act of October 30, 1992
16 (106 Stat. 4706), all collectively hereinafter referred to as Federal Reclamation law, between
17 THE UNITED STATES OF AMERICA, hereinafter referred to as the United States, and CITY
18 OF SHASTA LAKE, hereinafter referred to as the Contractor, an incorporated City of the State
19 of California, duly organized, existing, and acting pursuant to the laws thereof;

20 WITNESSETH, That:

21 EXPLANATORY RECITALS

22 [1st] WHEREAS, the United States has constructed and is operating the Central Valley
23 Project (Project), California, for diversion, storage, carriage, distribution and beneficial use, for
24 flood control, irrigation, municipal, domestic, industrial, fish and wildlife mitigation, protection

25 and restoration, generation and distribution of electric energy, salinity control, navigation and
26 other beneficial uses, of waters of the Sacramento River, the American River, the Trinity River,
27 and the San Joaquin River and their tributaries; and

28 [2nd] WHEREAS, the United States constructed the Shasta Dam pumping facilities and
29 the Toyon Pipeline, hereinafter collectively referred to as the Shasta Division facilities, which
30 will be used in part for the furnishing of water to the Contractor pursuant to the terms of this
31 Contract; and

32 [3rd] WHEREAS, the rights to Project Water were acquired by the United States
33 pursuant to California law for operation of the Project; and

34 [4th] WHEREAS, the Contractor is the successor in interest by assignment of long term
35 water service contracts designated Contract No. I1r-1515, originally entered with the United
36 States on August 12, 1948, by the Shasta Dam Public Utility District, and amendatory Contract
37 No. I1r-1523, entered with the United States on December 5, 1975, by the Summit City Public
38 Utility District, which contracts were together subsumed in a single temporary contract that was
39 renewed successively as Contract Nos. 8-07-20-W0715, 0-07-20-W0885, 2-07-20-W1024, and
40 No. 4-07-20-W1134, that established terms for the delivery to the Contractor of Project Water
41 from the Shasta Division facilities from August 22, 1988, through February 28, 1994; and

42 [5th] WHEREAS, the Contractor and the United States have pursuant to subsection
43 3404(c)(1) of the Central Valley Project Improvement Act (CVPIA), subsequently entered into
44 interim renewal contract(s) identified as Contract No(s). 4-07-20-W1134, 4-07-20-W1134-IR2,
45 4-07-20-W1134-IR3, 4-07-20-W1134-IR4, 4-07-20-W1134-IR5, 4-07-20-W1134-IR6, 4-07-20-
46 W1134-IR7, 4-07-20-W1134-IR8, 4-07-20-W1134-IR9, and 4-07-20-W1134-IR10, the current
47 of which is hereinafter referred to as the "Existing Contract," which provided for the continued
48 water service to the Contractor from March 1, 2004, through February, 28, 2006; and

49 [6th] WHEREAS, Section 3404(c) of the CVPIA provides for long-term renewal of the
50 Existing Contract following completion of appropriate environmental documentation, including a

51 programmatic environmental impact statement (PEIS) pursuant to the National Environmental
52 Policy Act (NEPA), analyzing the direct and indirect impacts and benefits of implementing the
53 CVPIA and the potential renewal of all existing contracts for Project Water; and

54 [7th] WHEREAS, the United States has completed the PEIS and all other appropriate
55 environmental review necessary to provide for long-term renewal of the Existing Contract; and

56 [8th] WHEREAS, the Contractor has requested the long-term renewal of the Existing
57 Contract, pursuant to the terms of the Existing Contract, Federal Reclamation law, and the laws
58 of the State of California, for water service from the Project; and

59 [9th] WHEREAS, the United States has determined that the Contractor has fulfilled all
60 of its obligations under the Existing Contract; and

61 [10th] WHEREAS, the Contractor has demonstrated to the satisfaction of the
62 Contracting Officer that the Contractor has utilized the Project Water supplies available to it for
63 reasonable and beneficial use and, based upon a needs analysis cooperatively prepared by the
64 Contracting Officer and the Contractor, has demonstrated projected future demand for water use
65 that exceeds the Contract Total to be made available to it pursuant to this Contract; and

66 [11th] WHEREAS, water obtained from the Project has been relied upon by urban and
67 agricultural areas within California for more than 50 years, and is considered by the Contractor
68 as an essential portion of its water supply; and

69 [12th] WHEREAS, the economies of regions within the Project, including the
70 Contractor's, depend upon the continued availability of water, including water service from the
71 Project; and

72 [12.1] WHEREAS, Contractor has made and will continue to make substantial capital
73 investments in diversion and treatment facilities, and requires a consistent, predictable quality of
74 raw water in order to meet Safe Drinking Water Act requirements for its municipal customers,
75 and to provide a consistent and predictable quality of water for its industrial customers; and

76 [13th] WHEREAS, the Secretary intends through coordination, cooperation, and
77 partnerships to pursue measures to improve water supply, water quality, and reliability of the
78 Project for all Project purposes; and

79 [13.1] WHEREAS, the Contractor is located in the region of the Redding Groundwater
80 Basin, and it is the desire of both the United States and the Contractor to facilitate the
81 cooperative efforts of local water service agencies to develop the Redding Groundwater Basin
82 for conjunctive management and use with Project Water supplies, to maximize the reasonable
83 beneficial use of water for the water service agencies and their customers in the region; and

84 [14th] WHEREAS, the mutual goals of the United States and the Contractor include: to
85 provide for reliable Project Water supplies; to control costs of those supplies; to achieve
86 repayment of the Project as required by law; to guard reasonably against Project Water
87 shortages; to achieve a reasonable balance among competing demands for use of Project Water;
88 and to comply with all applicable environmental statutes, all consistent with the legal obligations
89 of the United States relative to the Project; and

90 [15th] WHEREAS, the parties intend by this Contract to develop a more cooperative
91 relationship in order to achieve their mutual goals; and

92 [16th] WHEREAS, the United States and the Contractor are willing to enter into this
93 Contract pursuant to Federal Reclamation law on the terms and conditions set forth below;

94 NOW, THEREFORE, in consideration of the mutual and dependent covenants herein
95 contained, it is hereby mutually agreed by the parties hereto as follows:

96 DEFINITIONS

97 1. When used herein unless otherwise distinctly expressed, or manifestly
98 incompatible with the intent of the parties as expressed in this Contract, the term:

99 (a) "Calendar Year" shall mean the period January 1 through December 31,
100 both dates inclusive;

101 (b) "Charges" shall mean the payments required by Federal Reclamation law
102 in addition to the Rates and Tiered Pricing Component specified in this Contract as determined
103 annually by the Contracting Officer pursuant to this Contract;

104 (c) "Condition of Shortage" shall mean a condition respecting the Project
105 during any Year such that the Contracting Officer is unable to deliver sufficient water to meet the
106 Contract Total;

107 (d) "Contracting Officer" shall mean the Secretary of the Interior's duly
108 authorized representative acting pursuant to this Contract or applicable Federal Reclamation law
109 or regulation;

110 (e) "Contract Total" shall mean the maximum amount of water to which the
111 Contractor is entitled under subdivision (a) of Article 3 of this Contract;

112 (f) "Contractor's Service Area" shall mean the area to which the Contractor is
113 permitted to provide Project Water under this Contract as described in Exhibit "A" attached
114 hereto, which may be modified from time to time in accordance with Article 35 of this Contract
115 without amendment of this Contract;

116 (g) "CVPIA" shall mean the Central Valley Project Improvement Act, Title
117 XXXIV of the Act of October 30, 1992 (106 Stat. 4706);

118 (h) Omitted;

119 (i) Omitted;

120 (j) "Full Cost Rate" shall mean an annual rate as determined by the
121 Contracting Officer that shall amortize the expenditures for construction properly allocable to the
122 Project irrigation or M&I functions, as appropriate, of facilities in service including all O&M
123 deficits funded, less payments, over such periods as may be required under Federal Reclamation
124 law, or applicable contract provisions. Interest will accrue on both the construction expenditures
125 and funded O&M deficits from October 12, 1982, on costs outstanding at that date, or from the

126 date incurred in the case of costs arising subsequent to October 12, 1982, and shall be calculated
127 in accordance with subsections 202(3)(B) and (3)(C) of the Reclamation Reform Act of
128 October 12, 1982 (96 Stat. 1263), as amended, hereinafter referred to as RRA. The Full Cost
129 Rate includes actual operation, maintenance, and replacement costs consistent with Section 426.2
130 of the Rules and Regulations for the RRA;

131 (k) Omitted;

132 (l) Omitted;

133 (m) Omitted;

134 (n) Omitted;

135 (o) "Municipal and Industrial (M&I) Water" shall mean Project Water made
136 available to the Contractor for purposes other than the commercial production of agricultural
137 crops or livestock;

138 (p) "M&I Full Cost Water Rate" shall mean the Full Cost Rate applicable to
139 the delivery of M&I Water;

140 (q) "Operation and Maintenance" or "O&M" shall mean normal and
141 reasonable care, control, operation, repair, replacement (other than capital replacement), and
142 maintenance of Project facilities;

143 (r) Omitted;

144 (s) "Project" shall mean the Central Valley Project owned by the United
145 States and managed by the Department of the Interior, Bureau of Reclamation;

146 (t) "Project Contractors" shall mean all parties who have water service
147 contracts for Project Water from the Project with the United States pursuant to Federal
148 Reclamation law;

149 (u) "Project Water" shall mean all water that is developed, diverted, stored, or
150 delivered by the Secretary in accordance with the statutes authorizing the Project and in
151 accordance with the terms and conditions of water rights acquired pursuant to California law;

152 (v) "Rates" shall mean the payments determined annually by the Contracting
153 Officer in accordance with the then-current applicable water ratesetting policies for the Project,
154 as described in subdivision (a) of Article 7 of this Contract;

155 (w) "Recent Historic Average" shall mean the most recent five-year average of
156 the final forecast of Water Made Available to the Contractor pursuant to this Contract or its
157 preceding contract(s);

158 (x) "Secretary" shall mean the Secretary of the Interior, a duly appointed
159 successor, or an authorized representative acting pursuant to any authority of the Secretary and
160 through any agency of the Department of the Interior;

161 (y) "Tiered Pricing Component" shall be the incremental amount to be paid
162 for each acre-foot of Water Delivered as described in subdivision (j) of Article 7 of this Contract;

163 (z) "Water Delivered" or "Delivered Water" shall mean Project Water
164 diverted for use by the Contractor at the point(s) of delivery approved by the Contracting
165 Officer;

166 (aa) "Water Made Available" shall mean the estimated amount of Project
167 Water that can be delivered to the Contractor for the upcoming Year as declared by the
168 Contracting Officer, pursuant to subdivision (a) of Article 4 of this Contract;

169 (bb) "Water Scheduled" shall mean Project Water made available to the
170 Contractor for which times and quantities for delivery have been established by the Contractor
171 and Contracting Officer, pursuant to subdivision (b) of Article 4 of this Contract; and

172 (cc) "Year" shall mean the period from and including March 1 of each
173 Calendar Year through the last day of February of the following Calendar Year.

174 TERM OF CONTRACT

175 2. (a) This Contract shall be effective March 1, 2005, through February 28,
176 2045, and supersedes the Existing Contract. In the event the Contractor wishes to renew this

177 Contract beyond February 28, 2045, the Contractor shall submit a request for renewal in writing
178 to the Contracting Officer no later than two years prior to the date this Contract expires.

179 (b) Omitted.

180 (c) This Contract shall be renewed for successive periods of up to 40 years
181 each, which periods shall be consistent with then-existing Reclamation-wide policy, under terms
182 and conditions mutually agreeable to the parties and consistent with Federal and State law. The
183 Contractor shall be afforded the opportunity to comment to the Contracting Officer on the
184 proposed adoption and application of any revised policy applicable to the delivery of M&I Water
185 that would limit the term of any subsequent renewal contract with the Contractor for the
186 furnishing of M&I Water to less than 40 years.

187 (d) The Contracting Officer shall make a determination ten years after the
188 date of execution of this Contract, and every five years thereafter during the term of this
189 Contract, of whether a conversion to a contract under subsection (c)(1) of Section 9 of the
190 Reclamation Project Act of 1939 can be accomplished. The Contracting Officer anticipates that
191 during the term of this Contract, all authorized Project construction expected to occur will have
192 occurred, and on that basis the Contracting Officer agrees upon such completion to allocate all
193 costs that are properly assignable to the Contractor, and agrees further that, at any time after such
194 allocation is made, and subject to satisfaction of the condition set out in this subdivision, this
195 Contract shall, at the request of the Contractor, be converted to a contract under said subsection
196 9(c)(1), of the Reclamation Project Act of 1939, subject to applicable Federal law and under
197 stated terms and conditions mutually agreeable to the Contractor and the Contracting Officer. A
198 condition for such conversion to occur shall be a determination by the Contracting Officer that,
199 account being taken of the amount credited to return by the Contractor as provided for under
200 Federal Reclamation law, the remaining amount of construction costs assignable for ultimate
201 return by the Contractor can probably be repaid to the United States within the term of a contract
202 under said subsection 9(c)(1). If the remaining amount of costs that are properly assignable to

203 the Contractor cannot be determined during the term of this Contract, the Contracting Officer
204 shall notify the Contractor, and provide the reason(s) why such a determination could not be
205 made. Further, the Contracting Officer shall make such a determination as soon thereafter as
206 possible so as to permit, upon request of the Contractor and satisfaction of the condition set out
207 above, conversion to a contract under said subsection 9(c)(1). In the event such determination of
208 costs has not been made at a time which allows conversion of this Contract during the term of
209 this Contract or the Contractor has not requested conversion of this Contract within such term,
210 the parties shall incorporate in any subsequent renewal contract as described in subdivision (c) of
211 this Article a provision that carries forth in substantially identical terms the provisions of this
212 subdivision.

213 WATER TO BE MADE AVAILABLE AND DELIVERED TO THE CONTRACTOR

214 3. (a) During each Year, consistent with all applicable State water rights,
215 permits, and licenses, Federal law, and subject to the provisions set forth in Articles 11 and 12 of
216 this Contract, the Contracting Officer shall make available for delivery to the Contractor 4,400
217 acre-feet of Project Water for M&I purposes. Water Delivered to the Contractor in accordance
218 with this subdivision shall be scheduled and paid for pursuant to the provisions of Articles 4 and
219 7 of this Contract.

220 (b) Because the capacity of the Project to deliver Project Water has been
221 constrained in recent years and may be constrained in the future due to many factors including
222 hydrologic conditions and implementation of Federal and State laws, the likelihood of the
223 Contractor actually receiving the amount of Project Water set out in subdivision (a) of this
224 Article in any given Year is uncertain. The Contracting Officer's modeling referenced in the
225 PEIS projected that the Contract Total set forth in this Contract will not be available to the
226 Contractor in many years. During the most recent five years, the Recent Historic Average of
227 water made available to the Contractor was 2,530 acre-feet. Nothing in subdivision (b) of this
228 Article shall affect the rights and obligations of the parties under any provision of this Contract.

229 (c) The Contractor shall utilize the Project Water in accordance with all
230 applicable legal requirements.

231 (d) The Contractor shall make reasonable and beneficial use of all water
232 furnished pursuant to this Contract. Groundwater recharge programs (direct, indirect, or in lieu),
233 groundwater banking programs, surface water storage programs, and other similar programs
234 utilizing Project Water or other water furnished pursuant to this Contract conducted within the
235 Contractor's Service Area which are consistent with applicable State law and result in use
236 consistent with Federal Reclamation law will be allowed; Provided, That any direct recharge
237 program(s) is (are) described in the Contractor's water conservation plan submitted pursuant to
238 Article 26 of this Contract; Provided, further, That such water conservation plan demonstrates
239 sufficient lawful uses exist in the Contractor's Service Area so that using a long-term average,
240 the quantity of Delivered Water is demonstrated to be reasonable for such uses and in
241 compliance with Federal Reclamation law. Groundwater recharge programs, groundwater
242 banking programs, surface water storage programs, and other similar programs utilizing Project
243 Water or other water furnished pursuant to this Contract conducted outside the Contractor's
244 Service Area may be permitted upon written approval of the Contracting Officer, which approval
245 will be based upon environmental documentation, Project Water rights, and Project operational
246 concerns. The Contracting Officer will address such concerns in regulations, policies, or
247 guidelines.

248 (e) The Contractor shall comply with requirements applicable to the
249 Contractor in biological opinion(s) prepared as a result of a consultation regarding the execution
250 of this Contract undertaken pursuant to Section 7 of the Endangered Species Act of 1973 (ESA),
251 as amended, that are within the Contractor's legal authority to implement. The Existing
252 Contract, which evidences in excess of 54 years of diversions for M&I purposes of the quantities
253 of water provided in subdivision (a) of Article 3 of this Contract, will be considered in
254 developing an appropriate baseline for biological assessment(s) prepared pursuant to the ESA,

255 and any other needed environmental review. Nothing herein shall be construed to prevent the
256 Contractor from challenging or seeking judicial relief in a court of competent jurisdiction with
257 respect to any biological opinion or other environmental documentation referred to in this
258 Article.

259 (f) As soon as possible following each declaration of Water Made Available
260 under Article 4 of this Contract, the Contracting Officer will make a determination whether
261 Project Water, or other water available to the Project, can be made available to the Contractor in
262 addition to the Contract Total under Article 3 of this Contract during the Year without adversely
263 impacting other Project Contractors. At the request of the Contractor, the Contracting Officer
264 will consult with the Contractor prior to making such a determination. If the Contracting Officer
265 determines that Project Water, or other water available to the Project, can be made available to
266 the Contractor, the Contracting Officer will announce the availability of such water and shall so
267 notify the Contractor as soon as practical. The Contracting Officer will thereafter meet with the
268 Contractor and other Project Contractors capable of taking such water to determine the most
269 equitable and efficient allocation of such water. If the Contractor requests the delivery of any
270 quantity of such water, the Contracting Officer shall make such water available to the Contractor
271 in accordance with applicable statutes, regulations, guidelines, and policies.

272 (g) The Contractor may request permission to reschedule for use during the
273 subsequent Year some or all of the Water Made Available to the Contractor during the current
274 Year, referred to as "carryover." The Contractor may request permission to use during the
275 current Year a quantity of Project Water which may be made available by the United States to
276 the Contractor during the subsequent Year, referred to as "preuse." The Contracting Officer's
277 written approval may permit such uses in accordance with applicable statutes, regulations,
278 guidelines, and policies.

279 (h) The Contractor's right pursuant to Federal Reclamation law and applicable
280 State law to the reasonable and beneficial use of Water Delivered pursuant to this Contract

281 during the term thereof and any subsequent renewal contracts, as described in Article 2 of this
282 Contract, during the terms thereof shall not be disturbed so long as the Contractor shall fulfill all
283 of its obligations under this Contract and any renewals thereof. Nothing in the preceding
284 sentence shall affect the Contracting Officer's ability to impose shortages under Article 11 or
285 subdivision (b) of Article 12 of this Contract or applicable provisions of any subsequent renewal
286 contracts.

287 (i) Project Water furnished to the Contractor pursuant to this Contract may be
288 delivered for other than M&I purposes upon written approval by the Contracting Officer in
289 accordance with the terms and conditions of such approval.

290 (j) The Contracting Officer shall make reasonable efforts to protect the water
291 rights necessary for the Project and to provide the water available under this Contract. The
292 Contracting Officer shall not object to participation by the Contractor, in the capacity and to the
293 extent permitted by law, in administrative proceedings related to the Project Water rights;
294 Provided, That the Contracting Officer retains the right to object to the substance of the
295 Contractor's position in such a proceeding; Provided further, That in such proceedings the
296 Contracting Officer shall recognize the Contractor has a legal right under the terms of this
297 Contract to use Project Water.

298 TIME FOR DELIVERY OF WATER

299 4. (a) On or about February 20 of each Calendar Year, the Contracting Officer
300 shall announce the Contracting Officer's expected declaration of the Water Made Available.
301 Such declaration will be expressed in terms of both Water Made Available and the Recent
302 Historic Average and will be updated monthly, and more frequently if necessary, based on
303 then-current operational and hydrologic conditions and a new declaration with changes, if any, to
304 the Water Made Available will be made. The Contracting Officer shall provide forecasts of
305 Project operations and the basis of the estimate, with relevant supporting information, upon the
306 written request of the Contractor. Concurrently with the declaration of the Water Made

307 Available, the Contracting Officer shall provide the Contractor with the updated Recent Historic
308 Average.

309 (b) On or before each March 1 and at such other times as necessary, the
310 Contractor shall submit to the Contracting Officer a written schedule, satisfactory to the
311 Contracting Officer, showing the monthly quantities of Project Water to be delivered by the
312 United States to the Contractor pursuant to this Contract for the Year commencing on such
313 March 1. The Contracting Officer shall use all reasonable means to deliver Project Water
314 according to the approved schedule for the Year commencing on such March 1.

315 (c) The Contractor shall not schedule Project Water in excess of the quantity
316 of Project Water the Contractor intends to put to reasonable and beneficial use within the
317 Contractor's Service Area or to sell, transfer, or exchange pursuant to Article 9 of this Contract
318 during any Year.

319 (d) Subject to the conditions set forth in subdivision (a) of Article 3 of this
320 Contract, the United States shall deliver Project Water to the Contractor in accordance with the
321 initial schedule submitted by the Contractor pursuant to subdivision (b) of this Article, or any
322 written revision(s), satisfactory to the Contracting Officer, thereto submitted within a reasonable
323 time prior to the date(s) on which the requested change(s) is/are to be implemented.

324 POINT OF DIVERSION AND RESPONSIBILITY FOR DISTRIBUTION OF WATER

325 5. (a) Project Water scheduled pursuant to subdivision (b) of Article 4 of this
326 Contract shall be delivered to the Contractor at the 16-inch water meter located at the
327 interconnection of the pumping plant discharge line at the water treatment facilities which are
328 located adjacent to the Shasta Dam visitor area, and any additional point or points of delivery
329 either on Project facilities or another location or locations mutually agreed to in writing by the
330 Contracting Officer and the Contractor.

331 (b) The Contracting Officer or other appropriate entity as designated by the
332 Contracting Officer (hereinafter referred to as the "Other Appropriate Entity") shall make all

333 reasonable efforts to maintain sufficient flows to deliver Project Water to the Contractor at the
334 design capacity of the pumping plant minus losses due to the Contractor's treatment facilities and
335 delivery pipe sizes.

336 (c) Omitted.

337 (d) All Water Delivered to the Contractor pursuant to this Contract shall be
338 measured and recorded with equipment furnished, installed, operated, and maintained by the
339 Contractor at the point or points of delivery established pursuant to subdivision (a) of this
340 Article. Upon the request of either party to this Contract, the Contracting Officer shall
341 investigate the accuracy of such measurements and shall take any necessary steps to adjust any
342 errors appearing therein. For any period of time when accurate measurements have not been
343 made, the Contracting Officer shall consult with the Contractor prior to making a final
344 determination of the quantity delivered for that period of time.

345 (e) The Contracting Officer shall not be responsible for the control, carriage,
346 handling, use, disposal, or distribution of Water Delivered to the Contractor pursuant to this
347 Contract beyond the delivery points specified in subdivision (a) of this Article. The Contractor
348 shall indemnify the United States, its officers, employees, agents, and assigns on account of
349 damage or claim of damage of any nature whatsoever for which there is legal responsibility,
350 including property damage, personal injury, or death arising out of or connected with the control,
351 carriage, handling, use, disposal, or distribution of such Water Delivered beyond such delivery
352 points, except for any damage or claim arising out of (i) acts or omissions of the Contracting
353 Officer or any of its officers, employees, agents, or assigns with the intent of creating the
354 situation resulting in any damage or claim, (ii) willful misconduct of the Contracting Officer or
355 any of its officers, employees, agents, or assigns, (iii) negligence of the Contracting Officer or
356 any of its officers, employees, agents, or assigns, or (iv) damage or claims resulting from a
357 malfunction of facilities owned and/or operated by the United States.

358 MEASUREMENT OF WATER WITHIN THE CONTRACTOR'S SERVICE AREA

359 6. (a) The Contractor has established a measuring program satisfactory to the
360 Contracting Officer. The Contractor shall ensure that all surface water delivered for M&I
361 purposes is measured at each M&I service connection. The water measuring devices or water
362 measuring methods of comparable effectiveness must be acceptable to the Contracting Officer.
363 The Contractor shall be responsible for installing, operating, and maintaining and repairing all
364 such measuring devices and implementing all such water measuring methods at no cost to the
365 United States. The Contractor shall use the information obtained from such water measuring
366 devices or water measuring methods to ensure its proper management of the water, to bill water
367 users for water delivered by the Contractor; and, if applicable, to record water delivered for M&I
368 purposes by customer class as defined in the Contractor's water conservation plan provided for
369 in Article 26 of this Contract. Nothing herein contained, however, shall preclude the Contractor
370 from establishing and collecting any charges, assessments, or other revenues authorized by
371 California law. The Contractor shall include a summary of all its annual surface water deliveries
372 in the annual report described in subdivision (c) of Article 26.

373 (b) To the extent the information has not otherwise been provided, upon
374 execution of this Contract, the Contractor shall provide to the Contracting Officer a written
375 report describing the measurement devices or water measuring methods being used or to be used
376 to implement subdivision (a) of this Article and identifying the agricultural turnouts and the M&I
377 service connections or alternative measurement programs approved by the Contracting Officer,
378 at which such measurement devices or water measuring methods are being used, and, if
379 applicable, identifying the locations at which such devices and/or methods are not yet being used
380 including a time schedule for implementation at such locations. The Contracting Officer shall
381 advise the Contractor in writing within 60 days as to the adequacy and necessary modifications,
382 if any, of the measuring devices or water measuring methods identified in the Contractor's report
383 and if the Contracting Officer does not respond in such time, they shall be deemed adequate. If

384 the Contracting Officer notifies the Contractor that the measuring devices or methods are
385 inadequate, the parties shall within 60 days following the Contracting Officer's response,
386 negotiate in good faith the earliest practicable date by which the Contractor shall modify said
387 measuring devices and/or measuring methods as required by the Contracting Officer to ensure
388 compliance with subdivision (a) of this Article.

389 (c) All new surface water delivery systems installed within the Contractor's
390 Service Area after the effective date of this Contract shall also comply with the measurement
391 provisions described in subdivision (a) of this Article.

392 (d) The Contractor shall inform the Contracting Officer and the State of
393 California in writing by April 30 of each Year of the monthly volume of surface water delivered
394 within the Contractor's Service Area during the previous Year.

395 (e) The Contractor shall inform the Contracting Officer on or before the 10th
396 calendar day of each month of the quantity of M&I Water taken during the preceding month.

397 RATES AND METHOD OF PAYMENT FOR WATER

398 7. (a) The Contractor shall pay the United States as provided in this Article for
399 all Delivered Water at Rates, Charges, and the Tiered Pricing Component established in
400 accordance with (i) the Secretary's then-existing ratesetting policy for M&I Water. Such
401 ratesetting policy shall be amended, modified, or superseded only through a public notice and
402 comment procedure; (ii) applicable Federal Reclamation law and associated rules and
403 regulations, or policies; and (iii) other applicable provisions of this Contract. Payments shall be
404 made by cash transaction, electronic funds transfer, or any other mechanism as may be agreed to
405 in writing by the Contractor and the Contracting Officer. The Rates, Charges, and Tiered Pricing
406 Component applicable to the Contractor upon execution of this Contract are set forth in Exhibit
407 "B," as may be revised annually.

408 (b) The Contracting Officer shall notify the Contractor of the Rates, Charges,
409 and Tiered Pricing Component as follows:

410 (1) Prior to July 1 of each Calendar Year, the Contracting Officer shall
411 provide the Contractor an estimate of the Charges for Project Water that will be applied to the
412 period October 1, of the current Calendar Year, through September 30, of the following Calendar
413 Year, and the basis for such estimate. The Contractor shall be allowed not less than two months
414 to review and comment on such estimates. On or before September 15 of each Calendar Year,
415 the Contracting Officer shall notify the Contractor in writing of the Charges to be in effect during
416 the period October 1 of the current Calendar Year, through September 30, of the following
417 Calendar Year, and such notification shall revise Exhibit "B."

418 (2) Prior to October 1 of each Calendar Year, the Contracting Officer
419 shall make available to the Contractor an estimate of the Rates and Tiered Pricing Component
420 for Project Water for the following Year and the computations and cost allocations upon which
421 those Rates are based. The Contractor shall be allowed not less than two months to review and
422 comment on such computations and cost allocations. By December 31 of each Calendar Year,
423 the Contracting Officer shall provide the Contractor with the final Rates and Tiered Pricing
424 Component to be in effect for the upcoming Year, and such notification shall revise Exhibit "B."

425 (c) At the time the Contractor submits the initial schedule for the delivery of
426 Project Water for each Year pursuant to subdivision (b) of Article 4 of this Contract, the
427 Contractor shall make an advance payment to the United States equal to the total amount payable
428 pursuant to the applicable Rate(s) set under subdivision (a) of this Article, for the Project Water
429 scheduled to be delivered pursuant to this Contract during the first two calendar months of the
430 Year. Before the end of the first month and before the end of each calendar month thereafter, the
431 Contractor shall make an advance payment to the United States, at the Rate(s) set under
432 subdivision (a) of this Article, for the Water Scheduled to be delivered pursuant to this Contract
433 during the second month immediately following. Adjustments between advance payments for
434 Water Scheduled and payments at Rates due for Water Delivered shall be made before the end of
435 the following month; Provided, That any revised schedule submitted by the Contractor pursuant

436 to Article 4 of this Contract which increases the amount of Water Delivered pursuant to this
437 Contract during any month shall be accompanied with appropriate advance payment, at the Rates
438 then in effect, to assure that Project Water is not delivered to the Contractor in advance of such
439 payment. In any month in which the quantity of Water Delivered to the Contractor pursuant to
440 this Contract equals the quantity of Water Scheduled and paid for by the Contractor, no
441 additional Project Water shall be delivered to the Contractor unless and until an advance
442 payment at the Rates then in effect for such additional Project Water is made. Final adjustment
443 between the advance payments for the Water Scheduled and payments for the quantities of Water
444 Delivered during each Year pursuant to this Contract shall be made as soon as practicable, but no
445 later than April 30th of the following Year, or 60 days after the delivery of Project Water carried
446 over under subdivision (g) of Article 3 of this Contract if such water is not delivered by the last
447 day of February.

448 (d) The Contractor shall also make a payment in addition to the Rate(s) in
449 subdivision (c) of this Article to the United States for Water Delivered, at the Charges and the
450 appropriate Tiered Pricing Component then in effect, before the end of the month following the
451 month of delivery. The payments shall be consistent with the quantities of M&I Water Delivered
452 as shown in the water delivery report for the subject month prepared by the Contracting Officer.
453 The water delivery report shall be deemed a bill for the payment of Charges and the applicable
454 Tiered Pricing Component for Water Delivered. Adjustment for overpayment or underpayment
455 of Charges shall be made through the adjustment of payments due to the United States for
456 Charges for the next month. Any amount to be paid for past due payment of Charges and the
457 Tiered Pricing Component shall be computed pursuant to Article 20 of this Contract.

458 (e) The Contractor shall pay for any Water Delivered under subdivision (a),
459 (f), or (g) of Article 3 of this Contract as determined by the Contracting Officer pursuant to
460 applicable statutes, associated regulations, any applicable provisions of guidelines or ratesetting
461 policies; Provided, That the Rate for Water Delivered under subdivision (f) of Article 3 of this

462 Contract shall be no more than the otherwise applicable Rate for M&I Water under subdivision
463 (a) of this Article.

464 (f) Payments to be made by the Contractor to the United States under this
465 Contract may be paid from any revenues available to the Contractor.

466 (g) All revenues received by the United States from the Contractor relating to
467 the delivery of Project Water or the delivery of non-Project water through Project facilities shall
468 be allocated and applied in accordance with Federal Reclamation law and the associated rules or
469 regulations, and the then-current Project ratesetting policy for M&I Water.

470 (h) The Contracting Officer shall keep its accounts pertaining to the
471 administration of the financial terms and conditions of its long-term contracts, in accordance
472 with applicable Federal standards, so as to reflect the application of Project costs and revenues.
473 The Contracting Officer shall, each Year upon request of the Contractor, provide to the
474 Contractor a detailed accounting of all Project and Contractor expense allocations, the
475 disposition of all Project and Contractor revenues, and a summary of all water delivery
476 information. The Contracting Officer and the Contractor shall enter into good faith negotiations
477 to resolve any discrepancies or disputes relating to accountings, reports, or information.

478 (i) The parties acknowledge and agree that the efficient administration of this
479 Contract is their mutual goal. Recognizing that experience has demonstrated that mechanisms,
480 policies, and procedures used for establishing Rates, Charges, and the Tiered Pricing
481 Component, and/or for making and allocating payments, other than those set forth in this Article
482 may be in the mutual best interest of the parties, it is expressly agreed that the parties may enter
483 into agreements to modify the mechanisms, policies, and procedures for any of those purposes
484 while this Contract is in effect without amending this Contract.

485 (j) (1) Beginning at such time as deliveries of Project Water in a Year
486 exceed 80 percent of the Contract Total, then before the end of the month following the month of
487 delivery the Contractor shall make an additional payment to the United States equal to the

488 applicable Tiered Pricing Component. The Tiered Pricing Component for the amount of Water
489 Delivered in excess of 80 percent of the Contract Total, but less than or equal to 90 percent of the
490 Contract Total, shall equal one-half of the difference between the Rate established under
491 subdivision (a) of this Article and the M&I Full Cost Water Rate. The Tiered Pricing
492 Component for the amount of Water Delivered which exceeds 90 percent of the Contract Total
493 shall equal the difference between (i) the Rate established under subdivision (a) of this Article
494 and (ii) the M&I Full Cost Water Rate.

495 (2) Omitted.

496 (3) For purposes of determining the applicability of the Tiered Pricing
497 Component pursuant to this Article, Water Delivered shall include Project Water that the
498 Contractor transfers to others but shall not include Project Water transferred to the Contractor,
499 nor shall it include the additional water provided to the Contractor under the provisions of
500 subdivision (f) of Article 3 of this Contract.

501 (k) For the term of this Contract, Rates under the respective ratesetting
502 policies will be established to recover only reimbursable O&M (including any deficits) and
503 capital costs of the Project, as those terms are used in the then-current Project ratesetting
504 policies, and interest, where appropriate, except in instances where a minimum Rate is applicable
505 in accordance with the relevant Project ratesetting policy. Changes of significance in practices
506 which implement the Contracting Officer's ratesetting policies will not be implemented until the
507 Contracting Officer has provided the Contractor an opportunity to discuss the nature, need, and
508 impact of the proposed change.

509 (l) Except as provided in subsections 3405(a)(1)(B) and 3405(f) of the
510 CVPIA, the Rates for Project Water transferred by the Contractor shall be the Contractor's Rates
511 adjusted upward or downward to reflect the changed costs, if any, incurred by the Contracting
512 Officer in the delivery of the transferred Project Water to the transferee's point of delivery in
513 accordance with the then applicable Project ratesetting policy. If the Contractor is receiving

514 lower Rates and Charges because of inability to pay and is transferring Project Water to another
515 entity whose Rates and Charges are not adjusted due to inability to pay, the Rates and Charges
516 for transferred Project Water shall not be adjusted to reflect the Contractor's inability to pay.

517 (m) Omitted.

518 (n) With respect to the Rates for M&I Water, the Contractor asserts that it is
519 not legally obligated to pay any Project deficits claimed by the United States to have accrued as
520 of the date of this Contract or deficit-related interest charges thereon. By entering into this
521 Contract, the Contractor does not waive any legal rights or remedies that it may have with
522 respect to such disputed issues. Notwithstanding the execution of this Contract and payments
523 made hereunder, the Contractor may challenge in the appropriate administrative or judicial
524 forums: (1) the existence, computation, or imposition of any deficit charges accruing during the
525 term of the Existing Contract and any preceding interim renewal contracts, if applicable; (2)
526 interest accruing on any such deficits; (3) the inclusion of any such deficit charges or interest in
527 the Rates; (4) the application by the United States of payments made by the Contractor under its
528 Existing Contract and any preceding interim renewal contracts, if applicable; and (5) the
529 application of such payments in the Rates. The Contracting Officer agrees that the Contractor
530 shall be entitled to the benefit of any administrative or judicial ruling in favor of any Project
531 M&I contractor on any of these issues, and credits for payments heretofore made, Provided, That
532 the basis for such ruling is applicable to the Contractor.

533 NON-INTEREST BEARING OPERATION AND MAINTENANCE DEFICITS

534 8. The Contractor and the Contracting Officer concur that, as of the effective date of
535 this Contract, the Contractor has no non-interest bearing O&M deficits and shall have no further
536 liability therefor.

537 SALES, TRANSFERS, OR EXCHANGES OF WATER

538 9. (a) The right to receive Project Water provided for in this Contract may be
539 sold, transferred, or exchanged to others for reasonable and beneficial uses within the State of

540 California if such sale, transfer, or exchange is authorized by applicable Federal and State laws,
541 and applicable guidelines or regulations then in effect. No sale, transfer, or exchange of Project
542 Water under this Contract may take place without the prior written approval of the Contracting
543 Officer, except as provided for in subdivision (b) of this Article, and no such sales, transfers, or
544 exchanges shall be approved absent all appropriate environmental documentation, including but
545 not limited to documents prepared pursuant to NEPA and ESA. Such environmental
546 documentation should include, as appropriate, an analysis of groundwater impacts and economic
547 and social effects, including environmental justice, of the proposed water transfers on both the
548 transferor and transferee.

549 (b) In order to facilitate efficient water management by means of water
550 transfers of the type historically carried out among Project Contractors located within the same
551 geographical area and to allow the Contractor to participate in an accelerated water transfer
552 program during the term of this Contract, the Contracting Officer shall prepare, as appropriate,
553 all necessary environmental documentation including, but not limited to, documents prepared
554 pursuant to NEPA and ESA, analyzing annual transfers within such geographical areas, and the
555 Contracting Officer shall determine whether such transfers comply with applicable law.
556 Following the completion of the environmental documentation, such transfers addressed in such
557 documentation shall be conducted with advance notice to the Contracting Officer, but shall not
558 require prior written approval by the Contracting Officer. Such environmental documentation
559 and the Contracting Officer's compliance determination shall be reviewed every five years and
560 updated, as necessary, prior to the expiration of the then-existing five-year period. All
561 subsequent environmental documentation shall include an alternative to evaluate not less than the
562 quantity of Project Water historically transferred within the same geographical area.

563 (c) For a water transfer to qualify under subdivision (b) of this Article, such
564 water transfer must: (i) be for irrigation purposes for lands irrigated within the previous three
565 years, for M&I use, groundwater recharge, water banking, similar groundwater activities, surface

566 water storage, or fish and wildlife resources; not lead to land conversion; and be delivered to
567 established cropland, wildlife refuges, groundwater basins or M&I use; (ii) occur within a single
568 Year; (iii) occur between a willing seller and a willing buyer; (iv) convey water through existing
569 facilities with no new construction or modifications to facilities and be between existing Project
570 Contractors and/or the Contractor and the United States, Department of the Interior; and (v)
571 comply with all applicable Federal, State, and local or tribal laws and requirements imposed for
572 protection of the environment and Indian Trust Assets, as defined under Federal law.

573 (d) For the purpose of determining whether Section 3405(a)(1)(M) of the
574 CVPIA applies to the Contractor as a transferor or transferee of Project Water, the Contracting
575 Officer acknowledges that the Contractor is within a county, watershed, or other area of origin,
576 as those terms are utilized under California law, of water that constitutes the natural flow of the
577 Sacramento River and its tributaries above the confluence of the American and Sacramento
578 Rivers.

579 APPLICATION OF PAYMENTS AND ADJUSTMENTS

580 10. (a) The amount of any overpayment by the Contractor of the Contractor's
581 O&M, capital, and deficit (if any) obligations for the Year shall be applied first to any current
582 liabilities of the Contractor arising out of this Contract then due and payable. Overpayments of
583 more than \$1,000 shall be refunded at the Contractor's request. In lieu of a refund, any amount
584 of such overpayment, at the option of the Contractor, may be credited against amounts to become
585 due to the United States by the Contractor. With respect to overpayment, such refund or
586 adjustment shall constitute the sole remedy of the Contractor or anyone having or claiming to
587 have the right to the use of any of the Project Water supply provided for herein. All credits and
588 refunds of overpayments shall be made within 30 days of the Contracting Officer obtaining
589 direction as to how to credit or refund such overpayment in response to the notice to the
590 Contractor that it has finalized the accounts for the Year in which the overpayment was made.

591 (b) All advances for miscellaneous costs incurred for work requested by the
592 Contractor pursuant to Article 25 of this Contract shall be adjusted to reflect the actual costs
593 when the work has been completed. If the advances exceed the actual costs incurred, the
594 difference will be refunded to the Contractor. If the actual costs exceed the Contractor's
595 advances, the Contractor will be billed for the additional costs pursuant to Article 25.

596 TEMPORARY REDUCTIONS--RETURN FLOWS

597 11. (a) Subject to: (i) the authorized purposes and priorities of the Project and the
598 requirements of Federal law; and (ii) the obligations of the United States under existing
599 contracts, or renewals thereof, providing for water deliveries from the Project, the Contracting
600 Officer shall make all reasonable efforts to optimize Project Water deliveries to the Contractor as
601 provided in this Contract.

602 (b) The Contracting Officer may temporarily discontinue or reduce the
603 quantity of Water Delivered to the Contractor as herein provided for the purposes of
604 investigation, inspection, maintenance, repair, or replacement of any of the Project facilities or
605 any part thereof necessary for the delivery of Project Water to the Contractor, but so far as
606 feasible the Contracting Officer will give the Contractor due notice in advance of such temporary
607 discontinuance or reduction, except in case of emergency, in which case no notice need be given;
608 Provided, That the United States shall use its best efforts to avoid any discontinuance or
609 reduction in such service. Upon resumption of service after such reduction or discontinuance,
610 and if requested by the Contractor, the United States will, if possible, deliver the quantity of
611 Project Water which would have been delivered hereunder in the absence of such discontinuance
612 or reduction.

613 (c) The United States reserves the right to all seepage and return flow water
614 derived from Water Delivered to the Contractor hereunder which escapes or is discharged
615 beyond the Contractor's Service Area; Provided, That this shall not be construed as claiming for
616 the United States any right to seepage or return flow being put to reasonable and beneficial use

617 pursuant to this Contract within the Contractor's Service Area by the Contractor or those
618 claiming by, through, or under the Contractor.

619 CONSTRAINTS ON THE AVAILABILITY OF WATER

620 12. (a) In its operation of the Project, the Contracting Officer will use all
621 reasonable means to guard against a Condition of Shortage in the quantity of water to be made
622 available to the Contractor pursuant to this Contract. In the event the Contracting Officer
623 determines that a Condition of Shortage appears probable, the Contracting Officer will notify the
624 Contractor of said determination as soon as practicable.

625 (b) If there is a Condition of Shortage because of errors in physical operations
626 of the Project, drought, other physical causes beyond the control of the Contracting Officer or
627 actions taken by the Contracting Officer to meet legal obligations then, except as provided in
628 subdivision (a) of Article 18 of this Contract, no liability shall accrue against the United States or
629 any of its officers, agents, or employees for any damage, direct or indirect, arising therefrom.

630 (c) Omitted.

631 (d) Project Water furnished under this Contract will be allocated in
632 accordance with the then-existing Project M&I Water Shortage Policy. Such policy shall be
633 amended, modified, or superseded only through a public notice and comment procedure.

634 (e) By entering into this Contract, the Contractor does not waive any legal
635 rights or remedies it may have to file or participate in any administrative or judicial proceeding
636 contesting (i) the sufficiency of the manner in which any Project M&I Water Shortage Policy
637 adopted after the effective date of this Contract was promulgated; (ii) the substance of such a
638 policy; or (iii) the applicability of such a policy. By agreeing to the foregoing, the Contracting
639 Officer does not waive any legal defenses or remedies that it may then have to assert in such a
640 proceeding.

641 13. Omitted.

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RULES AND REGULATIONS

643 14. The parties agree that the delivery of Project Water or use of Federal facilities
644 pursuant to this Contract is subject to Federal Reclamation law, as amended and supplemented,
645 and the rules and regulations promulgated by the Secretary of the Interior under Federal
646 Reclamation law.

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WATER AND AIR POLLUTION CONTROL

648 15. The Contractor, in carrying out this Contract, shall comply with all applicable
649 water and air pollution laws and regulations of the United States, and the State of California, and
650 shall obtain all required permits or licenses from the appropriate Federal, State, or local
651 authorities.

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QUALITY OF WATER

653 16. (a) Project facilities used to deliver Project Water to the Contractor pursuant
654 to this Contract shall be operated and maintained to enable the United States to deliver Project
655 Water to the Contractor in accordance with the water quality standards specified in subsection
656 2(b) of the Act of August 26, 1937 (50 Stat. 865), as added by Section 101 of the Act of
657 October 27, 1986 (100 Stat. 3050) or other existing Federal laws. The United States is under no
658 obligation to construct or furnish water treatment facilities to maintain or to improve the quality
659 of Water Delivered to the Contractor pursuant to this Contract. The United States does not
660 warrant the quality of Water Delivered to the Contractor pursuant to this Contract.

661 (b) The O&M of Project facilities shall be performed in such manner as is
662 practicable to maintain the quality of raw water made available through such facilities at the
663 highest level reasonably attainable as determined by the Contracting Officer. The Contractor
664 shall be responsible for compliance with all State and Federal water quality standards applicable
665 to surface and subsurface agricultural drainage discharges generated through the use of Federal
666 or Contractor facilities or Project Water provided by the Contractor within the Contractor's
667 Service Area.

WATER ACQUIRED BY THE CONTRACTOR
OTHER THAN FROM THE UNITED STATES

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17. (a) Omitted.

(b) Water or water rights now owned or hereafter acquired by the Contractor, other than from the United States, may be stored, conveyed, and/or diverted through Project facilities, subject to the completion of appropriate environmental documentation, with the approval of the Contracting Officer and the execution of any contract determined by the Contracting Officer to be necessary, consistent with the following provisions:

(1) The Contractor may introduce non-Project water into Project facilities and deliver said water to lands within the Contractor's Service Area subject to payment to the United States of an appropriate rate as determined by the applicable Project ratesetting policy, the RRA, and the Project use power policy, if Project use power policy is applicable, each as amended, modified, or superseded from time to time.

(2) Delivery of such non-Project water in and through Project facilities shall only be allowed to the extent such deliveries do not: (i) interfere with other Project purposes as determined by the Contracting Officer; (ii) reduce the quantity or quality of water available to other Project Contractors; (iii) interfere with the delivery of contractual water entitlements to any other Project Contractors; or (iv) interfere with the physical maintenance of the Project facilities.

(3) The United States shall not be responsible for control, care, or distribution of the non-Project water before it is introduced into or after it is delivered from the Project facilities. The Contractor hereby releases and agrees to defend and indemnify the United States and its respective officers, agents, and employees, from any claim for damage to persons or property, direct or indirect, resulting from acts of the Contractor, its officers', employees', agents', or assigns', act(s) in (i) extracting or diverting non-Project water from any source, or (ii) diverting such non-Project water into Project facilities.

694 (4) Diversion of such non-Project water into Project facilities shall be
695 consistent with all applicable laws, and if involving groundwater, consistent with any applicable
696 groundwater management plan for the area from which it was extracted.

697 (5) After Project purposes are met, as determined by the Contracting
698 Officer, the United States and the Contractor shall share priority to utilize the remaining capacity
699 of the facilities declared to be available by the Contracting Officer for conveyance and
700 transportation of non-Project water prior to any such remaining capacity being made available to
701 non-Project contractors.

702 OPINIONS AND DETERMINATIONS

703 18. (a) Where the terms of this Contract provide for actions to be based upon the
704 opinion or determination of either party to this Contract, said terms shall not be construed as
705 permitting such action to be predicated upon arbitrary, capricious, or unreasonable opinions or
706 determinations. Both parties, notwithstanding any other provisions of this Contract, expressly
707 reserve the right to seek relief from and appropriate adjustment for any such arbitrary, capricious,
708 or unreasonable opinion or determination. Each opinion or determination by either party shall be
709 provided in a timely manner. Nothing in subdivision (a) of Article 18 of this Contract is
710 intended to or shall affect or alter the standard of judicial review applicable under Federal law to
711 any opinion or determination implementing a specific provision of Federal law embodied in
712 statute or regulation.

713 (b) The Contracting Officer shall have the right to make determinations
714 necessary to administer this Contract that are consistent with the provisions of this Contract, the
715 laws of the United States and of the State of California, and the rules and regulations
716 promulgated by the Secretary of the Interior. Such determinations shall be made in consultation
717 with the Contractor to the extent reasonably practicable.

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COORDINATION AND COOPERATION

19. (a) In order to further their mutual goals and objectives, the Contracting Officer and the Contractor shall communicate, coordinate, and cooperate with each other, and with other affected Project Contractors, in order to improve the operation and management of the Project. The communication, coordination, and cooperation regarding operations and management shall include, but not be limited to, any action which will or may materially affect the quantity or quality of Project Water supply, the allocation of Project Water supply, and Project financial matters including, but not limited to, budget issues. The communication, coordination, and cooperation provided for hereunder shall extend to all provisions of this Contract. Each party shall retain exclusive decision making authority for all actions, opinions, and determinations to be made by the respective party.

(b) Within 120 days following the effective date of this Contract, the Contractor, other affected Project Contractors, and the Contracting Officer shall arrange to meet with interested Project Contractors to develop a mutually agreeable, written Project-wide process, which may be amended as necessary separate and apart from this Contract. The goal of this process shall be to provide, to the extent practicable, the means of mutual communication and interaction regarding significant decisions concerning Project operation and management on a real-time basis.

(c) In light of the factors referred to in subdivision (b) of Article 3 of this Contract, it is the intent of the Secretary to improve water supply reliability. To carry out this intent:

(1) The Contracting Officer will, at the request of the Contractor, assist in the development of integrated resource management plans for the Contractor. Further, the Contracting Officer will, as appropriate, seek authorizations for implementation of partnerships to improve water supply, water quality, and reliability.

743 (2) The Secretary will, as appropriate, pursue program and project
744 implementation and authorization in coordination with Project Contractors to improve the water
745 supply, water quality, and reliability of the Project for all Project purposes.

746 (3) The Secretary will coordinate with Project Contractors and the
747 State of California to seek improved water resource management.

748 (3.1) The Secretary and the Contractor desire to work together to
749 maximize the reasonable beneficial use of water for their mutual benefit. As a consequence, the
750 Secretary and the Contractor will work in partnership and with others in the region of the
751 Redding Groundwater Basin, including other Contractors in the Shasta and Trinity Divisions of
752 the Project, to facilitate the better integration with the region of the Redding Groundwater Basin
753 of all water supplies including, but not limited to, the better management and integration of
754 surface water and groundwater, transfers and exchanges of water, the development and better
755 utilization of surface water storage, the effective utilization of waste, seepage and return flow
756 water, and other operational and management options that may be identified in the future.

757 (4) The Secretary will coordinate actions of agencies within the
758 Department of the Interior that may impact the availability of water for Project purposes.

759 (5) The Contracting Officer shall periodically, but not less than
760 annually, hold division level meetings to discuss Project operations, division level water
761 management activities, and other issues as appropriate.

762 (d) Without limiting the contractual obligations of the Contracting Officer
763 under the other Articles of this Contract nothing in this Article shall be construed to limit or
764 constrain the Contracting Officer's ability to communicate, coordinate, and cooperate with the
765 Contractor or other interested stakeholders or to make decisions in a timely fashion as needed to
766 protect health, safety, or the physical integrity of structures or facilities.

767 CHARGES FOR DELINQUENT PAYMENTS

768 20. (a) The Contractor shall be subject to interest, administrative and penalty
769 charges on delinquent installments or payments. When a payment is not received by the due

770 date, the Contractor shall pay an interest charge for each day the payment is delinquent beyond
771 the due date. When a payment becomes sixty (60) days delinquent, the Contractor shall pay an
772 administrative charge to cover additional costs of billing and processing the delinquent payment.
773 When a payment is delinquent ninety (90) days or more, the Contractor shall pay an additional
774 penalty charge of six (6%) percent per year for each day the payment is delinquent beyond the
775 due date. Further, the Contractor shall pay any fees incurred for debt collection services
776 associated with a delinquent payment.

777 (b) The interest charge rate shall be the greater of the rate prescribed quarterly
778 in the Federal Register by the Department of the Treasury for application to overdue payments,
779 or the interest rate of one-half of one (0.5%) percent per month prescribed by Section 6 of the
780 Reclamation Project Act of 1939 (Public Law 76-260). The interest charge rate shall be
781 determined as of the due date and remain fixed for the duration of the delinquent period.

782 (c) When a partial payment on a delinquent account is received, the amount
783 received shall be applied, first to the penalty, second to the administrative charges, third to the
784 accrued interest, and finally to the overdue payment.

785 EQUAL OPPORTUNITY

786 21. During the performance of this Contract, the Contractor agrees as follows:

787 (a) The Contractor will not discriminate against any employee or applicant for
788 employment because of race, color, religion, sex, or national origin. The Contractor will take
789 affirmative action to ensure that applicants are employed, and that employees are treated during
790 employment, without regard to their race, color, religion, sex, or national origin. Such action
791 shall include, but not be limited to, the following: Employment, upgrading, demotion, or
792 transfer; recruitment or recruitment advertising; layoff or termination, rates of payment or other
793 forms of compensation; and selection for training, including apprenticeship. The Contractor
794 agrees to post in conspicuous places, available to employees and applicants for employment,
795 notices to be provided by the Contracting Officer setting forth the provisions of this
796 nondiscrimination clause.

797 (b) The Contractor will, in all solicitations or advertisements for employees
798 placed by or on behalf of the Contractor, state that all qualified applicants will receive
799 consideration for employment without discrimination because of race, color, religion, sex, or
800 national origin.

801 (c) The Contractor will send to each labor union or representative of workers
802 with which it has a collective bargaining agreement or other contract or understanding, a notice,
803 to be provided by the Contracting Officer, advising the said labor union or workers'
804 representative of the Contractor's commitments under Section 202 of Executive Order 11246 of
805 September 24, 1965, and shall post copies of the notice in conspicuous places available to
806 employees and applicants for employment.

807 (d) The Contractor will comply with all provisions of Executive Order
808 No. 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders
809 of the Secretary of Labor.

810 (e) The Contractor will furnish all information and reports required by said
811 amended Executive Order and by the rules, regulations, and orders of the Secretary of Labor, or
812 pursuant thereto, and will permit access to its books, records, and accounts by the Contracting
813 Officer and the Secretary of Labor for purposes of investigation to ascertain compliance with
814 such rules, regulations, and orders.

815 (f) In the event of the Contractor's noncompliance with the nondiscrimination
816 clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be
817 canceled, terminated, or suspended, in whole or in part, and the Contractor may be declared
818 ineligible for further Government contracts in accordance with procedures authorized in said
819 amended Executive Order, and such other sanctions may be imposed and remedies invoked as
820 provided in said Executive Order, or by rule, regulation, or order of the Secretary of Labor, or as
821 otherwise provided by law.

822 (g) The Contractor will include the provisions of paragraphs (a) through (g) in
823 every subcontract or purchase order unless exempted by the rules, regulations, or orders of the
824 Secretary of Labor issued pursuant to Section 204 of said amended Executive Order, so that such
825 provisions will be binding upon each subcontractor or vendor. The Contractor will take such
826 action with respect to any subcontract or purchase order as may be directed by the Secretary of
827 Labor as a means of enforcing such provisions, including sanctions for noncompliance:
828 Provided, however, That in the event the Contractor becomes involved in, or is threatened with,
829 litigation with a subcontractor or vendor as a result of such direction, the Contractor may request
830 the United States to enter into such litigation to protect the interests of the United States.

831 GENERAL OBLIGATION--BENEFITS CONDITIONED UPON PAYMENT

832 22. (a) The obligation of the Contractor to pay the United States as provided in
833 this Contract is a general obligation of the Contractor notwithstanding the manner in which the
834 obligation may be distributed among the Contractor's water users and notwithstanding the default
835 of individual water users in their obligations to the Contractor.

836 (b) The payment of charges becoming due hereunder is a condition precedent
837 to receiving benefits under this Contract. The United States shall not make water available to the
838 Contractor through Project facilities during any period in which the Contractor may be in arrears
839 in the advance payment of water rates due the United States. The Contractor shall not furnish
840 water made available pursuant to this Contract for lands or parties which are in arrears in the
841 advance payment of water rates levied or established by the Contractor.

842 (c) With respect to subdivision (b) of this Article, the Contractor shall have no
843 obligation to require advance payment for water rates which it levies.

844

COMPLIANCE WITH CIVIL RIGHTS LAWS AND REGULATIONS

845 23. (a) The Contractor shall comply with Title VI of the Civil Rights Act of 1964
846 (42 U.S.C. 2000d), Section 504 of the Rehabilitation Act of 1975 (P.L. 93-112, as amended), the
847 Age Discrimination Act of 1975 (42 U.S.C. 6101, et seq.) and any other applicable civil rights
848 laws, as well as with their respective implementing regulations and guidelines imposed by the
849 U.S. Department of the Interior and/or Bureau of Reclamation.

850 (b) These statutes require that no person in the United States shall, on the
851 grounds of race, color, national origin, handicap, or age, be excluded from participation in, be
852 denied the benefits of, or be otherwise subjected to discrimination under any program or activity
853 receiving financial assistance from the Bureau of Reclamation. By executing this Contract, the
854 Contractor agrees to immediately take any measures necessary to implement this obligation,
855 including permitting officials of the United States to inspect premises, programs, and documents.

856 (c) The Contractor makes this agreement in consideration of and for the
857 purpose of obtaining any and all Federal grants, loans, contracts, property discounts, or other
858 Federal financial assistance extended after the date hereof to the Contractor by the Bureau of
859 Reclamation, including installment payments after such date on account of arrangements for
860 Federal financial assistance which were approved before such date. The Contractor recognizes
861 and agrees that such Federal assistance will be extended in reliance on the representations and
862 agreements made in this Article, and that the United States reserves the right to seek judicial
863 enforcement thereof.

864 24. Omitted.

865 CONTRACTOR TO PAY CERTAIN MISCELLANEOUS COSTS

866 25. In addition to all other payments to be made by the Contractor pursuant to this
867 Contract, the Contractor shall pay to the United States, within 60 days after receipt of a bill and
868 detailed statement submitted by the Contracting Officer to the Contractor for such specific items
869 of direct cost incurred by the United States for work requested by the Contractor associated with
870 this Contract plus indirect costs in accordance with applicable Bureau of Reclamation policies
871 and procedures. All such amounts referred to in this Article shall not exceed the amount agreed
872 to in writing in advance by the Contractor. This Article shall not apply to costs for routine
873 contract administration.

874

WATER CONSERVATION

875 26. (a) Prior to the delivery of water provided from or conveyed through
876 Federally constructed or Federally financed facilities pursuant to this Contract, the Contractor

877 shall be implementing an effective water conservation and efficiency program based on the
878 Contractor's water conservation plan that has been determined by the Contracting Officer to meet
879 the conservation and efficiency criteria for evaluating water conservation plans established under
880 Federal law. The water conservation and efficiency program shall contain definite water
881 conservation objectives, appropriate economically feasible water conservation measures, and
882 time schedules for meeting those objectives. Continued Project Water delivery pursuant to this
883 Contract shall be contingent upon the Contractor's continued implementation of such water
884 conservation program. In the event the Contractor's water conservation plan or any revised water
885 conservation plan completed pursuant to subdivision (d) of Article 26 of this Contract have not
886 yet been determined by the Contracting Officer to meet such criteria, due to circumstances which
887 the Contracting Officer determines are beyond the control of the Contractor, water deliveries
888 shall be made under this Contract so long as the Contractor diligently works with the Contracting
889 Officer to obtain such determination at the earliest practicable date, and thereafter the Contractor
890 immediately begins implementing its water conservation and efficiency program in accordance
891 with the time schedules therein.

892 (b) Should the amount of M&I Water delivered pursuant to subdivision (a) of
893 Article 3 of this Contract equal or exceed 2,000 acre-feet per Year, the Contractor shall
894 implement the Best Management Practices identified by the time frames issued by the California
895 Urban Water Conservation Council for such M&I Water unless any such practice is determined
896 by the Contracting Officer to be inappropriate for the Contractor.

897 (c) The Contractor shall submit to the Contracting Officer a report on the
898 status of its implementation of the water conservation plan on the reporting dates specified in the
899 then existing conservation and efficiency criteria established under Federal law.

900 (d) At five-year intervals, the Contractor shall revise its water conservation
901 plan to reflect the then-current conservation and efficiency criteria for evaluating water
902 conservation plans established under Federal law and submit such revised water management

903 plan to the Contracting Officer for review and evaluation. The Contracting Officer will then
904 determine if the water conservation plan meets Reclamation's then-current conservation and
905 efficiency criteria for evaluating water conservation plans established under Federal law.

906 (e) If the Contractor is engaged in direct groundwater recharge, such activity
907 shall be described in the Contractor's water conservation plan.

908 EXISTING OR ACQUIRED WATER OR WATER RIGHTS

909 27. Except as specifically provided in Article 17 of this Contract, the provisions of
910 this Contract shall not be applicable to or affect non-Project water or water rights now owned or
911 hereafter acquired by the Contractor or any user of such water within the Contractor's Service
912 Area. Any such water shall not be considered Project Water under this Contract. In addition,
913 this Contract shall not be construed as limiting or curtailing any rights which the Contractor or
914 any water user within the Contractor's Service Area acquires or has available under any other
915 contract pursuant to Federal Reclamation law.

916 28. Omitted.

917 CONTINGENT ON APPROPRIATION OR ALLOTMENT OF FUNDS

918 29. The expenditure or advance of any money or the performance of any obligation of
919 the United States under this Contract shall be contingent upon appropriation or allotment of
920 funds. Absence of appropriation or allotment of funds shall not relieve the Contractor from any
921 obligations under this Contract. No liability shall accrue to the United States in case funds are
922 not appropriated or allotted.

923 BOOKS, RECORDS, AND REPORTS

924 30. (a) The Contractor shall establish and maintain accounts and other books and
925 records pertaining to administration of the terms and conditions of this Contract, including: the
926 Contractor's financial transactions, water supply data, and Project land and right-of-way
927 agreements; the water users' land-use (crop census), land ownership, land-leasing and water use
928 data; and other matters that the Contracting Officer may require. Reports thereon shall be
929 furnished to the Contracting Officer in such form and on such date or dates as the Contracting
930 Officer may require. Subject to applicable Federal laws and regulations, each party to this
931 Contract shall have the right during office hours to examine and make copies of the other party's
932 books and records relating to matters covered by this Contract.

933 (b) Notwithstanding the provisions of subdivision (a) of this Article, no
934 books, records, or other information shall be requested from the Contractor by the Contracting
935 Officer unless such books, records, or information are reasonably related to the administration or
936 performance of this Contract. Any such request shall allow the Contractor a reasonable period of
937 time within which to provide the requested books, records, or information.

938 (c) Omitted.

939 ASSIGNMENT LIMITED--SUCCESSORS AND ASSIGNS OBLIGATED

940 31. (a) The provisions of this Contract shall apply to and bind the successors and
941 assigns of the parties hereto, but no assignment or transfer of this Contract or any right or interest
942 therein shall be valid until approved in writing by the Contracting Officer.

943 (b) The assignment of any right or interest in this Contract by either party
944 shall not interfere with the rights or obligations of the other party to this Contract absent the
945 written concurrence of said other party.

946 (c) The Contracting Officer shall not unreasonably condition or withhold his
947 approval of any proposed assignment.

948 SEVERABILITY

949 32. In the event that a person or entity who is neither (i) a party to a Project contract,
950 nor (ii) a person or entity that receives Project Water from a party to a Project contract, nor (iii)
951 an association or other form of organization whose primary function is to represent parties to
952 Project contracts, brings an action in a court of competent jurisdiction challenging the legality or
953 enforceability of a provision included in this Contract and said person, entity, association, or
954 organization obtains a final court decision holding that such provision is legally invalid or
955 unenforceable and the Contractor has not intervened in that lawsuit in support of the plaintiff(s),
956 the parties to this Contract shall use their best efforts to (i) within 30 days of the date of such
957 final court decision identify by mutual agreement the provisions in this Contract which must be
958 revised, and (ii) within three months thereafter promptly agree on the appropriate revision(s).
959 The time periods specified above may be extended by mutual agreement of the parties. Pending

960 the completion of the actions designated above, to the extent it can do so without violating any
961 applicable provisions of law, the United States shall continue to make the quantities of Project
962 Water specified in this Contract available to the Contractor pursuant to the provisions of this
963 Contract which were not found to be legally invalid or unenforceable in the final court decision.

964 RESOLUTION OF DISPUTES

965 33. Should any dispute arise concerning any provisions of this Contract, or the
966 parties' rights and obligations thereunder, the parties shall meet and confer in an attempt to
967 resolve the dispute. Prior to the Contractor commencing any legal action, or the Contracting
968 Officer referring any matter to Department of Justice, the party shall provide to the other party
969 30 days' written notice of the intent to take such action; Provided, That such notice shall not be
970 required where a delay in commencing an action would prejudice the interests of the party that
971 intends to file suit. During the 30-day notice period, the Contractor and the Contracting Officer
972 shall meet and confer in an attempt to resolve the dispute. Except as specifically provided,
973 nothing herein is intended to waive or abridge any right or remedy that the Contractor or the
974 United States may have.

975 OFFICIALS NOT TO BENEFIT

976 34. No Member of or Delegate to Congress, Resident Commissioner, or official of the
977 Contractor shall benefit from this Contract other than as a water user or landowner in the same
978 manner as other water users or landowners.

979 CHANGES IN CONTRACTOR'S SERVICE AREA

980 35. (a) While this Contract is in effect, no change may be made in the
981 Contractor's Service Area, by inclusion or exclusion of lands, dissolution, consolidation, merger,
982 or otherwise, except upon the Contracting Officer's written consent.

983 (b) Within 30 days of receipt of a request for such a change, the Contracting
984 Officer will notify the Contractor of any additional information required by the Contracting
985 Officer for processing said request, and both parties will meet to establish a mutually agreeable
986 schedule for timely completion of the process. Such process will analyze whether the proposed
987 change is likely to: (i) result in the use of Project Water contrary to the terms of this Contract;

988 (ii) impair the ability of the Contractor to pay for Project Water furnished under this Contract or
989 to pay for any Federally-constructed facilities for which the Contractor is responsible; and
990 (iii) have an impact on any Project Water rights applications, permits, or licenses. In addition,
991 the Contracting Officer shall comply with the NEPA and the ESA. The Contractor will be
992 responsible for all costs incurred by the Contracting Officer in this process, and such costs will
993 be paid in accordance with Article 25 of this Contract.

994 FEDERAL LAWS

995 36. By entering into this Contract, the Contractor does not waive its rights to contest
996 the validity or application in connection with the performance of the terms and conditions of this
997 Contract of any Federal law or regulation; Provided, That the Contractor agrees to comply with
998 the terms and conditions of this Contract unless and until relief from application of such Federal
999 law or regulation to the implementing provision of the Contract is granted by a court of
1000 competent jurisdiction.

1001 NOTICES

1002 37. Any notice, demand, or request authorized or required by this Contract shall be
1003 deemed to have been given, on behalf of the Contractor, when mailed, postage prepaid, or
1004 delivered to the Area Manager, Bureau of Reclamation, Northern California Area Office,
1005 16349 Shasta Dam Boulevard, Shasta Lake, California 96019, and on behalf of the
1006 United States, when mailed, postage prepaid, or delivered to the City Mayor of the City of Shasta
1007 Lake, P. O. Box 777, 1650 Stanton Drive, Shasta Lake, California 96019. The designation of
1008 the addressee or the address may be changed by notice given in the same manner as provided in
1009 this Article for other notices.

1010 CONFIRMATION OF CONTRACT

1011 38. The Contractor, after the execution of this Contract, shall furnish to the
1012 Contracting Officer evidence that pursuant to the laws of the State of California, the Contractor
1013 is a legally constituted entity and the Contract is lawful, valid, and binding on the Contractor.
1014 This Contract shall not be binding on the United States until such evidence has been provided to
1015 the Contracting Officer's satisfaction.

1016 IN WITNESS WHEREOF, the parties hereto have executed this Contract as of
1017 the day and year first above written.

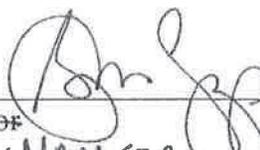
1018 THE UNITED STATES OF AMERICA

1019 By: 
1020 Regional Director, Mid-Pacific Region
1021 Bureau of Reclamation

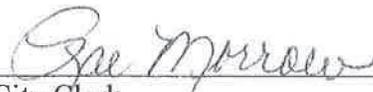
DEPARTMENT OF THE INTERIOR
OFFICE OF REGIONAL SOLICITOR
James E. Turner
APPROVED AS TO
FORM AND SUFFICIENCY

1022 (SEAL)

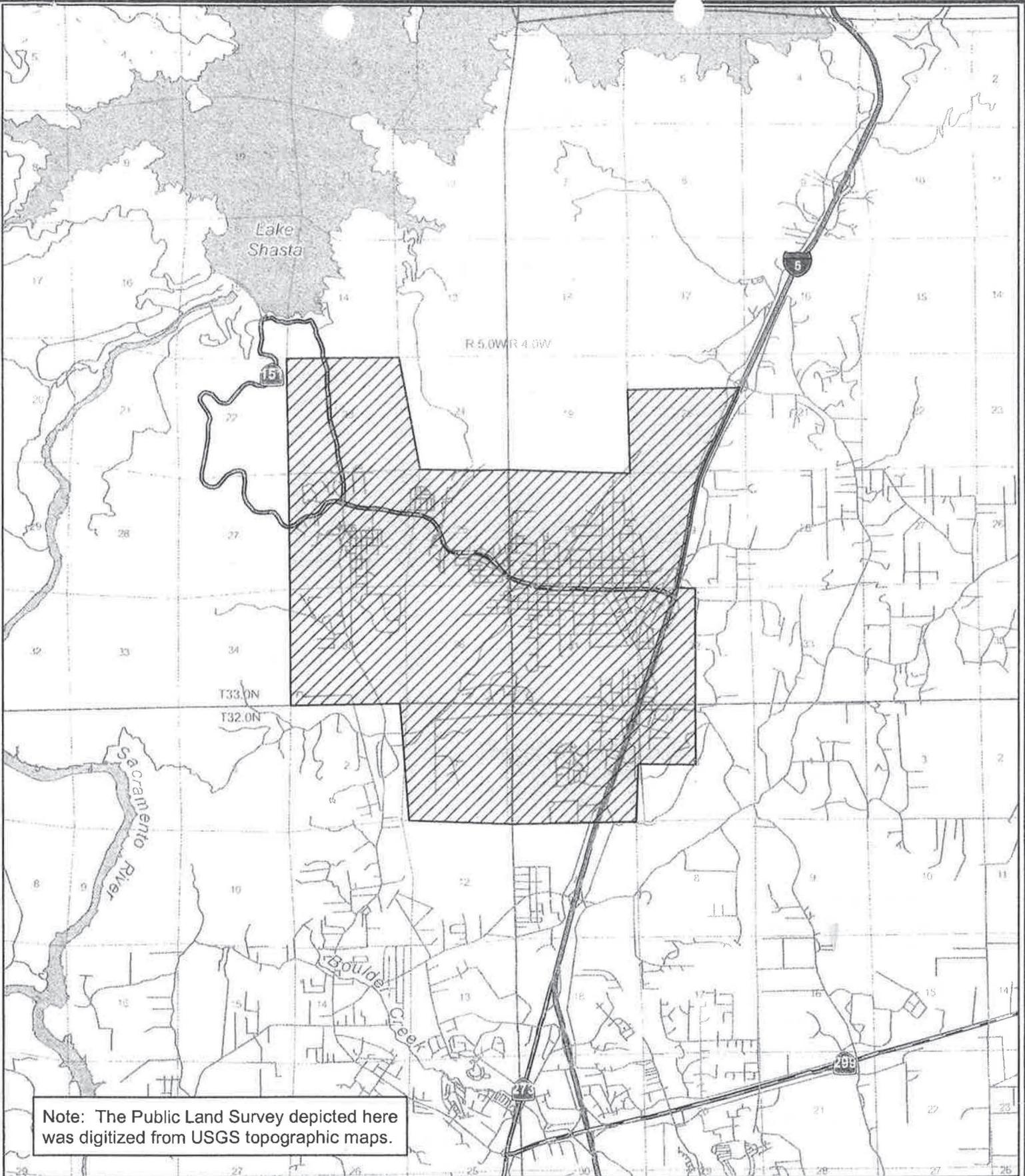
1023 CITY OF SHASTA LAKE

1024 By: 
1025 Mayor
CITY MANAGER

1026 Attest:

1027 By: 
1028 City Clerk

1029 (H:\public\Willows Final LTRC's\2005-01-31 City of Shasta Lake LTRC Final Draft
1030 Contract.doc)



Note: The Public Land Survey depicted here was digitized from USGS topographic maps.

-  Contractor's Service Area
-  Contractor's Service Area

City of Shasta Lake

Contract No. 4-07-20-W1134-LTR1

Exhibit A



EXHIBIT B

CITY OF SHASTA LAKE
2005 Water Rates and Charges per Acre-Foot

<u>COST OF SERVICE RATES:</u>	<u>M&I</u>
Capital Rate	(\$ 2.33)
O&M Rates:	
Water Marketing	3.89
Storage	6.67
Direct Pumping	8.58
Deficit Rate:	0.00
CFO/PRF Adjustment Rate 1/	<u>\$ 0.00</u>
TOTAL	<u>\$16.81</u>
<u>FULL COST RATE</u>	<u>\$16.81</u>
 <u>TIERED PRICING COMPONENTS:</u>	
Tiered Pricing Component >80% <=90% of Contract Total [Full Cost Rate – COS Rate / 2]	<u>\$ 0.00</u>
Tiered Pricing Component >90% of Contract Total [Full Cost Rate – COS Rate]	<u>\$ 0.00</u>
 <u>CHARGES UNDER P.L. 102-575 TO THE RESTORATION FUND 2/</u>	
Restoration Charges (3407(d)(2)(A))	<u>\$15.87</u>

1/ Chief Financial Officer (CFO) adjustment and Provision for Replacement (PFR) expense is being distributed over a 5-year period beginning in FY 2003 for those contractors that requested those costs be deferred.

2/ Restoration fund charges are payments in addition to the water rates and were determined pursuant to Title XXXIV of Public Law 102-575. Restoration fund charges are on a fiscal year basis (10/1 - 9/30).

Recent Historic Use, as defined in the CVP M&I Water Shortage Policy, is _____
acre-feet.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SHASTA LAKE AUTHORIZING THE CITY MANAGER TO ENTER INTO CONTRACTS FOR THE PURCHASE, SALE AND/OR ACQUISITION OF WATER WITH THE UNITED STATES BUREAU OF RECLAMATION.

WHEREAS, the City of Shasta Lake has negotiated a long-term contract for water supply with the United States Bureau of Reclamation; and

WHEREAS, the City of Shasta Lake provides water service to the residents and businesses of the City of Shasta Lake; and

WHEREAS, it is necessary to enter into contracts with the United States Bureau of Reclamation; and

WHEREAS, the United States Bureau of Reclamation is requesting that a resolution be adopted authorizing an official to sign water contracts; and

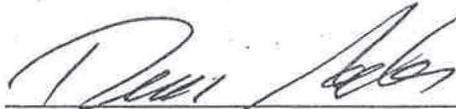
NOW THEREFORE, BE IT RESOLVED by the City Council of the City of Shasta Lake that, that the City Manager be authorized to enter into contracts with the United States Bureau of Reclamation.

PASSED, APPROVED AND ADOPTED this 1st day of March 2005 by the following vote.

AYES: DURYEE, FARR, HURLHEY, Siner, GOEKLER

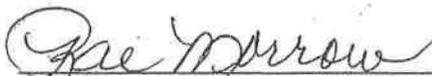
NOES: NONE

ABSENT: NONE



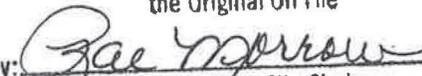
DEAN GOEKLER, Mayor

ATTEST:



RAE MORROW, City Clerk

I Certify That This is a True
and Correct Copy of
the Original On File

By: 
Office of the City Clerk



United States Department of the Interior



BUREAU OF RECLAMATION
2800 Cottage Way
Sacramento, CA 95825-1898

IN REPLY REFER TO:

JUN 3 0 2020

CGB-100
2.2.4.22

Manager
City of Shasta Lake
P.O. Box 777
Shasta Lake, CA 96019-0777

Subject: Water Infrastructure Improvements for the Nation Act Contract No. 4-07-20-W1134-P
Between the United States and the City of Shasta Lake Providing for Project Water
Service – Central Valley Project, California

Dear Mr. Duckett:

Enclosed is an executed original of the subject contract for your records. The Bureau of Reclamation appreciates the effort expended by the City of Shasta Lake and its representatives relative to this contract.

The exhibit titled, "Repayment Obligation – Current Calculation Under the WIIN Act, Section 4011 (a) (2)", for the Contract Amendment will be finalized on the Effective Date of the Contract Amendment, in accordance with the Water Infrastructure Improvements for the Nation Act of 2016 (Public Law 114-322).

If there are any questions, please contact Mr. Stanley Data, Repayment Specialist, at sdata@usbr.gov, or (916) 978-5246.

Sincerely,

Ernest A. Conant
Regional Director

Enclosure

INTERIOR REGION 10 • CALIFORNIA-GREAT BASIN

CALIFORNIA*, NEVADA*, OREGON*

* PARTIAL

bc: Assistant Solicitor, Water and Power Branch, Washington, DC
Director, Office of Policy and Administration, Denver, CO
Attention: 84-55000 (MKelly)
MP-440 (SData), MP-3400, NCAO-440 (REverest)
(w/copy of encl sent via e-mail to each)
MP-3600 (w/original contract)

WBR:SData:CCostamagna:06/17/2020:916-978-5246
C:\Users\sdata.BOR\Desktop\NCAO DTS\20200617 City of Shasta Lake Executed Contract
Transmittal v1.docx
Surname: MP-440 (2), MP-400, MP-3000, MP-115, MP-100

RESOLUTION CC-20-38

A SHASTA LAKE CITY COUNCIL RESOLUTION AUTHORIZING THE CITY MANAGER TO EXECUTE A CONVERSION CONTRACT CONVERTING THE CITY'S CURRENT WATER SERVICE CONTRACT WITH THE UNITED STATES BUREAU OF RECLAMATION TO A REPAYMENT CONTRACT AS ALLOWED UNDER THE WATER INFRASTRUCTURE IMPROVEMENT FOR THE NATION (WIIN) ACT PROVISIONS AND CONFIRMING AN EXEMPTION UNDER THE CALIFORNIA ENVIRONMENTAL QUALITY ACT BASED ON THE COMMON SENSE EXEMPTION

WHEREAS, the City Shasta Lake has participated in the contract water conversion negotiation provisions of the Water Infrastructure Improvements for the Nation Act with the United States Bureau of Reclamation; and

WHEREAS, the City previously assigned negotiators to begin the conversion process of the City's contract with the United State Bureau of Reclamation (Contract No. 4-07-20-W1134-LTR1); and

WHEREAS, the City and the United States Bureau of Reclamation have completed negotiations as necessary to reach a mutual agreement on the amendments to convert the City's Water Service contract to a Repayment contract as allowed under the Water Infrastructure Improvements for the Nation Act; and

WHEREAS, the amendment to the existing contract between the United States and the City of Shasta Lake providing for project water service and facilities repayment is consistent with the Common Sense Exemption called out in §15061(b)(3) of the CEQA Guidelines as it can be seen with certainty that the proposed project (contract) will not result in environmental impacts.

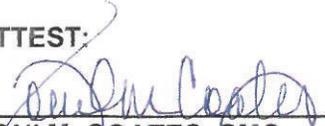
NOW, THEREFORE BE IT RESOLVED that the City Council of the City of Shasta Lake authorizes the City Manager to execute a conversion contract converting the City's current Water Service Contract with the United States Bureau of Reclamation to a Repayment contract as allowed under the Water Infrastructure Improvements for the Nation Act provisions.

PASSED, APPROVED, AND ADOPTED this 2nd day of June 2020 by the following vote:

AYES: KERN, MORGAN, WATKINS, POWELL
NOES: NONE
ABSENT: FARR


JANICE POWELL, Mayor

ATTEST:


TONI M. COATES, CMC
City Clerk

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Shasta Division, Central Valley Project, California

AMENDMENT TO THE EXISTING CONTRACT BETWEEN THE UNITED STATES
AND
CITY OF SHASTA LAKE
PROVIDING FOR
PROJECT WATER SERVICE AND FACILITIES REPAYMENT
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Exhibit A – Map of Contractor’s Service Area

Exhibit B – Rates and Charges

Exhibit C – Repayment Obligation and Payoff Schedule

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Shasta Division, Central Valley Project, California

AMENDMENT TO THE EXISTING CONTRACT BETWEEN THE UNITED STATES
AND
CITY OF SHASTA LAKE
PROVIDING FOR WATER SERVICE AND FACILITIES REPAYMENT

1 THIS AMENDMENT (“Amendment”) to Long-Term Renewal Contract Between the
2 United States and City of Shasta Lake Providing for Project Water Service from Shasta Division
3 (“Existing Contract”) (collectively, “Contract”), is made this 30th day of June, 2020,
4 in pursuance generally of the Act of June 17, 1902, (32 Stat. 388), and acts amendatory thereof
5 or supplementary thereto, including but not limited to, the Acts of August 26, 1937 (50 Stat.
6 844), as amended and supplemented, August 4, 1939 (53 Stat. 1187), as amended and
7 supplemented, July 2, 1956 (70 Stat. 483), June 21, 1963 (77 Stat. 68), October 12, 1982 (96
8 Stat. 1263), October 27, 1986 (100 Stat. 3050), as amended, Title XXXIV of the Act of October
9 30, 1992 (106 Stat. 4706), as amended, and the Water Infrastructure Improvements for the
10 Nation Act (Public Law 114-322, 130 Stat. 1628), Section 4011 (a-d) and (f) (“WIIN Act”), all
11 collectively hereinafter referred to as Federal Reclamation law, between the UNITED STATES
12 OF AMERICA, hereinafter referred to as the United States, represented by the officer executing
13 this Amendment, hereinafter referred to as the Contracting Officer, and City of Shasta Lake,
14 hereinafter referred to as the Contractor.

15 WITNESSETH, That:
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EXPLANATORY RECITALS

[1st] WHEREAS, the United States and the Contractor entered into Contract Number **4-07-20-W1134P**, which established terms for the delivery of Project Water to the Contractor from the **Shasta** Division, as in effect the date the WIIN Act was enacted, and as may have been amended; and

[2nd] WHEREAS, on December 16, 2016, the 114th Congress of the United States of America enacted the WIIN Act; and

[3rd] WHEREAS, Section 4011(a)(1) provides that “upon request of the contractor, the Secretary of the Interior shall convert any water service contract in effect on the date of enactment of this subtitle and between the United States and a water users’ association [Contractor] to allow for prepayment of the repayment contract pursuant to paragraph (2) under mutually agreeable terms and conditions.”; and

[4th] WHEREAS, Section 4011(a)(1) further provides that “the manner of conversion under this paragraph shall be as follows: (A) Water service contracts that were entered into under section (e) of the Act of August 4, 1939 (53 Stat. 1196), to be converted under this section shall be converted to repayment contracts under section 9(d) of that Act (53 Stat. 1195)”; and “(B) Water service contracts that were entered under subsection (c)(2) of section 9 of the Act of August 4, 1939 (53 Stat. 1194), to be converted under this section shall be converted to a contract under subsection (c)(1) of section 9 of that Act (53 Stat. 1195).”; and

[5th] WHEREAS, Section 4011(a)(4)(C) further provides all contracts entered into pursuant to Section 4011(a)(1), (2), and (3) shall “not modify other water service, repayment, exchange and transfer contractual rights between the water users’ association [Contractor], and

40 the Bureau of Reclamation, or any rights, obligations, or relationships of the water users'
41 association [Contractor] and their landowners as provided under State law.”; and

42 [6th] WHEREAS, Section 4011(d)(3) and (4) of the WIIN Act provides that
43 “implementation of the provisions of this subtitle shall not alter... (3) the priority of a water
44 service or repayment contractor to receive water; or (4) except as expressly provided in this
45 section, any obligations under the reclamation law, including the continuation of Restoration
46 Fund charges pursuant to section 3407(d) (Public Law 102-575), of the water service and
47 repayment contractors making prepayments pursuant to this section.”; and

48 [7th] WHEREAS, upon the request of the Contractor, the WIIN Act directs the
49 Secretary to convert municipal and industrial (M&I) water service contracts into repayment
50 contracts, amend existing repayment contracts, and allow contractors to prepay their construction
51 cost obligations pursuant to applicable Federal Reclamation law; and

52 [8th] WHEREAS, the Contracting Officer and the Contractor agree to amend the
53 Existing Contract with the execution of this Amendment; and

54 [9th] WHEREAS, the Contracting Officer and the Contractor agree that this
55 Amendment complies with Section 4011 of the WIIN Act.

56 NOW, THEREFORE, in consideration of the covenants herein contained, it is hereby
57 mutually agreed by the parties hereto as follows:

58 1. Article 1 of the Existing Contract, entitled DEFINITIONS is amended as
59 follows:

60 a. Subdivisions (m), (o) and (t) of Article 1 of the Existing Contract are
61 amended and replaced in their entirety with the following new subdivisions (m), (o) and (t):

62 (m) "Irrigation Water" shall mean the use of Project Water to irrigate
63 land primarily for the production of commercial agricultural crops or livestock, and domestic and
64 other uses that are incidental thereto.

65 (o) "Municipal and Industrial Water" shall mean the use of Project
66 Water for municipal, industrial, and miscellaneous other purposes not falling under the definition
67 of Irrigation Water or within another category of water use under an applicable Federal authority.

68 (t) "Project Contractors" shall mean all parties who have contracts for
69 water service for Project Water from the Project with the United States pursuant to Federal
70 Reclamation law.

71 **b. Subdivisions (dd) through (ff) are added at the end of Article 1 of the**
72 **Existing Contract as follows:**

73 (dd) "Additional Capital Obligation" shall mean construction costs or
74 other capitalized costs incurred after July 1, 2020 or not reflected in the Existing Capital
75 Obligation as defined herein and in accordance with Section 4011, subsection (a)(2)(B) and
76 (a)(3)(B) of the Water Infrastructure Improvements for the Nation Act (Public Law 114-322,130
77 Stat. 1628) ("WIIN Act").

78 (ee) "Existing Capital Obligation" shall mean the remaining amount of
79 construction costs or other capitalized costs allocable to the Contractor as described in section
80 4011, subsections (a)(2)(A) and (a)(3)(A) of the WIIN Act, and as identified in the Central
81 Valley Project Irrigation Water Rates and/or Municipal and Industrial Water Rates, respectively,
82 the Central Valley Project 2020 Ratebooks, as adjusted to reflect payments not reflected in such
83 schedule. The Contracting Officer has computed the Existing Capital Obligation and such
84 amount is set forth in Exhibit C, which is incorporated herein by reference.

85 (ff) "Repayment Obligation" shall mean the amount due and payable
86 to the United States, pursuant to the section 4011(a)(3)(A) of the WIIN Act.

87 **2. Article 2 of the Existing Contract, entitled TERM OF CONTRACT, is**
88 **amended and replaced in its entirety with the following new Article 2:**

89 2. (a) This Contract shall be effective July 1, 2020 and shall continue so
90 long as the Contractor pays applicable Rates and Charges under this Contract, consistent with
91 Section 9(d) or 9(c)(1) of the Act of August 4, 1939 (53 Stat. 1195) as applicable, and applicable
92 law;

93 (1) Provided, That the Contracting Officer shall not seek to
94 terminate this Contract for failure to fully or timely pay applicable Rates and Charges by the
95 Contactor, unless the Contracting Officer has first provided at least sixty (60) calendar days
96 written notice to the Contractor of such failure to pay and Contractor has failed to cure such
97 failure to pay, or to diligently commence and maintain full curative payments satisfactory to the
98 Contracting Officer within the sixty (60) calendar days' notice period;

99 (2) Provided further, That the Contracting Officer shall not
100 seek to suspend making water available or declaring Water Made Available pursuant to this
101 Contract for non-compliance by the Contractor with the terms of this Contract or Federal law,
102 unless the Contracting Officer has first provided at least thirty (30) calendar days written notice
103 to the Contractor and the Contractor has failed to cure such non-compliance, or to diligently
104 commence curative actions satisfactory to the Contracting Officer for a non-compliance that
105 cannot be fully cured within the thirty (30) calendar days' notice period. If the Contracting
106 Officer has suspended making water available pursuant to this paragraph, upon cure of such

107 noncompliance satisfactory to the Contracting Officer, the Contracting Officer shall resume
108 making water available and declaring Water Made Available pursuant to this Contract;

109 (3) Provided further, That this Contract may be terminated at
110 any time by mutual consent of the parties hereto.

111 (b) Upon complete payment of the Repayment Obligation by the
112 Contractor, and notwithstanding any Additional Capital Obligation that may later be established,
113 the acreage limitations, reporting, and the Full Cost pricing provisions of the Reclamation
114 Reform Act of 1982 shall no longer be applicable to the Contractor pursuant to this Contract.

115 (c) OMITTED.

116 (d) Notwithstanding any provision of this Contract, the Contractor
117 reserves and shall have all rights and benefits, under the Act of June 21, 1963 (77.Stat. 68), to the
118 extent allowed by law.

119 3. **Article 3, of the Existing Contract, entitled WATER TO BE MADE**
120 **AVAILABLE AND DELIVERED TO THE CONTRACTOR, is amended as follows:**

121 a. **Subdivision (h) of Article 3 of the Existing Contract is amended and**
122 **replaced in its entirety with the following new subdivision (h):**

123 (h) The Contractor's right pursuant to Federal Reclamation law and
124 applicable State law to the reasonable and beneficial use of the Water Delivered pursuant to this
125 Contract shall not be disturbed, and this Contract shall continue so long as the Contractor pays
126 applicable Rates and Charges under this Contract consistent with Section 9(d) or 9(c)(1) of the
127 Act of August 4, 1939 (53 Stat. 1195) as applicable, and applicable law. Nothing in the

128 preceding sentence shall affect the Contracting Officer's ability to impose shortages under
129 Article 11 or subdivision (b) of Article 12 of this Contract.

130 **4. Article 7 of the Existing Contract, entitled RATES AND METHOD OF**
131 **PAYMENT FOR WATER, is amended as follows:**

132 **(a) The heading of the Existing Contract is amended and replaced in its**
133 **entirety with RATES, METHOD OF PAYMENT FOR WATER AND ACCELERATED**
134 **REPAYMENT OF FACILITIES.**

135 **(b) Subdivision (a) of Article 7 of the Existing Contract is amended and**
136 **replaced in its entirety with the following new subdivision (a):**

137 **(a) Notwithstanding the Contractor's full prepayment of the**
138 **Repayment Obligation pursuant to section 4011, subsection (a)(2)(A) and subsection (a)(3)A) of**
139 **the WIIN Act, as set forth in Exhibit C, and any payments required pursuant to section 4011,**
140 **subsection (b) of the WIIN Act, to reflect the adjustment for the final cost allocation as described**
141 **in this Article, subsection (b), the Contractor's Project construction and other cost obligations**
142 **shall be determined in accordance with: (i) the Secretary's ratesetting policy for Irrigation Water**
143 **adopted in 1988 and the Secretary's then-existing ratesetting policy for M&I Water, consistent**
144 **with the WIIN Act; and such ratesetting policies shall be amended, modified, or superseded only**
145 **through a public notice and comment procedure; (ii) applicable Federal Reclamation law and**
146 **associated rules and regulations, or policies; and (iii) other applicable provisions of this Contract.**
147 **Payments shall be made by cash transaction, electronic funds transfers, or any other mechanism**
148 **as may be agreed to in writing by the Contractor and the Contracting Officer. The Rates and**

149 Charges applicable to the Contractor upon execution of this Contract are set forth in Exhibit “B,”
150 as may be revised annually.

151 (1) The Contractor shall pay the United States as provided for
152 in this Article of this Contract for all Delivered Water at Rates and Charges in accordance with
153 policies for M&I Water. The Contractor’s Rates shall be established to recover its estimated
154 reimbursable costs included in the operation & maintenance component of the Rate and amounts
155 established to recover deficits and other charges, if any, including construction costs as identified
156 in the following subdivisions.

157 (2) In accordance with the WIIN Act, the Contractor’s
158 allocable share of Project construction costs will be repaid pursuant to the provisions of this
159 Contract.

160 (A) The amount due and payable to the United States,
161 pursuant to the WIIN Act, shall be the Repayment Obligation. The Repayment Obligation has
162 been computed by the Contracting Officer in a manner consistent with the WIIN Act and is set
163 forth as a lump sum payment as set forth in Exhibit C. The Repayment Obligation is due in lump
164 sum within 60 days of the effective date of this Amendment as provided by the WIIN Act.

165 Notwithstanding any Additional Capital Obligation that may later be established, receipt of the
166 Contractor’s payment of the Repayment Obligation to the United States shall fully and
167 permanently satisfy the Existing Capital Obligation.

168 (B) Additional Capital Obligations that are not reflected
169 in the schedules referenced in Exhibit C and properly assignable to the Contractor, shall be
170 repaid as prescribed by the WIIN Act without interest except as required by law. Consistent with

171 Federal Reclamation law, interest shall continue to accrue on the M&I portion of the Additional
172 Capital Obligation assigned to the Contractor until such costs are paid. Increases or decreases in
173 the Additional Capital Obligation assigned to the Contractor caused solely by annual adjustment
174 of the Additional Capital Obligation assigned to each Project contractor by the Secretary shall
175 not be considered in determining the amounts to be paid pursuant to this subdivision (a)(2)(B),
176 however, will be considered under subdivision (b) of this Article. A separate agreement shall be
177 established by the Contractor and the Contracting Officer to accomplish repayment of the
178 Additional Capital Obligation assigned to the Contractor within the timeframe prescribed by the
179 WIIN Act, subject to the following:

180 (1) If the collective Additional Capital
181 Obligation properly assignable to the contractors exercising conversion under section 4011 of the
182 WIIN Act is less than five million dollars (\$5,000,000), then the portion of such costs properly
183 assignable to the Contractor shall be repaid not more than five (5) years after the Contracting
184 Officer notifies the Contractor of the Additional Capital Obligation; Provided, That the reference
185 to the amount of five million dollars (\$5,000,000) shall not be a precedent in any other context.

186 (2) If the collective Additional Capital
187 Obligation properly assignable to the contractors exercising conversion under section 4011 of the
188 WIIN Act is equal to or greater than five million dollars (\$5,000,000), then the portion of such
189 costs properly assignable to the Contractor shall be repaid as provided by applicable Federal
190 Reclamation law and Project ratesetting policy; Provided, That the reference to the amount of
191 five million dollars (\$5,000,000) shall not be a precedent in any other context.

192 **(c) Article 7 of the Existing Contract is amended to add a new**
193 **subdivision (b); subdivisions (b) through (n) of Article 7 of the Existing Contract are**
194 **redesignated as subdivisions (c) through (o):**

195 (b) In the event that the final cost allocation referenced in Section
196 4011(b) of the WIIN Act determines that the costs properly assignable to the Contractor are
197 greater than what has been paid by the Contractor, the Contractor shall be obligated to pay the
198 remaining allocated costs. The term of such additional repayment contract shall be not less than
199 one (1) year and not more than ten (10) years, however, mutually agreeable provisions regarding
200 the rate of repayment of such amount may be developed by the Contractor and Contracting
201 Officer. In the event that the final cost allocation indicates that the costs properly assignable to
202 the Contractor are less than what the Contractor has paid, the Contracting Officer shall credit
203 such overpayment as an offset against any outstanding or future obligations of the Contractor,
204 with the exception of Restoration Fund charges pursuant to section 3407(d) of Public Law 102-
205 575.

206 **5. Article 12 of the Existing Contract, entitled CONSTRAINTS ON THE**
207 **AVAILABILITY OF WATER, is amended as follows:**

208 **(a) Subdivisions (a) and (b) of Article 12 of the Existing Contract are**
209 **amended and replaced in their entirety with the following new subdivisions (a) and (b):**

210 (a) In its operation of the Project, the Contracting Officer will use all
211 reasonable means to guard against a Condition of Shortage in the quantity of Project Water to be
212 made available to the Contractor pursuant to this Contract. In the event the Contracting Officer
213 determines that a Condition of Shortage appears probable, the Contracting Officer will notify the
214 Contractor of said determination as soon as practicable.

215 (b) If there is a Condition of Shortage because of inaccurate runoff
216 forecasting or other similar operational errors affecting the Project; drought and other physical or
217 natural causes beyond the control of the Contracting Officer; or actions taken by the Contracting

250 **8. The Article numbers for Articles 17 through 38 of the Existing Contract are**
251 **amended and redesignated as Articles 16 through 37.**

252 **9. Article 20, redesignated Article 19, of the Existing Contract, entitled**
253 **CHARGES FOR DELINQUENT PAYMENTS, is amended and replaced in its entirety**
254 **with the following new Article 19:**

255 19. (a) The Contractor shall be subject to interest, administrative, and
256 penalty charges on delinquent payments. If a payment is not received by the due date, the
257 Contractor shall pay an interest charge on the delinquent payment for each day the payment is
258 delinquent beyond the due date. If a payment becomes 60 days delinquent, the Contractor shall
259 pay, in addition to the interest charge, an administrative charge to cover additional costs of
260 billing and processing the delinquent payment. If a payment is delinquent 90 days or more, the
261 Contractor shall pay, in addition to the interest and administrative charges, a penalty charge for
262 each day the payment is delinquent beyond the due date, based on the remaining balance of the
263 payment due at the rate of 6 percent per year. The Contractor shall also pay any fees incurred for
264 debt collection services associated with a delinquent payment.

265 (b) The interest rate charged shall be the greater of either the rate
266 prescribed quarterly in the Federal Register by the Department of the Treasury for application to
267 overdue payments, or the interest rate of 0.5 percent per month. The interest rate charged will be
268 determined as of the due date and remain fixed for the duration of the delinquent period.

269 (c) When a partial payment on a delinquent account is received, the
270 amount received shall be applied first to the penalty charges, second to the administrative
271 charges, third to the accrued interest, and finally to the overdue payment.

272 **10. Article 21, redesignated Article 20, of the Existing Contract, entitled EQUAL**
273 **OPPORTUNITY, is amended and replaced in its entirety with the following new Article**
274 **20:**

275 **EQUAL EMPLOYMENT OPPORTUNITY**

276 20. During the performance of this Contract, the Contractor agrees as follows:

277 (a) The Contractor will not discriminate against any employee or
278 applicant for employment because of race, color, religion, sex, sexual orientation, gender
279 identity, or national origin. The Contractor will take affirmative action to ensure that applicants
280 are employed, and that employees are treated during employment, without regard to their race,
281 color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall

282 include, but not be limited to the following: employment, upgrading, demotion, or transfer;
283 recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of
284 compensation; and selection for training, including apprenticeship. The Contractor agrees to
285 post in conspicuous places, available to employees and applicants for employment, notices to be
286 provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.

287 (b) The Contractor will, in all solicitations or advertisements for
288 employees placed by or on behalf of the Contractor, state that all qualified applicants will receive
289 consideration for employment without regard to race, color, religion, sex, sexual orientation,
290 gender identity, or national origin.

291 (c) The contractor will not discharge or in any other manner
292 discriminate against any employee or applicant for employment because such employee or
293 applicant has inquired about, discussed, or disclosed the compensation of the employee or
294 applicant or another employee or applicant. This provision shall not apply to instances in which
295 an employee who has access to the compensation information of other employees or applicants
296 as part of such employee's essential job functions discloses the compensation of such other
297 employees or applicants to individuals who do not otherwise have access to such information,
298 unless such disclosure is in response to a formal complaint or charge, in furtherance of an
299 investigation, proceeding, hearing, or action, including an investigation conducted by the
300 employer, or is consistent with the contractor's legal duty to furnish information.

301 (d) The Contractor will send to each labor union or representative of
302 workers with which it has a collective bargaining agreement or other contract or understanding, a
303 notice, to be provided by the Contracting Officer, advising the labor union or workers'
304 representative of the Contractor's commitments under section 202 of Executive Order 11246 of
305 September 24, 1965, and shall post copies of the notice in conspicuous places available to
306 employees and applicants for employment.

307 (e) The Contractor will comply with all provisions of Executive Order
308 No. 11246 of Sept. 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of
309 Labor.

310 (f) The Contractor will furnish all information and reports required by
311 Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of
312 the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and
313 accounts by the Contracting Agency and the Secretary of Labor for purposes of investigation to
314 ascertain compliance with such rules, regulations, and orders.

315 (g) In the event of the Contractor's noncompliance with the
316 nondiscrimination clauses of this Contract or with any of such rules, regulations, or orders, this
317 Contract may be canceled, terminated or suspended in whole or in part and the Contractor may
318 be declared ineligible for further Government contracts in accordance with procedures
319 authorized in Executive Order No. 11246 of Sept. 24, 1965, and such other sanctions may be

320 imposed and remedies invoked as provided in Executive Order No. 11246 of September 24,
321 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

322 (h) The Contractor will include the provisions of paragraphs (a)
323 through (h) in every subcontract or purchase order unless exempted by the rules, regulations, or
324 orders of the Secretary of Labor issued pursuant to section 204 of Executive Order No. 11246 of
325 September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor.
326 The Contractor will take such action with respect to any subcontract or purchase order as may be
327 directed by the Secretary of Labor as a means of enforcing such provisions, including sanctions
328 for noncompliance: *Provided, however*, that in the event the Contractor becomes involved in, or
329 is threatened with, litigation with a subcontractor or vendor as a result of such direction, the
330 Contractor may request the United States to enter into such litigation to protect the interests of
331 the United States.

332 **11. Article 22, redesignated Article 21, of the Existing Contract, entitled**
333 **GENERAL OBLIGATION – BENEFITS CONDITIONED UPON PAYMENT, is amended**
334 **as follows:**

335 (a) **Subdivisions (a) and (b) of Article 21 of the Existing Contract are**
336 **amended and replaced in their entirety with the following new subdivisions (a) and (b):**

337 (a) The obligation of the Contractor to pay the United States as
338 provided in this Contract is a general obligation of the Contractor notwithstanding the manner in
339 which the obligation may be distributed among the Contractor's water users and notwithstanding
340 the default of individual water users in their obligation to the Contractor.

341 (b) The payment of charges becoming due pursuant to this Contract is
342 a condition precedent to receiving benefits under this Contract. The United States shall not make
343 water available to the Contractor through Project facilities during any period in which the
344 Contractor is in arrears in the advance payment of water rates due the United States. The
345 Contractor shall not deliver water under the terms and conditions of this Contract for lands or
346 parties that are in arrears in the advance payment of water rates as levied or established by the
347 Contractor.

348 **12. Article 23, redesignated Article 22, of the Existing Contract, entitled**
349 **COMPLIANCE WITH CIVIL RIGHTS LAWS AND REGULATIONS, is amended and**
350 **replaced in its entirety with the following new Article 22:**

351 \

352 22. (a) The Contractor shall comply with Title VI of the Civil Rights Act
353 of 1964 (Pub. L. 88-352; 42 U.S.C. § 2000d), the Rehabilitation Act of 1973 (Pub. L. 93-112,
354 Title V, as amended; 29 U.S.C. § 791, et seq.), the Age Discrimination Act of 1975 (Pub. L. 94-
355 135, Title III; 42 U.S.C. § 6101, et seq.), \ [Title II of the Americans with Disabilities Act of
356 1990 (Pub. L. 101-336; 42 U.S.C. § 12131, et seq.)] \, and any other applicable civil rights laws,
357 and with the applicable implementing regulations and any guidelines imposed by the U.S.
358 Department of the Interior and/or Bureau of Reclamation.

359 (b) These statutes prohibit any person in the United States from being
360 excluded from participation in, being denied the benefits of, or being otherwise subjected to
361 discrimination under any program or activity receiving financial assistance from the Bureau of
362 Reclamation on the grounds of race, color, national origin, disability, or age. By executing this
363 Contract, the Contractor agrees to immediately take any measures necessary to implement this
364 obligation, including permitting officials of the United States to inspect premises, programs, and
365 documents.

366 (c) The Contractor makes this Contract in consideration of and for the
367 purpose of obtaining any and all Federal grants, loans, contracts, property discounts, or other
368 Federal financial assistance extended after the date hereof to the Contractor by the Bureau of
369 Reclamation, including installment payments after such date on account of arrangements for
370 Federal financial assistance which were approved before such date. The Contractor recognizes
371 and agrees that such Federal assistance will be extended in reliance on the representations and
372 agreements made in this article and that the United States reserves the right to seek judicial
373 enforcement thereof.

374 (d) Complaints of discrimination against the Contractor shall be
375 investigated by the Contracting Officer's Office of Civil Rights.

376 **13. OMITTED.**

377 **14. Article 26, of the Existing Contract, entitled WATER CONSERVATION,**
378 **is redesignated Article 25 and is amended as follows:**

379 **(a) The first sentence of subdivision (a) of redesignated Article 25 of the**
380 **Existing Contract is amended and replaced with the following:**

381 (a) Prior to the delivery of water provided from or conveyed through
382 federally constructed or federally financed facilities pursuant to this Contract, the Contractor

383 shall develop a water conservation plan, as required by subsection 210(b) of the Reclamation
384 Reform Act of 1982 and 43 C.F.R. 427.1 (Water Conservation Rules and Regulations).

385 Additionally, an effective water conservation and efficiency program shall be based on the
386 Contractor's water conservation plan that has been determined by the Contracting Officer to meet
387 the conservation and efficiency criteria for evaluating water conservation plans established under
388 Federal law.

389 **(b) Subdivision (b) of redesignated Article 25 of the Existing Contract is**
390 **amended to strike California Urban Water Conservation Council and insert Mid-Pacific**
391 **Region's then-existing conservation and efficiency criteria:**

392 (b) Should the amount of M&I Water delivered pursuant to
393 subdivision (a) of Article 3 of this Contract equal or exceed two thousand (2,000) acre-feet per
394 Year, the Contractor shall implement the Best Management Practices identified by the time
395 frames issued by the Mid-Pacific Region's then-existing conservation and efficiency criteria for
396 such M&I Water unless any such practice is determined by the Contracting Officer to be
397 inappropriate for the Contractor.

398 **(c) Subdivision (d) of redesignated Article 25 of the Existing Contract is**
399 **amended to strike then-current and insert then-existing:**

400 (d) At five (5)-year intervals, the Contractor shall revise its water
401 conservation plan to reflect the then-existing conservation and efficiency criteria for evaluating
402 water conservation plans established under Federal law and submit such revised water
403 management plan to the Contracting Officer for review and evaluation. The Contracting Officer
404 will then determine if the water conservation plan meets Reclamation's then-existing

405 conservation and efficiency criteria for evaluating water conservation plans established under
406 Federal law.

407 **15. OMITTED.**

408 **16. Article 30, of the Existing Contract, entitled BOOKS, RECORDS, AND
409 REPORTS, is redesignated Article 29, and is amended as follows:**

410 **(a) Subdivision (a) of Article 29 of the Existing Contract is amended and**
411 **replaced in its entirety with the following new subdivision (a):**

412 (a) The Contractor shall establish and maintain accounts and other
413 books and records pertaining to administration of the terms and conditions of this Contract,
414 including the Contractor's financial transactions; water supply data; project operation,
415 maintenance, and replacement logs; project land and rights-of-way use agreements; the water
416 users' land-use (crop census), land-ownership, land-leasing, and water-use data; and other
417 matters that the Contracting Officer may require. Reports shall be furnished to the Contracting
418 Officer in such form and on such date or dates as the Contracting Officer may require. Subject
419 to applicable Federal laws and regulations, each party to this Contract shall have the right during
420 office hours to examine and make copies of the other party's books and records relating to
421 matters covered by this Contract.

422 **17. Subdivision (a) of Article 31, redesignated Article 30, of the Existing**
423 **Contract, entitled ASSIGNMENT LIMITED – SUCCESSORS AND ASSIGNS**
424 **OBLIGATED, is amended and replaced in its entirety with the following new subdivision**

425 **(a):**

426 (a) The provisions of this Contract shall apply to and bind the successors and
427 assigns of the parties hereto, but no assignment or transfer of this Contract or any right or interest
428 therein by either party shall be valid until approved in writing by the other party.

429 **18. Article 34, redesignated Article 33, of the Existing Contract, entitled**
430 **OFFICIALS NOT TO BENEFIT, is amended and replaced in its entirety with the**
431 **following new Article 33:**

432 33. No Member of or Delegate to the Congress, Resident Commissioner, or
433 official of the Contractor shall benefit from this Contract other than as a water user or landowner
434 in the same manner as other water users or landowners.

435 **19. Subdivision (a) of Article 35, redesignated Article 34, of the Existing**
436 **Contract, entitled CHANGES IN CONTRACTOR'S SERVICE AREA, is amended and**
437 **replaced in its entirety with the following new subdivision (a):**

438 CHANGES IN CONTRACTOR'S ORGANIZATION

439 (a) While this Contract is in effect, no change may be made in the Contractor's
440 Service Area or organization, by inclusion or exclusion of lands or by any other changes which
441 may affect the respective rights, obligations, privileges, and duties of either the United States or
442 the Contractor under this Contract including, but not limited to, dissolution, consolidation, or
443 merger, except upon the Contracting Officer's written consent.

444 **20. Article 37, redesignated Article 36, of the Existing Contract, entitled**
445 **NOTICES, is amended and replaced in its entirety with the following new Article 36:**

446 36. Any notice, demand, or request authorized or required by this Contract
447 shall be deemed to have been given, on behalf of the Contractor, when mailed, postage prepaid,
448 or delivered to the Area Manager, Bureau of Reclamation, Northern California Area Office,
449 16349 Shasta Dam Boulevard, Shasta Lake, California 96019, and on behalf of the United
450 States, when mailed, postage prepaid, or delivered to the City Mayor of the City of Shasta Lake,
451 P.O. Box 777, 1650 Stanton Drive, Shasta Lake, California 96019. The designation of the
452 addressee or the address may be changed by notice given in the same manner as provided in this
453 article for other notices.

454 **21. OMITTED.**

455 **22. OMITTED.**

456 **23. OMITTED.**

457 **24. OMITTED.**

458 **25. OMITTED.**

491 IN WITNESS WHEREOF, the parties hereto have executed this Amendment as of the
492 day and year first above written.

493 **APPROVED AS TO LEGAL FORM AND SUFFICIENCY - REVIEWED BY:**

Digitally signed by BRIAN HUGHES
Date: 2020.06.16 10:07:13 -07'00'
OFFICE OF THE REGIONAL SOLICITOR DEPARTMENT OF THE INTERIOR
494
495 **TIME STAMP:** 1:37 pm, May 11 2020
496
497

UNITED STATES OF AMERICA
By: 
Regional Director
Interior Region 10: California-Great Basin
Bureau of Reclamation

498
499 (SEAL)

CITY OF SHASTA LAKE
By:  6/3/2020
City Manager

502 Attest:

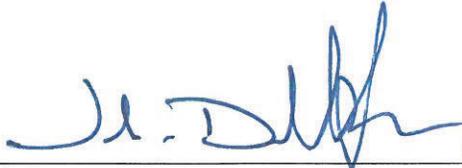
503 By: 
504 City Clerk

491 IN WITNESS WHEREOF, the parties hereto have executed this Amendment as of the
492 day and year first above written.

493 UNITED STATES OF AMERICA

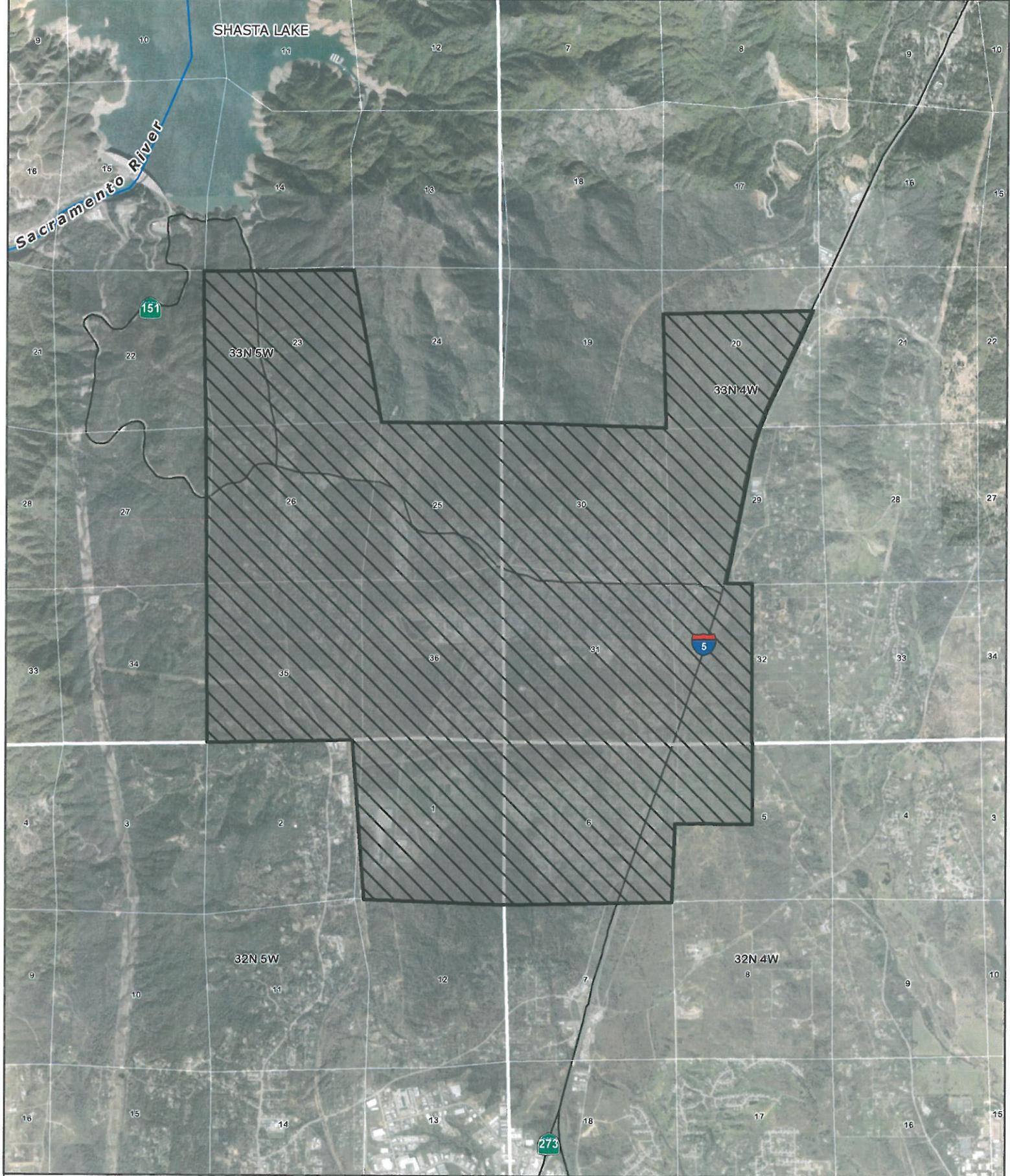
494 By: 
495 Regional Director
496 Interior Region 10: California-Great Basin
497 Bureau of Reclamation

498 CITY OF SHASTA LAKE
499 (SEAL)

500 By:  6/3/2020
501 City Manager

502 Attest:

503 By: 
504 City Clerk



-  District Boundary
-  Contractor's Service Area

City of Shasta Lake

Contract No. 4-07-20-W1134-P
Exhibit A

RECLAMATION
Managing Water in the West



**Exhibit B
 CITY OF SHASTA LAKE
 2020 Rates and Charges
 (Per Acre-Foot)**

	M&I Water
COST-OF-SERVICE (COS) RATES	
Capital Component	\$0.00
O&M Component	
Water Marketing	\$6.12
Storage	\$14.99
Conveyance	\$0.00
Direct Pumping	\$1.24
Deficit Cost Component	
Interest Bearing	\$34.79
ARRA Component	\$0.00
TOTAL COS RATE (Tier 1 Rate)	\$57.14
M&I FULL COST RATE	\$57.14
TIERED PRICING COMPONENTS (In Addition to Total COS Rate Above)	
M&I	
<i>Tier 2 Rate: >80% <=90% of Contract Total</i> [M&I Full Cost Rate - M&I COS Rate]/2 (Amount to be Added to Tier 1 Rate)	\$0.00
<i>Tier 3 Rate: >90% of Contract Total</i> [M&I Full Cost Rate - M&I COS Rate] (Amount to be Added to Tier 1 Rate)	\$0.00
CHARGES AND ASSESSMENTS (Payments in Addition to Rates)	
P.L. 102-575 Surcharges (Restoration Fund Payments) ¹ [Section 3407(d)(2)(A)]	\$21.82
P.L. 106-377 Assessment (Trinity Public Utilities District) ² [Appendix B, Section 203]	\$0.12

EXPLANATORY NOTES

- 1 The surcharges were determined pursuant to Title XXXIV of P.L. 102-575. Restoration Fund surcharges under P.L. 102-575 are determined on a fiscal year basis (10/1-9/30).
- 2 The Trinity Public Utilities District Assessment is applicable to each acre-foot of water delivered from 3/1 - 2/28 and is adjusted annually.

Recent Historic Use, as defined in the CVP M&I Water Shortage Policy, is 2,047 acre-feet.

Additional details of the rate components are available on the Internet at
www.usbr.gov/mp/cvpwaterrates/ratebooks.

Exhibit C

Repayment Obligation - Current Calculation under the WIIN Act, Section 4011 (a) (2)

Unpaid Construction Cost from the 2020 Water Rate Books*

Contractor: City of Shasta Lake
Facility: Toyon Pipeline
Contract: 4-07-20-W1134-P

Irrigation Construction Cost (2020 Irrigation Ratebook, Schedule A-2Ba)			
	Unpaid Cost	Discount	
Construction Cost (Excludes Intertie):	\$ -		
2019 Repayment (Estimate) **	\$ -		
Adjusted Construction Cost (Excludes Intertie):	\$ -	\$ -	
Intertie Construction Cost:	\$ -	\$ -	
Total	\$ -	\$ -	
If Paid in Installments (Used 20 yr CMT)			
	Due		
Payment 1	N/A	\$ -	
Payment 2	N/A	\$ -	
Payment 3	N/A	\$ -	
Payment 4	N/A	\$ -	
Total Installment Payments		\$ -	
20 yr CMT Rates			N/A
Discount Rate (1/2 of the Treasury Rate per the WIIN Act, Section 4011(a)(2)(A))			N/A

M&I Construction Cost (2020 M&I Ratebook, Sch A-2Ba)	
	Unpaid Cost
Construction Cost:	\$ (394,524)
2019 Repayment (Estimate) **	\$ -
Adjusted Construction Cost***:	\$ (394,524)

Calculation Support: Irrigation Lump Sum or First Payment Due Date N/A
 Days Until the End of the Fiscal Year N/A

Fiscal Yr	Unpaid Allocated Construction Cost			Unpaid Intertie Construction Cost			Total
	Beginning Balance	Straight Line Repayment	Present Value	Beginning Balance	Straight Line Repayment	Present Value	Present Values
2021	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2022	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2023	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2024	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2025	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2026	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2027	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2028	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2029	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2030	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2031-63				\$ -	\$ -	\$ -	\$ -
Total, Lump Sum Payment			\$ -			\$ -	\$ -

Amount of Reduction, Lump Sum \$ -

* Costs are assumed to be paid and all charges are assumed to be accurate. If at a later date charges are determined to need update, they are still required. Also, unpaid charges are still a requirement under contract.

** 2019 Repayment is based on a conservative estimate. If not sufficient, the remainder will be billed.

*** Excludes Interest to payment date as Interest will be computed as an annual expense as usual.

WATER DELIVERY AGREEMENT

BETWEEN

THE CITY OF REDDING

AND THE

CITY OF SHASTA LAKE

THIS AGREEMENT is made at Redding, California, by and between the City of Redding (Redding), a Municipal Corporation, whose address is 777 Cypress Avenue, Redding Ca. 96001 and the City of Shasta Lake (Shasta Lake), a Municipal Corporation, whose address is 1650 Stanton Drive, Shasta Lake, Ca. 96019 for a Water Delivery Agreement (Agreement).

RECITALS

A. "Redding is presently providing water service to residents in the area known as the "Summit City Pressure Zone" described on Exhibit "A", attached and incorporated herein.

B. A portion of the Summit City Pressure Zone lies within the incorporated boundaries of Shasta Lake and a portion lies within the unincorporated area of the County of Shasta, but in Redding's sphere of influence.

C. The water purchased from the Bureau of Reclamation (Bureau) by Redding to provide residential water service in the Summit City Pressure Zone is treated at Shasta Lake's Water Treatment Facility and is supplied through a master water meter located at the intersection of Nellie Bell Lane and Lake Blvd.

D. Redding and Shasta Lake desire to amend their service areas so that Shasta Lake will provide residential water service to all residences within its incorporated boundaries. Shasta Lake will in turn continue to provide such water service to the unincorporated area in the Summit City Pressure Zone operated and maintained by Redding.

NOW, THEREFORE, IT IS AGREED AS FOLLOWS:

1. **Boundary Change:** Shasta Lake will provide water service for all areas in the Summit City pressure zone that lie within the boundaries of Shasta Lake. Redding will continue to provide water service for the remainder of the Summit City Pressure Zone.
2. **Master Meter Relocation:** Redding will relocate the six-inch master water meter presently located at Nellie Bell Lane to the southern edge of the Shasta Lake City Limits to 12982 Beltline Road. The new master water meter location is shown on Exhibit "A". In conformity with Redding's Central Valley Project (CVP), Contract No.

Approved 7/6/04

C-4186

14-06-00-5272A (Buckeye Contract), with the Bureau, Redding will continue to be responsible for the maintenance of the master water meter.

3. **Water Purchase:** Redding shall continue to pay to Shasta Lake for water delivered through the master water meter at the tiered residential rate Shasta Lake charges its residential customers within its water contract service area, less the Bureau's contract water costs for CVP water charged to Redding.
4. **Transfer of Facilities:** Redding shall transfer to Shasta Lake ownership of all water delivery facilities and appurtenances used by Redding to provide service to customers who will be served by Shasta Lake as a result of this Agreement.
5. **New Customers:** Redding shall notify, no sooner than upon issuance of a water connection application, of any new water services that will be added to the water system that will be serviced through the newly relocated master water meter.
6. **Plant and Facilities Capacity Charges:** Redding will impose the same Water Connection Fee it charges for new water connections within the water service area of the City of Redding. The water connection fee, used to accommodate future growth and the needs of the infrastructure associated with that growth, will be divided seventy-five percent (75%) to Shasta Lake and twenty-five percent (25%) to Redding. Should Redding determine that it will be able to provide water service from its Buckeye Pressure Zone to the remainder of the Summit City Pressure Zone there will be no division of the connection fee.
7. **Water Assignment:** Redding will assign to Shasta Lake 30 acre-feet of the 40 acre-feet of CVP water allocated to the Summit City Zone in Redding's Buckeye Contract, subject to approval by the Bureau. Shasta Lake will obtain, with the Bureau's approval of the assignment of 30 acre-feet of CVP water in the Buckeye Contract to Shasta Lake.
8. **Customer Notification:** Redding shall notify all customers affected within the Summit City pressure zone of the proposed date of transfer of all water delivery facilities, appurtenances and services to Shasta Lake, and including the new water rates to be charged by Shasta Lake.
9. **Transfer Date:** The utility staff of Redding and Shasta Lake will agree on the mutually convenient transfer date.
10. **Transfer of Documents:** Redding will transfer to Shasta Lake all billing documents and records showing historical use and maintenance records for the portion of the system to be transferred. Included in the transfer of documents will be maps showing the system transfer, including easements, valve locations and reference points.
11. **Complete Assignment:** This Agreement constitutes the total understanding between the parties regarding this matter and supercedes all previous agreements or understandings in conflict herewith.
12. **Mutual Hold Harmless:** Each party shall indemnify and save harmless the other and its elected officials, officers, employees, agents, and volunteers and each and every one of them, from and against all actions, damages, penalties, costs liability, claims,

losses and expenses of any type and description including attorneys's fees and costs to which either may be subjected by reason of, or resulting from, directly or indirectly, the negligent performance of this agreement by the other.

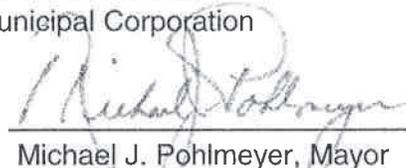
13. **Disputes:** If any action or arbitration is commenced to enforce any of the terms or conditions herein, or to enforce collection of monies due pursuant to this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees and costs.

14. **Date of Agreement:** The effective date of this Agreement shall be the date it is signed by the second party to sign.

IN WITNESS WHEREOF, City of Redding and the City of Shasta Lake have executed this Agreement on the days and year set forth below:

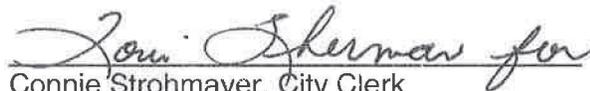
CITY OF REDDING
A Municipal Corporation

Date: 7-14, 2004

By: 
Michael J. Pohlmeier, Mayor

Attest

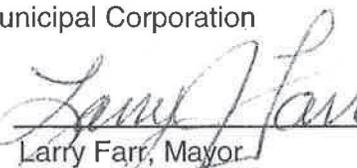
Form Approved:


Connie Strohmayer, City Clerk


FOR Brad L. Fuller, City Attorney
BARRY E. DEWALT

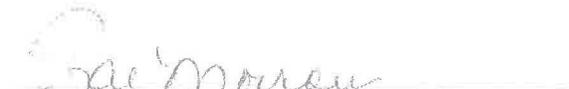
CITY OF SHASTA LAKE
A Municipal Corporation

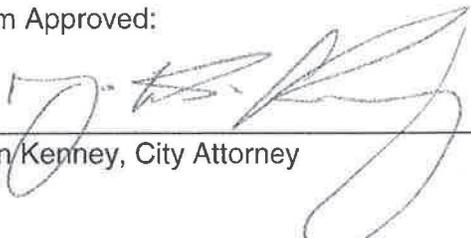
Date: 7/6, 2004

By: 
Larry Farr, Mayor

Attest

Form Approved:


Rae Morrow, City Clerk

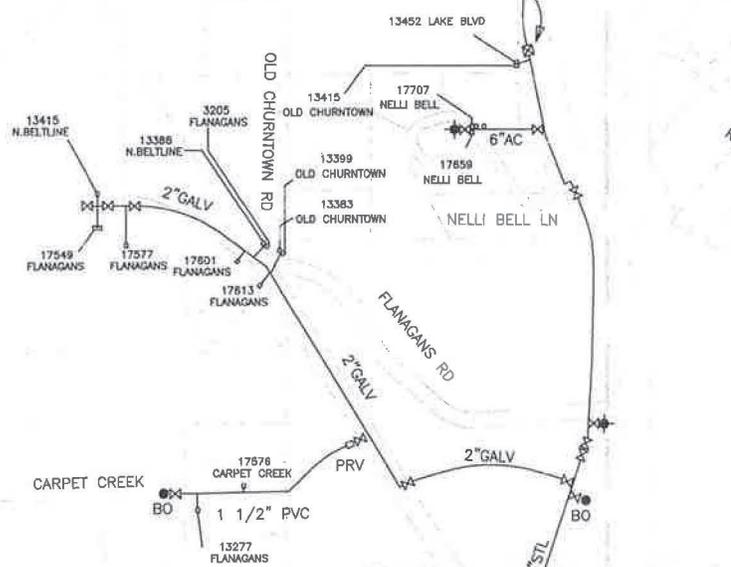

John Kenney, City Attorney

attachment
Location map

27 26
34 35

LAKE BLVD
HILL BLVD

ABANDON
EXIST METER
LOCATION



RANCHERA RD

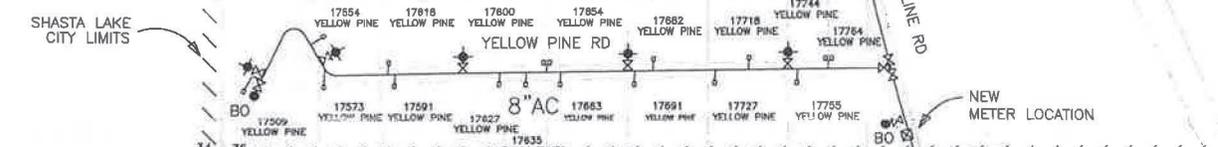


SCALE : 1" = 500'

13170
LAKE BLVD

N BELTLINE RD

SHASTA LAKE
CITY LIMITS



BUCKEYE CONTRACT BOUNDARY
14-06-200-5272A

NEW CONTRACT BOUNDARY

BUCKEYE CONTRACT BOUNDARY
14-06-200-5272A

WALKER MINE RD

8"

6" STL

SUMMIT CITY ZONE EXHIBIT A

JAN 2004

SHASTA COUNTY WATER AGENCY
Redding, California

CONTRACT FOR PROJECT WATER

This contract, made the 3rd day of March, 1998, by and between SHASTA COUNTY WATER AGENCY, a public agency of the State of California, hereinafter referred to as the "Agency," and City of Shasta Lake, hereinafter referred to as the "Contractor,"

WITNESSETH, That:

WHEREAS, the Agency has entered into a contract with the United State of America entitled "Contract Between the United States of America and Shasta County Water Agency Providing for Water Service," Contract No. 14-06-2003367A, dated June 30, 1967, hereinafter referred to as the "Master Contract," which contract will permit the diversion of water from Shasta Lake, Keswick Reservoir, and Whiskeytown Lake by the Agency and its contractors in such quantities and at such times as best suits their needs; and

WHEREAS, the Agency has the power to enter into contracts with any public corporation, person, district, municipality, or political subdivision of the State for the purchase and sale of water; and

WHEREAS, the Contractor desires to divert Project Water from the Sacramento River for municipal, industrial, or domestic purposes; and

WHEREAS, the U.S. Bureau of Reclamation has approved the point of diversion;

NOW, THEREFORE, IT IS AGREED:

1. The Master Contract is hereby made a part of this contract and the terms thereof and any determination or actions taken thereunder shall be binding upon the parties as if said contract were fully set out herein. Unless expressly stated or unless manifestly inconsistent with the context in which used, definitions contained in said Master Contract shall apply in this contract.

2. This contract shall be effective on the date set forth above. This contract shall remain in effect through the period of the Master Contract and any extension thereof. This contract may be terminated at any time upon consent of both parties.

3. The Contractor is entitled to divert water at such points of diversion as may be agreed upon in writing between the Agency and the Contractor for use within the Contractor's service area. The quantity of water the Contractor may divert shall not exceed 50 acre feet per year. If the Contractor wishes to divert less than the maximum amount of water permitted under this contract, he shall initially upon execution of this contract and for each subsequent calendar year submit by December 15th a schedule of diversion satisfactory to the Agency and approved by it for the water to be diverted during the following calendar year or portion thereof provided that no schedule will be approved for a lesser amount of water than the average amount diverted during the previous five year period.

4. The Contractor shall install, operate and maintain, at its sole expense, measuring equipment satisfactory to the Agency. In the event such equipment is found by the Agency to be faulty or not operating properly, it shall be repaired or replaced by the Contractor. In the event the Contractor fails to make such repairs or replacement within a reasonable time as determined by the Agency, it may be done by the Agency and the cost thereof shall be paid by the Contractor to the Agency within sixty (60) days following the date a statement of such cost is furnished by the Agency. During the time such measuring equipment is not operating properly, as determined by the Agency, the Agency shall estimate water usage during such time and bill the Contractor on the basis of said estimate.

5. The Contractor shall pay to the Agency all sums due under this contract in accordance with the rates of water service established by the Agency. These rates will be established to, as nearly as practicable, recover the actual costs incurred by the Agency under the Master Contract and the cost of administration involved. The rate currently established by the Agency for Project Water is Thirty-Seven Dollars (\$37.00) per acre foot for water delivered and Four Dollars (\$4.00) per acre foot for water under contract but not delivered. "Water under contract" shall mean the quantity of water the contractor is entitled to divert as shown in paragraph 3. This rate shall remain in effect unless the Contractor is notified of its revision at least sixty (60) days prior to

the beginning of any calendar year. Payment shall be due on January 31 of each year for water diverted or contracted for during the previous year, and shall be delinquent after thirty (30) days. A penalty of one (1) percent of the amount of any delinquency shall be charged for each month, or fraction thereof, of said delinquency. As a minimum, payment shall be due the Agency for the amount of water specified in the schedule submitted in accordance with Section 3 above, unless more water is actually diverted.

6. In accordance with Article 9 of the Master Contract, there may occur shortages in the quantity of water available to the Agency under said contract. The Agency reserves the right to allocate the available supply to all or some of its water users in such amounts as the Agency in its sole discretion may determine, and no liability shall accrue to the Agency or any of its officers or employees on the basis of said shortage or the Agency's decision to reduce water allocation to Contractor or any other purchaser of Agency water. Such shortage shall not relieve the Contractor of his obligation to make the payments required in this contract.

7. The Agency assumes no responsibility with respect to the quality of water which is made available under this contract.

8. The Contractor assumes all responsibility for the control, distribution and disposal of water diverted under this contract and holds the Agency harmless from damage connected herewith.

9. If the Contractor is in default under this contract the Agency may refuse delivery of water and may terminate this contract on ten (10) days written notice to the Contractor. If the Agency withholds termination in the event of default to afford the Contractor an opportunity to cure its default, or for any other reason, the Agency may nevertheless terminate this contract at any later time unless the default is cured prior to the date of termination.

10. The Contractor agrees that it will comply fully with all applicable federal laws, orders and regulations, and the laws of the State of California, all as administered by appropriate authority, concerning the pollution of streams, reservoirs, or water courses

with respect to the discharge of refuse, garbage, sewage effluent, industrial waste, oil, mine tailings, or other pollutants.

11. The Contractor agrees as follows:

(a) To comply with Title VI (Section 601) of the Civil Rights Act of July 2, 1964 (78 Stat. 241) which provides that "No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance," and be bound by the regulations of the Department of the Interior for the effectuation thereof, as set forth in 43 CFR 17.

(b) To obligate its subcontractors, subgrantees, transferees, successors in interest, or any other participants, receiving federal financial assistance hereunder, to comply with the requirements of this provision.

12. The Contractor shall not transfer or assign his rights under this contract without the written consent of the Agency.

IN WITNESS WHEREOF, the parties hereto have executed this contract the day and year first above written.

SHASTA COUNTY WATER AGENCY


MAR 17 1996
Patricia A. Clarke, Chairman
Board of Directors

ATTEST:
CAROLYN TAYLOR
Clerk of the Board

CITY OF SHASTA LAKE

By 
Deputy


City Council

APPROVED AS TO FORM
KAREN KEATING JAHR
County Counsel

By 
Deputy

AMENDED
WATER TRANSFER AGREEMENT
05-03

This Amended Water Transfer Agreement ("Agreement") is made and entered into between the City of Shasta Lake ("City") and Anderson-Cottonwood Irrigation District ("ACID").

RECITALS

1.0 ACID is an irrigation district duly authorized and existing under the laws of the State of California.

2.0 The City is a duly incorporated general law city organized and existing under the laws of the State of California.

3.0 The City seeks water to be used for its general municipal and industrial purposes.

4.0 ACID has 2,000 acre feet of CVP ("Project") water under Contract Number 14-06-2000-3346A-R-1 between ACID and the United States Bureau of Reclamation ("Bureau") which ACID desires to sell and transfer to the City.

IN WITNESS of the foregoing Recitals and in accordance with the terms and conditions set forth below, the parties agree as follows:

5.0 This Agreement shall be effective when last signed by the parties below and shall continue until February 28, 2045, or until termination, for reasons beyond ACID's control, of Contract No. 14-06-2000-3346A-R-1, under which the water to be made available for this Agreement is being made available, whichever is earlier.

6.0 Water to Be Transferred. ACID shall make available for transfer to the City up to a maximum of 2,000 acre-feet per year of Project Water subject to the terms of Contract No. 14-06-2000-3346A-R-1.

6.1. Retransfer. For the years 2008 through 2012, ACID may retransfer up to 500 acre-feet of the transferrable water, with the retransfer proceeds going to ACID. The City shall not be obligated to pay Bureau charges or ACID administrative fees for the re-transferred water. No portion of the amount received from any re-transferee shall

be paid or credited to the City. For purposes of Section 12, the "water available to the City" subject to proportionate reduction shall be 1500 acre feet.

7.0 Notice of Water Availability; Notice of Intent to Take. Not later than February 15 of each year during the term of this Agreement, ACID shall provide written notice of the quantity of water available for transfer and the cost per acre-foot. The City shall, by March 15th or within thirty (30) days of notice of water availability by ACID, whichever is later, inform ACID in writing of its intent to take delivery of Project water and of the quantity to be taken.

8.0 Payment of Bureau Charges. The rate for the transferred water shall comply with the Final Policy on Water Rates for Water Transfers from One Central Valley Project ("CVP") to Another CVP Contractor, dated April 28, 2005; until such documents are amended or superceded. The City shall pay annual Bureau charges:

a) For 1500 acre-feet of water, whether actually transferred or not;

b) For any additional quantity of water confirmed to be taken by the City pursuant to Section 7; and

c) Payment of Bureau charges, as provided above, is required even if water cannot be delivered by reason of conditions imposed by the Bureau and accepted by the City under Section 10.

9.0 Payment of ACID Administrative Fee. The City shall pay annually an ACID administrative fee:

a) For 1500 acre-feet, whether actually transferred or not;

b) For any additional quantity of water actually taken by the City; and

c) Payment of the ACID administrative fee, as provided in subdivision "a" of this section, is required even if water cannot be delivered by reason of conditions imposed by the Bureau and accepted by the City under Section 10.

For 2008, the administrative fee shall be \$35.00 per acre-foot. For the years 2009 through 2015, the administrative fee shall be increased 2% per year. For each year after 2015, the administrative fee shall be adjusted based upon changes to the Consumer Price Index, all Urban Consumers (CPI-U), base year 2015.

10.0 Bureau Approval. The City recognizes that the sale and transfer contemplated in this Agreement is subject to written approval by the Bureau. The City further recognizes that the transfer may be subject to environmental review by the Bureau. In the event that the Bureau imposes conditions on the transfer, the City shall have 30 days after receipt of notice of such conditions from ACID to consider whether these conditions are acceptable to the City. If the City, in the City's sole discretion, finds the conditions unacceptable, the City may terminate this Agreement without incurring any obligation to ACID.

11.0 Conditions, Measurement & Delivery Point. The 2,000 acre feet of Project water will be diverted by the City at its present diversion point located at the 16 inch water line meter located at the interconnection of the pumping plant discharge line at the water treatment facilities adjacent to the Shasta Dam Visitor Area. Additional point or points of delivery, either on CVP Project facilities or other locations, may be mutually agreed upon in writing by ACID and the City, which agreement will not be unreasonably withheld. The point or points of diversion shall also be the point or points of measurement of Project water purchased.

12.0 Critical Year Reductions. The Project water contemplated by this Agreement is subject to critical year reductions by the Bureau. In the event the Bureau reduces Project water available to ACID pursuant to its critical year reduction procedures, the total Project water available to the City will be subject to critical year reduction in the same proportion as other Project water is reduced to ACID.

13.0 Payment/Credit. ACID shall submit invoices to the City and the City shall pay such invoices in a manner that will allow ACID to make timely payments to the Bureau as required by Contract No. 14-06-2000-3346A-R-1. Except as provided in Section 6.1, if water for which the City has paid is re-transferred by ACID, the City shall receive a credit against its future obligations equal to the amount paid by the re-transferee to ACID.

per acre-foot for the re-transferred water, up to the amount actually paid by the City for Bureau charges and the ACID administrative fee per acre-foot of the re-transferred water. ACID is under no obligation to re-transfer water available for transfer under this Agreement. This credit will not exceed the amount of the City's obligation to ACID for such water.

14.0 Water Quality. The City acknowledges that ACID is not responsible for the quality of Project water transferred and ACID does not warrant its quality.

15.0 Water Rights Not Transferred. Nothing in this Agreement is intended to nor shall confer any appropriative, public trust or other right to water on any person or entity. The only rights granted to the parties as a result of this Agreement are those expressly set forth herein.

16.0 General Indemnity. Each party agrees to protect, defend, indemnify and hold harmless the other party, its officers, directors, agents, servants, employees and consultants from and against any and all losses, claims, liens, demands and causes of action of every kind or character without limitation occurring on or in any way incidental to or arising directly or indirectly out of the performance or non-performance of the indemnifying party.

17.0 Governing Law. This Agreement will be interpreted and enforced pursuant to the laws of the State of California.

18.0 Modifications. This Agreement may be modified only by a written instrument executed by both parties.

19.0 Entire Agreement. This Agreement contains the entire understanding between the parties relating to their interests, obligations and rights connected with the subject matters set forth herein. All prior communications, negotiations, stipulations or understandings, whether oral or in writing, are superceded by this Agreement.

20.0 Assigns and Successors. This Agreement shall be binding upon, and inure to the benefit of, the assigns and successors in interest of the parties herein.

21.0 Waiver. The waiver or failure to declare a breach as a result of a violation of any terms of this Agreement shall not constitute a waiver of that term or condition and shall not

provide the basis for a claim of estoppel, forgiveness or waiver by any party of that term or condition.

22.0 Attorney's Fees. If it is necessary for any party hereto to commence legal action or arbitration to enforce the provisions of this Agreement, the prevailing party shall be entitled to reasonable attorney's fees, expenses and costs incurred therein.

23.0 Notices. Any and all communications or notices in connection with this Agreement will be hand-delivered or sent by United States First Class Mail postage prepaid as follows:

TO THE CITY:

City Manager
P.O. Box 777
Shasta Lake, CA 96019

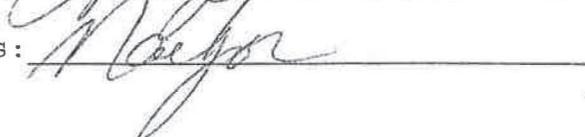
TO ANDERSON-COTTONWOOD IRRIGATION DISTRICT:

General Manager
2810 Silver Street
Anderson, CA 96007

IN WITNESS WHEREOF, the parties have executed this Amended Water Transfer Agreement as of the day and year stated below:

Dated: 4/24/08 . CITY OF SHASTA LAKE

By: 

Its: 

Dated: 4-28-08 . ANDERSON-COTTONWOOD IRRIGATION DISTRICT

By: Brenda L. Haynes

Its: Board President

RECLAMATION

Managing Water in the West

Finding of No Significant Impact

Five-Year Agreement – CVP Water Transfer - ACID to COSL – Contract Years 2019 – 2023 (April 1, 2019 through October 31, 2023)

NCAO-19-03

Prepared by:



Date:

8/2/19

Megan Simon
Natural Resources Specialist
Northern California Area Office

Concurred by:



Date:

8/2/2019

Paul Zedonis
Environmental and Natural Resources
Supervisory Natural Resources Specialist/
Division Manager
Northern California Area Office

Approved by:



Date:

8/20/19

Don Bader
Area Manager
Northern California Area Office

Background

In accordance with Section 102(2)(c) of the National Environmental Policy Act of 1969 (NEPA), as amended, the Bureau of Reclamation (Reclamation) prepared an Environmental Assessment (EA) to analyze the potential direct, indirect, cumulative impacts to the affected environment associated with Bureau of Reclamation's (Reclamation) decision to consent to the Anderson-Cottonwood Irrigation District's (ACID) transfer of up to 2,000 acre-feet (af) of Central Valley Project Water (Project Water) to the City of Shasta Lake (COSL). Project Water subject to transfer would be made available to the COSL at the COSL's existing point of diversion on the upstream face of Shasta Dam in Shasta County, California.

Acquiring water under the Proposed Action would supplement the COSL's existing water supply, used for general municipal and industrial purposes, thereby decreasing the frequency of water purchases on the open market that may be highly competitive, costlier, and less reliable in times of need. In accordance with Article 3(e) of the Settlement Contract, ACID is required to obtain Reclamation's written consent before it can transfer Project Water. Absent Reclamation's consent, the COSL would be required to operate within the confines of its water supply under its long-term renewal contract or purchase water from other willing sellers.

Reclamation made the EA available for a 30-day public comment from July 1 through August 1, 2019. No comments were received.

Proposed Action

The Proposed Action is Reclamation's annual consent to the transfer of up to 2,000 af of Project Water from ACID to COSL each Contract Year, beginning with the 2019 Contract Year and continuing annually for five years, or through October 31, 2023. Each year's transfer would be reviewed and conducted in accordance with Reclamation's current water transfer guidelines. The amount that could be transferred in any Contract Year would be subject to review by Reclamation for compliance with current regulatory requirements.

Findings

The EA was prepared in accordance with the NEPA Council on Environmental Quality regulations (40 CFR 1500-1508), and Department of the Interior Regulations (43 CFR Part 46). The EA found that any potential environmental impacts from the Proposed Action would be minor and temporary due to the conditions and controls indicated in the Proposed Action description above and described in full in the EA. As a result, Reclamation has determined that implementing the Proposed Action is not a major Federal action that would significantly affect the quality of the human environment and therefore, does not require the preparation of an Environmental Impact Statement.

Reclamation's determination is supported by the EA (EA-19-03-NCAO) which describes the existing environmental resources in the Project area and evaluates the effects of the Proposed

Action and No Action Alternative on those resources. The analysis provided in the EA is incorporated by reference and Reclamation's determination that the Proposed Action will not result in significant impacts is summarized in the following. References to sections of regulations, Executive Orders and agency policies defining "significant" are provided in parentheses, where applicable:

- The Proposed Action will not significantly affect public health or safety (40 CFR 1508.27(b)(3))
- The Proposed Action will not significantly impact natural resources and unique geographical characteristics such as historic or cultural resources; parks, recreation, and refuge lands; wilderness areas; Wild and Scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order (EO) 11990); flood plains (EO 11988); national monuments; migratory birds; and other ecologically significant or critical areas (40 CFR 1508.27(b)(3) and 43 CFR 46.215(b)).
- The Proposed Action will not have possible effects on the human environment that are highly uncertain or involve unique or unknown risks (40 CFR 1508.27(b)(5)).
- The Proposed Action will neither establish a precedent for future actions with significant effects nor represent a decision in principle about a future consideration (40 CFR 1508.27(b)(6)).
- There is no potential for the effects to be considered highly controversial (40 CFR 1508.27(b)(4)).
- The Proposed Action will not have significant cumulative impacts (40 CFR 1508.27(b)(7)).
- The Proposed Action will not have significant effects on historic properties (40 CFR 1508.27(b)(8)).
- The Proposed Action will have no effect on proposed or listed threatened or endangered species (40 CFR 1508.27(b)(9)).
- The Proposed Action will not violate Federal, state, tribal or local law or requirements imposed for the protection of the environment (40 CFR 1508.27(b)(10)).
- The Proposed Action will not affect any Indian Trust Assets (512 DM 2, Policy Memorandum dated December 15, 1993).
- Implementing the Proposed Action will not disproportionately affect minorities or low-income populations and communities (EO 12898).
- The Proposed Action will not limit access to, and ceremonial use of, Indian sacred sites on Federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites (EO 13007 and 512 DM 3).

WATER TRANSFER AGREEMENT

This Water Transfer Agreement ("Agreement") is made and entered into between the City of Shasta Lake ("City") and MCM Properties.

RECITALS

1. MCM Properties is a/an Corporation _____ duly authorized and existing under the laws of the State of California.
2. The City is a duly incorporated general law city organized and existing under the laws of the State of California.
3. The City seeks water to be used for its general municipal and industrial purposes.
4. MCM Properties has 325 acre feet of CVP (Project) water pursuant to Contract Number 14-06-200-7827A (Contract No. 7827A) with the United States Bureau of Reclamation ("Bureau"), which MCM Properties desires to make available for sale and transfer to the City.

IN WITNESS WHEREOF and in accordance with the terms and conditions set forth below, the parties agree as follows:

5. Term of Agreement. This Agreement shall be effective when last signed by the parties below and shall continue until February 28, 2045, or until termination, for reasons beyond MCM Properties' control, of Contract No. 7827A, under which the water to be made available for this Agreement is being made available, which ever is earlier.
6. Water to Be Transferred. MCM Properties shall make available for transfer to the City up to a maximum of 325 acre-feet per year of Project water pursuant to Contract No. 7827A. MCM Properties shall make available an additional 132 acre feet per year of Project water if agreed upon annually by both parties. The City shall have first right to this 132 acre feet per year of excess Project water if MCM Properties determines that the Project water is available for transfer.
7. Purchase of Water. During the term of this Agreement, the City may purchase up to, and shall have the first right of refusal for 325 acre-feet of Project water from MCM Properties beginning March 1, 2006, and each calendar year thereafter. Not later than February 15 of each year during the term of this Agreement, MCM Properties shall confirm to the City that the Project water to be made available pursuant to Contract No. 7827A can be delivered, the quantity available, and its cost per acre foot. The City shall thereafter inform MCM Properties of its intent to take delivery of Project water as described herein for such year and confirm the quantity to be transferred.

8. Rate Applicable to Transferred Water. The rate for the transferred water shall comply with the Final Policy on Water Rates for Water Transfers from One Central Valley Project (CVP) Contractor to Another CVP Contractor, dated April 28, 2005; until such documents is amended or superseded.

9. Compensation. For the Project water not taken, and not otherwise sold or transferred by MCM Properties to another party, the City agrees to pay all fees, charges, and costs imposed by the Bureau on MCM Properties relating to the purchase of the Project water. For Project water delivered, the City shall pay all fees, charges and costs imposed by the Bureau on MCM Properties relating to the purchase and transfer of such Project water.

a) Interest Bearing Operation and Maintenance Deficit Rate. In addition to the fees, charges and costs imposed by the Bureau, the City agrees to pay an additional sum equal to the "interest bearing operation and maintenance deficit component", which the Bureau incorporates into MCM Properties' irrigation rate in Contract No. 7827A, for each ac/ft diverted. As an example, the City would pay the 2005 Bureau temporary rate of \$20.26 per ac/ft, plus MCM Properties' "interest bearing deficit component" of \$4.27 per ac/ft, for a total of \$24.53 per ac/ft for water transferred during the 2005 water year.

(b) Surcharge. The City shall pay an additional surcharge to MCM Properties per acre-foot of Project water, due annually on September 15th. The surcharge that the City of Shasta Lake will pay to MCM Properties shall be \$15.00 per acre-foot, increased annually by 2.5 %.

The parties acknowledge that the Project water transferred must first be scheduled and purchased by MCM Properties from the Bureau. For the Project water delivered, the City will pay all purchase and transfer charges and any other fees, charges or costs imposed on MCM Properties for such Project water.

10. Bureau Approval. The parties recognize that the sale and transfer contemplated in this Agreement is subject to prior written approval by the Bureau. The City further recognizes that the transfer may be subject to environmental review by the Bureau. In the event that the Bureau imposes conditions on the transfer, the City shall have 30 days after receipt of notice of such conditions from MCM Properties to consider whether these conditions are acceptable to the City. If the City, in the City's sole discretion, finds the conditions unacceptable, the City may terminate this Agreement without incurring any obligation to MCM Properties

11. Conditions, Measurement & Delivery Point. The Project water delivered will be diverted by the City at its present diversion point located at the 16 inch water line meter located at the interconnection of the pumping plant discharge line at the water treatment facilities adjacent to the Shasta Dam Visitor Area. Additional point or points

of delivery, either on CVP Project facilities or other locations, may be mutually agreed upon in writing by MCM Properties and the City. The point or points of diversion shall also be the point or points of measurement of Project water purchased.

12. Critical Year Reductions. The Project water contemplated by this Agreement is subject to critical year reductions by the Bureau. In the event the Bureau reduces Project water available to MCM Properties pursuant to its critical year reduction procedures, the total water available to the City will be subject to critical year reduction in the same proportion as other Project water is reduced to MCM Properties

13. Payment. MCM Properties shall submit invoices to the City and the City shall pay such invoices in a manner that will allow MCM Properties to make timely payments to the Bureau as required by Contract No. 7827A. The City recognizes that the Project water being made available for transfer by MCM Properties is subject to a “take or pay” provision in Contract No. 7827A. Subject to certain reduction requirements, MCM Properties is required to pay for 75% of the Project water under Contract No. 7827A whether the Project water is used or not. The City agrees to assume MCM Properties’ obligations of the provisions of the Bureau contract and to pay for the Project water whether the Project water is actually transferred or not. Therefore, the City agrees to pay for, each year, 75% of the 325 acre-feet per year of Project water. In the event that the City does not take the Project water made available for transfer under this Agreement and MCM Properties sells or transfers the Project water to another party, the City’s obligation to MCM Properties shall be credited by the amount MCM Properties receives from the party to whom it sells.

14. Water Quality. The City acknowledges that MCM Properties is not responsible for the quality of Project water transferred and MCM Properties does not warrant its quality.

15. Water Rights Not Transferred. Nothing in this Agreement is intended to nor shall confer any appropriate, public trust or other right to water on any person or entity. The only rights granted to the parties as a result of this Agreement are those expressly set forth herein.

16. General Indemnity. Each party agrees to protect, defend, indemnify and hold harmless the other party its officers, directors, agents, servants, employees and consultants from and against any and all losses, claims, liens, demands and causes of action of every kind or character without limitation occurring on or in any way incidental to or arising directly or indirectly out of the performance or non-performance of the indemnifying party.

17. Governing Law. This Agreement will be interpreted and enforced pursuant to the laws of the State of California.

18. Modifications. This Agreement may be modified only by a written instrument executed by both parties.

19. Entire Agreement. This Agreement contains the entire understanding between the parties relating to their interests, obligations and rights connected with the subject matters set forth herein. All prior communications, negotiations, stipulations or understandings, whether oral or in writing, are superceded by this Agreement.

20. Assigns and Successors. This Agreement shall be binding upon and inure to the benefit of, the assigns and successors in interest of the parties herein.

21. Waiver. The waiver or failure to declare a breach as a result of a violation of any terms of this Agreement shall not constitute a waiver of that term or condition and shall not provide the basis for a claim of estoppel, forgiveness or waiver by any party of that term or condition.

22. Attorney's Fees. If it is necessary for any party hereto to commence legal action or arbitration to enforce the provisions of this Agreement, the prevailing party shall be entitled to reasonable attorney's fees, expenses and costs incurred therein.

23. Notices. Any and all communications or notices in connection of this Agreement will be hand-delivered or sent by United States First Class Mail postage prepaid as follows:

TO THE CITY:

City Manager
P.O. Box 777
Shasta Lake, CA 96019

TO MCM PROPERTIES INC.:

Clairelee and Ralph Bulkley
5001 Ensley Road
Knights Landing, Ca. 95645

IN WITNESS WHEREOF, the parties have executed this Agreement as of the day and year first written above.

CITY OF SHASTA LAKE

By: Gerry Cupp by cm
City Manager Date 1/23/06

MCM PROPERTIES INC.

By: MCM Properties, Inc. by Charles Leung
Date 1/25/06
Cullley
Pres.

WATER USE AGREEMENT

This Agreement, effective March 1, 2020, is made by and between THE MCCONNELL FOUNDATION, a California non-profit corporation, (hereafter "McConnell") and City of Shasta Lake, a California municipal corporation (hereafter "Contractor").

RECITALS

A. McConnell has the right to receive 5,100 acre feet of water each year from the United States Department of the Interior, Bureau of Reclamation's (hereafter "Reclamation") Central Valley Project (hereafter "CVP") pursuant to a written contract dated August 11, 2000 (hereafter the "Contract").

B. Under the terms of the Contract, McConnell may designate the place of delivery of Contract water to any area that is within the permitted place of use for CVP water and temporarily assign its rights to receive Contract water to another party.

C. Contractor holds an existing contract to receive CVP water from Reclamation. Contractor's service area is within the permitted place of use for CVP water.

D. McConnell desires to grant to Contractor, and Contractor desires to purchase, the right to receive Five Hundred (500) acre feet of Contract water, pursuant to the terms and conditions set forth below.

NOW, THEREFORE, the parties agree as follows:

TERMS AND CONDITIONS

1. **Purpose of Agreement:** The purpose of this Agreement is to allow Contractor to purchase a portion of McConnell's Contract water during the 2020-2021 water year ("Water Year") only.

2. **Term of Agreement:** This Agreement is effective as of the date first indicated above and shall expire February 28, 2021; unless otherwise extended by a written agreement signed by both parties.

3. **Quantity of Water:** The quantity of water Contractor is entitled to receive under this Agreement is Five Hundred (500) acre feet (hereafter "Quantity"). Water delivered to Contractor under this Agreement shall be made available to Contractor by Reclamation pursuant to the terms of the Contract and in the quantity set forth in the Water Delivery Schedule attached hereto as Exhibit "A" and incorporated herein by reference, or as subsequently amended.

4. **Measurement of Water:** The water made available to Contractor under this Agreement will be measured with equipment owned, installed, operated and maintained by Contractor. Upon request by McConnell, Contractor will investigate the accuracy of such measurements and promptly correct any discovered errors.

5. **Use of Water:** The parties agree that water made available under this Agreement may be used for municipal and irrigation purposes.

6. **Payment for Water:** Contractor shall pay to McConnell the sum of Seventy-One Dollars and Six Cents (\$71.06) per acre foot for each acre foot of water purchased under this Agreement. Payments must be received by McConnell within thirty days of each month during which water is scheduled for delivery, and shall be made for the full amount of McConnell water scheduled for that month. Contractor understands that this is a "take or pay" agreement and that Contractor's failure to take delivery of water scheduled under this Contract does not affect Contractor's obligation to pay for the water purchased, provided that if Reclamation permits a change in the schedule, Contractor will pay for the water in accordance with the modified schedule. All payments to McConnell shall be sent to the address indicated in Paragraph 14, below.

7. **Delivery Schedule:** Water shall be available for diversion by Contractor at its existing point of diversion for CVP water in accordance with the attached Water Delivery Schedule. Any quantity of water not diverted by Contractor during the month in which it is scheduled shall be available to Contractor during any subsequent month of the Water Year only upon rescheduling through a revised Water Delivery Schedule and subject to Reclamation's prior approval at least seven (7) days prior to the end of the originally scheduled month. Failure by Reclamation to reschedule unused water shall not relieve Contractor of its obligation to pay McConnell for the water.

8. **Limits on Use:** Contractor may use the water diverted under this Agreement for any beneficial use within its existing service area for CVP water. Contractor may not reallocate, transfer, sell or exchange any portion of the water diverted under this Agreement without McConnell's prior written approval, which may be withheld at McConnell's sole discretion.

9. **Reporting Requirements:** Contractor shall provide McConnell with monthly reports identifying the quantity of water diverted under this Agreement during the immediately preceding month. These reports must be received by McConnell by the 7th day of each month following any month in which water is diverted under this Agreement. Contractor also shall report to Reclamation by the 10th day of each month the quantity of water diverted under this Agreement.

10. **Interruption by Reclamation:** Contractor understands that the water made available under this Agreement is being delivered by Reclamation pursuant to the terms of McConnell's Contract. McConnell shall not be liable to Contractor for any interruption or reduction of water deliveries under this Agreement caused by Reclamation not delivering water under McConnell's Contract. In the event Reclamation does not deliver water to Contractor under this agreement for reasons unrelated to Contractor's actions or inactions, Contractor shall not be required to pay for the undelivered quantity.

11. **Default:** If Contractor fails to pay any amount owed under this Agreement for a period of three (3) days after receiving written notice of this failure from McConnell, McConnell may terminate this Agreement and exercise its rights and remedies under the law.

12. **Assignment Restricted:** Contractor's rights and obligations under this Agreement shall not be assigned without McConnell's prior written consent, which may be withheld in McConnell's sole

and absolute discretion, and any assignment without consent shall be void and have no effect. Subject to this restriction, this Agreement shall inure to the benefit of and be binding on the parties and their respective successors, heirs and assigns.

13. **Indemnification and Hold Harmless:** McConnell shall not be responsible for the control, carriage, handling, use, disposal or distribution of water made available to Contractor under this Agreement. Contractor shall indemnify, defend and hold McConnell, its affiliates, partners, officers, directors, shareholders, employees, independent contractors, agents, successors and assigns harmless from any damage or claim of damage of any nature whatsoever for which there is legal responsibility, including property damage, personal injury or death arising out of or connected with the control, carriage, handling, use, disposal, or distribution of such water, including but not limited to court costs and attorney fees and the fees of expert witnesses.

14. **Notices:** Any notices given under this Agreement shall be in writing and shall be served either personally or delivered by first class or express United States mail with postage prepaid, return receipt requested pursuant to registered or certified mail, or by a nationally recognized overnight commercial courier service with charges prepaid. Notices may also effectively be given by transmittal over electronic transmitting devices if the party to whom the notice is being sent has a receiving device in its office, and provided a complete copy of the notice shall also be served either personally or in the same manner as required for a mailed notice. Notices shall be deemed received at the earlier of actual receipt or three (3) days following deposit in the United States mail with postage prepaid or with a nationally recognized overnight commercial courier service with charges prepaid. Notices shall be directed to the following addresses:

To: McConnell,

John Mancasola
The McConnell Foundation
800 Shasta View Drive
Redding, CA 96003-8208

With a copy to:

Swanson Law Office
Jeffery J. Swanson
2515 Park Marina Drive, Suite 102
Redding, CA 96001

To: Contractor,

John Duckett, City Manager
City of Shasta Lake
4477 Main Street
Shasta Lake, CA 96019

Any party may change its address for notice purposes by giving notice to the others in accordance with this paragraph, provided that the address change shall not be effective until three (3) days after notice of the change.

15. **Force Majeure:** Neither party shall be liable for any loss, damage or penalty resulting from delays or failures in performance resulting from acts of God or other causes beyond its control. Each party agrees to notify the other party promptly of any circumstance delaying its performance and to resume performance as soon thereafter as is reasonably practicable. If there is such a delay or failure due to events as set forth in this paragraph, such delay or failure will result in all scheduled deadlines and time limitations being extended by an amount of time equal to such delay or failure.

16. **Severability:** The unenforceability, invalidity, or illegality of any provision of this Agreement shall not render the other provisions unenforceable, invalid or illegal.

17. **Attorneys' Fees:** In any dispute between the parties, whether or not resulting in litigation, the prevailing party shall be entitled to recover from the other party all reasonable costs, including, without limitation, reasonable attorneys' fees.

18. **No Party Deemed Drafter:** In the event of a dispute between any of the parties hereto over the meaning of this Agreement, no party shall be deemed to have been the drafter hereof, and the principle of law that contracts are construed against the drafter does not and shall not apply.

19. **Authority:** Upon request, each party shall deliver to the other party a certified copy of a resolution of its board of directors/governing body or other evidence authorizing the execution of this Agreement and naming the persons authorized to execute this Agreement on behalf of the named entity.

20. **Counterpart Copies:** This Agreement may be signed in counterpart or duplicate copies, by original, facsimile or email signature, and any signed counterpart or duplicate copy shall be equivalent to a signed original for all purposes.

21. **Entire Agreement/Amendments:** This Agreement, which includes the Exhibits, contains all representations and the entire understanding and agreement between the parties. Correspondence, memoranda, and oral or written agreements which originated before the date of this Agreement are replaced in total by this Agreement unless otherwise expressly stated in this Agreement. The provisions of this Agreement may be waived, altered, amended, or repealed, in whole or in part, only on the written consent of all parties to this Agreement.

IN WITNESS WHEREOF, the parties hereto have signed their names as of the date and year indicated below.

THE MCCONNELL FOUNDATION

By: 
JOHN A. MANCASOLA,
President

Date: 3.20.20

CONTRACTOR

By: 
JOHN DUCKETT,
City Manager

Date: 3/9/2020

EXHIBIT "A"

**WATER SCHEDULE
THE MCCONNELL FOUNDATION/CITY OF SHASTA LAKE**

WATER YEAR 2020-2021

Month	Quantity (af)	Point of Diversion	Place of Use
March	105	COSL Intake – 001	City of Shasta Lake
November	135	COSL Intake – 001	City of Shasta Lake
December	100	COSL Intake – 001	City of Shasta Lake
January	80	COSL Intake – 001	City of Shasta Lake
February	80	COSL Intake – 001	City of Shasta Lake
Total Scheduled	500		

AGREEMENT FOR PURCHASE AND SALE OF WATER

This agreement is made this 7th day of August, 2007, by and between the City of Shasta Lake ("Shasta Lake" herein) and the City of Redding ("Redding" herein) as follows:

Recitals

- A. Shasta Lake desires to improve its water system reliability by purchasing water on an emergency basis from Redding for delivery at an intertie point within Shasta Lake.
- B. Redding presently has a surplus of ground water which it can sell to Shasta Lake.
It is agreed that:
 1. **Water Delivery.** Redding will deliver up to 200,000 gallons of water per day on an emergency basis to Shasta Lake. For each gallon of water delivered, Redding will pump an equivalent amount of ground water into its system to replace the water delivered to Shasta Lake.
 2. **Intertie Point.** The intertie point shall be at the end of Redding's existing 6-inch transmission main that extends east from Newtown Road, under the Union Pacific Railroad tracks, and terminates at a service connection on the east side of the railroad (Refer to attached Exhibit A).
 3. **Construction and Maintenance of Intertie.** Shasta Lake shall maintain the intertie during the life of this agreement.
 4. **Water Cost.** Shasta Lake shall pay Redding a rate equal to Redding's water commodity rate in effect at the time of the deliveries plus ground water pumping costs and any other costs associated with pumping and delivery of water to Shasta Lake. The delivery rate will be updated periodically. Billing shall be monthly for the water delivered during the previous billing period. The water rate for the current one year term of the agreement shall be \$1.14 per one hundred cubic feet delivered.
 5. **Term.** The term of this agreement shall be for one year and shall renew for successive one year terms until such time as either party terminates this Agreement pursuant to Section 7.
 6. **Bureau of Reclamation Approval.** Although not anticipated, the parties acknowledge that the approval of the United States Bureau of Reclamation may be required for the transfer of water between the parties. It is the current understanding of the parties that a groundwater transfer shall not be construed by the Bureau as the transfer of CVP surface water. It shall be the responsibility of Shasta Lake to confirm this understanding before delivery of water begins.
 7. **Termination.** (a) This agreement may be terminated without cause by either Party upon the expiration of thirty (30) calendar days following mailing of a written notice to the non-terminating party.

-3-
Approved 8-7-07

C-3721

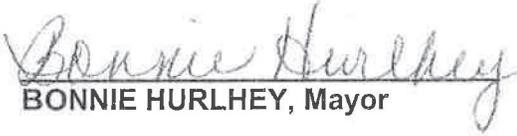
8. **Notice.** Any Notice required to be given by the terms of this agreement shall be by first-class mail, postage prepaid, addressed to the City Manager or at the then current business address of the other party.
9. **Attorneys Fees.** If any action is brought by either party to enforce any term of this agreement, the prevailing party shall be entitled to its reasonable attorneys fees and costs.
10. **Mutual Hold Harmless.** The City of Shasta Lake shall indemnify and save harmless the City of Redding, its elected officials, officers, employees, agents and volunteers, and each and every one of them, from and against all actions, damages, costs, liability, claims, losses and expenses of every type and description to which any or all of them may be subjected, by reason of, or resulting from, directly or indirectly, the negligent performance of this agreement by the City of Shasta Lake.

The City of Redding shall indemnify and save harmless the City of Shasta Lake, its elected officials, officers, employees, agents and volunteers, and each and every one of them, from and against all actions, damages, costs, liability, claims, losses and expenses of every type and description to which any or all of them may be subjected, by reason of, or resulting from, directly or indirectly, the negligent performance of this agreement by the City of Redding.

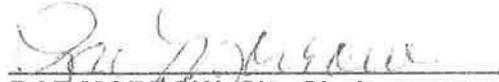
11. **Drought & Emergency Restrictions.** Notwithstanding the hold harmless provisions of Paragraph 10, negligent performance shall not include the inability to deliver the amount of water requested by Shasta Lake due to drought conditions. This agreement to deliver water shall be subject to the same conditions which Redding may place upon the quantity of water used by its resident customers, including percentage cutbacks.

IN WITNESS WHEREOF, the parties, through their duly authorized representatives, have executed this agreement as of the date first above written.

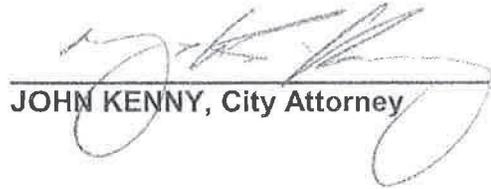
CITY OF SHASTA LAKE


BONNIE HURLHEY, Mayor

ATTEST:


RAE MORROW, City Clerk

FORM APPROVED:


JOHN KENNY, City Attorney

CITY OF REDDING


DICK DICKERSON, Mayor

ATTEST:


CONNIE STROHMAYER, City Clerk

FORM APPROVED:


BARRY E. DEWALT, Asst. City Attorney

EMERGENCY INTERTIE AGREEMENT
BETWEEN
BELLA VISTA WATER DISTRICT
AND
THE CITY OF SHASTA LAKE

This agreement, made this 17th day of June, 1997, by and between Bella Vista Water District, a California Water District, hereinafter referred to as District, and the City of Shasta Lake, hereinafter referred to as City.

RECITALS

The parties hereto have determined that it would be in their best interest to utilize water interties between them for the purpose of water transfers in times of emergency;

The parties hereto have further determined that it would be in their mutual best interests to set forth their respective rights, duties, and obligations concerning emergency transfers of water in a written agreement.

WHEREFORE the parties hereby agree as follows:

1. **Definitions.** For purposes of the agreement, "emergency" includes, but is not limited to, mechanical failures, broken water mains, and system contamination, however, in no event shall a reduced supply of available water to either party be considered an "emergency" for purposes of this agreement;
2. **Notice.** Prior to any transfer of water pursuant to this Agreement, the requesting party shall notify the supplying party orally, that such a transfer is desired, what emergency condition exists which would permit the requested transfer, the anticipated duration of such emergency, and the anticipated quantity of water to be delivered during such transfer. Upon receipt of the request, the supplying party's

authorized agent, shall immediately make a determination as to whether such transfer will be approved, and shall inform the requesting party of its decision, and give the rate of transfer of water in G.P.M., and the start of delivery time. The receiving party will confirm in writing this arrangement within twenty-four (24) hours of start of delivery. The determination of whether or not to approve a request for water transfer shall be in the sole discretion of the supplying party;

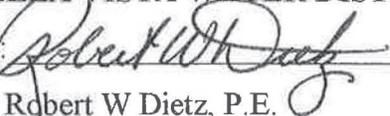
3. **Duration of Transfer.** As water transfers pursuant to this Agreement are strictly limited to emergency situations, any transfer of water shall automatically terminate thirty days (30) from the time the transfer was approved by the supplying party. If the receiving parties request for water transfer exceeds the thirty (30) day period, the receiving party shall submit an additional request for water transfer as provided above;
4. **Costs.** The supplying party, pursuant to a transfer of water under this Agreement, shall be entitled to compensation for actual water supplied based on its wholesale cost of water transferred per emergency, plus the actual cost of treatment, transportation, and administrative costs connected therewith. Neither party is to profit from such transfer;
5. **Indemnification.** The parties hereto agree to indemnify and hold the supplying party harmless from any and all claims of any nature whatsoever arising from , or relating to, the quality of water transferred pursuant to this Agreement, or the inability of failure of the supplying party to deliver water for any reason;
6. **Bureau of Reclamation Approval.** The parties hereby acknowledge that written approval from the United States Bureau of Reclamation may be required for transfer of water between the parties. In the event the Bureau of Reclamation does not grant such approval this Agreement shall terminate;
7. **Termination.** This Agreement shall commence on the date of signing thereof and shall continue until such time as one or more of the following occurs: (a) the United States Bureau of Reclamation disapproves of the transfer contemplated herein; (b) either party determines in its sole discretion that the transfer

contemplated herein would not be in its the best interests; or, either party gives written notice to the other that this Agreement is terminated upon receipt of which this Agreement shall terminate excepting any unpaid financial obligations owing to either upon termination.

8. **Disputes.** If any action or arbitration is commenced to enforce any of the terms or conditions herein, or to enforce collection of monies due pursuant to this Agreement, the prevailing party shall be entitled to reasonable attorney's fees and costs from the losing party;

IN WITNESS WHEREOF, the parties, through their duly authorized representatives, have executed this Agreement as of the date first above written.

BELLA VISTA WATER DISTRICT

By:  _____

Robert W Dietz, P.E.
General Manager

THE CITY OF SHASTA LAKE

By:  _____

Linda Frank, Mayor

WATER PURCHASE AGREEMENT

BETWEEN

CITY OF SHASTA LAKE

AND

BELLA VISTA WATER DISTRICT

This Agreement is made this 7th day of December, 1999, by and between the Bella Vista Water District, a California Water District (hereinafter referred to as "BVWD") and the City of Shasta Lake (hereafter "Shasta Lake"). This Agreement is made with reference to the following facts:

A. BVWD and Shasta Lake maintain a water pipeline intertie connecting their respective public water systems to each other. The foregoing mentioned pipeline has previously been in use for emergency purposes only for transfer of temporary water supplies between the parties to this Agreement.

B. The intertie which is the subject of this Agreement is located at 2703 Akrick Park, Redding, California (hereinafter "the intertie").

C. Shasta Lake has requested to purchase by transfer through the intertie, a portion of BVWD's groundwater supplies. BVWD has determined that, subject to the conditions set forth below in this Agreement, it has sufficient groundwater supply to provide to Shasta Lake.

NOW THEREFORE, IT IS AGREED:

1. Subject to the provisions of paragraph six below, availability and the terms and conditions set forth below in this Agreement, BVWD hereby agrees to sell and Shasta Lake hereby agrees to purchase up to 250 acre feet/year of BVWD groundwater supplies for each year this Agreement is in effect.

2. Water purchased under this Agreement shall be delivered by BVWD to Shasta Lake through the intertie.

3. Water delivered through the intertie shall be measured by means of a six-inch meter installed and maintained by Shasta Lake. The cost of further maintenance shall be borne by Shasta Lake.

4. BVWD shall invoice Shasta Lake monthly for water actually delivered through the intertie. Statements are due and payable upon receipt. The water rate applied to delivery to Shasta Lake under this Agreement shall be \$0.54 per 100 cubic feet, subject to an annual rate increase adjustment of 3% beginning on March 1, 2001.

5. Total water deliveries for which BVWD is obligated under this Agreement are limited to 250 acre feet per year. BVWD shall provide the supply at 250 gpm at the intertie. Additional supplies, if requested by Shasta Lake, may be made available at the sole discretion of BVWD under terms and conditions to be agreed upon prior to delivery by BVWD.

6. BVWD shall be relieved of its obligations hereunder under conditions where BVWD has determined, in its sole discretion, that continued supplies of groundwater to Shasta Lake jeopardizes BVWD's ability to provide service to its customers, including, but not limited to, service for fire protection, human consumption, and sanitation. Under such circumstances, BVWD shall provide Shasta Lake with written notice of such interruption of service, the nature of the conditions justifying the interruption or reduction, the expected duration of service interruption, and the date on which such interruption will commence (which shall be not less than 10 days from the date of the notice).

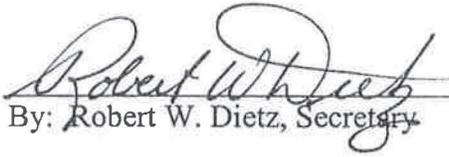
7. Shasta Lake hereby waives any and all claims for loss or damages against BVWD arising from insufficient water quantity or unacceptable water quality under conditions which arise from circumstances which are beyond the control of BVWD.

8. This Agreement shall become effective on the date of execution and shall continue in full force and effect until such time as one or more of the following events first

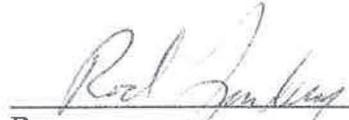
occurs: (i) the expiration of five (5) years from its date; or (ii) 180 days written notice of intent to terminate this Agreement is delivered by either party to the other. This Agreement may be renewed for successive five (5) year terms at the request of either party, upon mutually agreeable terms and conditions.

IN WITNESS WHEREOF, the parties, through their duly acting and authorized representatives, have executed this Agreement as of the date first written above.

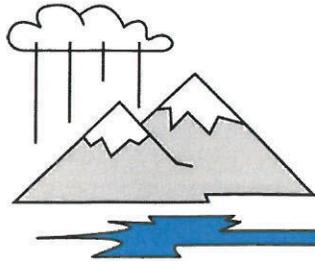
BELLA VISTA WATER DISTRICT


By: Robert W. Dietz, Secretary

THE CITY OF SHASTA LAKE


By: Rod Lindsay, Mayor

W-100-095-046



DIRECTORS
TED BAMBINO BOB NASH
JIM SMITH LEIMONE WAITE
FRANK SCHABARUM

DAVID J. COXEY
Secretary/Treasurer/General Manager

BELLA VISTA WATER DISTRICT

11368 E. STILLWATER WAY • REDDING, CALIFORNIA 96003-9510
TELEPHONE (530) 241-1085 • FAX (530) 241-8354

May 30, 2018

Mr. John Duckett
City Manager
1650 Stanton Drive
Shasta Lake, CA 96019

Re: Letter of Agreement for Intertie Meter Replacement and Relocation

Dear Mr. Duckett:

This Letter of Agreement (LOA) between the Bella Vista Water District (“DISTRICT”) and the City of Shasta Lake (“CITY”) is in response to our discussions and meetings on the subject matter.

Background: The DISTRICT and CITY have an existing water system intertie connection that allows for water to flow from one agency’s public water system to the other during times of emergency. Both agencies entered into an “Emergency Intertie Agreement Between Bella Vista Water District and the City of Shasta Lake,” on June 17, 1997.

The water meter that measures water delivery between the two agencies is no longer functioning correctly and needs to be replaced. Water age and quality considerations makes the installation of blow-off valves desirable so that either agency can flush lines to ensure high quality water prior to activating the intertie. Recent and anticipated development in the region makes it desirable to relocate the meter to a location closer to the common boundary between the two agencies. Additionally, both agencies believe that it is desirable to update the language, terms and conditions in a superseding Emergency Intertie Agreement.

Purpose: It is recognized by both parties that it is desirable to have a fully functional water system intertie during emergency events to ensure continued water service until the emergency can be mitigated. Accurate water metering is necessary for operations, equity and reimbursement. Blow-off assemblies are desirable for flushing purposes to ensure water quality and disinfection residual.

Costs for Materials: The DISTRICT and CITY agree to share the material costs for a new meter, pipe fittings, blow-off assemblies and appurtenances equally (50% each). DISTRICT will plan to order, receive and install the materials and will provide receipts and documentation to the CITY for reimbursement of 50 percent of material costs and not to exceed \$6,000, with payment due in 30-days.

We are an equal opportunity employer and provider.

Mr. Duckett
May 30, 2018
Page 2 of 2

Installation Labor and Equipment: The DISTRICT will provide all necessary labor and equipment to install the new intertie meter, valves, fitting and appurtenances. DISTRICT will remove the existing pressure reducing valve.

Term: This Letter of Agreement will become effective on the date counter-signed below and shall remain in effect until the new intertie installation and reimbursement is completed.

Bella Vista Water District hereby requests the existing "Emergency Intertie Agreement Between Bella Vista Water District and the City of Shasta Lake," dated June 17, 1997, terminate upon execution of a successor Agreement by both parties. Once installed, the intertie will be operated in accordance with the "Emergency Intertie Agreement Between Bella Vista Water District and the City of Shasta Lake."

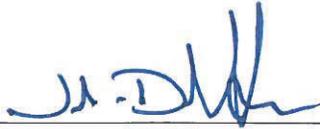
Thank you for your assistance and mutual commitment to ensuring continued water service during emergency events. Please sign both copies of this LOA and return one to Bella Vista Water District.

Sincerely,



David J. Coxey
General Manager

IN DUPLICATE



City of Shasta Lake

Date: 6/29/2018

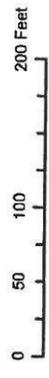


Proposed Intertie Location
 +/- 280 ft from District Boundary

- Valve
- Pressure Reducing Valve
- Water Main
- Meter
- Proposed Intertie
- Existing Intertie
- Parcels

EXHIBIT A

Bella Vista Water District / Shasta Lake City Intertie



EMERGENCY INTERTIE AGREEMENT

BETWEEN

THE CITY OF SHASTA LAKE

AND

BELLA VISTA WATER DISTRICT

THIS AGREEMENT is made in Redding, California, by and between THE CITY OF SHASTA LAKE, a Municipal Corporation ("CITY"), whose address is 1650 Stanton Drive, Shasta Lake, CA 96019 and BELLA VISTA WATER DISTRICT, ("DISTRICT"), a California Water District, whose address is 11368 East Stillwater Way, Redding, CA 96003, for an Emergency Intertie Agreement ("Agreement").

RECITALS

- A. There presently exists between the parties an Emergency Intertie Agreement which was executed by the CITY and DISTRICT on June 17, 1997. Upon execution of this document, the existing Emergency Intertie Agreement shall be terminated and be of no further force or effect as between the parties.
- B. The parties hereto have determined that it would be in their best interests to utilize a water intertie between them for the purpose of water transfers in times of emergency; the Intertie is a direct physical connection between the two agencies water systems consisting of mainline water valves, two blow-off assemblies, and a forward and reverse water meter to account for water supplied by either agency under this Agreement.
- C. The parties hereto further determine that it would be in their mutual best interests to set forth their respective rights, duties, and obligations concerning emergency transfers of water and maintenance of Intertie equipment, facilities and appurtenances (the "Intertie") in a written agreement.

NOW, THEREFORE, IT IS AGREED AS FOLLOWS:

- 1. Definitions: For purposes of the Agreement, "emergency" includes, but is not limited to, mechanical failures, broken water mains, fire and system contamination; however, in no event shall a reduced supply of available water to either party be considered an "emergency" for purposes of this Agreement.
- 2. Notice: Prior to any transfer of water pursuant to this Agreement, the requesting party shall notify the supplying party orally that such a transfer is desired; what emergency condition exists which would permit that requested transfer, the anticipated duration of such emergency, and the anticipated quantity of water to be delivered during such transfer. Upon receipt of the request, the supplying party's authorized agent, shall immediately make a determination as to whether such transfer will be approved and shall orally inform the requesting party of its decision, and give the rate of transfer of water in gallons per minute (GPM), and the start of delivery time. The determination of whether or not to

approve a request for water transfer shall be in the sole discretion of the supplying party. The party receiving water will confirm with the supplying party, in writing, the specific conditions concerning the transfer, such writing to be sent within twenty-four (24) hours of the start of delivery of water.

3. Duration of Transfer: All water transfers pursuant to this Agreement are strictly limited to emergency situations, any approval of a transfer of water shall terminate immediately upon the conclusion of the emergency or automatically terminate thirty days (30) from the time the transfer was orally approved by the supplying party, whichever is earlier. However, if the receiving party's request for water transfer exceeds the thirty (30) day period, the receiving party shall submit an additional request for water prior to the end of the automatic thirty (30) day termination date. The supplying party may revise or terminate the transfer as necessary in order to minimize system impacts.
4. Intertie Point: An existing Intertie point between the parties to this Agreement already exist at the City of Shasta Lake Pump Station and will be relocated, as shown on Exhibit A. The parties shall cooperate in making the Intertie meter facilities accessible to each party so as to facilitate the use of water pursuant to this Agreement.
5. Transfer of Water: The supplying party, pursuant to a transfer of water under this Agreement shall be entitled to compensation for actual water supplied pursuant to this Agreement. Water shall be replaced in kind, to the supplying party, through the intertie point listed in this agreement. The transfer of the replacement water shall take place within one year of the start of delivery of water for the emergency and preferably within the same CVP Contact Water Year. Both parties shall agree on the time and duration of the transfer of water to be replaced.
6. Water Quality: The receiving party, pursuant to a transfer of water under this Agreement, shall be responsible for periodic routine flushing and for flushing immediately prior to taking delivery of water through the intertie to ensure that water is of high quality and contains a disinfectant residual.
7. Indemnification: A party receiving water transfers pursuant to this Agreement hereby agrees to indemnify and hold harmless the supplying party, its directors, officials, officers, employees, agents and volunteers, and each and every one of them, from any and all claims of any nature whatsoever arising from or relating to, directly or indirectly, negligent performance of this Agreement by the supplying party, or relating to the quality of water transferred pursuant to this Agreement, or the inability of failure of the supplying party to deliver water for any reason whatsoever.
8. Bureau of Reclamation Approval: The parties hereby acknowledge that written approval from the United States Bureau of Reclamation ("Bureau") may be required for transfer of surface source water between the parties. Transfers of groundwater are not subject to Bureau approval.
9. Term: This Agreement shall commence on the last date of signing hereto and shall continue until such time as either party determines in its sole and absolute discretion that the transfer contemplated herein would not be in its best interests. Either party can, at any time, provide written notice to the other party that this Agreement is to be terminated on

the date and time provided in the written notice. This Agreement shall terminate on the date and time provided in the written notice; however, that any unpaid financial obligations owing to either party shall survive termination of this Agreement and be payable in accordance with their terms.

10. Disputes: If any action or arbitration is commenced to enforce any of the terms or conditions herein, or to enforce collection of monies due pursuant to this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees and costs.
11. Maintenance: Maintenance and repair of the Intertie meter facilities shall be shared equally with regard to incurred expenses of repair, replacement, and calibration. Prior to maintenance and repair of the Intertie meter facilities, the parties shall agree with respect to the work to be done and the cost thereof. All other maintenance and repair of the intertie water line shall be the responsibility of the respective utilities within their service area.
12. Date of Agreement: The date of this agreement shall be the date it is signed by the second party to sign.

IN WITNESS WHEREOF, the City of Shasta Lake and the Bella Vista Water District have executed this Agreement on the days and year set forth below.

CITY OF SHASTA LAKE,
A Municipal Corporation

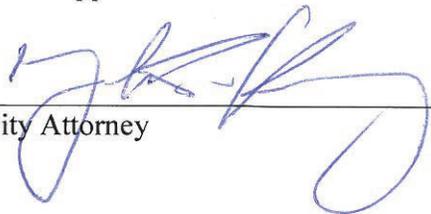
Date: JUNE 28, 2018

By: 
John N. Duckett, Jr.
City Manager

Attest


City Clerk

Form Approved:


City Attorney

Date: June 28, 2018, 2018

BELLA VISTA WATER DISTRICT
a California Water District

By: 
Robert Nash
President, Board of Directors

Attest

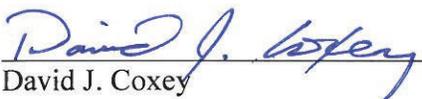

David J. Coxey
General Manager/Secretary-Treasurer

Exhibit A – Intertie Location Map

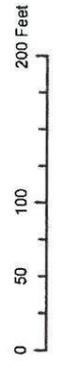


Proposed Intertie Location
 +/- 280 ft from District Boundary

- Valve
- Pressure Reducing Valve
- Water Main
- Meter
- Proposed Intertie
- Existing Intertie
- Parcels

EXHIBIT A

Bella Vista Water District / Shasta Lake City Intertie



P.O. BOX 990431
REDDING, CA 96099-0431
PHONE (530) 246-0680



8930 PLACER ROAD
REDDING, CA 96001-9719
FAX (530) 246-2254

COMMUNITY SERVICES DISTRICT

February 5, 2016

John Duckett, City Manager
City of Shasta Lake
PO Box 777
Shasta Lake, CA 96019

Subject: Agreement for Purchase and Sale of Water Between the Centerville Community Services District and the City of Shasta Lake – No. 2016-01

Dear John,

Attached for your records is a signed original of the subject agreement. Being that the agreement is for use of 65 acre-feet during February 2016, please notify me at your earliest convenience should your usage trends indicate a need for additional water so that it can be properly reviewed and scheduled.

Please contact me at your earliest convenience should you need further information or wish to discuss this subject further.

Sincerely,

A handwritten signature in blue ink, appearing to read "Chris Muehlbacher".

Chris Muehlbacher
District Manager

**AGREEMENT FOR PURCHASE AND SALE OF WATER
BETWEEN THE CENTERVILLE COMMUNITY SERVICES DISTRICT
AND THE CITY OF SHASTA LAKE**

This Agreement is made and entered into to be effective the 2nd day of February, 2016, by and between the CENTERVILLE COMMUNITY SERVICES DISTRICT (hereinafter referred to as "CENTERVILLE"), a Community Services District organized in compliance with the laws of the State of California, and the City of Shasta Lake (hereinafter referred to as "CONTRACTOR"). Sale of this water is contingent upon CENTERVILLE's M&I contract allocation from the Bureau of Reclamation remaining at 100%. If that allocation is reduced, this Agreement shall be terminable by CENTERVILLE upon written notice to CONTRACTOR. This Agreement is entered into with respect to the following facts:

A. CENTERVILLE, pursuant to a Contract Between the United States of America and Centerville Community Services District for Exchange of Water, Contract #00-WC-20-1708 dated August 11, 2000 (the "Contract"), owns nine hundred (900) acre-feet of water (the "Water");

B. The Contract further provides that CENTERVILLE may designate one or more persons or entities to receive Water without such designation being deemed an assignment or transfer requiring approval by the Bureau of Reclamation;

C. The Contract provides that the Water shall be made available by the Bureau of Reclamation to CENTERVILLE or its designee, without charge, at existing Central Valley Project ("CVP") facilities located in Shasta County; and

D. CONTRACTOR desires to purchase from CENTERVILLE Sixty-Five (65) acre-feet of Water for use during the month of February 2016.

NOW, THEREFORE, THE PARTIES HERETO AGREE AS FOLLOWS:

1. **Purchase and Sale of Water:** CENTERVILLE hereby agrees to sell to CONTRACTOR and CONTRACTOR hereby agrees to buy from CENTERVILLE, Sixty-Five (65) acre-feet of Water for use during the term of this Agreement and as hereinafter provided.

2. **Term:** CONTRACTOR shall purchase Water for use during the month of February 2016 within the City of Shasta Lake. This Agreement shall terminate February 29, 2016.

3. **Payment for Water:** CONTRACTOR shall pay to CENTERVILLE upon execution of this Agreement the sum of Fourteen Thousand Six Hundred and Twenty-Five Dollars (\$14,625.00) being Two Hundred and Twenty-Five Dollars (\$225.00) per acre-foot of Water, plus Two Hundred Fifty Dollars (\$250.00) for an Administration Fee.

4. **Scheduling and Delivery of Water:** CENTERVILLE will, pursuant to the Contract, schedule delivery of the Water for the month of February 2016. CONTRACTOR upon execution of this Agreement has scheduled the amount of Water to be delivered during the month of this Agreement as included in Exhibit "A".

The Contract provides that the Water shall be made available to CENTERVILLE or its designees at any existing CVP facility located in Shasta County. CENTERVILLE shall notify the Bureau of Reclamation that the Sixty-Five (65) acre-feet of Water purchased by CONTRACTOR shall be delivered to CONTRACTOR at the City of Shasta Lake's access point at Shasta Lake. CENTERVILLE's obligation to serve water is contingent upon the availability of water and existence of delivery.

5. **Verification of Water:** CONTRACTOR shall provide a written verification at the end of the month, of the total Water removed from Shasta Lake pursuant to the terms of this Agreement. In the event that CONTRACTOR utilizes in excess of the Sixty-Five (65) acre-feet of Water provided for by this Agreement, CONTRACTOR agrees to pay to CENTERVILLE the sum of Two Hundred Twenty-Five Dollars (\$225.00) per acre-foot and pro-rated for any water used less than one (1) full acre-foot. Such payment shall be made at the time of the written verification provided to CENTERVILLE by CONTRACTOR. It is expressly understood, that CONTRACTOR has no right to exceed the Sixty-Five (65) acre-feet of water sold to CONTRACTOR pursuant to this Agreement and CONTRACTOR covenants and agrees to not do so.

6. **Permits:** Should any permit or authorization from any regulatory agency having jurisdiction thereof be required for the removal and/or use of the Water it shall be the responsibility of CONTRACTOR at its sole cost and expense to obtain any and all such permits or authorizations.

7. **Law:** The rights and obligations contained in this Agreement shall be governed by the provisions of California law.

8. **No Party Deemed Drafter:** In the event of any dispute between the parties hereto over the content or interpretation of this Agreement, neither party hereto shall be deemed to have been the drafter hereof, each party having been separately represented by legal counsel.

9. **Attorney's Fees:** In the event suit or action is brought by any party under this Agreement to interpret or to enforce any of the terms of this Agreement, the prevailing party shall be entitled to an award of reasonable attorney's fees and court costs to be fixed by the court having jurisdiction thereof.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement to be effective as of the day and year first above written.

CENTERVILLE COMMUNITY SERVICES DISTRICT

By  2/5/2016
CHRIS MUEHLBACHER
District Manager

CITY OF SHASTA LAKE

By  2/3/2016
JOHN DUCKETT
City Manager

Exhibit "A" – Water Schedule

City of Shasta Lake	
February - 2016	65 – acre-feet
TOTAL	65 – acre-feet

Appendix E

CLIMATE CHANGE VULNERABILITY ASSESSMENT

The Climate Change Vulnerability Assessment is taken from the Climate Change Handbook for Regional Water Planning, USEPA and DWR, 2011. The vulnerability assessment highlights those water-related resources that are important to a region and are sensitive to climate change.

I. Water Demand

Are there major industries that require cooling/process water in your planning region?

- As average temperatures increase, cooling water needs may also increase.
- Identify major industrial water users in your region and assess their current and projected needs for cooling and process water.

Does water use vary by more than 50% seasonally in parts of your region?

- Seasonal water use, which is primarily outdoor water use, is expected to increase as average temperatures increase and droughts become more frequent.
- Where water use records are available, look at total monthly water uses averaged over the last five years (if available). If maximum and minimum monthly water uses vary by more than 25%, then the answer to this question is "yes"
- Where no water use records exist, is crop irrigation responsible for a significant (say >50%) percentage of water demand in parts of your region?

Are crops grown in your region climate-sensitive? Would shifts in daily heat patterns, such as how long heat lingers before night-time cooling, be prohibitive for some crops?

- Fruit and nut crops are climate-sensitive and may require additional water as the climate warms.

Do groundwater supplies in your region lack resiliency after drought events?

- Droughts are expected to become more frequent and more severe in the future. Areas with a more hardened demand may be particularly vulnerable to droughts and may become more dependent on groundwater pumping.

Are water use curtailment measures effective in your region?

- Droughts are expected to become more frequent and more severe in the future. Areas with a more hardened demand may be particularly vulnerable to droughts.

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Are some instream flow requirements in your region either currently insufficient to support aquatic life, or occasionally unmet?

- Changes in snowmelt patterns in the future may make it difficult to balance water demands. Vulnerabilities for ecosystems and municipal/agricultural water needs may be exacerbated by instream flow requirements that are:
 1. not quantified,
 2. not accurate for ecosystem needs under multiple environmental conditions including droughts, and
 3. not met by regional water managers.

II. Water Supply

Does a portion of the water supply in your region come from snowmelt?

- Snowmelt is expected to decrease as the climate warms. Water systems supplied by snowmelt are therefore potentially vulnerable to climate change.
- Where watershed planning documents are available, refer to these in identifying parts of your region that rely on surface water for supplies; if your region contains surface water supplies originating in watersheds where snowpack accumulates, the answer to this question is "Yes."
- Where planning documents are not available, identify major rivers in your region with large users. Identify whether the river's headwaters are fed by snowpack.

Does part of your region rely on water diverted from the Delta, imported from the Colorado River, or imported from other climate-sensitive systems outside your region?

- Some imported or transferred water supplies are sources from climate-sensitive watersheds, such as water imported from the Delta and the Colorado River.

Does part of your region rely on coastal aquifers? Has salt intrusion been a problem in the past?

- Coastal aquifers are susceptible to salt intrusion as sea levels rise, and many have already observed salt intrusion due to over-extraction, such as the West Coast Basin in southern California.

Would your region have difficulty in storing carryover supply surpluses from year to year?

- Droughts are expected to become more severe in the future. Systems that can store more water may be more resilient to droughts.

Has your region faced a drought in the past during which it failed to meet local water demands?

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- Droughts are expected to become more severe in the future. Systems that have already come close to their supply thresholds may be especially vulnerable to droughts in the future.

Does your region have invasive species management issues at your facilities, along conveyance structures, or in habitat areas?

- As invasive species are expected to become more prevalent with climate change, existing invasive species issues may indicate an ecological vulnerability to climate change.

III. Water Quality

Are increased wildfires a threat in your region? If so, does your region include reservoirs with fire-susceptible vegetation nearby which could pose a water quality concern from increased erosion?

- Some areas are expected to become more vulnerable to wildfires over time. To identify whether this is the case for parts of your region, the California Public Interest Energy Research (PIER) Program has posted wildfire susceptibility projections as a Google Earth application at: <http://cal-adapt.org/fire/>. These projections are only the results of a single study and are not intended for analysis, but can aid in qualitatively answering this question. Read the application's disclaimers carefully to be aware of its limitations.

Does part of your region rely on surface water bodies with current or recurrent water quality issues related to eutrophication, such as low dissolved oxygen or algal blooms? Are there other water quality constituents potentially exacerbated by climate change?

- Warming temperatures will result in lower dissolved oxygen levels in water bodies, which are exacerbated by algal blooms and in turn enhance eutrophication. Changes in streamflows may alter pollutant concentrations in water bodies.

Are seasonal low flows decreasing for some waterbodies in your region? If so, are the reduced low flows limiting the waterbodies' assimilative capacity?

- In the future, low flow conditions are expected to be more extreme and last longer. This may result in higher pollutant concentrations where loadings increase or remain constant.

Are there beneficial uses designated for some water bodies in your region that cannot always be met due to water quality issues?

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- In the future, low flows are expected decrease, and to last longer. This may result in higher pollutant concentrations where loadings increase or remain constant.
- Does part of your region currently observe water quality shifts during rain events that impact treatment facility operation?*
 - While it is unclear how average precipitation will change with temperature, it is generally agreed that storm severity will probably increase. More intense, severe storms may lead to increased erosion, which will increase turbidity in surface waters. Areas that already observe water quality responses to rainstorm intensity may be especially vulnerable.

IV. Sea Level Rise

- Has coastal erosion already been observed in your region?*
 - Coastal erosion is expected to occur over the next century as sea levels rise.
- Are there coastal structures, such as levees or breakwaters, in your region?*
 - Coastal structures designed for a specific mean sea level may be impacted by sea level rise.
- Is there significant coastal infrastructure, such as residences, recreation, water and wastewater treatment, tourism, and transportation) at less than six feet above mean sea level in your region?*
 - Coastal flooding will become more common, and will impact a greater extent of property, as sea levels rise. Critical infrastructure in the coastal floodplain may be at risk.
 - Digital elevation maps should be compared with locations of coastal infrastructure.
- Are there climate-sensitive low-lying coastal habitats in your region?*
 - Low-lying coastal habitats that are particularly vulnerable to climate change include estuaries and coastal wetlands that rely on a delicate balance of freshwater and salt water.
- Are there areas in your region that currently flood during extreme high tides or storm surges?*

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- Areas that are already experiencing flooding during storm surges and very high tides, are more likely to experience increased flooding as sea levels rise.
- Is there land subsidence in the coastal areas of your region?*
 - Land subsidence may compound the impacts of sea level rise.
- Do tidal gauges along the coastal parts of your region show an increase over the past several decades?*
 - Local sea level rise may be higher or lower than state, national, or continental projections.
 - Planners can find information on local tidal gauges at http://tidesandcurrents.noaa.gov/sltrends/sltrends_states.shtml?region=ca

V. Flooding

- Does critical infrastructure in your region lie within the 200-year floodplain? DWR's best available floodplain maps are available at: http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fes/best_available_maps/*
 - While it is unclear how average precipitation will change with temperature, it is generally agreed that storm severity will probably increase. More intense, severe storms may lead to higher peak flows and more severe floods.
 - Refer to FEMA floodplain maps and any recent FEMA, US Army Corps of Engineers, or DWR studies that might help identify specific local vulnerabilities for your region. Other follow-up questions that might help answer this question:
 1. What public safety issues could be affected by increased flooding events or intensity? For example, evacuation routes, emergency personnel access, hospitals, water treatment and wastewater treatment plants, power generation plants and fire stations should be considered.
 2. Could key regional or economic functions be impacted from more frequent and/or intense flooding?
- Does part of your region lie within the Sacramento-San Joaquin Drainage District?*
 - The SSJDD contains lands that are susceptible to overflows from the Sacramento and San Joaquin Rivers, and are a key focus of the Central Valley Flood Protection Plan. (<http://www.water.ca.gov/cvfmpp/program.cfm>).
- Does aging critical flood protection infrastructure exist in your region?*

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- Levees and other flood protection facilities across the state of California are aging and in need of repair. Due to their overall lowered resiliency, these facilities may be particularly vulnerable to climate change impacts.
- DWR is evaluating more than 300 miles of levees in the San Joaquin and Sacramento Rivers Valleys and the Delta (<http://www.water.ca.gov/levees/>).

Have flood control facilities (such as impoundment structures) been insufficient in the past?

- Reservoirs and other facilities with impoundment capacity may be insufficient for severe storms in the future. Facilities that have been insufficient in the past may be particularly vulnerable.

Are wildfires a concern in parts of your region?

- Wildfires alter the landscape and soil conditions, increasing the risk of flooding within the burn and downstream areas. Some areas are expected to become more vulnerable to wildfires over time. To identify whether this is the case for parts of your region, the California Public Interest Energy Research Program (PIER) has posted wildfire susceptibility projections as a Google Earth application at: <http://cal-adapt.org/fire/>. These projections are the results of only a single study and are not intended for analysis, but can aid in qualitatively answering this question. Read the application's disclaimers carefully to be aware of its limitations.

VI. Ecosystem and Habitat Vulnerability

Does your region include inland or coastal aquatic habitats vulnerable to erosion and sedimentation issues?

- Erosion is expected to increase with climate change, and sedimentation is expected to shift. Habitats sensitive to these events may be particularly vulnerable to climate change.

Does your region include estuarine habitats which rely on seasonal freshwater flow patterns?

- Seasonal high and low flows, especially those originating from snowmelt, are already shifting in many locations.

Do climate-sensitive fauna or flora populations live in your region?

- Some specific species are more sensitive to climate variations than others.

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Do endangered or threatened species exist in your region? Are changes in species distribution already being observed in parts of your region?

- Species that are already threatened or endangered may have a lowered capacity to adapt to climate change.

Does the region rely on aquatic or water-dependent habitats for recreation or other economic activities?

- Economic values associated with natural habitat can influence prioritization.

Are there rivers in your region with quantified environmental flow requirements or known water quality/quantity stressors to aquatic life?

- Constrained water quality and quantity requirements may be difficult to meet in the future.

Do estuaries, coastal dunes, wetlands, marshes, or exposed beaches exist in your region? If so, are coastal storms possible/frequent in your region?

- Storm surges are expected to result in greater damage in the future due to sea level rise. This makes fragile coastal ecosystems vulnerable.

Does your region include one or more of the habitats described in the Endangered Species Coalition's Top 10 habitats vulnerable to climate change <http://www.endangered.org/its-getting-hot-out-there/> ?

- These ecosystems are particularly vulnerable to climate change.

Are there areas of fragmented estuarine, aquatic, or wetland wildlife habitat within your region? Are there movement corridors for species to naturally migrate? Are there infrastructure projects planned that might preclude species movement?

- These ecosystems are particularly vulnerable to climate change.

VII. Hydropower

Is hydropower a source of electricity in your region?

- As seasonal river flows shift, hydropower is expected to become less reliable in the future.

Appendix I **Climate Change Vulnerability Assessment** Final

Are energy needs in your region expected to increase in the future? If so, are there future plans for hydropower generation facilities or conditions for hydropower generation in your region?

- Energy needs are expected to increase in many locations as the climate warms. This increase in electricity demand may compound decreases in hydropower production, increasing its priority for a region.

Appendix F
ENERGY INTENSITY FORM

Urban Water Supplier:

City of Shasta Lake

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

Retail Potable Deliveries

Table O-1B: Recommended Energy Reporting - Total Utility Approach

Enter Start Date for Reporting Period	1/1/2020	Urban Water Supplier Operational Control		
End Date	12/31/2020			
<input type="checkbox"/> Is upstream embedded in the values reported?		Sum of All Water Management Processes	Non-Consequential Hydropower	
<i>Water Volume Units Used</i>	AF		Total Utility	Hydropower
<i>Volume of Water Entering Process (volume unit)</i>		2,215	0	2,215
<i>Energy Consumed (kWh)</i>		333,317	0	333,317
<i>Energy Intensity (kWh/vol. converted to MG)</i>		462	#DIV/0!	462

Quantity of Self-Generated Renewable Energy

0 kWh

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

Metered Data

Data Quality Narrative:

Energy consumption data for retail potable water deliveries. The City does not have any hydropower.

Narrative:

The energy consumed was obtained from the electric power bills that are based on electric meter reads.

Appendix G

2020 CONSUMER CONFIDENCE REPORT

2020 Consumer Confidence Report

Water System Information

Water System Name: City of Shasta Lake

Report Date: March 8, 2021

Type of Water Source(s) in Use: Surface Water

Name and General Location of Source(s): Lake Shasta

Drinking Water Source Assessment Information: A *source water assessment* was conducted for the City of Shasta Lake's Raw Water Intake in January 2003. The source is considered vulnerable to the following activities not associated with any detected contaminants: Automobile gas stations, chemical/petroleum, processing/storage, and concentrated animal facilities as defined in federal regulations. A copy of the *assessment* may be viewed at the City of Shasta Lake, 4477 Main St.

Time and Place of Regularly Scheduled Board Meetings for Public Participation: 6:00 pm, 1st and 3rd Tuesday of each month. Shasta Lake Council Chambers, 4488 Red Bluff St.

For More Information, Contact: Tony Thomasy, 530-275-7488

About This Report

We test the drinking water quality for many constituents as required by state and federal regulations. This report shows the results of our monitoring for the period of January 1 to December 31, 2020 and may include earlier monitoring data.

Importance of This Report Statement in Five Non-English Languages (Spanish, Mandarin, Tagalog, Vietnamese, and Hmong)

Language in Spanish: Este informe contiene información muy importante sobre su agua para beber. Favor de comunicarse City of Shasta Lake a 4477 Main St. 530-275-7400 para asistirlo en español.

Language in Mandarin: 这份报告含有关于您的饮用水的重要讯息。请用以下地址和电话联系 City of Shasta Lake 以获得中文的帮助: 4477 Main St. 530-275-7400.

Language in Tagalog: Ang pag-uulat na ito ay naglalaman ng mahalagang impormasyon tungkol sa inyong inuming tubig. Mangyaring makipag-ugnayan sa City of Shasta Lake 4477 Main St. o tumawag sa 530-275-7400 para matulungan sa wikang Tagalog.

Language in Vietnamese: Báo cáo này chứa thông tin quan trọng về nước uống của bạn. Xin vui lòng liên hệ City of Shasta Lake tại 4477 Main St. 530-275-7400 để được hỗ trợ giúp bằng tiếng Việt.

Language in Hmong: Tsaab ntawv no muaj cov ntsiab lus tseem ceeb txog koj cov dej haus. Thov hu rau City of Shasta Lake ntawm 4477 Main St. 530-275-7400 rau kev pab hauv lus Askiv.

Terms used in this Report

Term	Definition
Level 1 Assessment	A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.
Level 2 Assessment	A Level 2 assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an <i>E. coli</i> MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.
Maximum Contaminant Level (MCL)	The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.
Maximum Contaminant Level Goal (MCLG)	The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency (U.S. EPA).
Maximum Residual Disinfectant Level (MRDL)	The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
Maximum Residual Disinfectant Level Goal (MRDLG)	The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
Primary Drinking Water Standards (PDWS)	MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.
Public Health Goal (PHG)	The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.
Regulatory Action Level (AL)	The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
Secondary Drinking Water Standards (SDWS)	MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect the health at the MCL levels.
Treatment Technique (TT)	A required process intended to reduce the level of a contaminant in drinking water.
Variations and Exemptions	Permissions from the State Water Resources Control Board (State Board) to exceed an MCL or not comply with a treatment technique under certain conditions.
ND	Not detectable at testing limit.
ppm	parts per million or milligrams per liter (mg/L)
ppb	parts per billion or micrograms per liter (µg/L)
ppt	parts per trillion or nanograms per liter (ng/L)
ppq	parts per quadrillion or picogram per liter (pg/L)
pCi/L	picocuries per liter (a measure of radiation)

Sources of Drinking Water and Contaminants that May Be Present in Source Water

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

Contaminants that may be present in source water include:

- *Microbial contaminants*, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

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

Regulation of Drinking Water and Bottled Water Quality

In order to ensure that tap water is safe to drink, the U.S. EPA and the State Board prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health.

About Your Drinking Water Quality

Drinking Water Contaminants Detected

Tables 1 through 7 list all of the drinking water contaminants that were detected during the most recent sampling for the constituent. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. The State Board allows us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data, though representative of the water quality, are more than one year old. Any violation of an AL, MCL, MRDL, or TT is asterisked. Additional information regarding the violation is provided later in this report.

Table 1. Sampling Results Showing the Detection of Coliform Bacteria

Complete if bacteria are detected.

Microbiological Contaminants	Highest No. of Detections	No. of Months in Violation	MCL	MCLG	Typical Source of Bacteria
Total Coliform Bacteria (State Total Coliform Rule)	(In a month) 0	0	1 positive monthly sample ^(a)	0	Naturally present in the environment
Fecal Coliform or <i>E. coli</i> (State Total Coliform Rule)	(In the year) 0	0	A routine sample and a repeat sample are total coliform positive, and one of these is also fecal coliform or <i>E. coli</i> positive	None	Human and animal fecal waste
<i>E. coli</i> (Federal Revised Total Coliform Rule)	(In the year) 0	0	(b)	0	Human and animal fecal waste

(a) Two or more positive monthly samples is a violation of the MCL

(b) Routine and repeat samples are total coliform-positive and either is *E. coli*-positive or system fails to take repeat samples following *E. coli*-positive routine sample or system fails to analyze total coliform-positive repeat sample for *E. coli*.

Table 2. Sampling Results Showing the Detection of Lead and Copper

Complete if lead or copper is detected in the last sample set.

Lead and Copper	Sample Date	No. of Samples Collected	90 th Percentile Level Detected	No. Sites Exceeding AL	AL	PHG	No. of Schools Requesting Lead Sampling	Typical Source of Contaminant
Lead (ppb)	2019	30	ND	0	15	0.2	0	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
Copper (ppm)	2019	30	.08	0	1.3	0.3	N/A	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

Table 3. Sampling Results for Sodium and Hardness

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL	PHG (MCLG)	Typical Source of Contaminant
Sodium (ppm)	2012	6.92	N/A	None	None	Salt present in the water and is generally naturally occurring
Hardness (ppm)	2012	50	N/A	None	None	Sum of polyvalent cations present in the water, generally magnesium and calcium, and are usually naturally occurring

Table 4. Detection of Contaminants with a Primary Drinking Water Standard

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	MCL [MRDL]	PHG (MCLG) [MRDLG]	Typical Source of Contaminant
Aluminum (ppb)	2012	73	N/A	1000	600	Erosion of natural deposits; residue from some surface water treatment processes
Flouride (ppm)	2012	0.1	N/A	4.0	4.0	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
Chlorine (ppm)	2020	2.04	0.1 to 2.5 average	4.0	4.0	Disinfection added to drinking water by regulation
Total Trihalomethanes (ppb) (Distribution System)	Quarterly 2020	28.9 average	20.7 to 40.8	80	N/A	By-product of drinking water disinfection

Total of Five Haloacetic Acids-HAA5 (ppb) (Distribution System)	Quarterly 2020	14.3 average	3.28 to 24.3	60	N/A	By-product of drinking water disinfection
Total Chromium (ppb)	2015	0.32 average	0.23 to 0.36	50	100	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits

Table 5. Detection of Contaminants with a Secondary Drinking Water Standard

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	SMCL	PHG (MCLG)	Typical Source of Contaminant
Aluminum (ppb)	2012	73	N/A	200	-	Erosion of natural deposits; residue from some surface water treatment processes
Chloride (ppb)	2012	2.1	N/A	500	N/A	Runoff/leaching from natural deposits; seawater influence
Sulfate (ppm)	2012	3.5	N/A	500	N/A	Runoff/leaching from natural deposits; seawater influence
Specific Conductance (uS/cm)	2012	120	N/A	1600	N/A	Runoff/leaching from natural deposits; seawater influence
Total Dissolved Solids (ppm)	2012	81	N/A	1000	N/A	Runoff/leaching from natural deposits
Turbidity (NTU) (before treatment)	2012	1.8	N/A	5	N/A	Soil runoff
Manganese, Total (ppb)	2019	0.52	N/A	50	N/A	Leaching from natural deposits

Table 6. Detection of Unregulated Contaminants

Chemical or Constituent (and reporting units)	Sample Date	Level Detected	Range of Detections	Notificati on Level	Health Effects Language
Hexavalent Chromium (ppb)	2015	0.31 average	0.24 to 0.37	none	<p>Typical Source of Contaminant: Discharge from electroplating factories, leather tanneries, wood preservation, chemical synthesis, refractory production, and textile manufacturing facilities; erosion of natural deposits.</p> <p>Health Effects Language: Some people who drink water containing hexavalent chromium in excess of the 10 ppb over many years may have an increased risk of getting cancer. The PHG is 0.02 ppb. There is currently no MCL for hexavalent chromium. The previous California MCL of 10 ppb was withdrawn on September 11, 2017.</p>
Strontium (ppb)	2015	57 average	55.7 to 59.3	None	<p>Typical Source of Contaminant: Natural and common occurring element. Strontium mainly enters water through leaching of limestone. It can also be released to the environment as a by-product of mining operations and via air deposition from coal burning and phosphate fertilizers.</p> <p>Health Effects Language: Exposure to low levels of stable strontium has not been shown to affect adult health. Exposure to high levels of stable strontium can result in impaired bone growth in children. EPA has set a limit of 4,000 ppb strontium in drinking water. source: Agency for Toxic Substances and Disease Registry https://www.atsdr.cdc.gov/toxfaqs/TF.asp?id=655&tid=120</p>
Total Organic Carbon (ppm)	2019	1.8	N/A	None	<p>Typical Source of Contaminant: Various natural and manmade sources</p> <p>Health Effects Language: Total organic carbon has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes and haloacetic acids. Drinking water containing these byproducts in excess of the MCL (see table 4) may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of cancer.</p>
Bromide (ppb)	2019	8.1	N/A	None	<p>Typical Source of Contaminant: Naturally occurring. Can also be released to the environment by certain coal-fired power plants.</p> <p>Health Effects Language: Like total organic carbon, bromide provides a medium for the formation of disinfection by-products, specifically trihalomethanes (see health effects language for total organic carbon, above)</p>

Additional General Information on Drinking Water

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

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. U.S. EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Lead-Specific Language: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. [Enter Water System’s Name] is responsible for providing high quality drinking water but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. [Optional: If you do so, you may wish to collect the flushed water and reuse it for another beneficial purpose, such as watering plants.] If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (1-800-426-4791) or at <http://www.epa.gov/lead>.

This Consumer Confidence Report (CCR) reflects changes in drinking water regulatory requirements during 2016. All water systems are required to comply with the state Total Coliform Rule. Effective April 1, 2016, all water systems are also required to comply with the federal Revised Total Coliform Rule. The new federal rule maintains the purpose to protect public health by ensuring the integrity of the drinking water distribution system and monitoring for the presence of microbials (i.e., total coliform and E. coli bacteria). The U.S. EPA anticipates greater public health protection as the new rule requires water systems that are vulnerable to microbial contamination to identify and fix problems. Water systems that exceed a specified frequency of total coliform occurrences are required to conduct an assessment to determine if any sanitary defects exist. If found, these must be corrected by the water system.

For Systems Providing Surface Water as a Source of Drinking Water

Table 7. Sampling Results Showing Treatment of Surface Water Sources

Treatment Technique ^(a) (Type of approved filtration technology used)	Contact Clarification/Filtration
Turbidity Performance Standards ^(b) (that must be met through the water treatment process)	Turbidity of the filtered water must: 1 – Be less than or equal to <u>0.2</u> NTU in 95% of measurements in a month. 2 – Not exceed <u>1.0</u> NTU for more than eight consecutive hours. 3 – Not exceed <u>5.0</u> NTU at any time.
Lowest monthly percentage of samples that met Turbidity Performance Standard No. 1.	100%
Highest single turbidity measurement during the year	0.78 NTU
Number of violations of any surface water treatment requirements	0

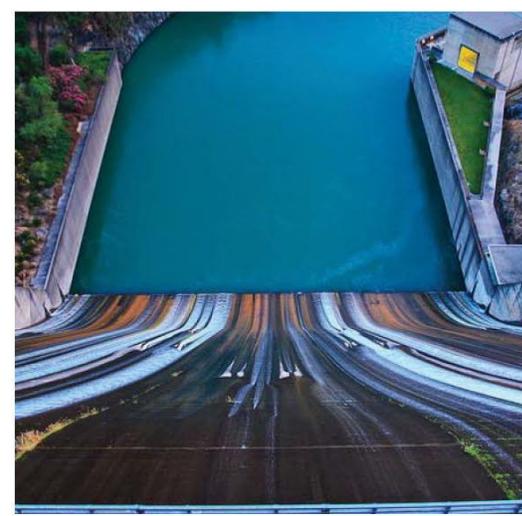
(a) A required process intended to reduce the level of a contaminant in drinking water.

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

Violation Summary Information

The City did not violate any primary or secondary drinking water standard, monitoring requirement, or reporting requirement during 2020. In addition, the City’s surface water treatment plant did not violate any performance standards during 2020.

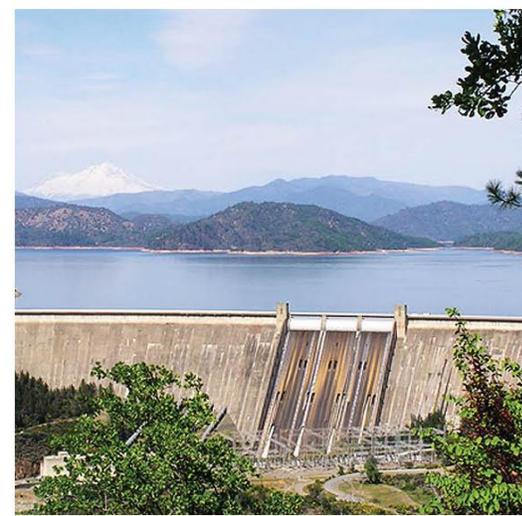
Appendix H
HAZARD MITIGATION PLAN



**CITY OF
SHASTA
LAKE**

Hazard Mitigation Plan 2014 Update

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CITY OF SHASTA LAKE HAZARD MITIGATION PLAN (HMP)

An Update to the 2005 Plan

March 2014

PREPARED FOR:
CITY OF SHASTA LAKE



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Section 1. Introduction

Natural disasters cause death and injuries, as well as significant damage to our communities, businesses, public infrastructure, and environment. The impacts of these damages result in the displacement of people and tremendous costs due to response and recovery dollars, economic loss, and burden. The City of Shasta Lake (Shasta Lake) Hazard Mitigation Plan (HMP) is an effort undertaken by the City to mitigate the effects of natural hazards and return to “the norm” sooner with fewer impacts to people and infrastructure.

Hazard mitigation planning is the process through which hazards are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. While natural disasters cannot be prevented from occurring, the effects of natural disasters can be reduced or eliminated through a well-organized public education and awareness effort, preparedness activities and mitigation actions.

After disasters, repairs and reconstruction are often completed in such a way as to simply restore to pre-disaster conditions. Such efforts expedite a return to normalcy; however, the replication of pre-disaster conditions results in a cycle of damage, reconstruction, and repeated damage. Hazard mitigation ensures that such cycles are broken and that post-disaster repairs and reconstruction result in increased resiliency for Shasta Lake.

1.1 *Background and Purpose*

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more, as well as destroy or severely damage existing buildings, structures, infrastructure, and other facilities. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. Many disasters cause extreme burden to city governments and small communities throughout California.

In an attempt to reduce the community burden from the effects of natural hazards, Shasta Lake, in partnership with the Shasta Lake Fire Protection District, developed the 2005 Multi-Hazard Mitigation Plan. As required, the 2005 HMP was developed in accordance with the Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 provides the legislative basis for the Federal Emergency Management Agency (FEMA) hazard mitigation planning requirements and funding before and after a hazard event. FEMA requires that an HMP be updated every 5 years. In response, Shasta Lake elected to allocate funding from the 2008 Disaster Recover Initiative (DRI)¹ for the time and effort required to fulfill update cycle requirements.

Over the past 60 years Shasta County has experienced numerous natural disasters, resulting in disaster proclamations and disaster declarations. Since 1964, 28 federal declarations have been documented in Shasta County, including three droughts, ten severe storm events, ten flooding events, and twelve wildfires. These recorded natural hazard events provide a hazard footprint across the region which helps mitigation planners understand hazards that could occur in Shasta Lake and their associated risks to life and property. Understanding natural hazard risks provides a foundation for developing solutions to

¹ Subject to congressional (federal) funds allocations, the State DRI Program (DRI Program) provides grants to eligible Counties and Cities to assist with the physical and economic recovery from federally declared disasters (i.e., wildfire, earthquake, flooding). City of Shasta Lake was able to obtain DRI Program funds after statewide fires in 2008.

mitigate or eliminate potential impacts through public education and outreach, preparedness activities, and mitigation actions.

For those hazards that can be mitigated, Shasta Lake must be prepared to implement efficient and effective short- and long-term actions where needed. The purpose of the Shasta Lake HMP 2014 Update is to provide the City with a blueprint for hazard mitigation action planning. The plan identifies resources, information, and strategies for risk reduction, and provides a tool to measure the success of mitigation implementation on a continual basis. The strategies identified in the 2014 HMP are developed with the following intentions:

- Risk reduction from natural hazards through a set of defined mitigation actions.
- Establishment of a basis for coordination and collaboration among participating agencies and public.
- Assisting in meeting the requirements of federal assistance programs.²

The 2014 HMP does not supersede current city plans and strategies, but rather enhances the City's ability to communicate and mitigate natural hazard risk. Information in this plan will be used to help guide and coordinate mitigation activities and decisions for City staff and citizens. Proactive mitigation planning will help reduce the cost of disaster response and recovery to Shasta Lake and its residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions from natural hazards.

1.2 Authority

This plan update was prepared pursuant to the requirements of the DMA 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the *Federal Register* on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act (DMA) or DMA 2000.)

While the DMA emphasizes the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations establish the requirements local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). As described in this plan, Shasta Lake is subject to many kinds of hazards; thus, access to these federal disaster assistance and hazard mitigation funding is vital to ensure a more resilient community.

1.3 Plan Organization

The HMP is organized into seven sections to reflect the logical procession of activities undertaken to develop the plan and includes all relevant documentation required to meet the necessary criteria for FEMA approval. Each section is briefly described below.

- **Section 1. Introduction** describes the background and purpose of the plan, as well as the authority for development of the plan.
- **Section 2. Community Profile** describes the Shasta Lake's history, geography, topography, climate, population, economy, housing, and land use and development trends.

² The HMP is developed to ensure eligibility for federal and state disaster assistance, including Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation (PDM), Hazard Mitigation Grant Programs (HMGP), Flood Mitigation Assistance Program (FMA), and other hazard mitigation program dollars from across a wide range of state and federal funding opportunities.

- **Section 3. What's New** provides background to the 2005 HMP and the 2014 HMP Update and details the process undertaken by the HMP Update Planning Committee to review, assess, and update the 2005 Shasta lake LHMP. This section also describes the changes and additions that have been identified to develop the updated plan.
- **Section 4. The Planning Process** describes the 10-Step HMP Planning Process, as well as the meetings and outreach activities undertaken to engage City officials, staff, and the public.
- **Section 5. Natural Hazard Risk Assessment** identifies and prioritizes natural hazards affecting Shasta Lake, and assesses the City's vulnerability from the identified hazards.
- **Section 6. Mitigation Strategy** identifies mitigation goals, assesses the City's capabilities to implement mitigation actions, reviews the status of previously identified mitigation actions, and identifies and prioritizes new mitigation actions.
- **Section 7. Plan Implementation and Maintenance** discusses plan adoption and implementation, as well as the process to monitor, evaluate, update, and maintain the HMP. This section also includes a discussion on continued public involvement.

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Section 2. Community Profile

The Community Profile summarizes the City’s history and existing environmental and socioeconomic conditions. Environmental and socioeconomic factors include geography, topography, climate, population, economic, housing, and land use and development trends.

2.1 *City of Shasta Lake History*

The City of Shasta Lake originated from five small communities: Central Valley, Project City, Pine Grove, Summit City, and a Federal government-built community named Toyon. These communities were established during the construction of Shasta Dam, beginning in 1938. The workers at Shasta Dam built these communities to provide low cost homes for their families while working on the dam. Homes built during this era (1930s/1940s) are often referred as “dam houses”.

Central Valley was constructed at the midpoint on Shasta Dam Boulevard. Project City was built at the intersection of Highway 99 and Shasta Dam Boulevard, while Pine Grove began at what today is the intersection of Interstate 5 (I-5) and Pine Grove Avenue. Summit City began at the intersection of Shasta Dam and Lake Boulevards. As time passed, Central Valley became the commercial hub for those working on Shasta Dam (Various Contributors n.d.).

First called “Government Camp”, the U.S. Bureau of Reclamation (USBR) built the town of Toyon on 41 acres of what was once the privately-owned Seaman Ranch. By 1950, Toyon had concrete sidewalks, commercial water, and power from Shasta Dam, and its own sewage treatment plant and landfill. In order to reside in Toyon, one had to be employed by USBR (Various Contributors n.d.).

All USBR employees vacated Toyon properties by the end of 1964, when the facility was turned over to the U.S. Job Corps as a work camp. The U.S. Job Corps supervision and management of Toyon ended in 1972. The historic Seaman Ranch Community House and the large USBR headquarters building burned to the ground during this era. Today, a metal storage building and the flagpole are the only remaining structures other than overgrown streets and sidewalks. Currently, the site is fenced off from Shasta Dam Boulevard (Various Contributors n.d.).

Through the 1960s and 1970s, the population grew at a slow pace. Population figures for the unincorporated communities in the 1980s consisted of 3,424 people in Central Valley, 1,659 people in Project City and 1,139 people in Summit City. After population and the areas of each city increased, discussions of city-wide incorporation began to materialize in 1993. Incorporation became a reality on July 2, 1993, when 60 percent of the residents voted for incorporation (Various Contributors n.d.).

2.2 *Geography, Topography, and Climate*

2.2.1 *Geography*

According to the United States Census Bureau, Shasta Lake has a total area of 10.9 square miles (28 km²), 99.93 percent of which was comprised by land and 0.07 percent covered by water. The City is located in the western third of Shasta County, just north of the City of Redding (the County Seat of Shasta County). Mount Shasta, a stratovolcano³ located north in Siskiyou County, is a prominent feature across the city landscape. Shasta Lake is located North-West of the City in the Shasta-Trinity National

³ A stratovolcano, also known as a composite volcano, is a conical volcano built up by many layers (strata) of hardened lava, tephra, pumice, and volcanic ash.

Forest. Shasta Lake, just outside the city limits, was created by the construction and completion of Shasta Dam stretching across the Sacramento River.

Interstate I-5 is a prominent transportation route that runs along the eastern portion of the City. There are three major exit ramps to the City from Interstate I-5; these include Pine Grove Avenue (Exit 84), Shasta Dam Boulevard(Exit 85), and Mountain Gate/Wonderland Boulevard (Exit 87) just north of the City. See Figure 2-1 and Figure 2-2 for location and geographic setting.

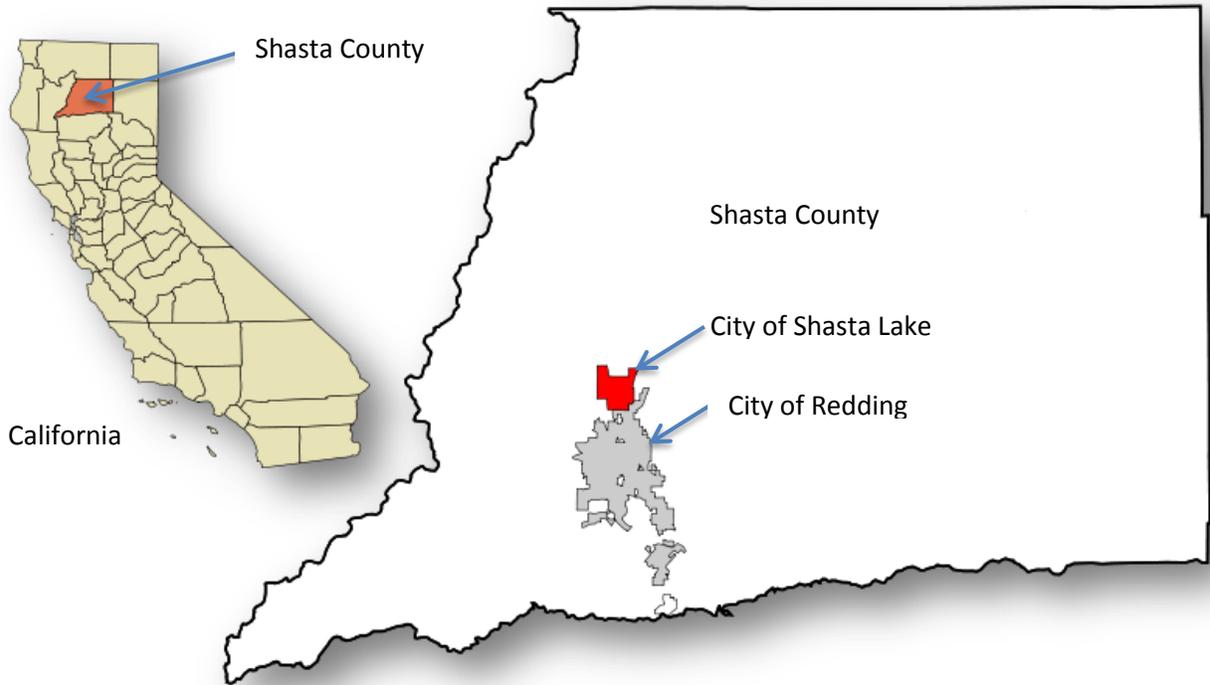


Figure 2-1: City of Shasta Lake Regional Map

2.2.2 Topography

Surrounded by mountains to the north, east, and west, and open to California’s Sacramento Valley to the south, the City of Shasta Lake varies in terrain and elevation. The urban center of the City is relatively flat at an approximate elevation of 190 feet (FT). The area east and northeast of the City transition from flat topography to slight rolling hills along I-5. In the western area of the City, elevations begin to increase following Lake Boulevard in a northerly direction from the urban center. As Lake Boulevard travels up in elevation toward Shasta Lake, the road meanders in a valley more than 700 feet below the adjacent hills. Just north of the urban center, there are areas where elevations reach as high as 3000 feet along the edges of Shasta Lake. See Figure 2-3.

2.2.3 Climate

The City of Shasta Lake receives approximately 63 inches of rain per year; the U.S. average is 37. Average snowfall is 5 inches. The number of days with any measurable precipitation is approximately 85 days a year, and on average there are 246 sunny days per year in Shasta Lake. The July average high temperature is around 95 degrees and the January average low temperature is 39 degrees. The Shasta

Lake comfort index⁴, which is based on humidity during the hot months, is 58 out of 100, while the average comfort index for the U.S. is 44. See Table 2-1 for a complete summary of average climate information.

Table 2-1: City of Shasta Lake Climate Summary Table

Climate Measurements	Shasta Lake, CA	United States
Avg. Rainfall (in.)	63.2	36.5
Avg. Snowfall (in.)	4.7	25
Avg. Precipitation Days	85	100
Avg. Sunny Days	246	205
Avg. July High	95	86.5
Avg. Jan. Low	38.7	20.5
Comfort Index (higher=better)	58	44
UV Index	4.8	4.3
Avg. Elevation FT.	830	1,443

Source: http://www.bestplaces.net/climate/city/california/shasta_lake

⁴ This comfort index provides a general idea for how comfortable your time outdoors will be. The index is calculated on a number of weather factors, including temperature, probability of precipitation, humidity, wind speed, and cloud cover. The higher the comfort index, the more comfortable the climate is perceived by general populations across the U.S. One would expect to see a higher index with shirt-sleeve temperatures, minimal chances of rainfall, relatively low humidity, light winds, and fair skies. On the contrary, the lower the index values one would see cool, damp, and windy conditions.

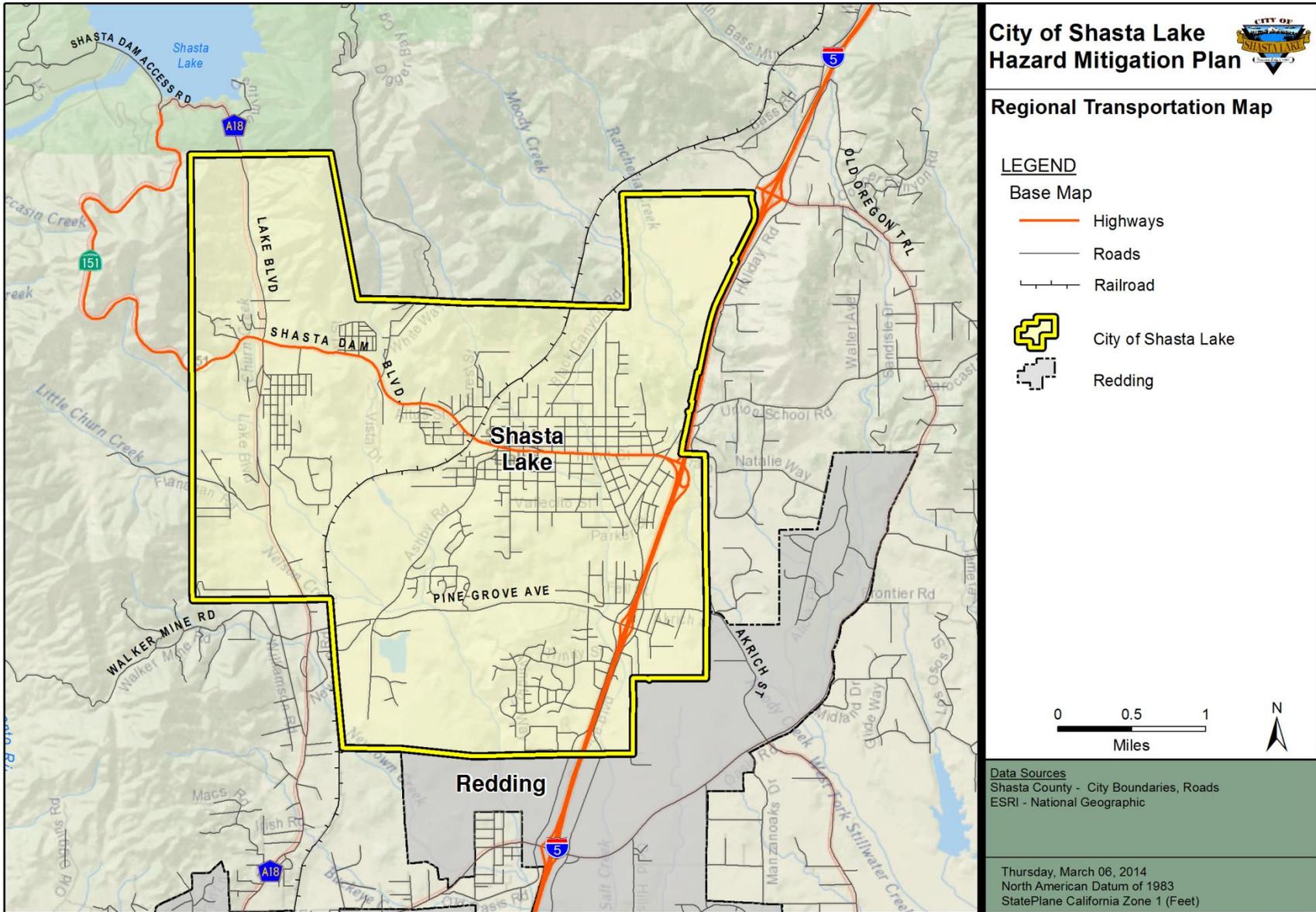


Figure 2-2: Regional Transportation and Road Network.

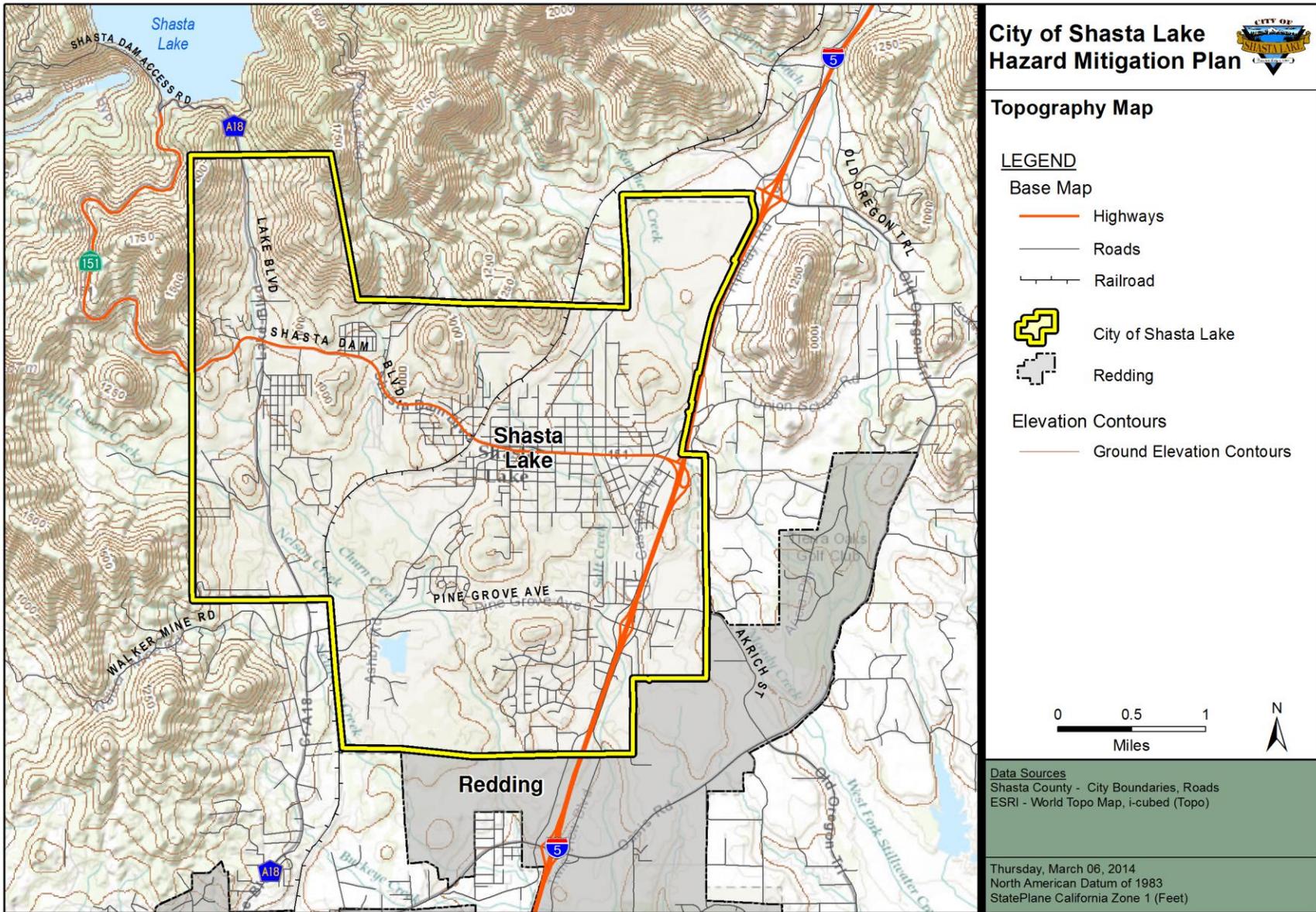


Figure 2-3: Topography of the City of Shasta Lake and surrounding areas



2.3 Socioeconomic Factors

The population, economic, and housing factors of the City of Shasta Lake are described in this section. Understanding these socioeconomic factors is imperative to determining the potential impacts a natural hazard event can have on the City's population and economy.

2.3.1 Population

According to the 2010 U.S. Census Data, Shasta Lake's total population is 10,164 residents⁵. Shasta Lake has 930.7 people per square mile, which is almost four times the state average of 239.1 people per square mile. The City saw an increase of 12.8 percent between the 2000 and 2010 census. The population is densest in the southern section of the City, with 1,500 and 2,500 in each census block, while the western and center sections of the City indicate approximately 1,000 to 1,500 people in each census block. The eastern side of the City (along I-5 and North of Pine Grove Ave) contains lower population densities with approximately 500-1,000 per census block. See Figure 2-5 for population distribution by census block. The racial makeup of Shasta Lake is primarily White (81 percent). Hispanic or Latinos account for 8.5 percent of the population, while Native Americans constitute 3.8 percent of the population; Asian residents make up 2.3 percent of the City's population.

2.3.2 Employment

According to the 2007-2011 American Community Survey, U.S. Census Data, there are 7,894 people over 16 years of age, of which 4,322 are in the labor force. Out of the 4,310 people in the labor force, 3,840 are employed, and 470 are unemployed. Of the employed population, 28.2 percent work in management, business science, and arts occupations; 23.6 percent work in service occupations; 28.4 percent work in sales and office occupations; 8.6 percent work in natural resources, construction, and maintenance; and 11.1 percent work in production, transportation, and material moving occupations. The median household income in Shasta Lake is \$42,901. The major employers in the City are the Sierra Pacific Mill, Knauf Insulation and various businesses within the City's Industrial Park.

2.3.3 Housing

According to the 2007-2011 American Community Survey, U.S. Census Data, there are 4,475 housing units in Shasta Lake. Of the total housing units, 3,929 are occupied and 546 are vacant. The majority of homes in Shasta Lake (76.4 percent) are single-unit detached homes. The second largest type is mobile homes, which make up 10.5 percent of the total housing stock. The majority of homes in Shasta Lake are also owner-occupied (74.0 percent), with the remaining 26.0 percent categorized as renter-occupied units. On average, 95.1 percent of housing units have one occupant or less per room. Of the housing stock, approximately 25.6 percent are worth \$200,000 - \$299,999 and 24.1 percent are worth \$150,000 - \$199,999 in value with the remaining housing units with values below \$150,000.

2.4 Land Use and Future Development Areas

Generally, the land surrounding the City consists of private ownership and land owned and managed by federal agencies. The City of Shasta Lake is abutted by federal property on the North and West side of the City. The U.S. Bureau of Land Management (BLM) manages the land west of the City, and the United States Forest Service (USFS) manages land north of the City (Shasta-Trinity National Forest). Shasta Lake and Shasta Dam and its infrastructure is managed and operated by the USBR. See for more information on surrounding land use and ownership.

⁵ 2010 U.S. Census population may not account for seasonal residents.

Shasta Lake has a General Plan (GP) which serves as a blueprint for establishing long-range development policies. The GP provides a basis for private development proposals and public projects to remain consistent with existing city, regional and state policies. The GP is designed to help the city address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), to include possible future annexations. The City’s Sphere of Influence is co-terminus with the city limits. The GP is scheduled to be updated over the next two years. The City does not expect any significant land use changes to occur as a result of the GP update. For more information on the General Plan Land Use Element see: <http://www.ci.shasta-lake.ca.us/index.aspx?NID=478>.

In 2012, the City of Shasta Lake received a development initiative application from Mountain Gate Meadows LLC to develop twenty-one parcels of land that would include roughly 1,600 housing units and 195,584 square feet of commercial and professional offices. The project includes open space, parks, and trails. The proposed development would occur in the northeast section of the City, on the west side of I-5 and south of the Mountain Gate/Wonderland Boulevard I-5 Interchange. This area of the City has been largely undeveloped and there are no existing structures on the site.

2.4.1 Single-family new house construction building permits

Construction permits can often provide a valuable snapshot into the health of the housing market of a community. The ten-year period from 1997 to 2007 saw the average cost of new homes built increase over \$100,000, or 146 percent. After peaking in 2007, the average cost dropped dramatically in 2008, mirroring what was occurring in the rest of the U.S. at the time. The number of new buildings being constructed began to drop significantly. As the economy has begun rebounding in recent years, the average cost of new buildings has begun to rise again. The number of buildings being constructed has not returned to pre-“crash” levels and is not expected to return to those levels for several years. See Table 2-2 for a summary of single family home construction permits.

Table 2-2: Single-Family Construction Permit Summary

Year	Average Cost	Buildings Permits
1997	\$79,200	63
1998	\$83,500	27
1999	\$88,600	48
2000	\$89,400	60
2001	\$82,400	128
2002	\$81,000	100
2003	\$97,000	81
2004	\$105,200	56
2005	\$108,100	86
2006	\$195,100	44
2007	\$195,100	30
2008	\$120,400	17
2009	\$133,100	11
2010	\$115,800	7
2011	\$116,300	4
2012	\$135,700	4

Source: <http://www.city-data.com/city/Shasta-Lake-California.htm#ixzz2n78cIzm0>

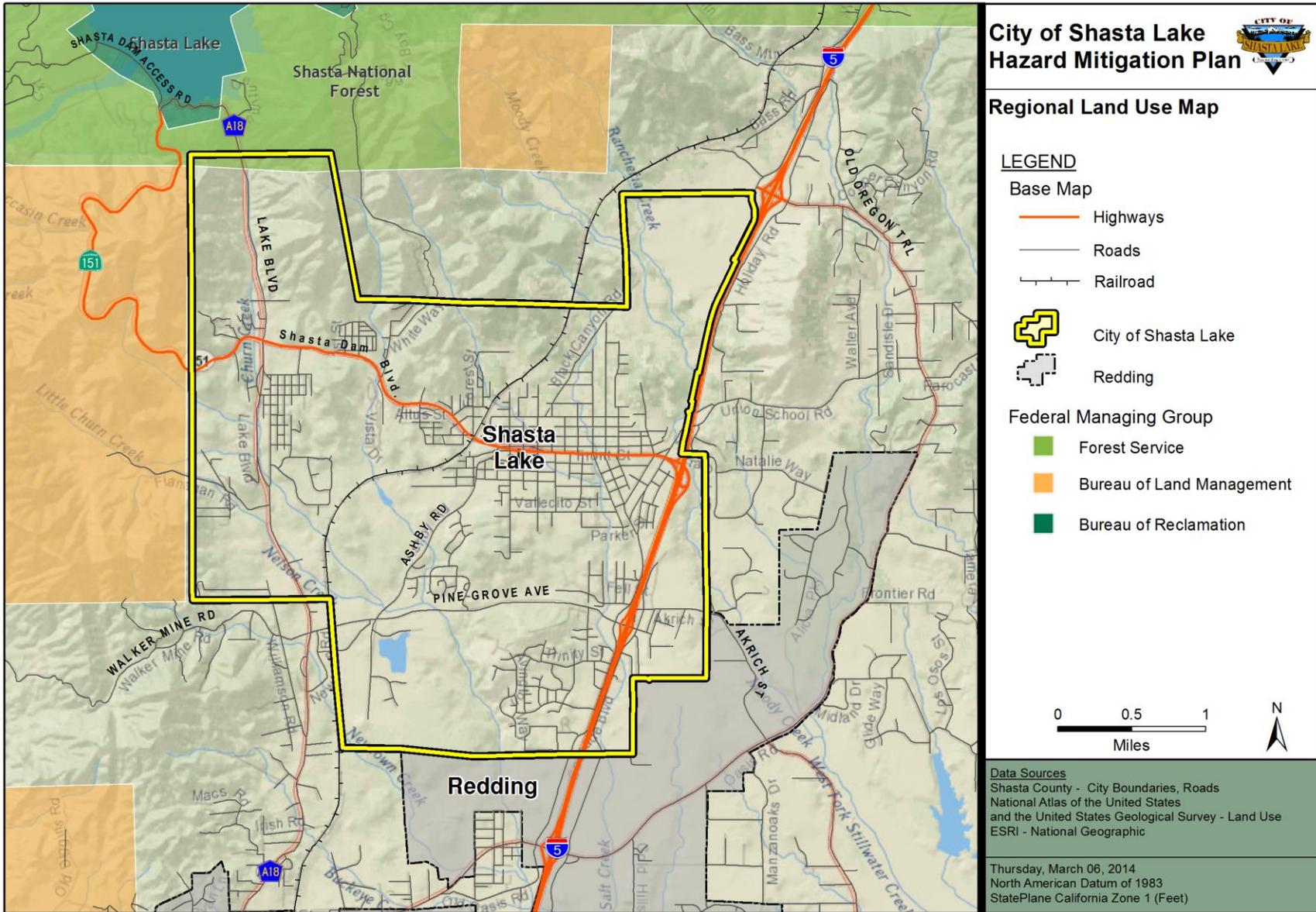


Figure 2-4: Regional Land-Use.

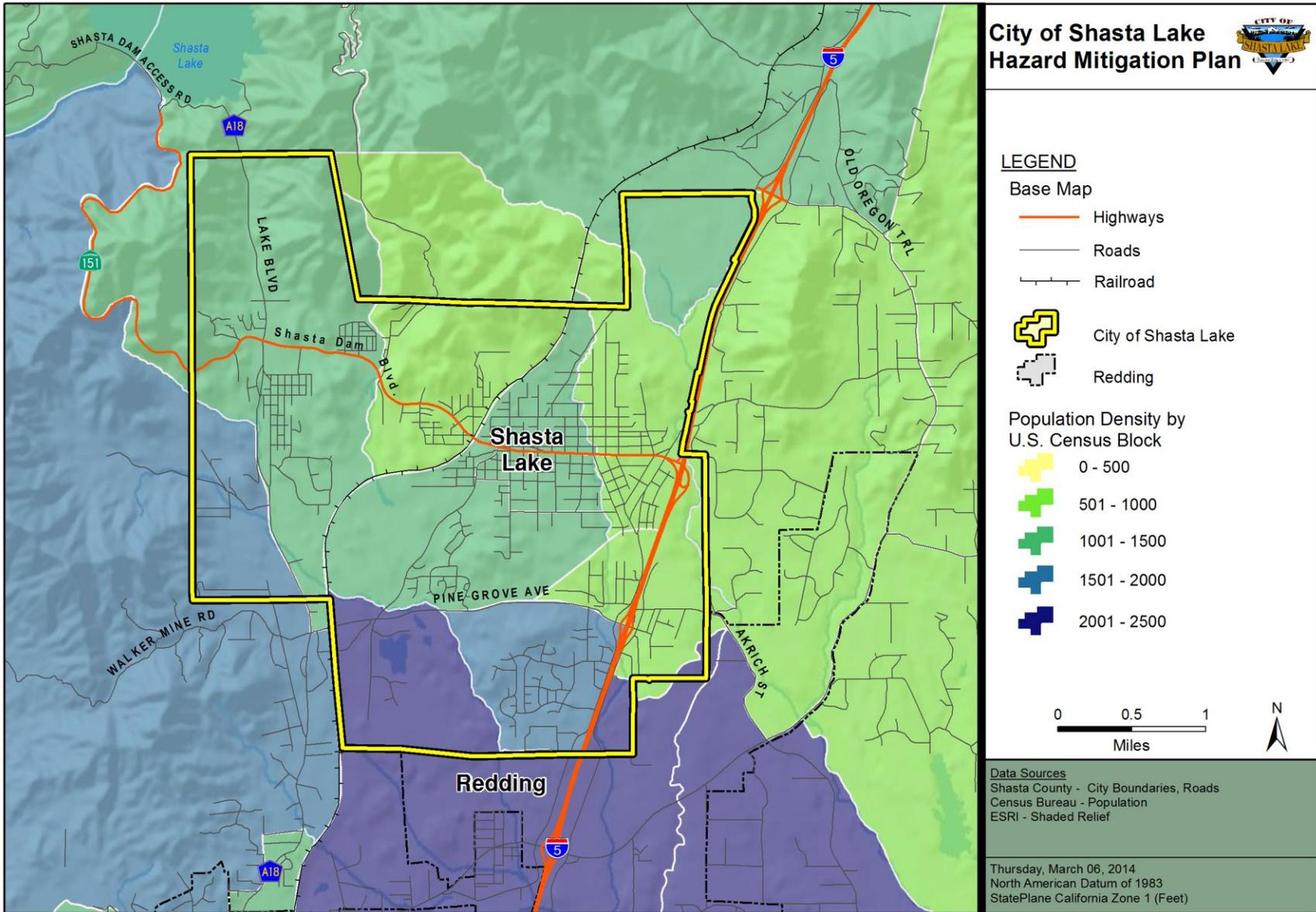


Figure 2-5: Shasta Lake Population Density

Section 3. What's New

This section of the plan includes background information on the 2005 LHMP and the 2014 HMP Updates. The 2005 Mitigation Actions were reviewed and have been changed, updated, and revised to reflect new priorities in the 2014 HMP. The sections below describe the background and planning process for 2013 changes and updates.

3.1 2005 LHMP and 2014 HMP Update Background

In June of 2005, Shasta Lake adopted its first LHMP, as required by the DMA 2000. The 2005 LHMP provided a high-level overview of the hazards affecting the City. The hazards identified in the 2005 LHMP included wildland urban interface fires, drought, extreme temperatures, dam inundation, severe storms and flooding. The plan also included a vulnerability assessment and mitigation actions to decrease the impacts of these hazards to the City.

Important to Note: Due to changes in the City's reporting structure, the plan administration and update process of the 2014 HMP has been administered by the Department of Development Services. Due to this change, the 2014 HMP has become a "single" jurisdictional plan. Mitigation Actions previously developed under the 2005 plan have been updated to reflect management changes. Due to limited resources and the size of the community, the Shasta Lake Fire Protection District is recognized as a support agency in the 2014 HMP. With limited City resources this change will increase plan update efficiencies.

The 2014 planning process began on July 25, 2013 with the initial Planning Committee meeting held in Shasta Lake at the Wintu Cultural Resources Center. A series of four meetings were subsequently conducted to lead the Planning Committee through the planning process and to gather the information required to develop this plan update.

The 2014 HMP contains many of the same elements as the 2005 LHMP. However, instead of simply updating the data in the 2005 LHMP, the Planning Committee has taken this opportunity to strengthen the plan through the use of new research methods and information systems. Geographic Information Systems (GIS) mapping has provided the City with the tools to develop data sets which are much more comprehensive than featured in the 2005 LHMP.

The 2014 HMP focuses on natural hazards; the human-caused hazards of hazardous materials and public health hazards identified in the 2005 HMP have been removed, as these issues are generally covered by other planning initiatives such as the City of Shasta Lake General Plan Safety Element and regional emergency operations plans. The 2014 HMP features new mitigation actions which focus on four different classifications. These classifications include:

1. Local Plans and Regulations – intended to reduce the City's vulnerability to future hazard events through the implementation of codes and regulations.
2. Structure and Infrastructure Projects – intended to protect existing structures by retrofitting, relocating, or modifying the structure to withstand a hazard event.
3. Natural Systems – to reduce the effects of hazards on the natural resources within a region by preserving and/or restoring natural areas along with their mitigation functions.
4. Public Information and Awareness – to advise residents, potential buyers, and visitors about hazards, potentially hazardous areas, and mitigation techniques.

3.2 Successful Mitigation Activities Since 2005

The 2005 HMP, adopted and approved by the City of Shasta Lake and the SLFPD, and approved by the California Emergency Management Agency (Cal EMA), now the California Office of Emergency Services (Cal OES), and FEMA, has been implemented through various on-going projects, plans and programs. With respect to the mitigation action items and strategy developed in 2005, Shasta Lake has been making improvements toward lowering natural hazard risk to life and property within the City. Significant risk reduction efforts have been made for floodplain management, flood damage prevention, and fire hazard abatement. These successful policies, programs, and projects are summarized below.

3.2.1 Public Works Improvements

Based on the results of the 2005 Shasta Lake LHMP, a Storm Drainage Master Plan was completed in 2009. This planning effort identified current shortfalls in the City’s drainage system and a range of possible solutions. Many of the issues discussed within the plan directly relate to urban flooding issues faced by the City. Some of the information found within the drainage master plan has been incorporated into the 2014 HMP mitigation actions. The greatest impediment to delivering the storm drainage improvements is funding. The City’s tax base is minimal and much of the drainage issues are a result of the County approving development prior to incorporation without the benefit of improvements.

3.2.2 Wildland Fire Mitigation

The City of Shasta Lake has worked with the SLFPD and the Western Shasta Resource Conservation District (RCD) to establish fuel breaks prioritized locations identified in the 2005 LHMP. These fuel breaks are largely the result of grant funding and are undertaken one at a time, due to the required physical labor to clear large swaths of ground. Recent projects have been completed on the Western area of the City near the Mountain Lakes High School and on the Northern side of the City. These areas will be aligned to provide overall coverage of the northern city limits of Shasta Lake which intersect vast areas of forest managed by other (private and public). Figure 3-1 provides an example of fuel reduction area near Mountain Lakes High School.



Figure 3-1: Western Shasta RCD Fuel Reduction Project located East of Mt. Lakes High School

3.3 What's New in the HMP Update

For the 2014 HMP, the Shasta Lake HMP Planning Committee reviewed and analyzed the 2005 LHMP. This included a review of the planning process, historical disasters, hazard and risk assessment, mitigation goals, mitigation actions, and plan maintenance and updating process sections.

The 2014 HMP has been completely revamped to include Shasta Lake specific hazard information to fully capture the City's unique hazard environment and focus limited resources on relevant mitigation efforts. Table 3-1 details the changes incorporated into the Shasta Lake 2014 HMP. These changes include an expanded community profile, extensive public outreach strategy, in-depth hazard profiles, detailed risk assessments including detailed overlay analysis, specific mitigation actions, and a specific maintenance and updating process for the next five years.

Table 3-1: Changes to the Plan Components

2014 Shasta Lake HMP Sections	Changes Incorporated into the updated HMP
Introduction	<ul style="list-style-type: none"> ▪ The 2014 HMP includes an expanded community profile section with updated demographic and other City-specific data to inform readers of the changes in the planning area. This is important, as hazard mitigation can be conducted early and ahead of population growth and future development.
Multi-Jurisdictional Planning Process	<ul style="list-style-type: none"> ▪ To meet DMA 2000 criteria, the 2014 HMP includes detailed documentation about the planning process for the planning process, its participants, and the meetings/workshops conducted have been thoroughly documented to meet FEMA requirements. See Section 4 and Appendix B. ▪ Included as part of the planning process is the documentation of the public outreach strategy and public participation in the plan development. See Section 4 and Appendix B ▪ The 2014 HMP is a single jurisdiction plan. The previous version was a cooperative multi-jurisdiction plan between the City of Shasta Lake and the SLFPD. The SLFPD Chief and the Fire Marshal are 2014 HMP Planning Committee members.
Historical Disasters	<ul style="list-style-type: none"> ▪ Historical disaster information has been updated since the adoption of the 2005 LHMP. New information is now included in the hazard profiles. See hazard information and photos throughout Section 5. ▪ The HMP now includes disasters that were not federally-declared in the City, resulting in losses and damages to the City. This addition is specifically related to the 2013 Flanagan Fire, which caused significant damage on BLM land bordering the Shasta Lake. Please refer to Section 5.3 for more information.

2014 Shasta Lake HMP Sections	Changes Incorporated into the updated HMP
Hazard Profile and Risk Assessment	<ul style="list-style-type: none"> ▪ The 2005 LHMP hazards have been updated and changed based upon Planning Committee priorities, FEMA guidance, and risk assessment outcomes. ▪ The 2005 LHMP hazard profiles and risk assessments have been updated with new and current data from the City. ▪ Potential impacts to the City from identified hazards have been described in terms of exposure analysis of population, parcel values (based on Shasta County Assessor’s data), and critical facilities in the City. This was done to aid hazard mitigation planners to compare hazard risk for each hazard and provide data on how exposure to populations and assets change with each hazard. See Section 5 for more information on hazard risk and the related exposure.
Goals, Objectives and Mitigation Actions	<ul style="list-style-type: none"> ▪ To meet FEMA requirements, the Planning Committee reviewed the 2005 HMP goals and determined current day validity. Due to changes in City priorities, the goals and objectives have been updated to meet the current hazard environments. ▪ The 2014 HMP now includes an expanded City-specific capabilities assessment for implementing the mitigation actions. By understanding capabilities to conduct mitigation actions within the City, the Planning Committee developed mitigation actions that meet current-day and near-term resources. ▪ The 2014 HMP includes detailed mitigation actions based upon the risk assessment and capabilities to carry out mitigation actions over the next 5 years. Newly identified and prioritized City-specific mitigation actions can be found in Section 6.
Plan Maintenance and Updating Process	<ul style="list-style-type: none"> ▪ The 2014 HMP now includes an expanded implementation strategy for selected mitigation actions. Implementation strategies provide a detailed step-by-step process for which mitigation champions throughout the City can follow when implementing mitigation actions. Implementation strategy worksheets can be found in Appendix D. ▪ Following FEMA guidance, the 2014 HMP provides expanded plan maintenance and update processes. This is done to provide the City’s mitigation champions and administrators a consistent method to update and report on plan progress and successes, and/or difficulties in implementing mitigation actions. See Section 7 for more information. ▪ The 2014 HMP now includes plan monitoring and evaluation progress reporting forms which will be updated on an annual basis. The Annual Review Questionnaire and Mitigation Action Progress Report forms will assist the monitoring and evaluation process and reduce the burden of future plan updates. Reporting forms can be found in Appendix D.

Section 4. The Planning Process

This section describes each stage of the planning process used to develop the 2014 HMP. The 2014 HMP planning process provides a framework for document development and follows the FEMA recommended steps. The 2014 HMP follows a prescribed series of planning steps which includes organizing resources, assessing risk, developing the mitigation plan, drafting the plan, reviewing and revising the plan, and adopting and submitting the plan for approval. Each is described in this section.

4.1 Planning Process

Hazard mitigation planning in the United States is guided by the statutory regulations described in the DMA 2000 and implemented through 44 Code of Federal Regulations (CFR) Part 201 and 206. FEMA’s HMP guidelines outline a four-step planning process for the development and approval of HMPs. Table 4-1 lists the specific CFR excerpts that identify the requirements for approval.

Table 4-1: DMA 2000 CFR Crosswalk

DMA 2000 (44 CFR 201.6)	2014 HMP Plan Section
(1) Organize Resources	Section 4
201.6(c)(1)	Organize to prepare the plan
201.6(b)(1)	Involve the public
201.6(b)(2) and (3)	Coordinate with other agencies
(2) Assess Risks	Section 5
201.6(c)(2)(i)	Assess the hazard
201.6(c)(2)(ii) and (iii)	Assess the problem
(3) Develop the Mitigation Plan	Section 6
201.6(c)(3)(i)	Set goals
201.6(c)(3)(ii)	Review possible activities (actions)
201.6(c)(3)(iii)	Draft an action plan
(4) Plan Maintenance	Section 7
201.6(c)(5)	Adopt the plan
201.6(c)(4)	Implement, evaluate, and revise

For the development of the 2014 HMP, a planning process was customized to address the City’s unique population and demographic. All basic federal guidance documents and regulations are met through the customized process. As shown in Figure 4-1, the HMP planning process (and documented in the corresponding sections) included organizing resources, assessing risk, developing the mitigation action strategy, drafting the plan, reviewing and revising the plan, and adopting and submitting the plan.

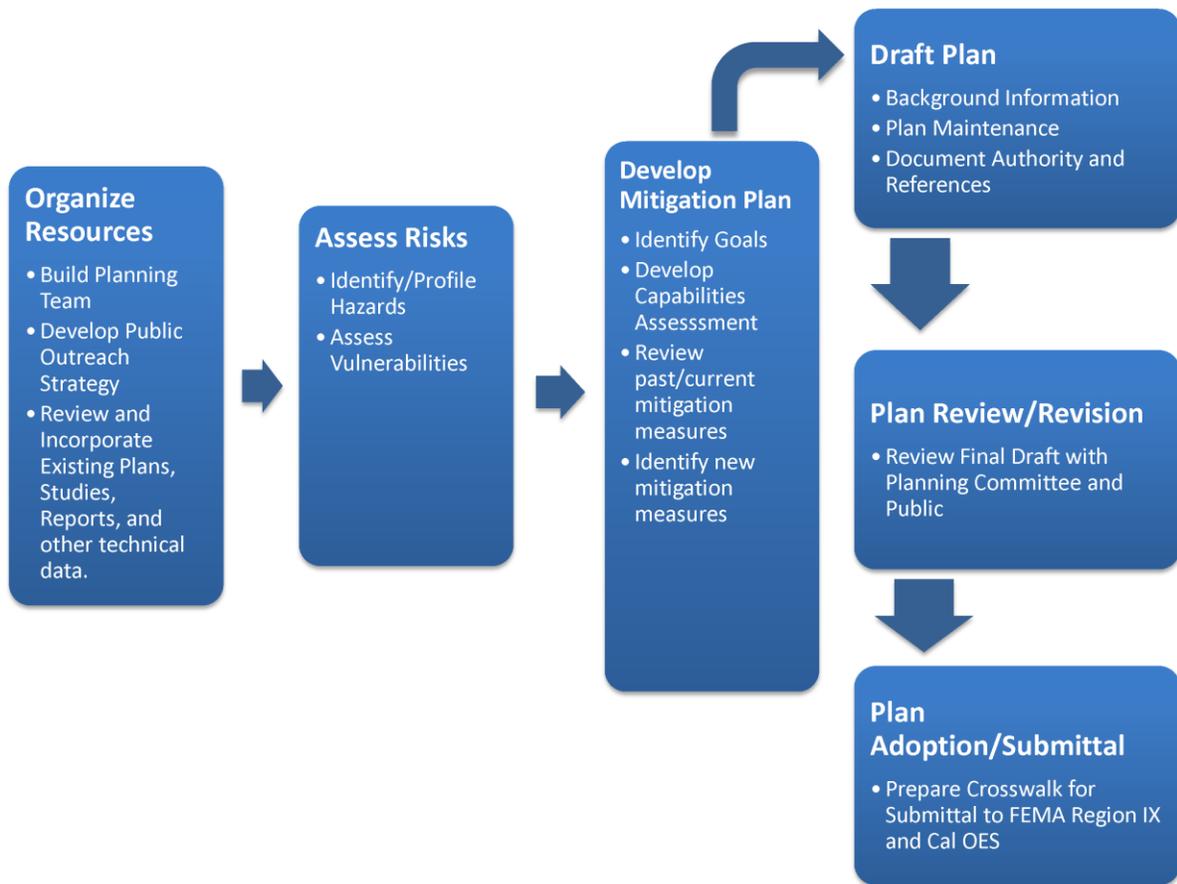


Figure 4-1: Shasta Lake HMP Planning Process

4.2 Organize Resources

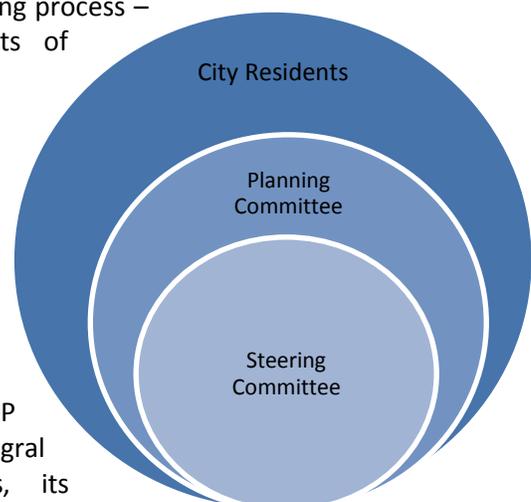
This section describes the first step of the 2014 HMP planning process – Organizing Resources. Organizing the resources consists of planning team development and document review tasks.

4.2.1 Building the Planning Team

The Planning Team, key to the back bone of the planning process, was critical for the development of the 2014 HMP. The Planning Team consisted of a Steering Committee, Planning Committee, engaged City Residents, and a HMP consultant used for plan development and facilitation.

4.2.1.1 Steering Committee

At the core of the 2014 HMP planning process is the HMP Steering Committee. The HMP Steering Committee was integral in ensuring the success of the planning process, its implementation, and future maintenance. The City developed a



professional services agreement with a HMP consultant (Michael Baker International) to provide direction for the development of the 2014 update. Members of the MHMP Steering Committee were also a part of the MHMP Planning Committee discussed below.

4.2.1.2 Planning Committee

The 2014 HMP Planning Committee consisted of key decision makers in specific government functions representing City, Regional, and Federal government organizations. The committee included stakeholders who actively participated in the planning process. Planning processes included:

- A series of structured coordination meetings
- Collection of valuable local information and other requested data
- Decision on plan process and content
- Development of mitigation actions for the HMP
- Review and comment on plan drafts
- Coordination of the public input process

The preparation of the 2014 HMP required a series of meetings and workshops intended to facilitate discussion and initiate data collection efforts with local community officials. More importantly, the meetings and workshops prompted continuous input and feedback from local officials throughout the update process. Table 4-2 provides a list of the 2014 HMP Planning Committee members.

Table 4-2: 2014 HMP Planning Committee

Name	Organization	Title / Role
Adam Osborn	COSL, Electric Dept.	Admin. Services Assist./GIS
Adrian Rogers	Shasta Lake Fire Protection District	Fire Chief
Carla Thompson	COSL, Development Services Dept.	Director
Chuck Dahlen	Shasta Lake Fire Protection District	Fire Marshal
Dave Griffiths	Chamber of Commerce	Board President (also Lehigh Southwest Cement Purchasing Manager)
Debbie Israel	COSL Development Service Dept.	Senior Planner/Project Manager
Greg Burgin	Wintu Tribe of Northern California	Councilmember
Jim Harrell	Gateway Unified School District	Superintendent
Jose Castro	COSL Public Works Dept.	Public Works Supervisor
Loree Byzick	Superior California Economic Development District (SCEDD)	Citizen Representative
Rob Littell	U.S. Bureau of Reclamation (BOR)	Operations Supervisor
Sean Tiedgen	Shasta Regional Transportation Agency	Associate Transportation Planner
Tim Bradley	U.S. Bureau of Land Management (BLM)	Fire Management Officer
Tony Osa	Shasta College Fire Technology	EMS, Director

4.2.1.3 HMP Consultant Team

To provide assistance to the HMP Planning Committee, the City enlisted Michael Baker Jr., Inc. (Baker) due to its expertise in assisting public sector entities with developing hazard mitigation plans and strategies for particular hazard prone areas. Baker supported the City through facilitation of the planning process, data collection, and meeting material and document development. The HMP Consultant Team, as shown in Table 4-3, consists of a variety of hazard mitigation professionals.

Table 4-3: HMP Consultant Team

HMP Update Project Team	HMP Update Project Team Role
Ethan Mobley, AICP	Project Manager
Carver Struve	Technical Advisor
Jason Farrell, CFM	Planner
Jason Isherwood, GISP	GIS Specialist/Spatial Analyst
Lane Simmons	GIS Specialist/Spatial Analyst
Dave DeMar, District Manager	Western Shasta RCD
Ryan Teubert, CFM	Western Shasta RCD

4.2.1.4 Planning Committee Meetings

The HMP Planning Committee met throughout the development of the updated HMP document. Table 4-4 provides a summary of the meetings conducted throughout the planning process, including meeting date, type, and topics discussed. Meeting documentation, including agendas, hazard maps, PowerPoint presentations, minutes, sign-in sheets, and other relevant handouts, are provided in Appendix B.

Table 4-4: Meeting Summary

Date	Meeting Type	Topics
August 2013	Planning Committee Meeting #1	<p><i>Part 1:</i></p> <ul style="list-style-type: none"> ▪ <i>Project Overview</i> ▪ <i>HMP Update Process and Components</i> ▪ <i>Overview of Existing 2005 LHMP</i> ▪ <i>Project Timeline</i> <p><i>Part 2:</i></p> <ul style="list-style-type: none"> ▪ <i>Planning Area Population / Land Use / Economics / Future Development</i> ▪ <i>Resources / Capabilities Assessment</i> ▪ <i>Public Outreach Strategy</i> ▪ <i>Workshop Process, Format and Advertisement</i>
September 2013	Planning Committee Meeting #2	<p><i>Part 1:</i></p> <ul style="list-style-type: none"> ▪ <i>Hazard Overview & Draft Risk Assessment Outcomes</i> ▪ <i>Question and Answer Session</i> ▪ <i>Community Asset Inventory Review</i> ▪ <i>Group Analysis, Risk Factor Development</i> <p><i>Part 2:</i></p> <ul style="list-style-type: none"> ▪ <i>Identify Draft Problem Statements</i> ▪ <i>Continued Workshop Planning</i> ▪ <i>Next Steps</i>

Date	Meeting Type	Topics
October 2013	Hazard ID and Profiling Workshops and Hazard Mitigation Open House Series	<p><i>Hazard Identification and Profiling</i></p> <ul style="list-style-type: none"> ▪ <i>Earthquake Hazard Rapid Visual Screening for Commercial and Residential Units</i> ▪ <i>Wildfire Risk Assessments and Profiling</i> ▪ <i>Flood Risk Assessments and Profiling</i> <p><i>Two (2) Open Houses</i></p> <ul style="list-style-type: none"> ▪ <i>Hazard Communication</i> ▪ <i>Mitigation Ideas for Residents</i>
October 2013	Planning Committee Meeting #3	<p><i>Part 1:</i></p> <ul style="list-style-type: none"> ▪ <i>Workshop Overview</i> ▪ <i>Public Survey Results Overview</i> <p><i>Part 2:</i></p> <ul style="list-style-type: none"> ▪ <i>Problem Statement Recap</i> ▪ <i>Goals and Objectives Review and Refinement</i>
November 2013	Planning Committee Meeting #4	<p><i>Mitigation Strategy Development :</i></p> <ul style="list-style-type: none"> ▪ <i>Mitigation Review and Mitigation Refinement</i> ▪ <i>Mitigation Priorities and Capabilities</i> ▪ <i>Mitigation Action Implementation Strategies</i>
January 2014 - March, 2014	Plan Review Meetings	<p><i>Plan Review and Refinement:</i></p> <ul style="list-style-type: none"> ▪ <i>Public Plan Review</i> ▪ <i>City Planning Commission Review</i> ▪ <i>City Council Review</i>



Figure 4-2: Shasta Lake Planning Meeting #3

4.2.2 Public Outreach

Public outreach is a major and required component of the 2014 HMP. The Shasta Lake HMP Public Outreach Strategy was developed to maximize public involvement in the HMP planning process. The HMP Public Outreach Strategy details the utilization of websites, local media, and community-based services and establishments to engage the public throughout the HMP planning process. This section provides additional information on the project website and workshop process used during the HMP plan development.

4.2.2.1 Hazard Mitigation Open House Workshops

In order to capture the hazards and critical infrastructure throughout Shasta Lake, the HMP Planning Team worked with City agencies and the public in an intense one week-long workshop. The week-long workshop consisted of field work and a set of open houses to provide information about local hazards within the City. Public drop-in style open houses were held on October 8th and 9th, 2013 during this time. During the open houses the field team and Steering Committee members communicated hazard risks to residents and received comments concerning hazards. Figure 4-2 exhibits an open house photo before residents arrived.



Figure 4-2: Mountain Lakes High School Open House

The HMP Steering Committee worked with agencies in the field to identify hazards, critical infrastructure, and successful mitigation actions by “ground-truthing” areas prone to natural disasters. The City’s Development Services and Public Works Department, Western Shasta RCD and the consultant team captured information on local infrastructure, problem areas and other community infrastructure.

During the October Workshop, two public open houses were held at the Mountain Lakes High School and the Wintu Cultural Resources Center providing distinct neighborhood settings. The open houses showcased the hazard profiling process and the data collected during ground-truthing exercises. The public was able to learn about the HMP planning process and review the HMP Update documents, as well as provide input on the planning process and data/information collected to date. The open houses

provided opportunities for the public to interact with the City Staff and HMP field team. A survey was conducted which allowed the public to provide input on a variety of the topics being covered within the plan. More information on use of survey results can be found in Section 6.4.3.1.

4.2.2.2 Publicizing the Plan

The HMP Planning Team created public notices in the form of postcards, and mailed them out to the community. These postcards were sent to every household in the City in an attempt to generate as much public participation as possible. The postcard can be seen in Figure 4-3.



Figure 4-3 Open House Invitation Postcard

The City of Shasta Lake also sent individual letters to every property owner with property within the identified flood plain to heighten the level of attention by those property owners.

Together with the public input received during the Open House Series, draft copies of the HMP document were posted on the Shasta Lake website (Under the Development Services Department web page) for general public review and comment. A document review open house was conducted before plan finalization. The 2014 HMP was also made available for review at the COSL Development Services Dept. office. These efforts provided citizens with several opportunities to review the content of the, to ask questions and suggest possible final revisions.

4.2.3 Review and Incorporate Existing Information

The HMP Planning Committee reviewed and assessed existing plans, studies, and data available from local, state, and federal sources. Documents reviewed and incorporated as part of the HMP planning process are shown in Table 4-5.

Table 4-5: Existing Plans, Studies, Reports, and Other Technical Data/Information

Existing Plans, Studies, Reports, and Other Technical Data/Information	Planning Process / Area of Document Inclusion
2013(Draft) California State Enhanced MHMP	Hazard Profiles
California Drought Contingency Plan	Drought Profile and Drought Mitigation Plan Development
California Drought Report 2010	Drought Profile and Drought Mitigation Plan Development
The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2)	Earthquake Hazard Profile Development
FEMA Hazard Mitigation How-to Guides	2012 Hazard Mitigation Plan Development, Start to Finish
City of Shasta Lake Digital Flood Insurance Rate Map (DFIRM) panels	Flood Hazard Profile and Development of FEMA special flood Hazard area depth grids.
Existing Zoning and Floodplain Management Ordinances	Flood Hazard Regulatory Environment and Mitigation Strategy
NFIP flood insurance policies and claims records.	Flood Hazard Regulatory Environment and Mitigation Strategy
FEMA E-74 Reducing the Risks of Nonstructural Earthquake Damage – A Practical Guide	Earthquake Mitigation Strategy
FEMA Local Mitigation Planning Handbook	Local Plan Integration Methods
FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards, January 2013	Mitigation Strategy Development
USGS Landslide Types and Processes (White Paper)	Landslide Mitigation Strategy Development
NOAA Record Storm Events	Death and Injuries Report for past disaster declarations
13 Fuels Key Guide, Documented by Albini (1976) and Rothermel (1972).	Wildfire Hazard Profile
City of Shasta Lake General Plan (1999)	Local Plan Integration
Stillwater-Churn Creek Community Wildfire Protection Plan	Wildfire Hazard Profile
City of Shasta Lake Storm Drainage Master Plan (2009)	Flood Hazard Regulatory Environment and Mitigation Strategy
American Planning Association – California Chapter; Planning for Wildfires, A Regulatory Agency Response	Wildfire Mitigation Strategy
California Geological Survey (CGS) Landslide GIS Data and Mapping Information	Landslide Hazard Profile and Mitigation Strategy Development

4.2.4 Assess Risks

In accordance with FEMA requirements, the 2014 HMP Planning Committee identified and prioritized the natural hazards affecting Shasta Lake and assessed the vulnerability from them. Results from this phase of the HMP planning process aided subsequent identification of appropriate mitigation actions to reduce risk in specific locations from hazards. This phase of the HMP planning process is detailed in Section 5.

4.2.4.1 Identify/Profile Hazards

Based on a review of past hazards, as well as a review of the existing plans, reports, and other technical studies/data/information, the 2014 HMP Planning Committee determined if the existing hazards were still valid, and identified new hazards that could affect the City. Updated content for each hazard profile is provided in Section 5.

4.2.4.2 Assess Vulnerabilities

Hazard profiling exposes the unique characteristics of individual hazards and begins the process of determining which areas within Shasta Lake are vulnerable to specific hazard events. The vulnerability assessment included field visits and a GIS overlaying method for hazard risk assessments. Using these methodologies, vulnerable populations, infrastructure, and potential loss estimates impacted by natural hazards were determined. Detailed information on vulnerability assessment for each hazard is provided in Section 5.

4.2.5 Develop Mitigation Plan

The 2014 HMP was prepared in accordance with DMA 2000 and FEMA's HMP guidance documents. This document provides an explicit strategy and blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and Shasta Lake's ability to expand on and improve these existing tools. Developing the mitigation plan involved identifying goals, assessing existing capabilities, reviewing the 2005 mitigation actions, and identifying new mitigation actions. This step of the HMP planning process is detailed in Section 6 and summarized below.

4.2.5.1 Identify Goals

The HMP Planning Committee reviewed the 2005 LHMP goals, hazards profiles, and vulnerability assessments, and developed new goals and objectives for the 2014 HMP based on current and revised information. The Goals and Objectives are presented in Section 1 and again in Section 5.

4.2.5.2 Develop Capabilities Assessment

A capabilities assessment is a comprehensive review of all the various mitigation capabilities and tools currently available to the City to implement the mitigation actions that are prescribed in the 2014 HMP. The HMP Planning Committee identified the technical, financial, and administrative capabilities to implement mitigation actions, as detailed in Section 5.

4.2.5.3 Identify Mitigation Actions

As part of the 2014 HMP planning process, the HMP Planning Committee reviewed and analyzed the status of the mitigation actions identified in the 2005 LHMP and provided data and information on the status of the existing mitigation actions. Once the review and analysis of the 2005 LHMP mitigation actions was complete, the HMP Consultant Team and HMP Planning Committee worked together to identify and develop new mitigation actions with implementation elements. Mitigation actions were prioritized and detailed implementation strategies were developed during Planning Committee

Meeting #4. A detailed approach of the review of the existing mitigation actions, identification, and prioritization of new mitigation actions, and the creation of the implementation strategy is provided in Section 6.

4.2.5.4 Draft HMP Update

Once the risk assessment and mitigation strategy were completed, information, data, and associated narratives were compiled into the 2014 HMP. Section 3 provides detailed information on “what’s new” and updated as part of the 2014 HMP.

4.2.5.5 Plan Review and Revision

Once the “Draft” 2014 HMP was completed, a public and government review period was established for official review and revision. Public comments were accepted, reviewed, and incorporated into this update. Applicable comments from the public have been received and addressed prior to the “authorization to submit” to FEMA and Cal OES review parties.

4.2.5.6 Plan Adoption and Submittal

This plan has been submitted and approved by FEMA and adopted by the City as the official statement of Shasta Lake hazards. A copy of the resolution is provided in Appendix A. This section will be completed after approval by Cal OES and FEM.

4.2.5.7 Plan Maintenance

Updated plan maintenance procedures, found in Section 7, include the measures Shasta Lake and participating agencies will take to ensure the HMP’s continuous long-term implementation. The procedures also include the manner in which the HMP will be regularly monitored, reported upon, evaluated, and updated to remain a current and meaningful planning document.

Section 5. Natural Hazard Risk Assessment

Natural hazard risk assessment is the process of measuring the potential impact to life, property and economic impacts resulting from natural hazards. The intent of the risk assessment is to identify, as much as practicable given existing/available data, the qualitative and quantitative vulnerabilities of a community. The results of the risk assessment provide a framework for a better understanding of potential impacts to the community and a foundation on which to develop and prioritize mitigation actions (see Section 6). Mitigation actions can reduce damage from natural disasters and an implementation strategy can direct scarce resources to areas of greatest vulnerability described in this section.

This risk assessment follows the methodology described in FEMA publication, *Understanding Your Risks—Identifying Hazards and Estimating Losses* (FEMA 386-2, 2002), which outlines a four-step process:

- 1) Identify Hazards
- 2) Profile Hazard Events
- 3) Inventory Assets
- 4) Estimate Losses

Information gathered during the Shasta Lake planning process related to the above four steps are incorporated into the following discussions in this chapter.

Section 5.1: Hazard Identification identifies and prioritizes the natural hazards that threaten the City. The reasoning for omitting some hazards from further consideration is also provided in this discussion.

Section 5.2 through Section 5.7: Hazard Profiles describe each of the natural hazards that pose a threat to the City. Information includes the location, extent/magnitude/severity, previous occurrences, and the likelihood of future occurrences.

Section 5.8: Vulnerability Assessment presents the City’s exposure to natural hazards, identifying at-risk populations and assets, including city-owned facilities and other critical facilities. Where the information was available, potential dollar loss estimates for facilities are provided to show a partial representation of the financial cost of a disaster to a community.

5.1 Identifying the Hazards

Per FEMA Guidance, the first step in developing the Risk Assessment is identifying the hazards. The HMP Planning Committee reviewed a number of previously prepared hazard mitigation plans and other relevant documents to determine the universe of natural hazards with potential to affect the City. Table 5-1 provides a crosswalk of hazards identified in the 2005 LHMP, Shasta Lake 1999 General Plan Safety Element, Shasta County 2011 HMP, and California State 2014 Multi-Hazard Mitigation Plan (MHMP).

The document review crosswalk is a tool to develop a preliminary list of hazards for further review. Ten major and relevant natural and manmade hazards were identified based on a thorough document evaluation. The review crosswalk aids planners in discussing hazards for additional consideration. For example, there was no mention of slope failure/erosion in the 2005 LHMP or 2011 Shasta County HMP, while the 2013 State MHMP recognizes slope failure as a prevalent hazard in certain parts of the state.

Table 5-1: Document Review Crosswalk

Hazards	2005 Shasta Lake HMP	1999 Shasta Lake General Plan Public Health and Safety Element	2011 Shasta County HMP	2013 (Draft) California State MHMP
Natural Hazards				
Geologic and Seismic Hazards				
<i>Earthquake/Seismic Shaking</i>	■	■	■	■
<i>Slope Failure / Erosion</i>		■		■
<i>Volcano</i>	■		■	■
Dam Failure	■		■	■
Drought	■		■	■ ⁶
Flooding	■	■	■	■
Wildfire	■	■	■	■
Severe / Extreme Weather			■	■ ⁷
<i>Extreme Heat / High Temp</i>	■		■	■
<i>Severe Storm</i>	■		■	■
Man Made Hazards				
Hazardous Material Releases/Spills	■	■	■	■
CBRNE (Chemical, Biological, Radiological, Nuclear, & Explosive)			■	■ ⁸
Pandemic/Epidemic/ Vector Borne Disease Hazards	■		■	■
MCI – Multi Casualty Incidents			■	

After the document review process, previous hazard occurrences were used to validate existing hazards and identify new hazard risks. Previous hazard occurrences provide a historical view of hazard risk, and a window into potential hazards that can affect the City in the future. Information about Federal and State disaster declarations in Shasta County⁹ was compiled from FEMA and Cal OES’s databases, as shown in Table 5-2.

Though not a complete snapshot of hazard incidences in the City (since not all hazard events are federally or state declared), Table 5-2 provided the City’s HMP Planning Committee with solidified accounts of disasters affecting areas around the City dating back to 1964. As shown in Table 5-2, large regional incidents have affected Shasta County and entire portions of the State. Severe wildfires were declared across the State during the 2008 fire season. Fires ignited in multiple locations across the State causing extensive damage in the County and across California. Though none of fire footprints were

⁶ Listed under Climate Related Hazards

⁷ Listed under Climate Related Hazards

⁸ Listed under Radiological Accidents and Terrorism

⁹ FEMA does not maintain disaster records at the local level for cities, special districts or other municipal organizations.

located within City boundaries, residents of Shasta Lake experienced secondary effects of wildfire including air quality degradation.

Table 5-2: Federal and State Declared Disasters

Year	Disaster Type	Disaster Name	Disaster#
12/24/1964	Flood	Heavy Rains & Flooding	DR-183
1/26/1969	Flood	Severe Storms & Flooding	DR-253
2/16/1970	Flood	Severe Storms & Flooding	DR-283
1/25/1974	Flood	Severe Storms & Flooding	DR-412
1/20/1977	Drought	Drought	EM-3023
2/9/1983	Coastal Storm	Coastal Storms, Floods, Slides & Tornadoes	DR-677
2/21/1986	Flood	Severe Storms & Flooding	DR-758
9/29/1988	Fire	Wildfires	DR-815
8/29/1992	Fire	Old Gulch & Fountain Fires	DR-958
2/3/1993	Flood	Severe Winter Storm, Mud & Land Slides, & Flooding	DR-979
1/10/1995	Severe Storm(s)	Severe Winter Storms, Flooding, Landslides, Mud Flows	DR-1044
3/12/1995	Severe Storm(s)	Severe Winter Storms, Flooding Landslides, Mud Flow	DR-1046
1/4/1997	Severe Storm(s)	Severe Storms, Flooding, Mud And Landslides	DR-1155
9/1/1999	Fire	CA-Wildfires-08/25/1999	EM-3140
9/4/2002	Fire	Squirrel Fire	FS-2461
10/28/2003	Fire	CA-Whitmore Fire-10-28-2003	FM-2508
8/11/2004	Fire	CA-Bear Fire-08-11-2004	FM-2544
8/14/2004	Fire	CA-French Fire 08-14-2004	FM-2547
8/14/2004	Fire	CA-Lake Fire 08-14-2004	FM-2548
8/26/2005	Fire	Manton Fire	FM-2580
9/13/2005	Hurricane	Hurricane Katrina Evacuation	EM-3248
2/3/2006	Severe Storm(s)	Severe Storms, Flooding, Mudslides, And Landslides	DR-1628
6/29/2007	Fire	Creek Fire	FM-2702
6/28/2008	Fire	Wildfires	EM-3287

Source: FEMA: California State Disaster History; CAL OES Emergency & Disaster Proclamations and Executive Orders by Date (November 2003-Current)

Based on the review of hazards identified in similar and relevant documents, previous incidents, historical knowledge of localized events, and natural hazard trends, the HMP Planning Team developed a preliminary list of hazards of seven natural hazards with significant potential to occur in the City: Wildfire, Flooding, Geologic Hazards (Seismic Activity, Volcano, and Slope Erosion), Severe Weather, and Drought & Extreme Heat. Due to limited resources to implement mitigation actions, a streamlined list of identified hazards ensures that appropriate levels of efforts are allocated to the hazards determined to have the largest potential impacts on the City. The 2014 HMP focuses on natural hazards; the human-

caused hazards of hazardous materials and public health hazards identified in the 2005 HMP have been removed, as these issues are generally covered by other planning initiatives such as the City of Shasta Lake General Plan Safety Element and regional emergency operations plans.

5.2 Hazard Profiles

Natural hazards are profiled individually in this section in order of priority. The profiles in this section provide a baseline definition and description in relation to the City. Hazard profiles are used to develop a vulnerability assessment, where natural hazard vulnerability to the community is quantified in terms of population and assets affected for each hazard deemed significant by the Planning Committee.

Important to Note: Each hazard symbol, as shown below, is placed at the beginning of each hazard profile and vulnerability analysis located throughout Section 5.



-Wildfire



-Flooding



-Earthquake (Geologic Hazard)



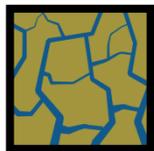
-Slope Failure (Geologic Hazard)



-Volcano (Geologic Hazard)



-Severe Weather



-Drought & Extreme Heat

5.3 Wildfire Hazard Profile

Wildfire events are unwanted wildland fires, including unauthorized human-caused fires, escaped debris burns, and other ignition sources that lead to fire over wildland areas. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildland fires affect grass, forest, and brush lands, as well as any structures located within them. Human access to wildland areas, such as urban development in forested areas, increases the risk of fire due to a greater chance for human carelessness.



Generally, there are three major factors that sustain wildfires and predict a given area's potential to burn. These factors are fuel, topography, and weather.

- Fuel – Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and volume. Fuel sources are diverse and include everything from dead tree leaves, twigs, and branches, to dead standing trees, live trees, brush, and cured grasses. Manmade structures are also considered a fuel source, such as homes and other associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Fuel is the only factor that is under human control.
- Topography – An area's terrain and slope affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes.
- Weather – Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out fuels that feed wildfires, creating a situation where fuel will ignite more readily and burn more intensely. Thus, during periods of drought the threat of wildfire increases. Wind is the most treacherous weather factor. The greater the wind, the faster a fire can spread and the more intense it can be. Wind shifts, in addition to wind speed, can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. As part of a weather system, lightning also ignites wildfires, often in terrain difficult to reach by firefighters.

Wildfires can be classified as either a wildland fire or a wildland-urban interface (WUI) fire. A wildland fire occurs in an area that is relatively undeveloped except for the possible existence of basic infrastructure such as roads and power lines. A WUI fire occurs in an area that is developed with structures and other human developments. In WUI fires, the fire is fueled by both naturally occurring vegetation and the urban structural elements themselves. According to the National Fire Plan issued by the U.S. Departments of Agriculture and Interior, the wildland-urban interface is defined "as the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels". The areas at risk within the City fall into the classic WUI category. Figure 5-1 and Figure 5-2 provide typical examples of WUI interfaces zones.



Eastern termination of Red Bluff Ave looking North toward wooded area.

Figure 5-1: Shasta Lake WUI Exhibit 1

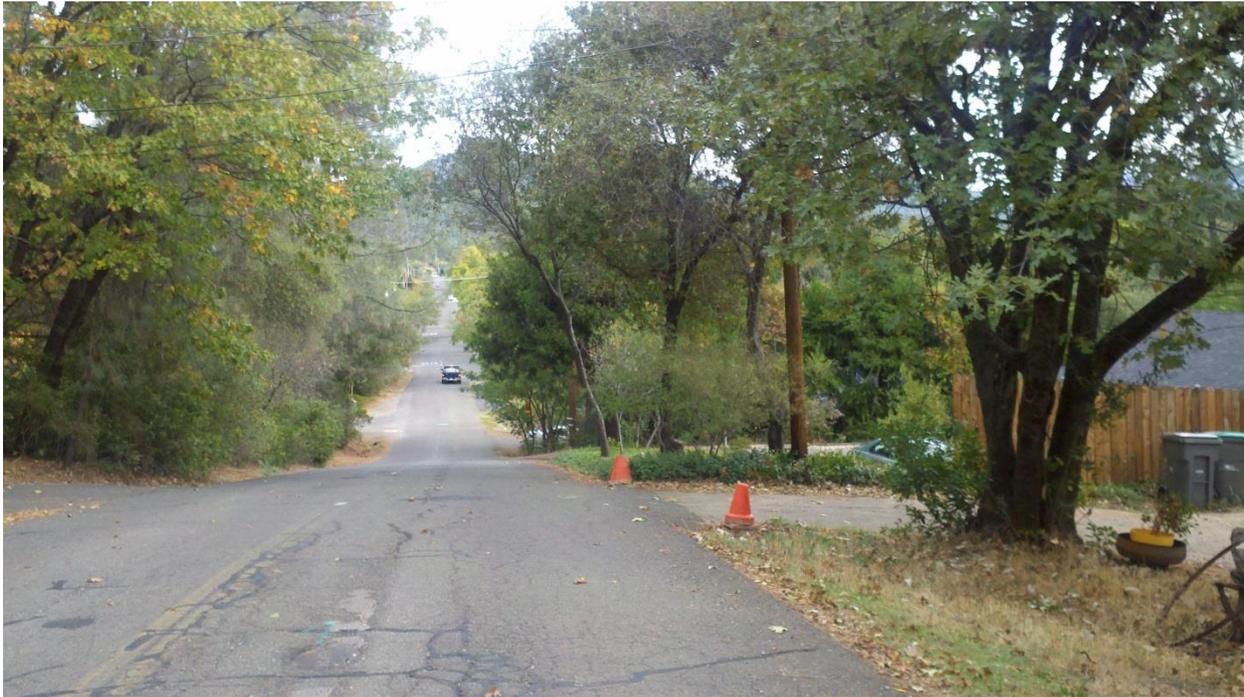


Figure 5-2: Shasta Lake WUI Exhibit 2

5.3.1 Regulatory Environment

The regulatory setting for fire protection and management in Shasta Lake is comprised of a single jurisdiction. However, there are federal agencies responsible for lands just outside of the City boundaries. These agencies are the U.S. Forest Service (USFS) and the United States Bureau of Land

Management. Wildfires and structure fires are managed separately with local, state, and federal involvement occurring at defined geographical boundaries known as “Responsibility Areas”. This system of responsibility, although fully encompassing, requires coordination among all levels of government as well as community service districts and local residents.

5.3.1.1 Federal

The USFS plays a major role in wildfire protection on federal lands. These lands include the federal lands which border the City of Shasta Lake, and fall within the Stillwater-Churn Creek and Keswick planning areas discussed in *Section 5.3.1.3.1*.

5.3.1.2 State

The California Department of Forestry and Fire Protection or (CAL FIRE) has statutory responsibility for wildfire protection on private lands in California. CAL FIRE is the agency responsible for fire suppression and prevention on non-federal lands identified as State Responsibility Areas (SRAs) and on lands where a contract has been signed for CAL FIRE protection, known as Direct Protection Areas (DPAs). CAL FIRE may also provide and manage emergency services through cooperative agreements with counties and fire districts.

In 2000, the State Board of Forestry and CAL FIRE completed an update of the state fire plan for wildfire protection in California. The overall goal of the plan is to reduce total costs and losses from wildland fires by protecting assets at risk through focused pre-fire management prescriptions and increasing initial attack success. CAL FIRE’s statewide Initial Attack Fire Policy is to aggressively attack all wildfires, with the goal of containing 95% of all fire starts to fewer than 10 acres.

5.3.1.3 Local

Fire protection for fire emergencies within City boundaries, including structures and vehicles, is the responsibility of the SLFPD. The SLFPD has three stations, with the main station (Station 1) being staffed full time..Station 2 (Akrich St.) is used only for storage and on-demand use but is not staffed. Station 3 (Lake Boulevard) houses the District’s training facility and Board Room and is staffed by the Battalion Chief on Mon.-Fri.

5.3.1.3.1 Community Wildfire Protection Plans

The City of Shasta Lake wildfire protection is addressed in Community Wildfire Protection Plans (CWPP). The Stillwater-Churn Creek CWPP and the Keswick Basin CWPP address the wildfire risk in the Shasta Lake region. With the exception of the area west of Lake Blvd, the Stillwater-Churn Creek CWPP addresses the majority of the city. The area west of Lake Blvd is addressed in the Keswick Basin CWPP.

Each CWPP identifies wildfire risk within their respective planning areas, and provides a listing of proposed mitigation actions/projects to reduce wildfire risk within each planning area. The Stillwater-Churn Creek CWPP includes eight actions (out of a total of twenty-four) for the Shasta Lake region. The Keswick CWPP contains a number of fuel break and fire access/escape routes associated with Shasta Lake. Western Shasta Resource Conservation District (WSRCD) prepared both CWPP(s) and involved the associated Fire Districts in the Plans which include fuel breaks and effort coordination. <http://www.westernshastarc.org/>

5.3.1.3.2 California's Wildland-Urban Interface Code Information

California's wildland fire information is located in Chapter 47 of 2007 California Building Code and Chapter 7A of California Building Code January, 2009 supplement. California Public Resources Code (P.R.C.) Section 4251-4290 and Section 4291 address wildland fire hazards and building codes.

The purpose of these codes are to establish the minimum requirements consistent with nationally recognized good practices to safeguard the public health, safety and general welfare from the hazards of wildfire conditions in new and existing buildings, structures and premises, and to provide safety and assistance to fire fighters and emergency responders during emergency operations¹⁰.

5.3.1.3.3 City Codes for Wildfire Hazards

The City of Shasta Lake adopts the latest edition of the California Building Codes and has adopted several references to P.R.C. 4291. P.R.C. 4291 is addressed in the City of Shasta Lake Municipal Code **15.10.050 - Elements of Landscape Documentation Package**. Under **15.10.050** a landscape design plan for projects in fire-prone areas shall address fire safety and prevention. Under **15.10.050** defensible space, or zone, around a building or structure is required per P.R.C. Section 4291(a) and (b). **15.10.050** also prohibits fire-prone plant materials and highly flammable mulches.

City of Shasta Lake Municipal Code **12.36.062** requires a *Pre-Development Review on Major Projects*. **12.36.062** requires fire safety standards to be considered in residential project design (e.g., setback from proposed main/ accessory structures, fire breaks, clearance from the tree canopy on the property).

5.3.2 Past Occurrences

Shasta County has been included in nine Fire Management Assistance Declarations since 2002. In addition, the County has been a part of two federal disaster declarations and two federal emergency declarations related to fire. However, not all of these fires have impacted the City. See Figure 5-4 for location and extent of the fires that have had an impact on Shasta Lake.

In 2004, a proclamation was issued declaring a local state of emergency in Shasta County based upon fire conditions caused by three fires including the Lake Fire. The City of Shasta Lake was threatened from the Lake fire and a mandatory evacuation forced approximately 500 people from their homes. The Flanagan Fire in September of 2013 reached a size in excess of 70 acres. More than 100 firefighters responded to the fire from Shasta Lake, Anderson, Happy Valley, Cottonwood, Redding, and the California Department of Forestry. The fire was wholly contained within the SLFPD. While no homes were damaged, an abandoned car and small trailer were burned in the fire. The fire started on Sunday, September 1, and spread quickly because of very dry conditions. Arson is suspected to be the cause of the fire.

Table 5-3: Shasta Lake Wildfire Occurrences

Year	Fire Name	Acres Impacted
1963	South Pacific Rail Road (SPRR)	725
1983	Kittyhawk	262
2000	Union	320
2001	Fawndale	70
2002	Keswick	7.5
2003	Mine	14
2004	Lake	119
2004	Terra	18

¹⁰ For more information on wildland hazards and building codes visit:
http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_codes.php#testingstandards

Year	Fire Name	Acres Impacted
2005	Iron	11
2005	Keswick	32
2006	Shasta ¹¹	145
2008	Shu Lightning Motion Fire	28,329
2013	Flanagan Fire	70

Although the City has been in close proximity to major fire events, the region has not yet sustained any substantial damage attributed to fires for as long as records have been maintained.

5.3.3 Location/Geographic Extent

Wildfire risk analysis from California Department of Forestry and Fire Protection (CAL FIRE), helps illustrate the areas at risk from a wildfire event. CAL FIRE developed a Fuel Rank assessment methodology for the California Fire Plan¹² to identify and prioritize pre-fire projects that reduce the potential for large catastrophic fire. The fuel ranking methodology assigns ranks based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe weather condition (wind speed, humidity, and temperature). The procedure makes an initial assessment of rank based on Fire Resource Assessment Program (FRAP) assigned fuel model and slope (California Department of Forestry and Fire Protection 2012). Figure 5-3 shows a simplified fuel model ranking diagram. Figure 5-5 shows a fuel rank map based upon CALFIRE’s fuel model for Shasta Lake. This map indicates moderate, high, and very high fuel rank based on inputs such as fuel, slope, brush density (ladder fuels), and tree density (crown cover).

CAL FIRE pre-fire engineers verify fuel rankings and use the fuel rank assessment in conjunction with three additional Fire Plan assessments (weather, assets at risk and level of service) to assign the final risk ranking. The areas with the highest risk of wildfire are spread throughout the City and are generally located in areas with greater fuel loads from denser forestation.

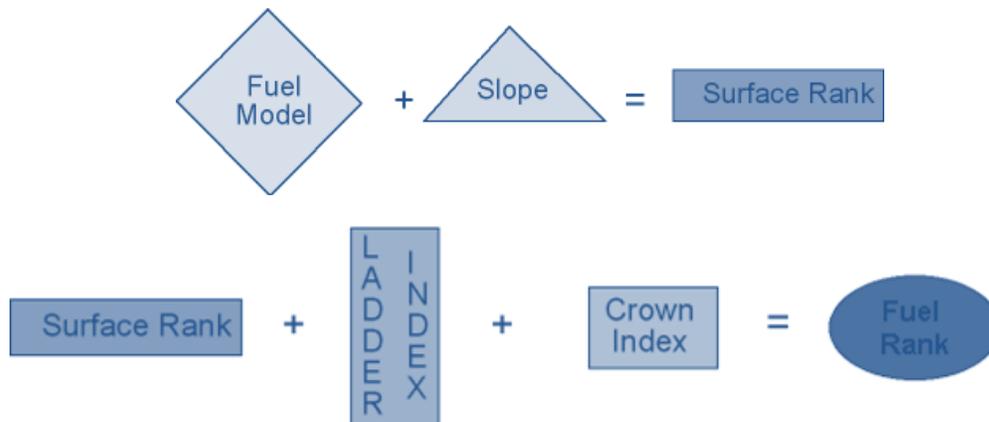


Figure 5-3: FRAP Fuel Model

¹¹ Suppression costs were \$1,312,624

¹² The California Fire Plan is the state's road map for reducing the risk of wildfire. The Fire Plan is a cooperative effort between the State Board of Forestry and Fire Protection and the California Department of Forestry and Fire Protection. By placing the emphasis on what needs to be done long before a fire starts, the Fire Plan looks to reduce firefighting costs and property losses, increase firefighter safety, and contribute to ecosystem health.

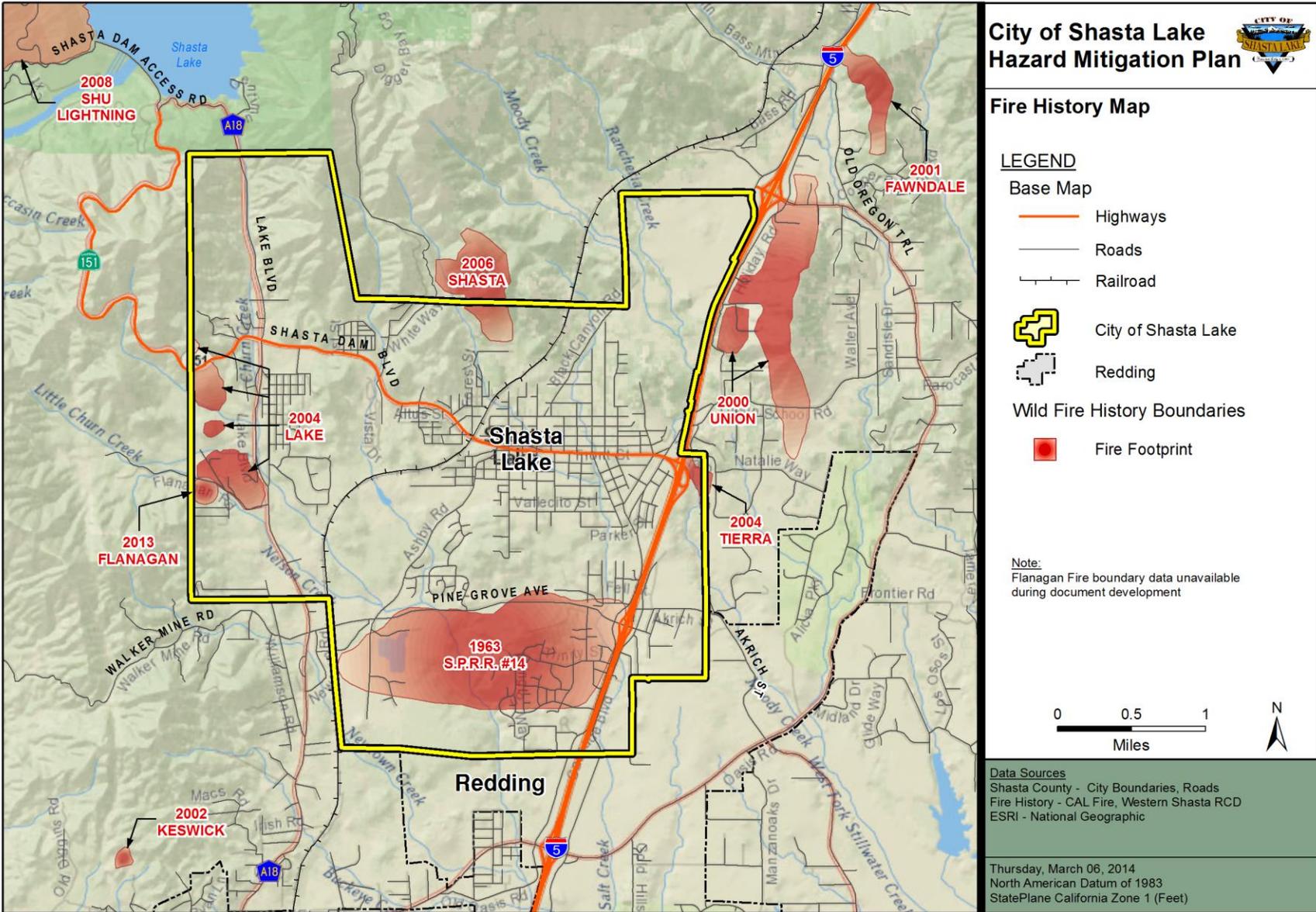


Figure 5-4: Historical Fires

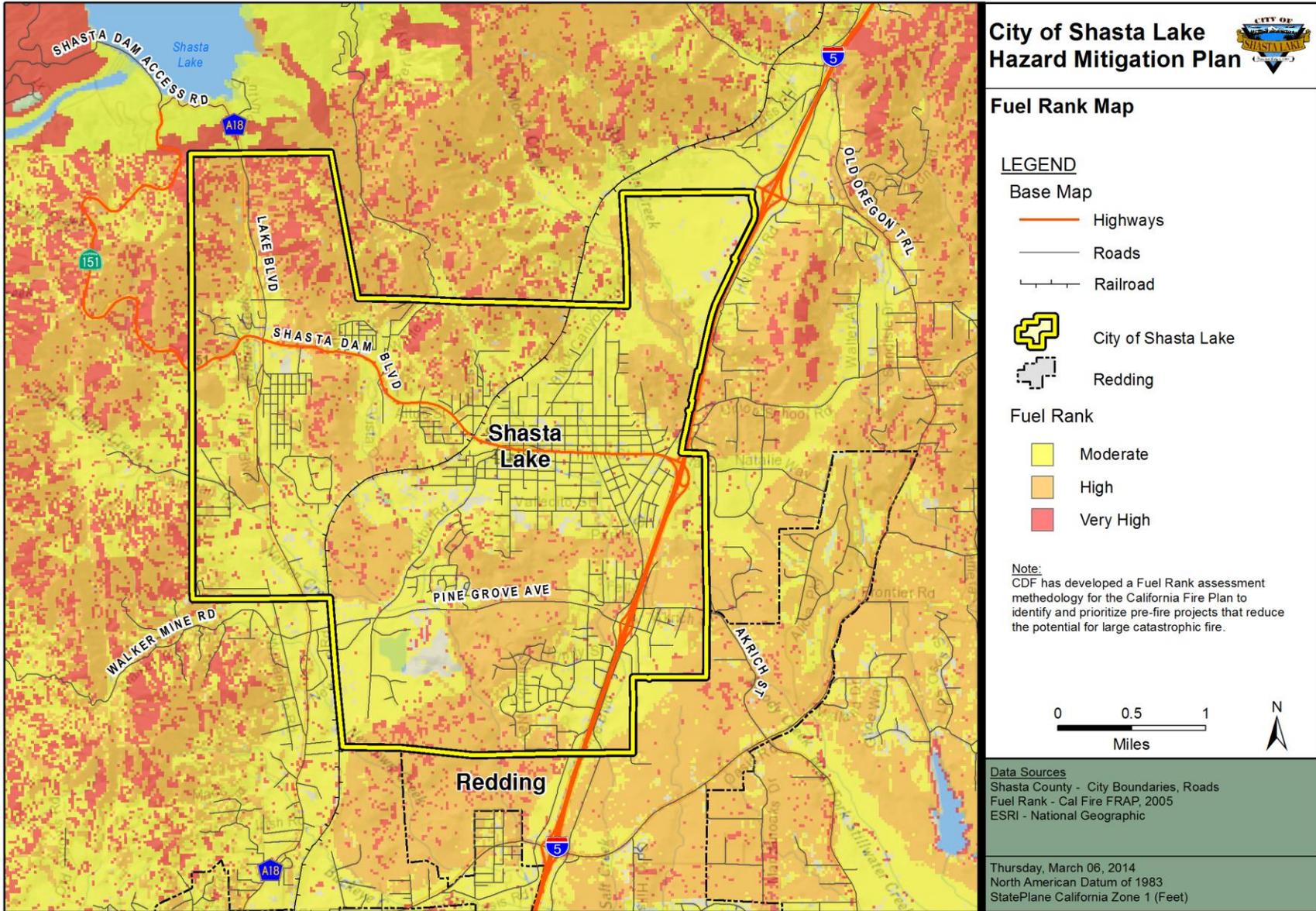


Figure 5-5: Shasta Lake Fuel Rankings

5.3.4 Magnitude/Severity

The magnitude and severity of a wildfire event is measured by calculating the number of acres burned in a specific wildfire event and the severity of the burn classifications¹³. Burn classifications are not available for each fire perimeter presented in Table 5-3. The below burn severity classifications have been adapted from USDA Natural Resources Conservation Service.

Low Fire Severity (Type III)

General statements:

- primarily occur on rangeland
- no sediment delivery
- natural recovery likely

Indicators:

- duff (decaying leaves and branches covering a forest floor) and debris are partly burned
- soil is a normal color
- hydrophobicity is low to absent
- standing trees may have some brown needles

Interpretations:

- root crowns and surface roots will re-sprout quickly
- infiltration and erosion potential are not significantly changed

Medium Fire Severity (Type II)

General statements:

- primarily occur on steep, lightly timbered slopes with grass
- some sediment delivery

Indicators:

- duff is consumed
- burned needles are still evident
- ash is generally dark colored
- hydrophobicity is low to medium on surface soil up to 1 inch deep
- soil is brown to reddish-brown and up to 2 inches of soil is darkened from burning (below ash)
- roots are alive below 1 inch
- shrub stumps and small fuels are charred but present
- standing trees are blackened but not charcoal

Interpretations:

- root crowns will usually re-sprout
- roots and rhizomes below 1 inch will re-sprout
- most perennial grasses will re-sprout
- vegetative recovery (non-tree), depending on conditions, could be one to five years
- soil erosion potential will increase due to the lack of ground cover and moderate hydrophobicity

High Fire Severity (Type I)

General statements:

- primarily occurs in unprotected drainages on steep, timbered, north or east slopes with dense forest canopy

¹³ Natural Resources Conservation Service burn intensity classifications can be used to estimate soil heating by vegetative and physical conditions. Wildfire burn intensity is useful in preparing rehabilitation plans for properties and other post-fire activities.

- sediment delivery likely
- natural recovery limited

Indicators:

- duff consumed
- uniformly gray or white ash (in severe cases ash is thin and white or light)
- no shrub stumps or small fuels remain
- hydrophobicity medium to high – up to 2 inches deep
- 2 to 4 inches of soil is darkened (soil color often reddish orange)
- roots burned 2 to 4 inches
- soil physically affected (crusting, crystallization, agglomeration)
- standing trees charcoal up to 1 inch deep

Interpretations:

- soil productivity is significantly reduced
- some roots and rhizomes will re-sprout but only those deep in soil
- vegetative recovery (non-tree), depending on conditions, could be five to 10 years
- soil erosion potential can be significantly increased

5.3.5 Frequency/Probability of Future Occurrences

In Shasta Lake, wildfire season commences in early spring through late fall **every year** during the hotter, dryer months. Topography, weather, and vegetation provide the ingredients for destructive wildfires that can spread rapidly throughout the City.

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5.4 Flood Hazard Profile

Flood reduction, prevention, and mitigation are major challenges to Shasta Lake residents and its floodplain managers. Many areas of Shasta Lake are at risk to flooding, especially properties near creeks. Flood prone areas within Shasta Lake can be organized by watershed, thus examining the impact of water as it travels downhill on its journey towards Redding and the Sacramento River. The primary areas discussed in the following sections are: Churn Creek, Salt Creek, and Moody Creek. Localized flooding associated with creek or stream overflow occurs in Shasta Lake when rainfall runoff volumes exceed the design capacity of drainage facilities or a lack of flood control structures in place. Heavy seasonal rainfall, which typically occurs from late October through April, can result in stream overflows.



5.4.1 Regulatory Environment

The regulatory environment for flood control at the local, state, and federal level is complex, difficult to navigate, and varies based upon flood control structure, location of water bodies, and local participation in state and federal programs. This section focuses on the regulations that Shasta Lake uses to regulate development within the floodplain. This section also highlights some of the new requirements from the State of California as well as the National Flood Insurance Program (NFIP).

5.4.1.1 Local Building Codes

Shasta Lake has a number of building codes and development regulations in place to reduce flood risk for new construction, substantial improvements, or other man-made changes. The Development Services Director, as the floodplain administrator for the City, determines if new construction must meet certain flood zone construction criteria.

The Development Services Director has authority to perform Flood Zone Determinations per Shasta Lake Municipal Code, Article IV, **15.01.140**. Upon application for a development permit, the application and plans are reviewed to determine whether or not the site of the proposed structure is within any Special Flood Hazard Area (SFHA) designated by FEMA on regulatory Flood Insurance Rate Maps (FIRMs). More information on FEMA flood hazard areas is provided further on in this section.

New construction and substantial improvements of any structure shall have the lowest floor, including the basement, elevated at least one foot above the base flood elevation. Upon the completion of the structure, the elevation of the lowest floor including basement shall be certified by a registered professional engineer or surveyor, and verified by the community building inspector to be properly elevated. Such certification and verification shall be provided to the floodplain administrator. All new construction and substantial improvement with fully enclosed areas below the lowest floor (excluding basements) that are usable solely for parking of vehicles, building access or storage, and which are subject to flooding, shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwater. Designs for meeting this requirement must exceed the following minimum criteria¹⁴:

- a. Be certified by a registered professional engineer or architect; or
- b. Have a minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding. The bottom of all openings shall be no

¹⁴ Shasta Lake Code or Ordinances, Title 15, Chapter 15.04. - Provisions for Flood Hazard Reduction

higher than one foot above grade. Openings may be equipped with screens, louvers, valves or other coverings or devices provided that they permit the automatic entry and exit of floodwater.

5.4.1.1.1 National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. As a participating member of the NFIP, Shasta Lake NFIP administrators are dedicated to protecting homes with 60 NFIP policies currently in force. FEMA has prepared a detailed Flood Insurance Study (FIS) for areas of Shasta Lake; the study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood (100-year flood, base flood) and the 0.2-percent annual chance flood (500-year flood). Base flood elevations and the boundaries of the 0.1% and 0.2% Annual Chance flood zones are shown on FIRMs. More information on location and geographic extent are provided in Section 5.3.3.

Shasta Lake entered the NFIP on December 13th, 1977, and the City's initial FIRM became effective on September 27th, 1985. As a participant in the NFIP, the City is dedicated to regulating development in the FEMA floodplain areas in accordance with NFIP criteria. Structures permitted or built in the City before the NFIP regulatory requirements were incorporated into the City ordinances (before the effective date of the County's FIRM) and are called "pre-FIRM" structures.

For a complete explanation on base flood and flood zone information and California Regulation and the NFIP, please see California's Department of Water Resources NFIP Quick Guide:

<http://www.water.ca.gov/floodmgmt/lrafmo/fmb/docs/CAQG-screen.pdf>

5.4.1.2 Central Valley Flood Protection Plan

In 2007, legislation spearheaded by the California Department of Water Resources (DWR) to provide protection to people and property in areas especially prone to flooding in California's Central Valley was enacted. State legislative requirements provide Shasta County and the City of Shasta Lake local planning responsibilities for floodplain management (e.g., general plans, zoning ordinances, development agreements, tentative maps, and other actions).

Some of the requirements of the 2007 flood risk management legislation apply Statewide, while other legislation is additive and provides provisions applicable to lands within the Sacramento-San Joaquin Valley (SSJV), and further to lands also within the Sacramento-San Joaquin Drainage District (SSJDD). Please see Appendix C for more information on implementing California Flood Legislation into local planning. California Government Codes 65302 and 8685.9 are of particular importance to hazard mitigation planning. See Figure 5-6 for SSJV overview map.

Government Code 65302

Government Code 65302 authorizes, but does not require, cities and counties to adopt a local hazard mitigation plan specified in the Federal Disaster Mitigation Act of 2000 in conjunction with the Safety Element of the General Plan.

Government Code 8685.9

Government Code 8685.9 prohibits the State share for any eligible project under the California Disaster Assistance Act from exceeding 75 percent of total State eligible costs, unless the local agency is located within a city, county, or city and county that has adopted a local hazard mitigation plan in accordance with the Federal DMA 2000 as part of the safety element of its general plan. In other words, the

Legislature may provide for a State share of local costs that exceeds 75% of total State eligible costs if the local jurisdiction/agency has an adopted local hazard mitigation plan.

Government Code Section 8685.9 provides a financial incentive for implementation of Government Code Section 65302.6, which allows local jurisdictions to adopt a LHMP as part of the safety element. The financial incentive is realized when local jurisdictions incur State-eligible, post-disaster costs under California Disaster Assistance Act (CDAA)¹⁵.

Most importantly, the General Plan Safety Element will be required to reference information about floodplain management and flood hazards within the City of Shasta Lake. For further information, the crosswalks in Appendix C provide a checklist of the regulatory environment for the California Central Valley Flood Protection and SSJV.



Figure 5-6: Sacramento-San Joaquin Valley (SSJV)

¹⁵ California Disaster Assistance Act (CDAA) provides state financial assistance for recovery efforts to counties, cities, special districts, and certain eligible private non-profit agencies after a Governor's Proclamation or a Director's Concurrence by Cal OES. CDAA may be implemented as a "stand alone" funding source following a state disaster.

5.4.2 Past Occurrences

Shasta County has been a part of ten Federal Disaster Declarations that included flooding. The City of Shasta Lake has been able to avoid the bulk of the damages associated with flood events of this magnitude. However, Shasta Lake has experienced localized riverine and urban flooding, impacting residents and their property. The presence of zero Repetitive Loss (RL) properties¹⁶ in the city indicates flood impacts to private properties insured by the NFIP are minimal.

A RL *property* is a FEMA designation defined as an insured property that has made two or more claims of more than \$1,000 in any rolling 10-year period since 1978. The term “rolling 10-year period” means that a claim of \$1,000 can be made in 1991 and another claim for \$2,500 in 2000; or one claim in 2001 and another in 2007, as long as both qualifying claims happen within ten years of each other. Claims must be at least ten days apart but within ten years of each other. RL properties may be classified as a Severe Repetitive Loss (SRL) property under certain conditions. A SRL property has had four or more claims of at least \$5,000, or at least two claims that cumulatively exceed the building’s reported value. A property that sustains repetitive flooding may or may not be on the City’s RL property list for a number of reasons:

- Not everyone is required to carry flood insurance. Structures carrying federally-backed mortgages that are in a SFHA are required to carry flood insurance in Shasta Lake;
- Owners who have completed the terms of the mortgage or who purchased their property outright may not choose to carry flood insurance and instead bear the costs of recovery on their own;
- The owner of a flooded property that does carry flood insurance may choose not to file a claim;
- Even insured properties that are flooded regularly with filed claims may not meet the \$1,000 minimum threshold to be recognized as an RL property; or
- The owner adopted mitigation measures that reduce the impact of flooding on the structure, removing it from the RL threat and the RL list (in accordance with FEMA’s mitigation reporting requirements).

Extensive FEMA NFIP databases are used to track claims for every participating community. FEMA databases maintain all NFIP claims which allow for the examination of single-loss (SL) properties and RL properties. Shasta Lake has one property that has filed single-loss NFIP claim. The total dollar amount of claims paid to date by the NFIP is \$21,848 (SL claims data does not differentiate between building and contents).

NFIP Community Overview:

- Policies in force: 60
- Insurance in force: \$11,321,100
- Paid Losses: 1
- Total paid losses: \$21,858

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data are included in the list of restricted information. FEMA can only

¹⁶Correspondence letter from FEMA to City of Shasta Lake dated June 26th, 2013, indicated that the FEMA loss database contained no RL records to date.

release such data to state and local governments, and only if the data are used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

5.4.3 Location/Geographic Extent

The drainage pattern for the City of Shasta Lake general flows from north to south. There are three major streams that begin north of the City, flow through the City and travel south into Redding on their way to the Sacramento River. The westernmost stream is Churn Creek, which drains 6,000 acres when it leaves the City of Shasta Lake. The second stream is Salt Creek, which drains 2,424 acres as it leaves the City. Salt Creek collects runoff from the central core of Shasta Lake and converges with Churn Creek at the City of Redding. Lastly, Moody Creek the easternmost stream drains approximately 2,580 acres, a small area at the eastern-most portions of the City. See Figure 5-7 for location and extent of each drainage area.

The City’s topography provides sufficient slope to quickly dispense storm water runoff downstream. From time to time small streams are at critical capacities during heavy rain events. These events create shallow depth and high velocity stream channel characteristics. Under such conditions, any characteristic that blocks flow has the potential to create a hydraulic jump that can significantly increase water surface elevations, increasing the risk to structures due to high water or diverted flows into uncontrolled routes. Carefully engineered drainage improvements can help minimize these risks. Table 5-4 provides details on the City’s major waterways. Table 5-5 provides the total area for both the FEMA identified 1% Annual Chance (100-year) and the 0.2% Annual Chance (500-year) flood.

Table 5-4: Shasta Lake Waterways

Stream	Discharge Point	Total Watershed Area	Watershed within Shasta Lake
Churn Creek	South Central City Boundary just West of Avington Way	6,000 Acres	3,753 Acres
Salt Creek	South City Boundary, just East of I-5 at Crooked Oak Lane	2,424 Acres	1,889 Acres
Moody Creek	East City Boundary, just North of Akrich Street	2,581 Acres	903 Acres
Total		11,005 Acers	6,545 Acers

Table 5-5: Flood Hazard Area

Flood Hazard Type	Acres
1% Annual Chance	435.91
0.2% Annual Chance	55.56
Total Acreage with Flood Hazard	491.47

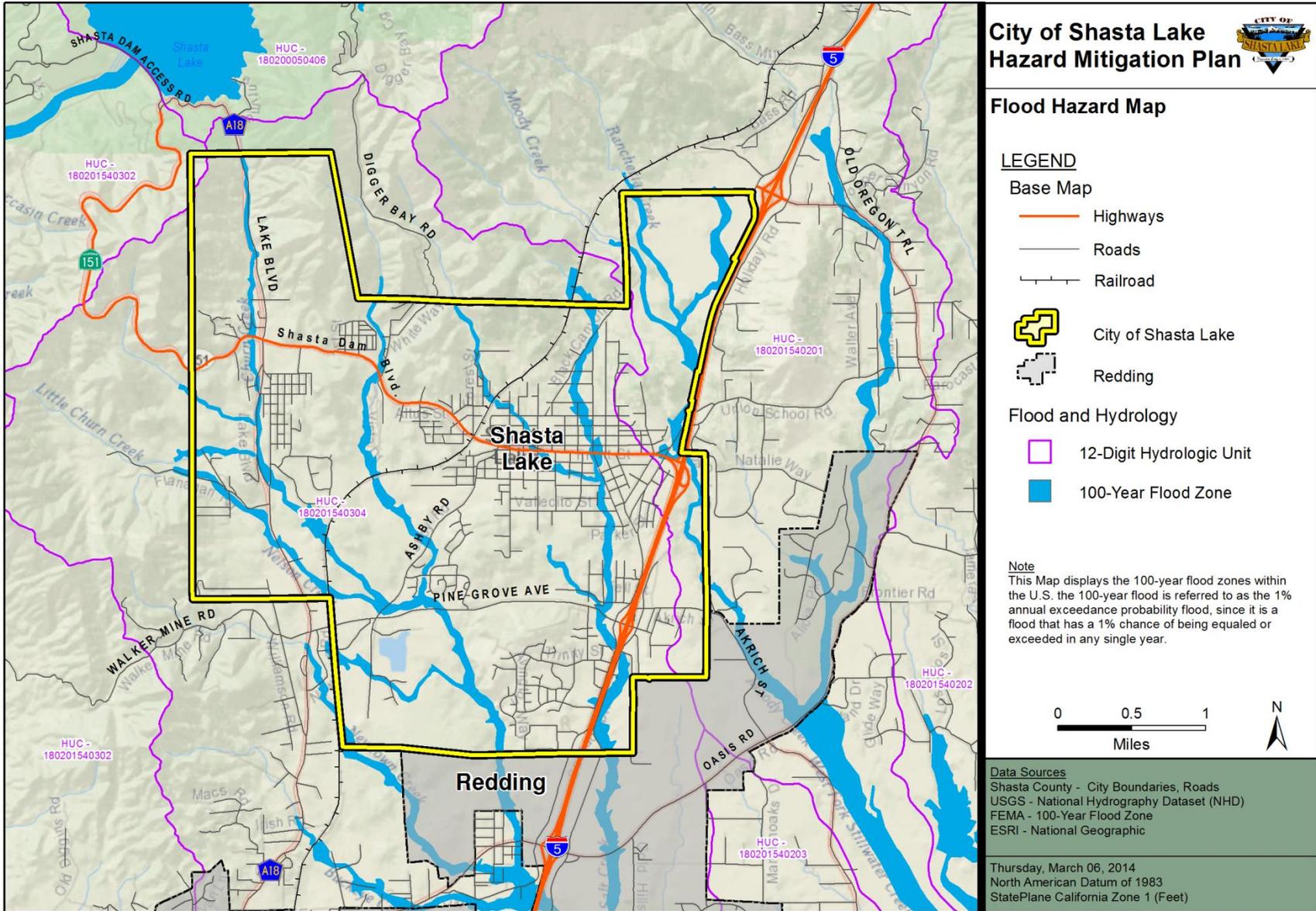


Figure 5-7: Flood Hazard Map

5.4.3.1 Churn Creek

Almost all runoff from the City of Shasta Lake drains into Churn Creek (with the exception of Moody Creek drainage area) and enters the Sacramento River south of the City of Redding. Most of the Churn Creek drainage area is either undeveloped or rural. The general topography is rolling foothills with significant undergrowth. Impervious surface areas are limited within the drainage area and drainage infrastructure is primarily culverts and bridges. Runoff is generally through natural channels which are well-defined and relatively steep. Ponding outside of the floodway within the City is relatively rare and occurs when the primary channel is blocked. These blockages are generally the result of debris accumulation or undersized drainage structures at roadways. Table 5-6 provides a summary of Churn Creek flooding issues.

Table 5-6: Churn Creek Area Flooding Issues

Area	Issues
Lake Blvd Area	The properties along Lake Blvd have a variety of culverts installed on their properties. These range from concrete commercial grade installations to homemade culverts constructed from railroad ties. A failure of one of these culverts could cause extensive flooding along Lake Blvd. Many of the culverts were overgrown, and impediments to flow were found.

5.4.3.2 Salt Creek

The Salt Creek basin drains into Churn Creek south of the City within the City of Redding. Most of the City’s urban development is drained into the Salt Creek basin. Although topography provides significant vertical relief, the drainage systems are less well defined and generally consist of culverts and meandering ditches and channels. Since most of the City’s urban core lies within higher elevations of the drainage area, run-off or peak flows arrive quickly. Flooding that may occur will generally dissipate rapidly, as peak flows pass through the system and proceed downstream. The rudimentary nature of the drainage systems within this basin has led to the creation of several ongoing flooding challenges within the City. Flood issues in the Salt Creek basin include street closures which limits access and convenience for residents in the area. Table 5-7 provides a summary of Salt Creek area flooding issues.

Table 5-7: Summary of Salt Creek Area Flooding Issues

Area	Issues
Red Bluff Street and Washington Avenue	The existing 24" CMP inlet does not adequately convey large storm flows. When dry the inlet is more than 50% blocked with debris. Most of the flows bypass the inlet and continue west.
Between Moon Shadow Court and Chico Street	An existing retention pond lacks an outlet and connection to an existing ditch to the east.
The alley south of Meade Street and north of Fort Peck Street running from San Gorgonio Avenue to Montana Ave.	Water flowing from an 18" CMP along the east side of San Gorgonio empties into the alley. Flows from a 24" CMP along the west side of San Gorgonio cross the street and empty into the alley.
The intersections of Grand Coulee Blvd. and Shasta Street and Grand Coulee Blvd. and Morning Star Way	Portions of Grand Coulee Blvd., between Shasta Street and Morning Star Way, annually floods.
Deer Creek Road, south of Fort Peck Street	The stream turns almost 90 degrees after exiting the culverts on the east side of the street. During periods of high water flows, this could lead to erosion issues, and may have already begun to erode the existing banks.



Figure 5-8 Culverts running under Deer Creek Road, South of Fort Peck Street

5.4.3.3 *Moody Creek*

Moody Creek is on the eastern edge of the City and its impacts to the overall drainage patterns are limited primarily to the vicinity of the Shasta Dam Blvd/I interchange. This creek drains into Stillwater Creek, and therefore is the only basin not within the Churn Creek system. Table 5-8 provides a summary of Moody Creek’s flooding issues.

Table 5-8: Summary of Moody Creek Area Flooding Issues

Area	Issues
Leona Avenue south of Akrich Street	Flows from the area flow from offsite and over an existing grated inlet continuing south on the east side of Leona Avenue.
Along Indian Avenue south of Sioux Court	Flows along the west side of Indian Avenue’s shoulder and continues north.

5.4.4 **Magnitude / Severity**

Magnitude and severity of flooding generally results from prolonged heavy rainfall and are characterized by high intensity, short duration runoff events, due to the relatively short distance from the top of the mountains. Floods usually occur during the season of highest precipitations or during heavy rainfalls after long dry spells. Widespread storms over the region can occur anytime from September through April. Flooding is more severe when the ground is frozen and infiltration is minimal due to saturated ground conditions, or when rain-on-snow in the higher elevations adds snowmelt to rainfall runoff, resulting in intensified flood conditions.

Cloudburst storms, sometimes lasting as long as 3 hours, can occur over the region anytime from late spring to early fall. They also may occur as extremely severe sequences within general winter rainstorms or during unseasonable rains. The intensity of cloudburst storms is very high, and the storms can produce enough precipitation to result in significant runoff (Shasta County 2011).

Backyard flooding as well as some street flooding can occur during severe storms. Reports of minor flooding to garages and outbuildings, landscape erosion, and flooded streets have occurred in the City. Trash and other debris can also be found obstructing culvert and pipe openings during even moderate flows in smaller channels, which can lead to clogging, obstruction, and eventual flooding of nearby properties.

Due to the Mediterranean climate and the variability of rainfall, stream flows throughout the City are highly variable and directly impacted from rainfall or flow from headwaters. Many streams in the City are dry during the summer months. Watercourses can experience a high amount of sedimentation during wet years and high amounts of vegetative growth during dry and moderate years. Many streams in Shasta County only flow during winter months. There are numerous undersized culverts throughout the city that cause flooding problems.

5.4.4.1 Flood Warning and Notification

The magnitude and severity of flood damage can be reduced with longer periods of warning time and proper notification before flood waters arrive. Warning times of 12 hours or more have proven adequate for preparing communities for flooding and reducing flood damages. More than 12 hours advance warning of a flood can reduce a community's flood damage by approximately 40% in comparison with unprepared communities (Read Sturgess and Associates 2000). In addition, seasonal notification for flooding can enhance awareness for residents at risk, and when communicated effectively advance notification can reach target audiences on a large scale. Shasta Lake coordinates with National Weather Service in Sacramento, CA and the California Department of Water Resources for flood forecasting in localized areas.

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5.5 Geologic Hazards

Geologic hazards pose a substantial danger to residents and city property. Geologic hazards exist in Shasta Lake due to naturally occurring geologic events and geologic hazards accelerated by human development. Common geologic hazards present throughout the City include seismic shaking or “earthquake”, volcanic activity, and slope failure. Each hazard is profiled in detail below.



5.5.1 Earthquake

The term "earthquake" refers to the vibration of the Earth's surface caused by movement along a fault, by a volcanic eruption, or even by manmade explosions. The vibration can be violent and cause widespread damage and injury, or may be barely felt. Most destructive earthquakes are caused by movements along faults. An earthquake is both the sudden slip on an active earth fault and the resulting shaking and radiated seismic energy caused by the slip (USGS 2009). Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface (see Section 5.5.7.1 for more information on earthquake magnitude and potential ground shake maps). Seismic shaking is typically the greatest cause of loss to structures during earthquakes.

Earthquakes may also cause landslides, particularly during the wet season, in areas of high water or saturated soils. The most likely areas for earthquake-induced landslides correlate to areas of high landslide potential discussed later in this section.

5.5.2 Volcano

A volcano is an opening in the ground where magma forces its way to the surface. Magma which reaches the earth's surface is called lava. Volcanoes can be active (erupting), dormant (sleeping) or extinct (no eruption for 10,000 years and unlikely to erupt again). Volcanoes produce a wide variety of natural hazards that can cause death and injury and destroy property hundreds of miles away and even affect global climate.

The effects of volcanic eruptions can be divided into primary and secondary effects. The primary effects are immediate and come from the eruption itself whereas the secondary effects result from the primary effects.

Primary effects of a volcanic eruption include:

Volcanic gases - All magma contains dissolved gases released during and between eruptions. These gases are mainly steam, carbon dioxide, and compounds of sulphur and chlorine.

Lava flows - Streams of molten rock.

Pyroclastic flows - High speed avalanches of hot ash, rock fragments, and gas which move down the sides of a volcano. These flows occur when the vent area or ash column collapses.

Tephra - Explosive power of an eruption causes old lava to be blasted into tiny pieces and hurled into the air. The fragments are tephra. Tephra fragments are classified by size:

- Ash – particles smaller than 2 mm (0.08 inches) in diameter,
- Lapilli or volcanic cinders – between 2 and 64 mm (0.08 and 2.5 inches) in diameter,
- Volcanic bombs or volcanic blocks – larger than 64 mm (2.5 inches) in diameter.

Secondary effects of a volcanic eruption include:

Lahars - A mixture of water, rock, ash, sand, and mud that originate from the slopes of a volcano. Lahars often happen because of heavy rainfall eroding volcanic deposits or heat from a volcanic vent suddenly melting snow and ice.

Landslides - Heat from cooling magma can cause hydrothermal alteration of the rocks, turning sections of them into clay. This weakens the rocks and increases the risk of slope failures.

Flooding - Explosive eruptions can change the surface areas around a volcano and disrupt drainage patterns, leading to long-term flooding.

In Shasta Lake the most likely hazard from volcanic activity will be tephra fall in the form of ash. Volcanic ash, the smallest tephra fragments, can travel hundreds to thousands of kilometers downwind from a volcano. Ash usually covers a much larger area and can be far more disruptive than the other more lethal types of volcano hazards. The size of ash particles that fall to the ground and the thickness of ash fall downwind from an erupting volcano are difficult to predict in advance.

Not only is there a wide range in the size of an eruption that might occur and the amount of tephra injected into the atmosphere, but the direction and strength of the prevailing wind can vary widely (U.S. Geological Survey n.d.). Figure 5-9 from the USGS provides a simplified sketch of a volcano with a tephra plume.

5.5.3 Slope Failure

Slope failure is the movement of soil, rock, or other earth materials, downhill in response to gravity. Slope failure includes rock falls and topples, debris flows and debris avalanches, earthflows, mudflows, creep, and lateral spread of rock or soil. Slope failure can occur when the force pulling the material on

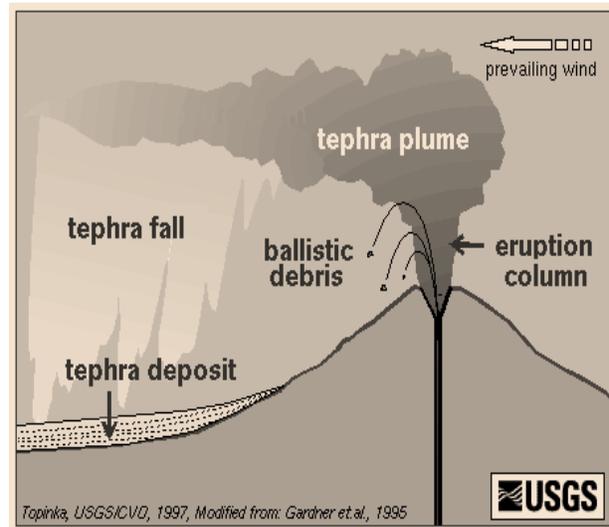


Figure 5-9: Volcano Cut-away Diagram.

the slope in a downward direction under gravitational influence exceeds the strength of the earth materials that compose the slope (USGS 2004). These materials may move by falling, toppling, sliding, spreading, and/or flowing. Strength of soil, rock (or snow), steepness of slope, and weight of the hillside material all play an important role in the stability of hillside areas.

5.5.3.1 Landslide

A landslide is a large mass of rocks and earth that suddenly and “quickly” moves down the side of a mountain or hill. Landslides frequently occur in areas where the soil is saturated from heavy rains or snowmelt. They can also be started by earthquakes, volcanic activity, changes in groundwater, disturbance, or change of a slope by man-made construction activities, or any combination of these factors.

Similar to soil base landslides rock falls, or topples, are usually sudden and occur on steep slopes. In a rock fall, rocks may fall, bounce, or roll down the slope. A topple occurs when part of a steep slope breaks loose and rotates forward.

Landslides often accompany other natural hazard events, such as floods, wildfires, or earthquakes. Landslides can occur slowly or very suddenly and can damage and destroy structures, roads, utilities, and forested areas, as well as injuries and death.

5.5.3.2 Slope Erosion and Sedimentation

Erosion or soil erosion is the “gradual” wearing a way of soil particles from natural processes such as wind, water and other elements. This also includes rocks and other geological materials.

Sedimentation is the means by which broken down particles from erosion are transported to either land or water based environments. Sedimentation can be large masses comprised of inorganic (or organic materials) and can have a dramatic impact on the environment. Sediment is transported by natural processes, although the volume or 'load' is often increased as a result of man-made interventions such as construction work.

5.5.4 Regulatory Environment

Numerous building and zoning codes exist at the state and local levels to decrease the impact of geologic hazard events on residents and infrastructure. Building and zoning codes include the 2010 California Standards Building Code (CSBC) and Shasta Lake Municipal Code. To protect lives and infrastructure in the City, the Building Division is responsible for code enforcement and ensures residents follow building and zoning codes that mitigate geologic hazards.

The 2010 CSBC is based on the International Building Codes (IBC), which is widely used throughout the United States. CSBC was modified for California’s conditions to include more detailed and stringent building requirements. The Shasta Lake Building Division utilizes the 2010 CSBC to regulate the infrastructure and development within the City.

Chapter 15.08 of the Shasta Lake Municipal Code (Grading, Erosion Control, and Hillside Development) has been established in an effort to prevent future erosion issues within the City. These codes will guide all future development on both private and public property.

5.5.5 Past Occurrences

5.5.5.1 Earthquake

Shasta Lake-area historical earthquake activity is significantly below California state average, however, the area is 321% greater than the overall U.S. average. See Table 5-9 for a list of major historical earthquakes that occurred in the region of Shasta Lake. See Section 5.5.7.1 for information on Magnitude and Intensity ratings.

Table 5-9: Major historic earthquakes in the Shasta Lake area greater than magnitude 5.0

Year	Magnitude (Richter)	Depth (Miles)	Class	Intensity (Modified Mercalli)	Distance from Shasta Lake (Miles)
4/25/1992	7.2	9.4	Major	VIII - XII	92.1
4/26/1992	6.6	12.6	Strong	VII - IX	99.3
8/17/1991	6.3	7.5	N.D.	N.D.	96.2
7/31/1987	6.0	0	N.D.	N.D.	98.1
8/1/1975	5.8	16	Moderate	VI - VII	96.2
11/26/1998	5.4	14.5	N.D.	N.D.	4.2
10/16/2013	2.3	N.D.	N.D.	I-II	5

Source: California Geologic Survey, 2012.

N.D. = No Data

On November 26 (Thanksgiving Day), 1998, the City of Shasta Lake experienced a local magnitude ML 5.4 earthquake centered 4.2 miles south-southwest of Shasta Lake near Keswick Dam. This was the largest recorded earthquake since the U.S. Geological Survey began monitoring Shasta County in 1981 and believed to be the largest earthquake close to Shasta Lake since 1878. No structural damage was reported in the City. Nonstructural damage reported consisted of broken merchandise, loss of power due to a damaged electrical panel, a fire sprinkler break in a mechanical room and two operating rooms at Mercy Medical Center in Redding and non-structural cracks at expansion joints in a highway overpass.

Outside of the City limits, a 4-million gallon water tank in Bella Vista lifted about an inch off its foundation, resulting in bent anchor bolt washers; and a PG & E transformer caught fire resulting in temporary power outage for 7,500 customers. The only reported earthquake injury occurred in the City of Shasta Lake when a woman slipped and fell (Shasta County 2011).

On October 16, 2013 the USGS recorded seven small earthquakes. The earliest was reported at just after 3 a.m. Tuesday, about 3 miles west of Lake Boulevard in Shasta Lake, or about 6.5 miles west of Interstate 5. The last earthquake was recorded at about 11:30 a.m. All of the earthquakes measured between 1.9 and 2.3 in magnitude. They may have not been felt by residents in the surrounding area. See Figure 5-10 for a USGS location map of the earthquake series.

5.5.5.2 Slope Failure

There has not been any disaster declarations associated with slope failure in Shasta Lake. However, there have been a few isolated incidences of slope failure in the form of slope erosion. Erosion and sedimentation issues have been generally related to development and earth movement in specific areas. These isolated incidences were not declared disasters; however all of them resulted in damage to infrastructure, and or the environment.

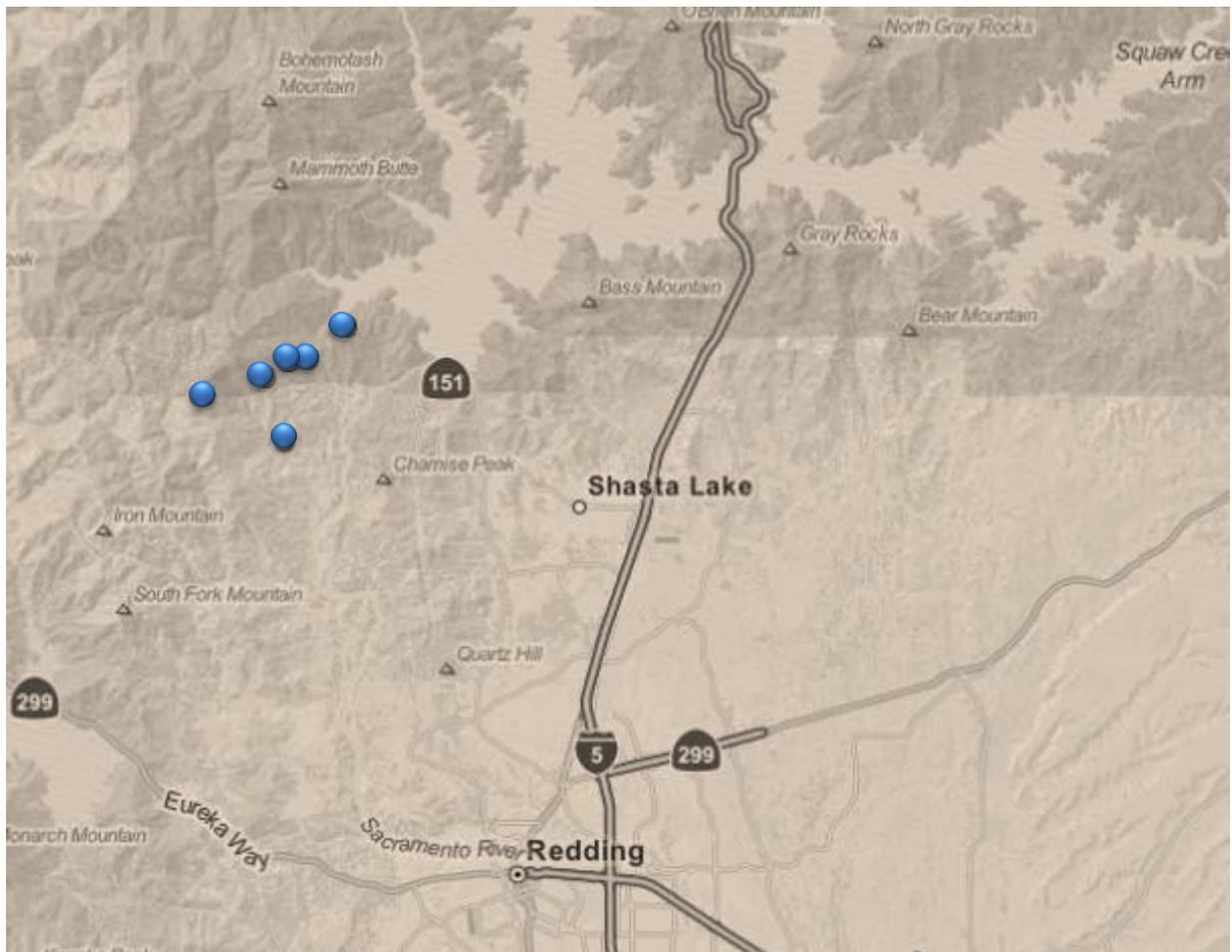


Figure 5-10: October 2013 Earthquakes- USGS Location Map

5.5.5.3 Volcano

Due to the location near a tectonic plate boundary, the Cascade Mountains have experienced more than 50 volcanic eruptions over the past 4,000 years. The Cascades have formed as a result of the subduction of the small Juan de Fuca plate (oceanic) under the large North American plate (continental). The Cascades extend northward from Lassen Peak (also known as Mount Lassen) in northern California to the confluence of the Nicola and Thompson Rivers in British Columbia. Figure 5-11 from the USGS shows volcanic eruptions in Cascade Mountain Range over the last 4,000 years (Lassen County 2009).

On May 22, 1915, an explosive eruption at Lassen Peak, the southernmost active volcano in the Cascade Range, devastated nearby areas and rained volcanic ash as far away as 200 miles to the east of the eruption. The Lassen explosion was the most powerful in a series of 1914 through 1917 eruptions. These were the last to occur in the Cascades before the 1980 eruption of Mt. St. Helens. Lassen Peak is the largest of a group of more than 30 volcanic domes that have erupted over the past 300,000 years. The following picture (Figure 5-12) from the National Park Service provides an illustration of the Lassen Peak eruption (Lassen County March 2010).

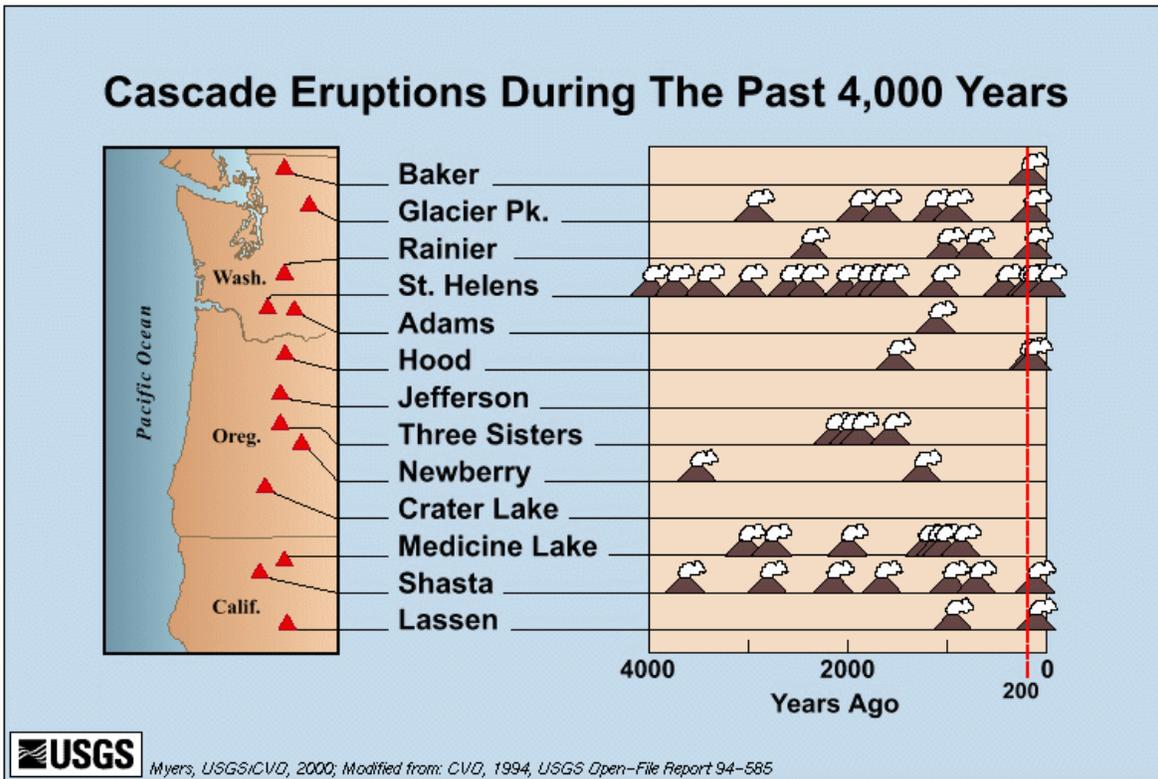


Figure 5-11: Historic Volcanic Eruptions



Figure 5-12: Mt. Lassen Volcanic Eruption

5.5.6 Location/Geographic Extent

5.5.6.1 Earthquake

The risk of seismic hazards to residents of Shasta Lake is based on the approximate location of earthquake faults within and outside the region. According to the California Department of Conservation’s Earthquake Fault Zone Maps, Shasta Lake is not near any active fault zones. However, the Battle Creek Fault Zone has been identified as the closest active and possibly a hazardous fault to Shasta Lake residence and property. The Battle Creek Fault Zone is a system of closely parallel faults that run between the Coast Ranges near the town of Cottonwood, California, extending northeast about 22 miles toward the southern slopes of Mt. Lassen. The faulting action is normal (vertical motion) with terrain to the south lower than terrain to the north. Although there have been no earthquakes in historic times, it is believed that the fault zone may still be active, and has been determined to be the closest active fault to the Shasta Dam (United States Department of the Interior 2011).

5.5.6.2 Slope Failure

Most slope failure hazards occur in areas of steeper slopes and in areas of low relief especially when the area has been recently subject to wildfire. Rates of erosion are contingent on a number of factors, including the type of soil material and structure, slope, water runoff and levels of human activity. Location and geographic extent of slope failure is changed by human development. Development can change the natural drainage patterns, resulting in destabilizing of soils, speeding hillside erosion.

The location and extent of potential slope failure problems can be predicted with mapping processes. The California Geological Survey conducted spatial analysis to develop the location and extent of landslide susceptibility in California. On the most basic level, weak rocks and steep slopes are more likely to generate landslides.

The map in Figure 5-13 uses detailed information on the location of past landslides, and the location and relative strength of rock units. It is intended to provide infrastructure owners, emergency planners and the public with a general overview of where landslides are more likely. The map does not include information on landslide triggering events, such as rainstorms or earthquake shaking, nor does it address susceptibility to shallow landslides such as debris flows. This map is not appropriate for evaluation of landslide potential at any specific site.

The Landslide Susceptibility Classes shown in Figure 5-13 express the generalization that on very low slopes, landslide susceptibility is low even in weak materials and that landslide susceptibility increases with slope and in weaker rocks. Very high landslide susceptibility, classes VIII, IX, and X, includes very steep slopes (greater than 25%) in hard rocks and moderate (moderately steep slopes are areas with a 15% to 25% grade) to very steep slopes in weak rocks.

5.5.6.3 Volcanic Activity

The location of volcanic threat to Shasta Lake extends from Mt. Shasta to the north and Mt Lassen to the east. Both volcanos are approximately 50 miles (80 kilometers) away. The geographic extent of hazard threat from both volcanos is related to tephra ash. USGS analysis indicates that Mount Shasta is not likely to erupt large volumes of ash in the future and areas subject to the greatest risk from air-fall tephra are located mainly east and within approximately 50 kilometers. The degree of risk from air-fall tephra decreases progressively as the distance from the volcano increases. Figure 5-14 depicts pyroclastic and tephra hazards from both Mount Shasta and Mount Lassen.

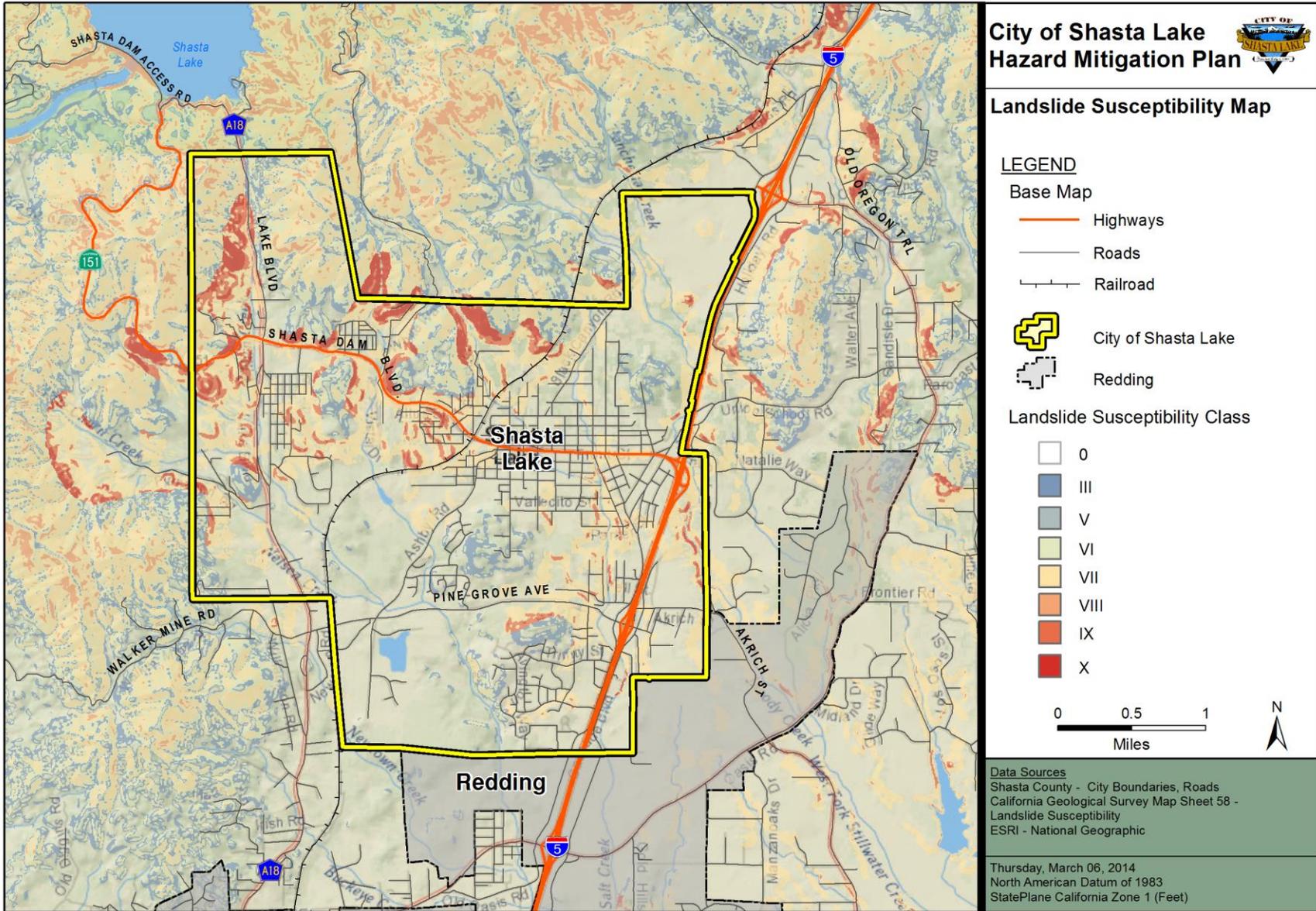


Figure 5-13: Landslide Hazard Map

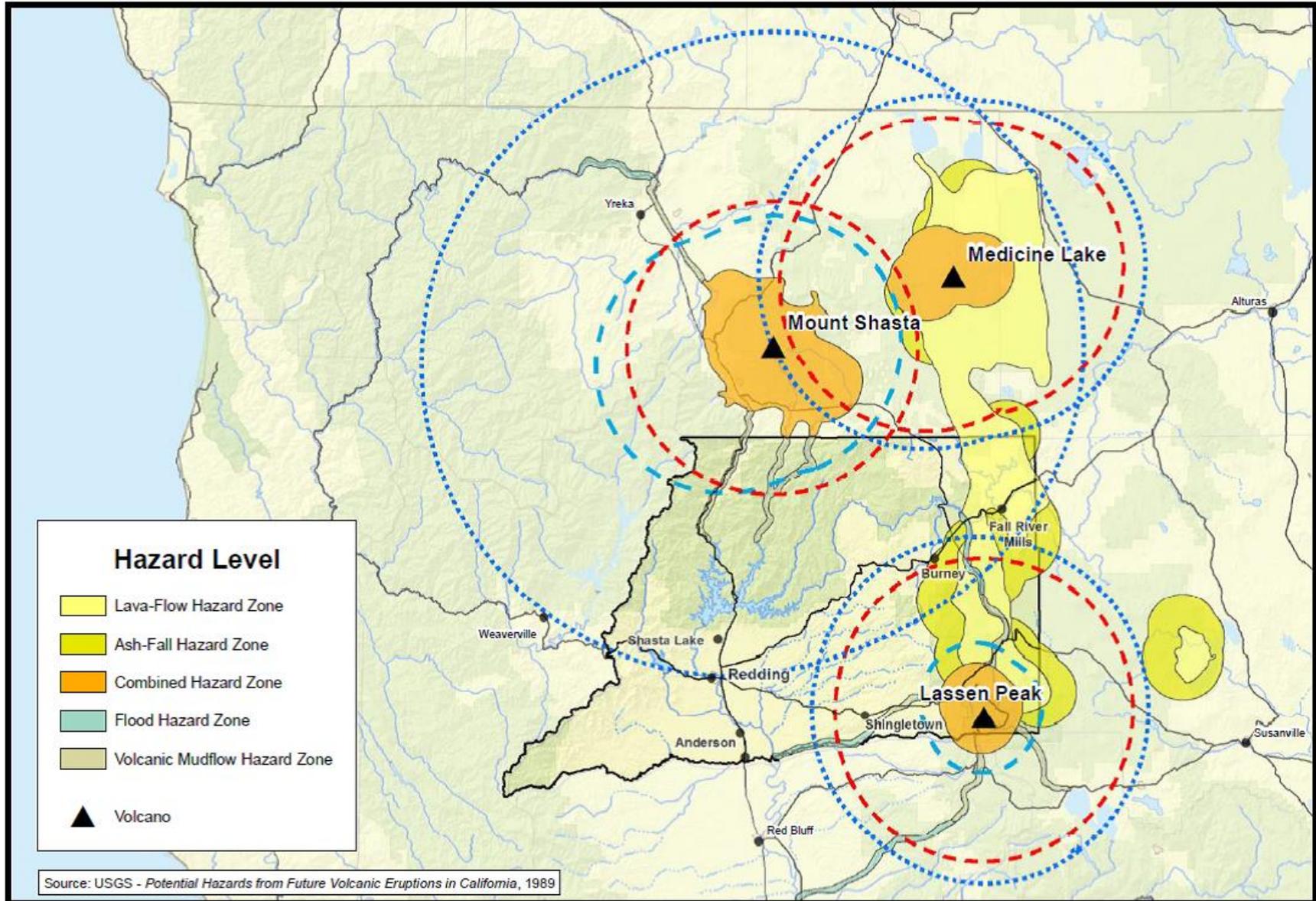


Figure 5-14: Shasta Lake Volcanic Activity Hazard Map

5.5.7 Magnitude/Severity

5.5.7.1 Earthquake

The most common method for measuring earthquakes is magnitude, which measures the strengths of earthquake. Although the Richter Scale is known as the measurement for magnitude, the majority of scientists currently use either the M_w Scale or Modified Mercalli Intensity (MMI) Scale. The effects of an earthquake in a particular location are measured by intensity. Earthquake intensity decreases with increasing distance from the epicenter of the earthquake.

The magnitude of an earthquake is related to the total area of the fault that ruptured, as well as the amount of offset (displacement) across the fault. As shown in Table 5-10, there are seven earthquake magnitude classes, ranging from great to micro. A great class of magnitude can cause tremendous damage to infrastructure in Shasta Lake, compared to a micro class, which results in minor damage to infrastructure.

Table 5-10: Moment Magnitude Scale

Earthquake Magnitude Classes		
Magnitude Class	Magnitude Range (M = Magnitude)	Probable Damage Description
Great	$M > 8$	Tremendous damage
Major	$7 \leq M < 7.9$	Widespread heavy damage
Strong	$6 \leq M < 6.9$	Severe damage
Moderate	$5 \leq M < 5.9$	Considerable damage
Light	$4 \leq M < 4.9$	Moderate damage
Minor	$3 \leq M < 3.9$	Rarely causes damage.
Micro	$M < 3$	Minor damage

The MMI Scale measures earthquake intensity as shown in Table 5-11. The MMI Scale has 12 intensity levels. Each level is defined by a group of observable earthquake effects, such as ground shaking and/or damage to infrastructure. Levels I through VI describe what people see and feel during a small to moderate earthquake. Levels VII through XII describe damage to infrastructure during a moderate to catastrophic earthquake.

Table 5-11: Modified Mercalli Scale

Earthquake Magnitude and Intensity		
Magnitude (M_w)	Intensity (Modified Mercalli Scale)	Description
1.0 – 3.0	I	I. Not felt except by very few people under especially favorable conditions.
3.0 – 3.9	II – III	II. Felt by a few people, especially those on upper floors of buildings. Suspended objects may swing.
		III. Felt quite noticeably indoors. Many do not recognize it as an earthquake. Standing motorcars may rock slightly.

Earthquake Magnitude and Intensity		
Magnitude (M _w)	Intensity (Modified Mercalli Scale)	Description
4.0 – 4.9	IV – V	IV. Felt by many who are indoors; felt by a few outdoors. At night, some awakened. Dishes, windows, and doors rattle.
		V. Felt by nearly everyone; many awakened. Some dishes and windows broken; some cracked plaster; unstable objects overturned.
5.0 – 5.9	VI – VII	VI. Felt by everyone; many frightened and run outdoors. Some heavy furniture moved; some fallen plaster or damaged chimneys.
		VII. Most people alarmed and run outside. Damage negligible in well-constructed buildings; considerable damage in poorly constructed buildings.
6.0 – 6.9	VII – IX	VIII. Damage slight in special designed structures; considerable in ordinary buildings; great in poorly built structures. Heavy furniture overturned. Chimneys, monuments, etc. may topple.
		IX. Damage considerable in specially designed structures. Buildings shift from foundations and collapse. Ground cracked. Underground pipes broken.
7.0 and Higher	VIII and Higher	X. Some well-built wooden structures destroyed. Most masonry structures destroyed. Ground badly cracked. Landslides on steep slopes.
		XI. Few, if any, masonry structures remain standing. Railroad rails bent; bridges destroyed. Broad fissure in ground.
		XII. Virtually total destruction. Waves seen on ground. Objects thrown into the air.

5.5.7.2 Slope Failure

Severity of slope failures is dependent on the area and amount of material involved in a failure event. Though there is not a classification system for “magnitude and severity” of a slope failure event, Table 5-12 provides the Varnes Landslide Classification¹⁷ based on material and type of movement.

¹⁷ Varnes, D. J. 1978. Slope movement types and processes. In: Special Report 176: Landslides: Analysis and Control (Eds: Schuster, R. L. & Krizek, R. J.). Transportation and Road Research Board, National Academy of Science, Washington D. C., 11-33.

Table 5-12: Landslide Classification Chart (Varnes 1978)

Type of movement		Type of material			
		Bedrock	Engineering soils		
			Predominantly fine	Predominantly coarse	
Falls		Rock fall	Earth fall	Debris fall	
Topples		Rock topple	Earth topple	Debris topple	
Slides	Rotational	Rock slump	Earth slump	Debris slump	
	Translational	Few units	Rock block slide	Earth block slide	Debris block slide
		Many units	Rock slide	Earth slide	Debris slide
Lateral spreads		Rock spread	Earth spread	Debris spread	
Flows		Rock flow	Earth flow	Debris flow	
		Rock avalanche		Debris avalanche	
		(Deep creep)	(Soil creep)		
Complex and compound		Combination in time and/or space of two or more principal types of movement			

5.5.7.3 Volcanic Activity

Eruption magnitude scale - called the Volcanic Explosivity Index (VEI)¹⁸ provides a measurement for the relative explosiveness of volcanic eruptions. The VEI measures how much volcanic material is ejected, the height of the material thrown into the atmosphere, and how long the eruptions last. The scale is logarithmic, or based on 10; therefore, an increase of “1” on the scale indicates an eruption 10 times more powerful than the number before it on the scale. The Mount Lassen eruption in 1914 (described in Section 5.5.5.3) and the Mount Shasta eruption in 1786 were considered VEI category 3 eruptions. Shasta has erupted 10-11 times during the last 3,400 years and at least 3 times in 750 years. Mount Shasta's history suggests it erupts at an average rate of roughly once per 250 to 300 years. The most recent explosion was moderate and approximately 2 on the VEI chart.

Table 5-13: Volcanic Explosivity Index

VEI	Description	Plume Height	Volume	Classification	Frequency of Eruption	Recent Examples
0	Non-explosive An outpouring of lava on the ground.	< 100 m	< 10,000 m ³	Hawaiian	Persistent	Kilauea
1	Gentle Low-level, small to medium volume	100–1000 m	> 10,000 m ³	Hawaiian/ Strombolian	daily	Nyiragongo (2002)
2	Explosive Dense cloud of ash and gases with volcanic bombs (2-3 meters in diameter)	1–5 km	> 1,000,000 m ³	Strombolian / Vulcanian	weekly	Ruapehu, New Zealand (1971), Mount Sinabung (2010)

¹⁸ The Volcanic Explosivity Index (VEI) was devised by Chris Newhall of the US Geological Survey and Stephen Self at the University of Hawaii in 1982 to provide a relative measure of the explosiveness of volcanic eruptions.

VEI	Description	Plume Height	Volume	Classification	Frequency of Eruption	Recent Examples
3	Severe Glowing avalanche of hot ash and pyroclastic flows.	3–15 km	> 10,000,000 m ³	Vulcanian / Pelean	Few months	Soufriere Hills (1995), Nevado del Ruiz, Colombia (1985)
4	Cataclysmic Columns of gas and ash extends to stratosphere	10–25 km	> 0.1 km ³	Pelean/ Plinian	≥ 1 yr.	Eyjafjallajoku II (2010)
5	paroxysmal	20–35 km	> 1 km ³	Plinian	≥ 10 yrs.	St. Helens, (1980)
6	colossal	> 30 km	> 10 km ³	Plinian / Ultra-Plinian	≥ 100 yrs.	Mount Pinatubo, Philippines (1991)
7	super-colossal	> 40 km	> 100 km ³	Ultra-Plinian	≥ 1,000 yrs.	Tambora, (1815)
8	mega-colossal	> 50 km	> 1,000 km ³	Supervolcanic	≥ 10,000 yrs.	Yellowstone (Pleistocene)

5.5.8 Frequency/Probability of Future Occurrences

5.5.8.1 Earthquake

The variable green and red colored map in Figure 5-15 is the Probabilistic Seismic Hazards Map (PSHM)¹⁹ for Magnitude of 6.0 or greater within the next 50 years in the Shasta Lake region (U.S. Geological Survey 2009). The lower the probability of an earthquake is to occur, the further the area is away from known active faults. The areas in grey, blue, and green are predicted to experience lower levels of shaking less frequently.

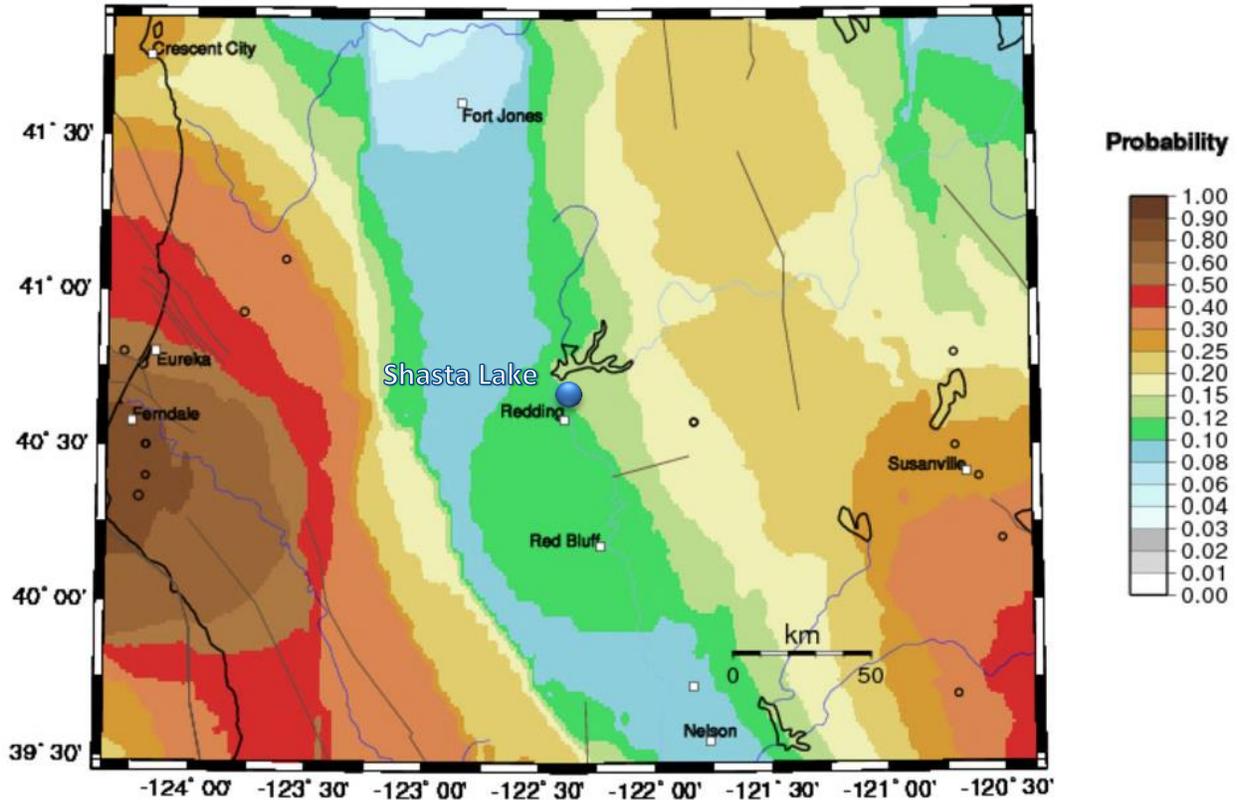
Though the map in Figure 5-15 shows a lower chance (12 to 15 percent) of an earthquake greater than Magnitude 6.0 occurring, a very infrequent earthquake could cause strong shaking in Shasta Lake.

Important to note: Earthquakes occur less frequently than other primary natural hazard events, but they have accounted for the greatest combined losses (deaths, injuries, and damage costs) in disasters since 1950 in California and have the greatest catastrophic disaster potential (Cal EMA 2010).

¹⁹ The 2008 USGS-National Seismic Hazard Mapping Project (NSHMP) update maps show the expected relative intensity of ground shaking and damage in California from anticipated future earthquakes. The shaking potential is calculated as the level of ground motion that has a 2% chance of being exceeded in 50 years, which is the same as the level of ground-shaking with about a 2500 year average repeat time. Although the greatest hazard is in areas of highest intensity as shown on the map, no region is immune from potential earthquake damage.

Probability of earthquake with M > 6.0 within 50 years & 50 km

Site: -122.37 d E 40.68



EQ probabilities from USGS PSHA 50 KM maximum horizontal distance from site of interest (bubble). Fault traces are brown. Epicenters M> 6.0 are small circles.

Figure 5-15: Earthquake Probability Map

5.5.8.2 Slope Failure

The probability of future slope erosion events occurring in Shasta Lake is likely. Probability of future occurrences is dependent upon seasonal precipitation and soil stability throughout the City.

5.5.8.3 Volcanic Activity

Activity in an area is the best guide to forecasting future eruptions, as scientists study the lava flows, ash, and other deposits from past eruptions. Studies by geologists show that Mount Shasta has erupted 10 or 11 times during the last 3,400 years and at least 3 times in the last 750 years. Mount Shasta does not erupt at regular intervals, but its history suggests that it erupts at an average rate of roughly once per 250 to 300 years (U.S. Geological Survey 1987).

If the behavior of the volcano has not changed, the chance is 1 in 25 to 30 that it will erupt in any one decade and 1 in 3 or 4 that it will erupt within a person's lifetime. Such large eruptions in the Lassen area have an average recurrence interval of about 10,000 years. However, the geologic history of the Lassen area indicates that volcanism there is episodic, having periods of relatively frequent eruptions separated by long quiet intervals. For example, the last large event before the Chaos Crags eruption was the one that built Lassen Peak 27,000 years ago (U.S. Geological Survey 1987).

After the eruption of Mount St. Helens in 1980, the USGS intensified its monitoring of active and potentially active volcanoes in the Cascade Range. Monitoring of the Lassen area includes periodic measurements of ground deformation and volcanic gas emissions and continuous transmission of data from a local network of nine seismometers to USGS offices in Menlo Park, California.

Should indications of a significant increase in volcanic activity be detected, the USGS will immediately deploy scientists and specially designed portable monitoring instruments to evaluate the threat. The National Park Service (NPS) has developed an emergency response plan that would be activated to protect the public in the event of an impending eruption (U.S. Geological Survey 2014).

For more information on Mt. Lassen Volcanic Hazards visit:

http://volcanoes.usgs.gov/volcanoes/lassen_volcanic_center/

For more information on Mt. Shasta Volcanic Hazards visit:

http://volcanoes.usgs.gov/volcanoes/mount_shasta/

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5.6 Severe Weather

Severe weather can be defined as any destructive weather event with the potential to damage property or cause loss of life. For example, excessive localized precipitation over a short period of time may result in related flash floods that threaten life and property. In regards to the City, severe winter weather usually occurs as localized storms that can bring heavy rains, hail and occasionally ice and snow.



Hailstones are usually less than two inches in diameter and can fall at speeds of 120 miles per hour (mph), which can be destructive to roofs, buildings, automobiles, vegetation, and crops. Extreme snow events are unlikely in Shasta Lake, however, a winter snow storm event in higher elevations can affect travel in the region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow or ice can collapse roofs and down trees and power lines. The cost of snow removal, damage repair, and business losses can have a tremendous impact on communities.

5.6.1 Regulatory Environment

There are negligible formal regulations that pertain to generalized severe weather events.

5.6.2 Past Occurrences

Since 1964, three federally or state declared severe winter weather events have occurred in Shasta County as shown in Table 5-14. According to FEMA Declarations and Cal EMA Emergency and Disaster Proclamations (November 1964 to present), these events include: severe winter storms, severe storms, winter storms, flooding, landslides, and mud flows.

Table 5-14: Severe Weather Federal Declarations

Disaster Number	Declaration Date	Disaster Type	Incident Type	Explanation	Cost*
979	02/03/1993	DR ¹	Severe Storm(s)	WINTER STORMS, MUD & LANDSLIDES, FLOODING	\$213,149,000
1044	01/10/1995	DR	Severe Winter Storm(s)	SEVERE WINTER STORMS, FLOODING, LANDSLIDES, AND MUD FLOWS	Unknown
1046	03/12/1995	DR	Severe Winter Storm(s)	SEVERE WINTER STORMS, FLOODING, LANDSLIDES, AND MUD FLOWS	\$27,657,478

*Events may have occurred over multiple counties, so damage may represent only a fraction of the total event damage and may not be specific to Shasta County

¹- Disaster Recovery

5.6.3 Location/Geographic Extent

According to the U.S. Environmental Protection Agency (EPA) Shasta Lake is located within the Central California Foothills and Coastal Mountains eco-region. The primary distinguishing characteristic of this ecoregion is its Mediterranean climate of hot dry summers and cool moist winters, and associated vegetative cover comprising mainly chaparral and oak woodlands; grasslands occur in some lower elevations and patches of pine are found at higher elevations.

Surrounding the lower and flatter Central California Valley, most of the region consists of open low mountains or foothills, but there are some areas of irregular plains and some narrow valleys. Large areas are in ranch lands and grazed by domestic livestock. Relatively little land has been cultivated, although some valleys in the ecoregion are major agricultural centers such as the Salinas or the wine vineyard center of Napa and Sonoma. Natural vegetation includes coast live oak woodlands, Coulter pine, and unique native stands of Monterey pine in the west, and blue oak, black oak, and grey pine woodlands to the east.

5.6.4 Magnitude/Severity

Seasons are sharply defined in the Northern portion of the Sacramento Valley region. Summer daytime temperatures are high, sunshine is almost constant, and the air dry. Winters are very cold with piercing north winds, possibility of snow and thick Tule fog. Cold air rolls off the hillsides on winter nights and pools in the colder flatlands. Most precipitation falls between October and March, as much as 4.75" per month. See Figure 5-16 for average monthly precipitation in the Shasta Lake Region.

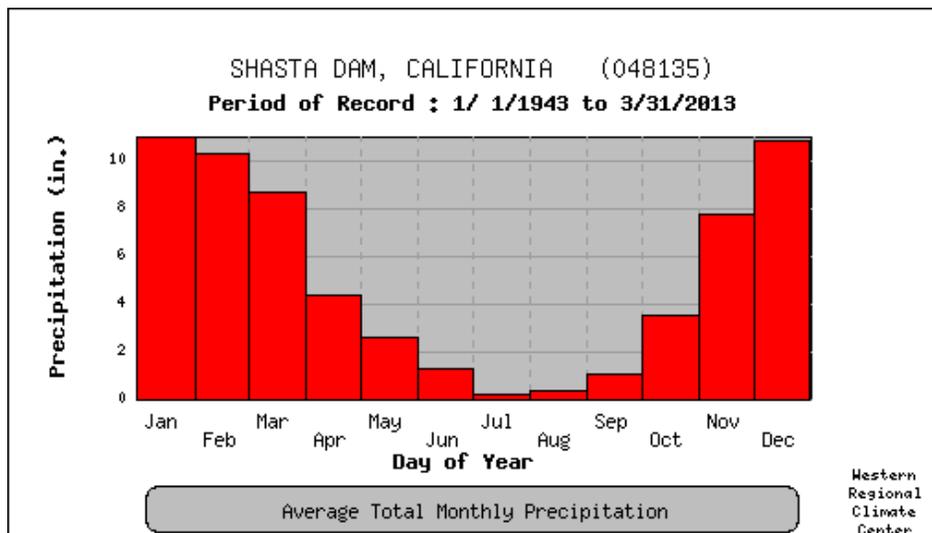


Figure 5-16: Shasta Lake Average Monthly Precipitation

Heavy rain and hail storms are some of the most common extreme weather events that occur in Shasta Lake. Some winter storms are accompanied by strong winds and freezing rain which can knock down trees, utility poles and power lines, and increases the likeliness of serious vehicle accidents. There have been extreme snow events that have occurred in Shasta Lake. As seen in Figure 5-17 the extreme winter storm events have included two January instances of over 20 inches of snow depth in Shasta Lake area. Two notable snow seasons occurred in 1951 – 1952 and 1949 – 1950. During these years the area received a total of 64 inches of snow in 1951-52 and 55 inches in 1949-50.

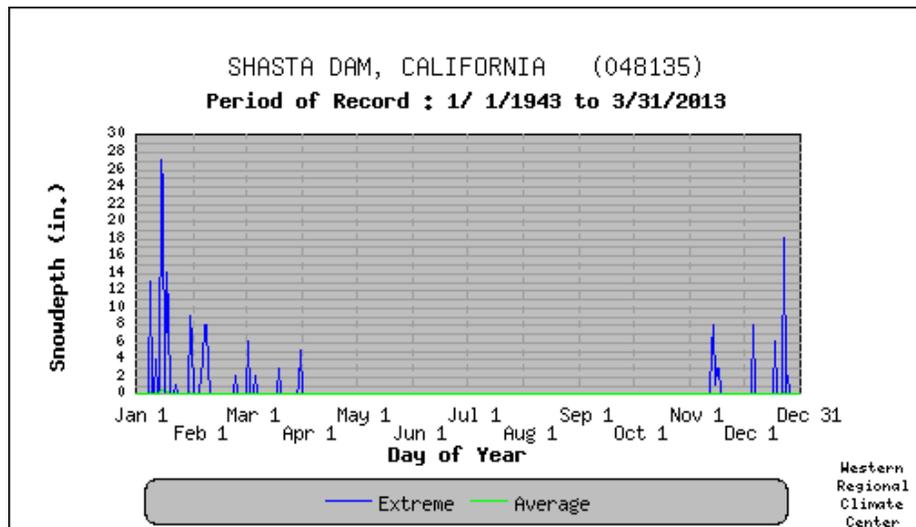


Figure 5-17: Shasta Lake Average and Extreme Snow depth

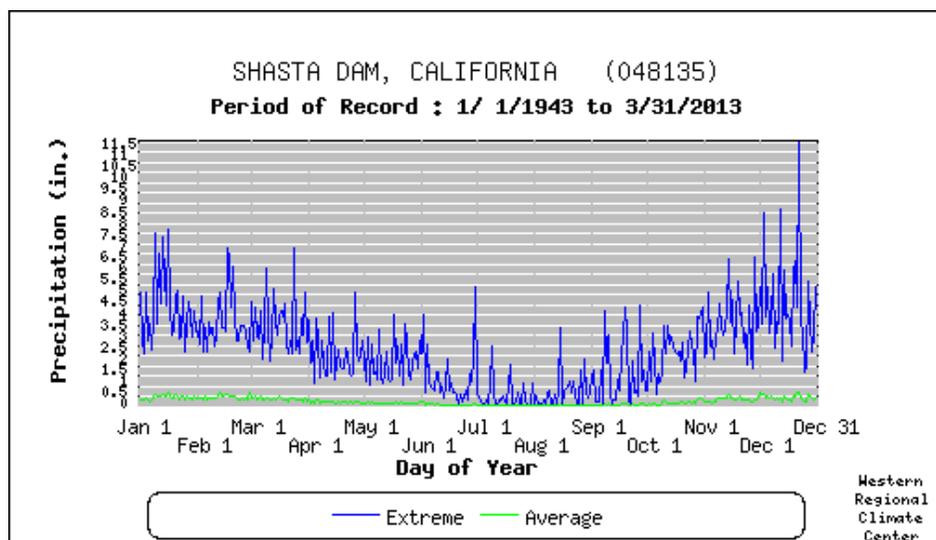


Figure 5-18: Shasta Lake Average and Extreme Monthly Snowfall

5.6.4.1 National Storm Data Review

Data from both the Spatial Hazard Events and Losses Database for the United States (SHELDUS) and the National Climatic Data Center (NCDC) Storm Events Database can be used to analyze the trends in severe weather patterns.

5.6.4.1.1 National Climatic Data Center (NCDC) Events

In addition to the federally declared events in Shasta County and SHELDUS, the National Oceanic and Atmospheric Administration’s (NOAA) NCDC has been tracking severe weather in Shasta Lake from 2006 through 2012. NCDC’s Storm Events Database contains detailed data on three severe weather events for Shasta Lake. The information below summarizes the magnitude and severity of these events.

Event One: Blizzard – 01/04/2008

A powerful Pacific storm brought widespread winds gusting to 60 mph, and in some areas to more than 80 mph, across interior Northern California, causing extensive damage and numerous power outages. Rainfall and liquid equivalent amounts ranged from 2 to 3 inches in the northern Central Valley and 4 to 11 inches in the mountains of Shasta County. Snowfall totals of 3 to 11 feet were reported in some parts of the northern Sierra Nevada Mountains, with winds up to and possibly exceeding 100 mph coupled with heavy snow bringing blizzard conditions. The one to two feet of snow fell at the higher elevations. Wind gusts reached 75 to 85 mph causing whiteout conditions for an extended period

Event Two: Winter Storm – 12/05/1998

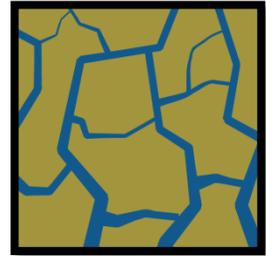
A cold Pacific storm produced snow across much of the Northern Sierra Nevada and Southern Cascades. Wet snow accumulated across the Northern Sacramento Valley with six inches just north of the city of Redding and two inches at the airport. Trace amounts to 1/2" fell across the Red Bluff area. The heavy wet snow downed power lines and caused more than a dozen valley accidents including a 30 vehicle pileup south of Castella. Interstate 5 was partially closed between 12:45 p.m. and 10:45 p.m. PST.

5.6.5 Frequency/Probability of Future Occurrences

Severe weather will continue to occur annually in Shasta Lake. The probability of future occurrences is highly likely. Due to past existing weather patterns and climate change, increases in the probability of future occurrences of severe weather events in the county are anticipated.

5.7 Drought and Extreme Heat

Drought and Extreme Heat are closely related hazards. In the California State Hazard Mitigation Plan (SHMP), climate change is treated as a condition that will occur and potentially exacerbate the impact of hazardous extreme heat and drought. Unlike other hazards profiled in this document, drought is a gradual phenomenon. According to the California SHMP, extreme heat and heat waves are existing hazards that will be exacerbated by climate change. Heat is one of the leading weather-related killers in the United States, resulting in hundreds of fatalities each year (National Weather Service 2012). This section provides definitions and profiles for the hazard of drought and extreme heat.



5.7.1.1 Drought

Drought is a normal, recurrent, feature of climate and originates from a deficiency of precipitation over an extended period, usually one or more seasons. Drought can result in a water shortage for some activity, group, or environmental sector. Drought is a complex natural hazard, which is reflected in the following four definitions commonly used to describe it:

- Agricultural – drought is defined principally in terms of naturally occurring soil moisture deficiencies relative to water demands of plant life, usually arid crops.
- Hydrological – drought is related to the effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
- Meteorological – drought is defined solely on the degree of dryness, expressed as a departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
- Socio-economic – drought associates the supply and demand of economic goods or services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply as a result of weather-related supply shortfall. It may also be called a water management drought.

Although climate is a primary contributor to hydrological drought, other factors such as changes in land use (e.g., deforestation), land degradation, and the construction of dams all affect the hydrological characteristics of a particular region. Since regions are interconnected by natural systems, the impact of meteorological drought may extend well beyond the borders of the precipitation-deficient area. Changes in land use upstream may alter hydrologic characteristics such as infiltration and runoff rates, resulting in more variable stream flow and a higher incidence of hydrologic drought downstream. Land use change is one way human actions alter the frequency of water shortage even when no change in the in precipitation has been observed (National Drought Mitigation Center 2014).

5.7.1.2 Extreme Heat

Temperatures that remain at 10 degrees or more above the average high temperature for the region and last for several weeks are defined as extreme heat. The National Weather Service (NWS) issues an Excessive Heat Warning/Advisory when an extreme heat event (a "heat wave") is expected within 36 hours. The NWS issues these warnings based on a "Heat Index" - a combination of heat and humidity - that is predicted to be 105 degrees or greater for two or more consecutive days. In California, local weather forecast offices may use different criteria for Excessive Heat Warning/Advisories based on maximum temperatures, nighttime temperatures, and other methods (California Climate Action Team 2012).

5.7.2 Regulatory Environment

5.7.2.1 Drought

Localized regulation or plans for drought are mentioned briefly in local municipal codes. Shasta Lake Municipal Code Section **17.84.005** addresses drought in the landscaping objectives. The objectives encourage the use of hardy plant species that are adaptable to local conditions and drought tolerant. The use of native plants is strongly encouraged.

On a statewide basis, a number of regulatory requirements and documents address planning for drought in California, most notably the 2010 California Drought Contingency Plan. Some localized drought conditions are addressed in the 2008 Stillwater-Churn Creek Watershed Action Plan.

5.7.2.1.1 Urban Water Management Plan

Urban Water Management Plans (UWMP) are prepared by California's urban water suppliers to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. Every urban water supplier that either provides over 3,000 acre-feet of water annually or serves more than 3,000 or more connections is required to assess the reliability of its water sources over a 20-year planning horizon considering normal, dry, and multiple dry years.

This assessment is to be included in the City's UWMP, which are to be prepared every 5 years and submitted to the Department of Water Resources (DWR). DWR then reviews the submitted plans to make sure they have completed the requirements identified in the UWMP Act (Division 6 Part 2.6 of the Water Code §10610 - 10656). The City's UWMP includes projected water use for single and multi-family housing needed for lower income households. The City does not have an approved 2010 UWMP as of yet but is in the process of selecting a consultant to prepare it for submittal to DWR.

5.7.2.1.2 California Drought Contingency Plan

The California Drought Contingency Plan was prepared in conjunction with the 2009 California Water Plan and will be updated every five years. The purpose of the plan is to minimize drought impacts by improving agency coordination, enhancing monitoring and early warning capabilities, conducting water shortage impact assessments, and implementing preparedness, response, and recovery programs.

The California Water Plan presents strategic plan elements including a vision, mission, goals, guiding principles, and recommendations for current water conditions, challenges and activities. The plan includes future uncertainties and climate change impacts, scenarios for 2050, and a roadmap for improving data and analytical tools needed for integrated water management and sustainability.

2008 Stillwater-Churn Creek Watershed Action Plan

Shasta Lake is located within the Stillwater-Churn Creek Watershed. This watershed is a part of the larger Sacramento River Watershed Program. The Stillwater-Churn Creek Watershed Action Plan includes a measure as a part of the Ahwahnee Water Principles²⁰, which suggests "Ground water treatment and brackish water desalination should be pursued when necessary to maximize locally available, drought-proof water supplies."

²⁰ The Local Government Commission has developed a set of principles and policies (based on whole system planning) called the Ahwahnee Water Principles for Resource Efficient Land Use. http://www.lgc.org/ahwahnee/h2o_principles.html

5.7.2.2 *Extreme Heat*

Like drought, localized regulation or plans for extreme heat are mentioned briefly in local municipal codes. In Section **17.84.005** of the Municipal Code, heat island effects are addressed in the landscaping objectives which encourage the use of trees and vegetation to provide shade and break up expanses of asphalt.

On a statewide basis, the 2012 Cool Pavements Bill (“AB 296”) was passed by the California legislatures. This bill will require the California Environmental Protection Agency (Cal EPA) to develop a definition for the term Urban Heat Island Effect (UHIE) and index. Upon completion of an UHIE index, the bill will provide resources for Cal EPA to develop a standard specification for sustainable or cool pavements. This bill would require the California Department of Transportation to develop the Cool Pavements Handbook and include additional strategies for the Heat Island Effect. As a result of this bill, “Hardscape Alternatives” may be included in the California Green Building Standards Code²¹.

5.7.3 **Past Occurrences**

5.7.3.1 *Drought*

The 2013 State Hazard Mitigation Plan (SHMP) states that from 1972 to 2009, there have been eight drought State Emergency Proclamations in California. Through 2012, Cal EMA’s administered costs due to drought total \$2,686,858,480. Shasta County has been included in one declared drought disaster since 1972. This event occurred in 1991, and resulted in over \$1.67 Billion paid out for crop losses by the USDA. The second, and most recent, drought declared by the Governor, was on January 17th, 2014.

5.7.3.1.1 *2014 Drought Conditions*

Water years 2012 and 2013 were dry statewide, and the 2013 record-low precipitation has worsened California's conditions for the 2014 water year (started October of 2013). Statewide reservoir storage is down significantly and impacts of two (possibly three) dry years in a row may cause significant water delivery issues in California.

Allocations for contractors of DWR’s State Water Project (SWP) and the U.S. Bureau of Reclamation’s (USBR’s) Central Valley Project (CVP) are dependent upon snowpack accumulation in the Cascades and Sierra Nevada. In November of 2013, DWR announced an initial allocation of just five percent of SWP contractors’ requested amounts.

Shasta Dam is currently at 16.61 feet (36 percent capacity); the previous record low year was set in 1976 at 27.99 feet. Figure 5-19 exhibits low water conditions at Shasta Lake on July 20, 2013 during statewide drought conditions. For more information on current drought conditions in California visit:

<http://www.water.ca.gov/waterconditions/drought/>

5.7.3.2 *Extreme Heat*

There have been many occurrences of extreme heat hazards throughout California. According to the California SHMP, the worst single heat wave event in California occurred in Southern California in 1955, when an eight-day heat wave resulted in 946 deaths. The July 2006 heat wave in California caused approximately 140 people deaths over a 13-day period.

²¹ The California Green Building Standards Code (CAL Green Code) is Part 11 of the California Building Standards Code and is the first statewide "green" building code in the US.



Figure 5-19: Photo of depleted Shasta Lake

Recently, an early July heat wave affected the area of Shasta Lake bringing consistently high temperatures above 100 degrees. The weather station on Lake Boulevard and Red Bud Lane recorded seven days of high temperatures exceeding 100 degrees; the same station reached 111.4 degrees on Tuesday, July 2, 2013. A record high of 116 degrees was recorded for the City of Redding the same day. John Beaudet Community Center, a local cooling center for the Red Cross, served a total of 28 people during July 2-4, 2013.

5.7.4 Location/Geographic Extent

5.7.4.1 Drought

Shasta Lake rarely experienced long periods of extremely low precipitation. Instead, drought will stem from depletion of Lake Shasta supply and water rationing set by the state. The geographic extent of drought conditions will extend to every resident on the City water supplies.

5.7.4.2 Extreme Heat

According to the California Climate Change Research Center, overall temperatures are expected to rise substantially throughout this century. During the next few decades, scenarios project average temperatures to rise between 1 and 2.3°F in the Shasta Region. These projections also differ depending on the time of year and the type of measurement (highs vs. lows), all of which have different potential effects to the state's ecosystem health, agricultural production, water use and availability, and energy demand (California Climate Change Center 2006).

Figure 5-20 and Figure 5-21 provide Cal Adapt²² modeled decadal July high temperature averages for 2010 and 2090. These figures provide current decade-long July temperature averages and possible July high heating trends for the remaining portion of the century. The data presented in the figures

²² Cal-Adapt has been funded to provide access to data and information that has been produced by the State's scientific and research community. The data available in this site offer a view of how climate change might affect California at the local level.

represent a “projection” of potential future climate scenarios, they are not predictions. These figures illustrate how the climate may change based on a variety of different potential social and economic factors. The visualizations are comprised of average values from a variety of scenarios and models.

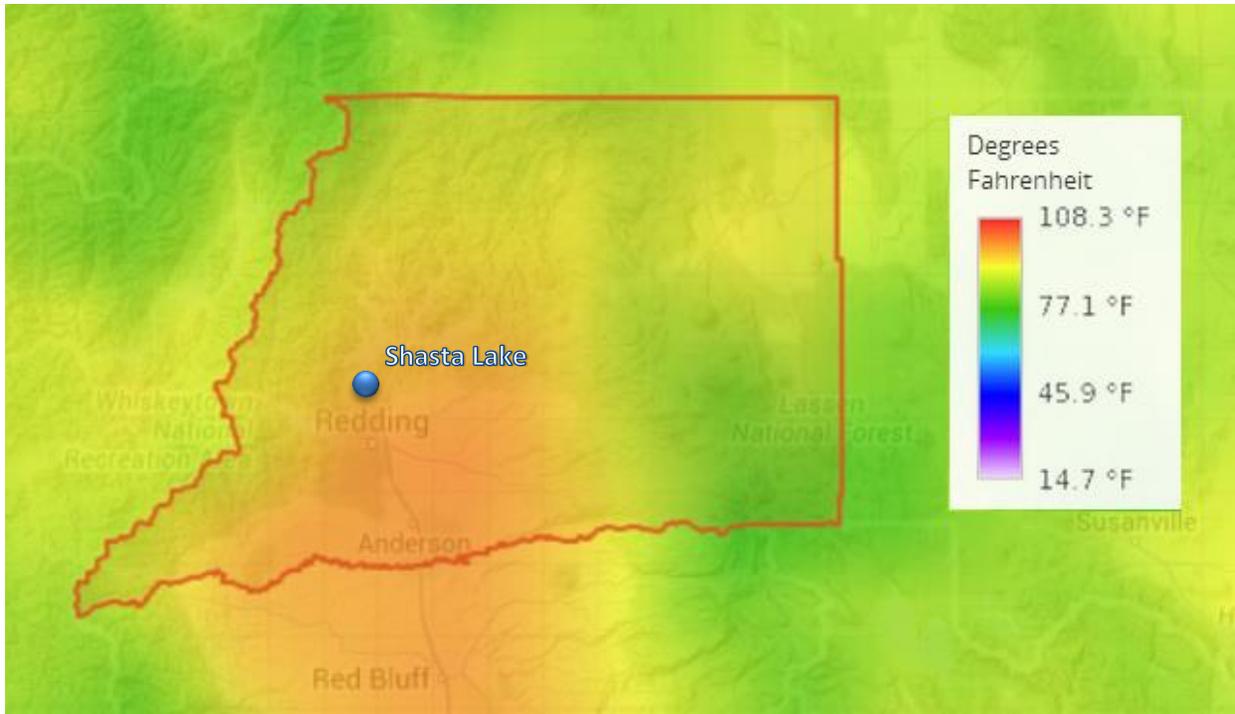


Figure 5-20: July Decadal Average High Temperature Map; 2010

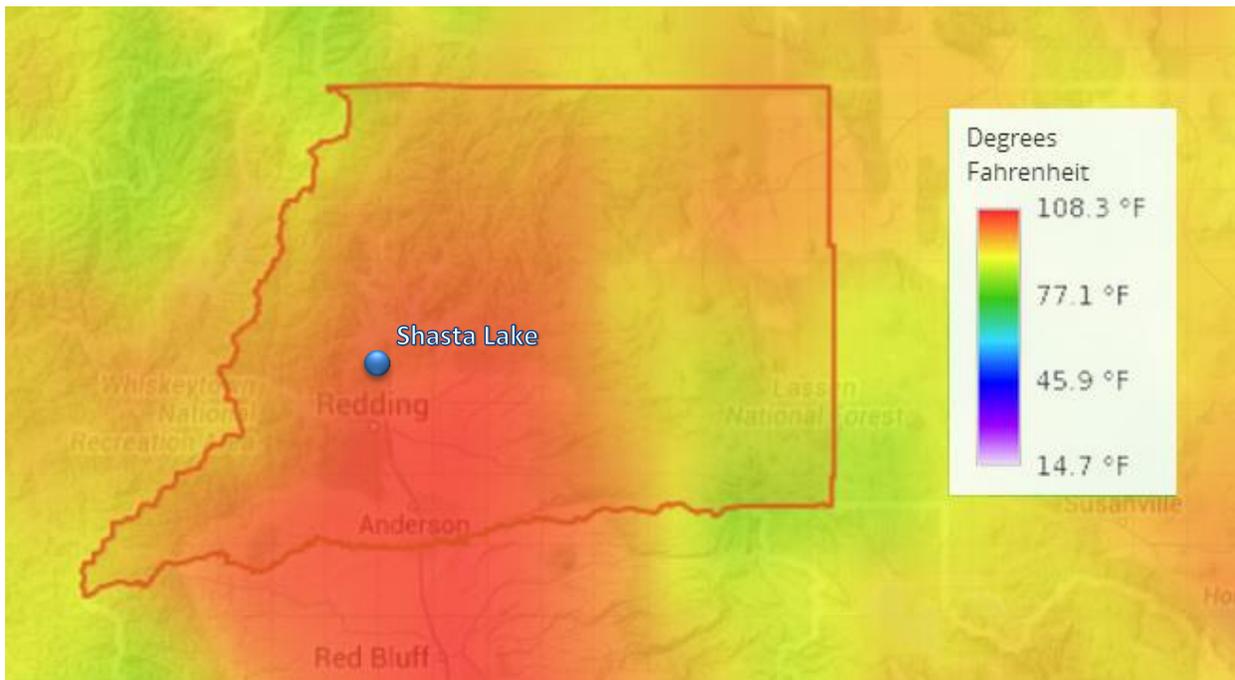


Figure 5-21: July Decadal Average High Temperature Map; 2090

5.7.5 Magnitude/Severity

5.7.5.1 Drought

Drought severity depends on numerous factors, including duration, intensity, and geographic extent, as well as regional water supply demands by humans and vegetation. The severity of drought can be aggravated by other climatic factors, such as prolonged high winds and low relative humidity. The magnitude of drought is usually measured in time and the severity of the hydrologic deficit.

Several resources are available to evaluate drought status and estimate future expected conditions. The National Integrated Drought Information System (NIDIS) Act of 2006 (Public Law 109-430) prescribes an interagency approach for drought monitoring, forecasting, and early warning. The NIDIS maintains the U.S. Drought Portal (www.drought.gov), a web-based access point to several drought related resources. Resources include the U.S. Drought Monitor (USDM) and the U.S. Seasonal Drought Outlook (USSDO).

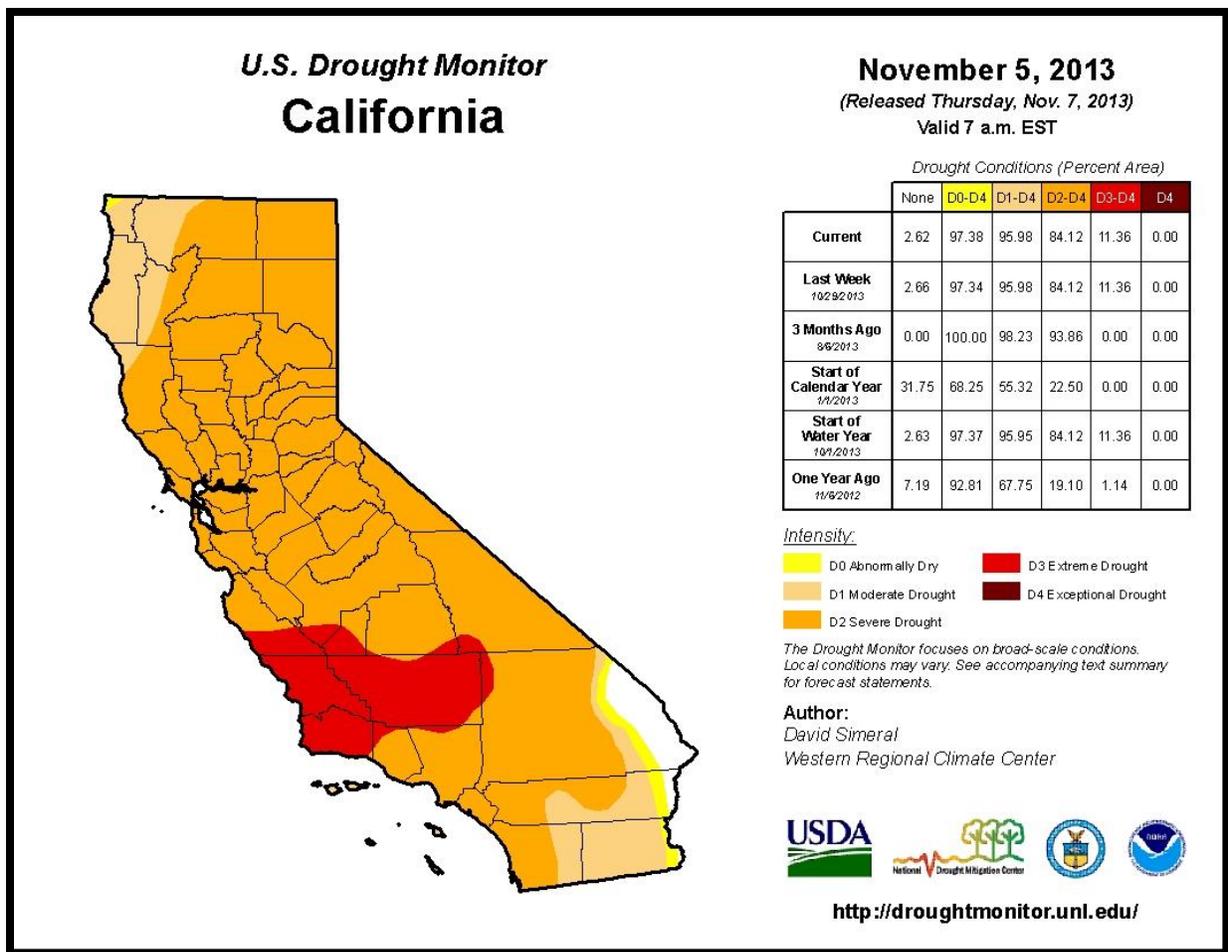
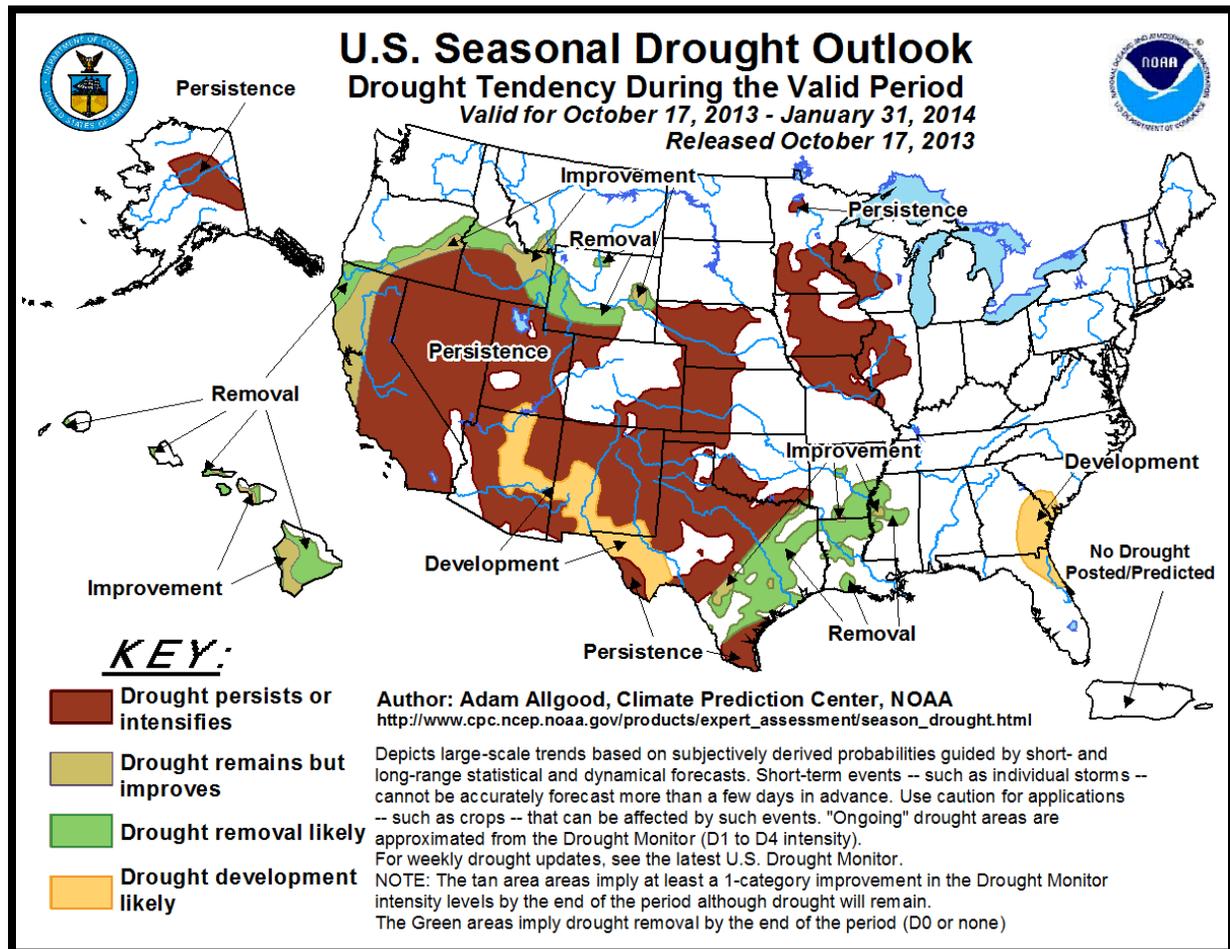


Figure 5-22: Drought Monitor Map for the State of California on November 27, 2013



Source: http://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.html

Figure 5-23: USSDO Drought Tendency Map (Valid October 17, 2013 to January 31, 2014)

A number of indices measure how much precipitation for a given period has deviated from historically established norms. The primary indicator for the USDM and USSDO for the western United States is the Palmer Drought Severity Index (PDSI).

PDSI is a commonly used index that measures the severity of drought for agriculture and water resource management. It is calculated from observed temperature and precipitation values and estimates soil moisture. While USDA uses the PDSI to determine when to grant emergency drought assistance, it is not considered consistent enough to characterize the risk of drought on a nationwide basis (FEMA, 1997) nor is it well suited to the dry, mountainous areas in the western U.S.

For western States with mountainous terrain and complex regional microclimates, it is useful to supplement the PDSI values with other indices such as Surface Water Supply Index and Standardized Precipitation Index (SPI). The Surface Water Supply Index takes snowpack and other unique conditions into account. The National Drought Mitigation Center (NDMC) uses the SPI to identify emerging drought months sooner than the PDSI. It is computed on various time scales to monitor moisture supply conditions. The SPI is the number of standard deviations that precipitation value would deviate from the

long-term mean. As shown in Figure 5-24 the 72-month SPI through the end of September 2013 for Shasta Lake is moderately dry.

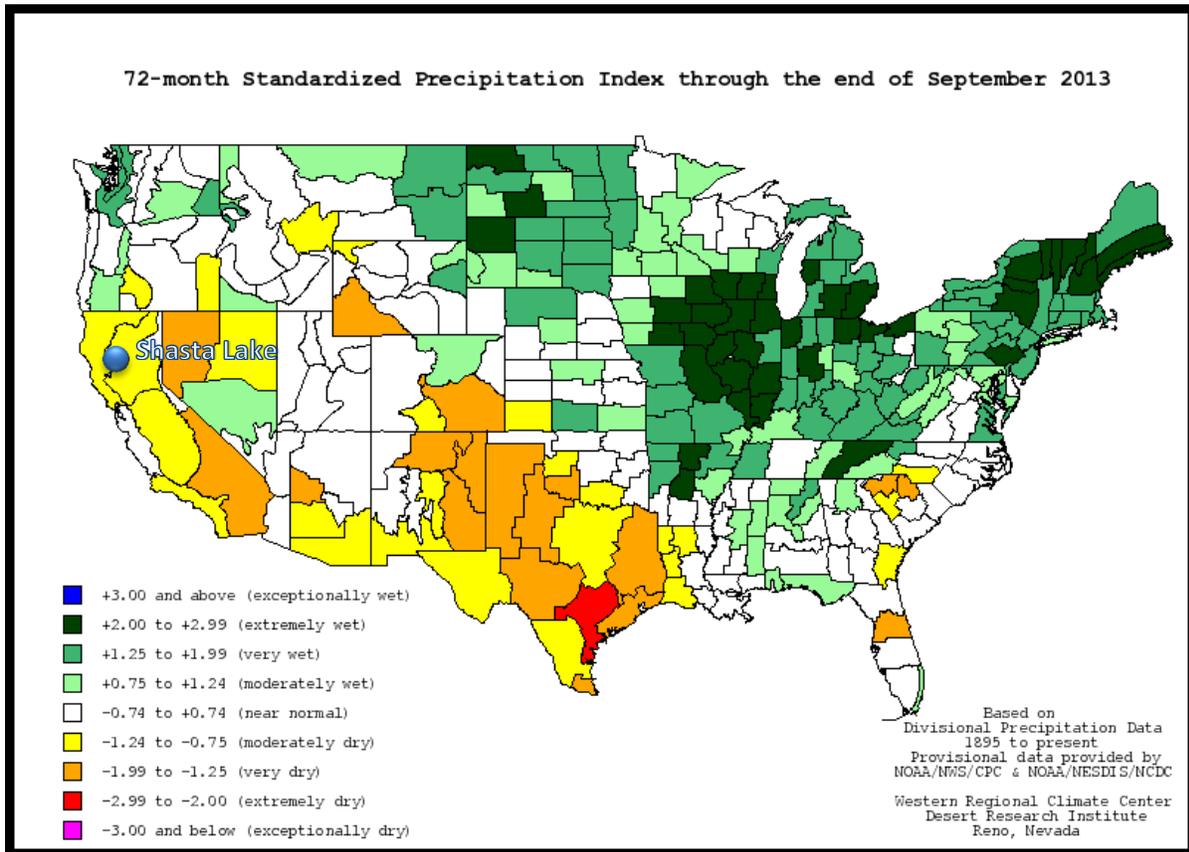


Figure 5-24: 72-Month SPI through the end of September 2013

The Vegetation Drought Response Index, or VegDRI, is a bi-weekly depiction of vegetation stress across the contiguous United States. VegDRI is a fine resolution (1-km²) index based on remote sensing data, and incorporates climate and biophysical data to determine the cause of vegetation stress. Development of the VegDRI map and associated products is a joint effort by the NDMC, the USGS National Center for Earth Resources Observation and Science (EROS), and the High Plains Regional Climate Center (HPRCC). Figure 5-35 illustrates the VegDRI results for the San Francisco Bay Area for November 4, 2013.

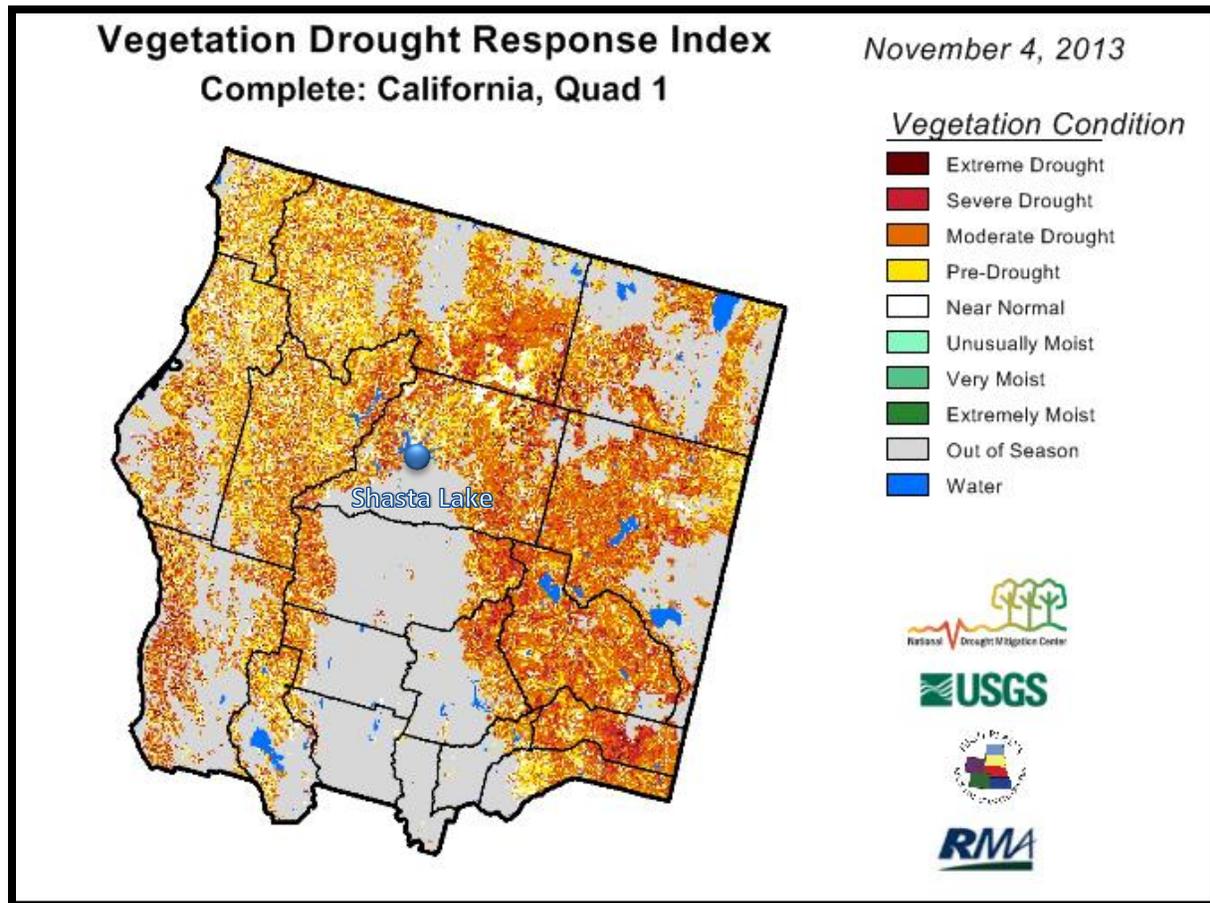


Figure 5-25: VegDRI results for California, Quad 1 for November 2013

5.7.5.2 Extreme Heat

Extremely high temperatures cause heat stress which can be divided into four categories (see Table 5-15). Each category is defined by apparent temperature. Apparent temperature is the general term for the perceived outdoor temperature, caused by the combined effects of air temperature, relative humidity, and wind speed. Apparent temperature is associated with a heat index value that captures the combined effects of dry air temperature and relative humidity on humans and animals. Major human risks for these temperatures include heat cramps, fainting, heat exhaustion, heatstroke, and death. Note that while the temperatures in Table 5-15 serve as a guide for various danger categories, the impacts of high temperatures will vary from person to person based on individual age, health, and other factors.

Temperature advisories, watches, and warnings are issued by the National Weather Service relating the above impacts to the range of temperatures typically experienced in California. Exact thresholds vary across the State, but in general *Heat Advisories* are issued when the heat index will be equal to or greater than 100°F, but less than 105°F, *Excessive Heat Warnings* are issued when heat indices will attain or exceed 105°F, and *Excessive Heat Watches* are issued when there is a possibility that excessive heat warning criteria may be experienced within twelve to forty-eight hours (NOAA NWS, 2010). See Figure 5-26 for a NOAA National Weather Service Heat Index.

Table 5-15: Four Categories of Heat Stress (FEMA, 1997)

DANGER CATEGORY	HEAT DISORDERS	APPARENT TEMPERATURE (°F)
I (Caution)	Fatigue possible with prolonged exposure and physical activity.	80 to 90
II (Extreme Caution)	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and physical activity.	90 to 105
III (Danger)	Sunstroke, heat cramps, or heat exhaustion likely; heat stroke possible with prolonged exposure and physical activity.	105 to 130
IV (Extreme Danger)	Heatstroke or sunstroke imminent.	>130

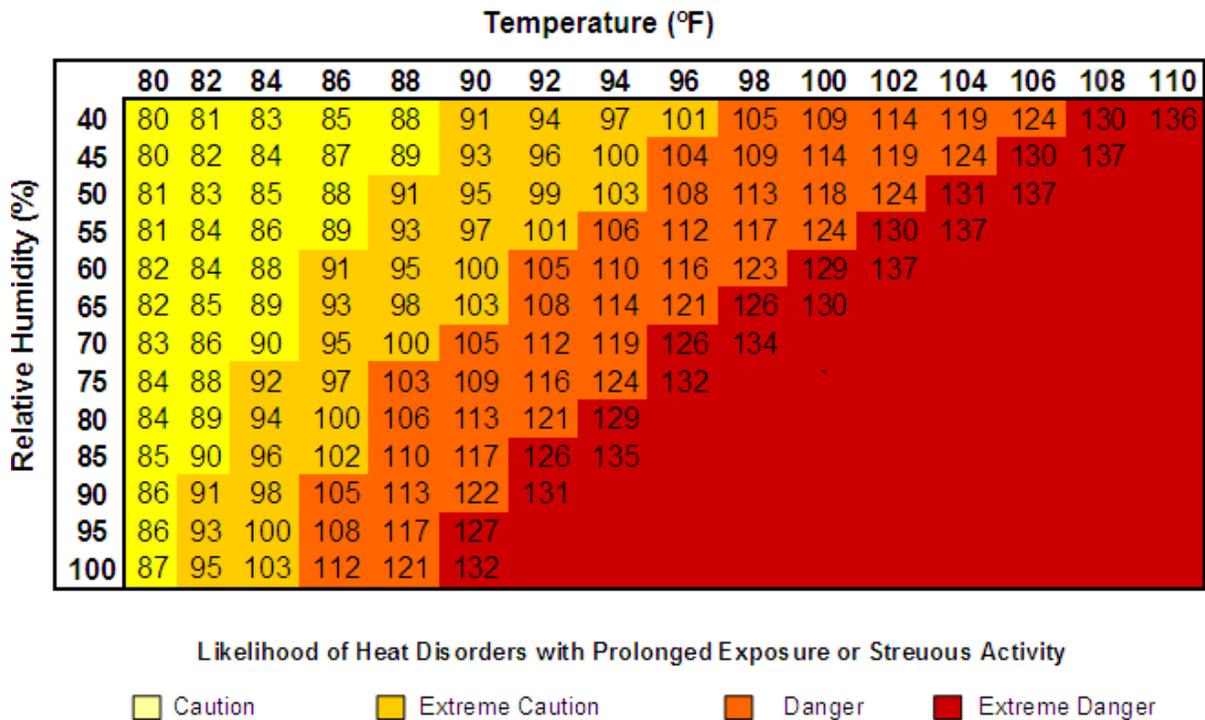


Figure 5-26: NOAA's National Weather Service Heat Index

5.7.6 Frequency/Probability of Future Occurrences

5.7.6.1 Drought

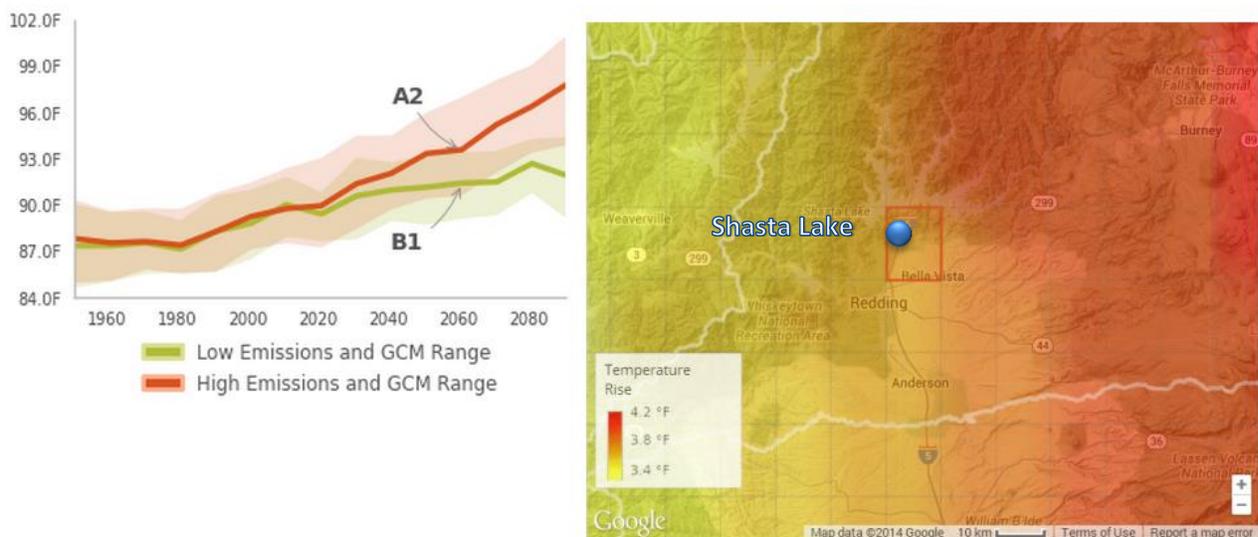
According to the 2013 California State Multi-Hazard Mitigation Plan (MHMP), climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences water supply agencies faced during 2013, highlighted above, underscore the need to examine the City's water storage, distribution, management, conservation, and use policies more closely. Drought related to climate change will increase pressure on California's water resources such as Shasta Lake. Decreasing snowmelt and spring stream flows coupled

with increasing populations, anticipated hotter climate, and demand for water in southern portions of California may lead to water shortages for City residents. By the end of the century, if temperatures rise to the medium warming range and precipitation decreases, late spring stream flow could decline by up to 30 percent (Cal-Adapt 2011). For more information on climate change and water supply and California please see:

<http://cal-adapt.org/blog/2011/apr/12/securing-adequate-water-supply/>

5.7.6.2 Extreme Heat

According to Cal Adapt climate modeling tools, summer temperatures are likely to increase more than those in winter and by 2100, if temperatures rise to the higher warming range, there could be up to 100 more days per year with temperatures above 95°F in the Lake Shasta area. Figure 5-27 exhibits the projected July average high temperature rise for the area surrounding Shasta Lake. The map includes the projected change in annual average temperatures across the region under a low carbon emissions scenario (B1) and shows the projected difference in temperature between a baseline time period (1961-1990) and an end of century period (2070-2090). By 2100, hotter temperatures are expected, with an increase of 3.4-5.5°F under the lower emissions scenario (B1) and 8-10.5°F under the higher emissions scenario (A2).



Source: Cal Adapt <http://cal-adapt.org/temperature/century/>
GCM = General Circulation Model²³

Figure 5-27: Projected July Average High Temperature Change.

²³ A general circulation model (GCM), a type of climate model, is a mathematical model of the general circulation of a planetary atmosphere or ocean. A GCM is based on equations that use a rotating sphere with thermodynamic terms for various energy sources (radiation, heat etc.). These equations are the basis for complex computer programs commonly used for simulating the atmosphere or ocean of the Earth. GCMs and global climate models are widely applied for weather forecasting, understanding the climate, and projecting climate change. Versions designed for decade to century time scale climate applications were originally created by Syukuro Manabe and Kirk Bryan at the Geophysical Fluid Dynamics Laboratory in Princeton, New Jersey.

5.8 Vulnerability Assessment

The information in this section provides an explicit representation of what a community stands to lose in a disaster. This is useful for City staff and other decision makers who will need to balance the costs of mitigation against the potential harm to residents and damage to property. It provides comparable measurements of community natural hazard exposure²⁴ and assists in determining which hazards and/or what parts of the City to focus on making resilient to disaster first. Based upon possible assets at risk, hazard mitigation resources can be directed where need be, in-part, by a vulnerability assessment and information found in hazard profiles presented in Section 5.3 through 5.7.

The vulnerability assessment is developed by providing the hazard mitigation analysts with quantitative and qualitative information for each hazard. Through an exposure analysis, quantitative data is developed for each hazard. An exposure analysis provides quantities of people and assets at risk to particular hazards. Qualitative data has been developed and presented in this section for hazards without measurable data. Qualitative data provides information beyond quantities of people and assets at risk, but rather a description of how the hazard could affect a region like Shasta Lake.

Note: The hazard exposure analysis has been developed with best available data and follows methodology described in the FEMA How to Guide #2 (Publication No. 386-2) “Understanding Your Risks—Identifying Hazards and Estimating Losses”.

5.8.1 Methodology

A vulnerability assessment was conducted for each of the identified priority hazards. Geospatial data is essential in determining population and assets exposed to particular hazards. Geospatial analysis can be conducted if a natural hazard has a particular spatial footprint that can be overlaid against the locations of people and assets. In Shasta Lake, wildfire, flood, earthquake, and slope failure have known geographic extents and corresponding spatial information about each hazard.

Several sources of data are necessary to conduct a vulnerability analysis.

Figure 5-28 provides an exhibit of the data inputs and outputs used to create the vulnerability analysis results presented in this section. U.S. Census data is the primary source in determining natural hazard exposure to City residents. Census data has been used to determine the population at risk, which is generally referred to as population exposure. Population exposure is provided for wildfire, flooding, earthquake, and slope failure potential hazards later in this section.

Together with the U.S. Census data, City asset data was used to provide a snapshot of how City assets are affected by natural hazards. For purposes of this study, asset data includes parcels and critical infrastructure within the City boundaries. Critical infrastructure is described as assets that are essential for people and a community to function. Critical infrastructure includes such as utilities, City-owned facilities, bridges, schools, and other community facilities that provide essential services to residents.

Critical facilities data was developed from a variety of sources including City owned and maintained data, state and federal government datasets, and private industry datasets. A critical infrastructure

²⁴ Elements at risk; Risk inventory; Exposure encompasses all elements, processes, and subjects that might be affected by a hazardous event. Consequently, exposure is the presence of social, economic, environmental or cultural assets in areas that may be impacted by a hazard.

spatial database was developed to translate critical facilities information into georeferenced²⁵ points. Critical facility points are overlaid with the spatial hazard layers to develop a list of “at risk” critical facilities. The City critical facilities that intersect with natural hazards are referred to as facilities with hazard “exposure”. Exposure results are presented later in this section.

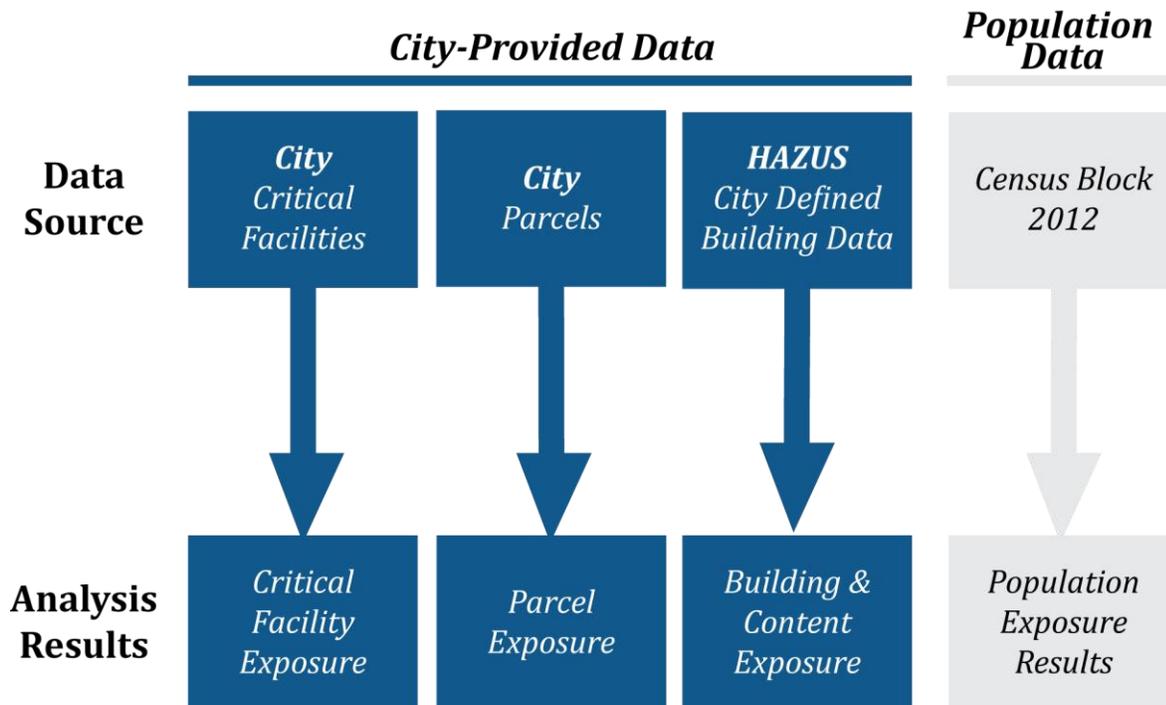


Figure 5-28: Data Source and Methodology

Lastly, FEMA’s Hazus-MH MR5 (Hazus) software was implemented to conduct detailed loss estimation for flood and earthquake. Hazus is a nationally applicable standardized methodology that contains models for estimating potential losses from earthquakes, floods, and hurricanes. HAZUS uses Geographic Information Systems (GIS) technology to estimate physical, economic, and social impacts of disasters. For purposes of this planning effort, Hazus was used to graphically illustrate the limits of identified high-risk locations due to possible earthquake and floods.

The vulnerability and potential impacts from priority hazards that do not have specific mapped areas nor the data to support additional vulnerability analyses are discussed in more general terms in alphabetical order following the discussion on wildfire, flooding, and geologic hazards.

5.8.2 Population and Asset Exposure

In order to describe exposure and loss estimation results for each hazard, it is important to understand the “total” population and “total” assets at risk. The risk for each hazard described in this section will refer to the percent of total population or percent of total assets exposed to a particular hazard. This provides the possible significance or vulnerability to people and assets during a “worst case scenario”

²⁵ To georeference something means to define its existence in physical space. That is, establishing its location in terms of map projections or coordinate systems. The term is used both when establishing the relation between raster or vector images and coordinates, and when determining the spatial location of other geographical features.

for each hazard with spatial extents. Sections below provide a description of the total population, critical facilities, and parcel exposure inputs.

5.8.2.1 *Population Exposure*

In order to develop hazard-specific vulnerability assessments, population near natural hazard risks should be determined to understand the total “at risk” population. We can understand how geographically-defined hazards may affect the City by analyzing the extent of the hazard in relation to the location of population. According to the 2010 U.S. Census, the total population for the City is 10,164.

For purposes of the vulnerability assessment approximately 9,344 residents (91.9%) are exposed to one or more hazards within the City boundaries. Each natural hazard scenario affects the City residents differently depending on the location of the hazard and the population density of where the hazard could occur. Vulnerability assessment sections presented later in this section summarize the population exposure for each natural hazard.

5.8.2.2 *Vulnerable Populations*

The severity of a disaster depends on both the physical nature of the extreme event and the socioeconomic nature of the populations affected by the event. Important socioeconomic factors tend to influence disaster severity. A core concept in a vulnerability analysis is that different people, even within the same region, have a different vulnerability to natural hazards.

5.8.2.2.1 *Income and Housing Condition*

Income or wealth is one of the most important factors in natural hazard vulnerability. This economic factor affects vulnerability of low income populations in several ways. Lower income populations are less able to afford housing and other infrastructure that can withstand extreme events. Low income populations are less able to purchase resources needed for disaster response and are less likely to have insurance policies that can contribute to recovery efforts. Lower income elderly populations are less likely to have access to medical care due to financial hardship. Because of these and other factors, when disaster strikes, low income residences are far more likely to be injured or left without food and shelter during and after natural disasters.

Figure 5-29 shows the median household income in the region in 2012. The “median” is the value that divides the distribution of household income into two equal parts (e.g., the middle). The average median household income in the United States was \$50,157 in 2012. The map in Figure 5-29 shows 2012 house estimates using Census 2010 geographies.

5.8.2.2.2 *Age*

Children and the elderly tend to be more vulnerable during an extreme natural disaster. They have less physical strength to survive disasters and are often more susceptible to certain diseases. The elderly often also have declining vision and hearing and often miss reports of upcoming natural hazard events. Children, especially young children, have the inability to provide for themselves.

Finally, both children and the elderly have fewer financial resources and are frequently dependent on others for survival. In order for these populations to remain resilient before and after a natural hazard event, it may be necessary to augment City residents with resources provided by City, state and federal emergency management agencies and organizations. See Figure 5-30 and Figure 5-31 for location of vulnerable population by age within the Shasta Lake region.

5.8.2.2.3 Social Vulnerability

Social vulnerability is represented as the social, economic, demographic, and housing characteristics that influence a community's ability to respond to, cope with, recover from, and adapt to natural hazards. Emergency response and hazard mitigation planners can assess populations from a perspective of their vulnerability to various hazards (fire, flood, etc.).

Physical vulnerability refers to a population's exposure to specific potential hazards, such as living in a designated flood plain (shown later in this section). Social vulnerability refers to potential exposure due to population and housing characteristics including age, income, disabilities, home value, or other factors. For example, low-income seniors may not have access to a car to simply drive away from an ongoing hazard such as a flood.

A social vulnerability index created from analysis by the Hazard and Vulnerability Hazard Research Institute²⁶ uses county-level socioeconomic and demographic data to construct an index of social vulnerability to natural hazards. The Social Vulnerability Index (SoVI©) for the United States is based on data collected from 2005 to 2009. It models multiple hazards and other socioeconomic data. Figure 5-32 provides a map that summarizes the SoVI© for populations within the region. To develop the map in Figure 5-32, ESRI²⁷ applied a model²⁸, to generate this data using current year demographics at the block group level.

²⁶ The University of Southern Carolina Hazard and Vulnerability Hazard Research Institute conducts basic research on hazard vulnerability and resilience and through its outreach efforts, assist in the improvement of emergency preparedness, planning, response, and recovery at local, state, national, and international scales.

²⁷ Esri's GIS (geographic information systems) mapping software helps you understand and visualize data to make decisions based on the best information and data.

²⁸ From the Susan Cutter, University of South Carolina, Hazards Research Lab, Department of Geography (<http://webra.cas.sc.edu/hvri/>)

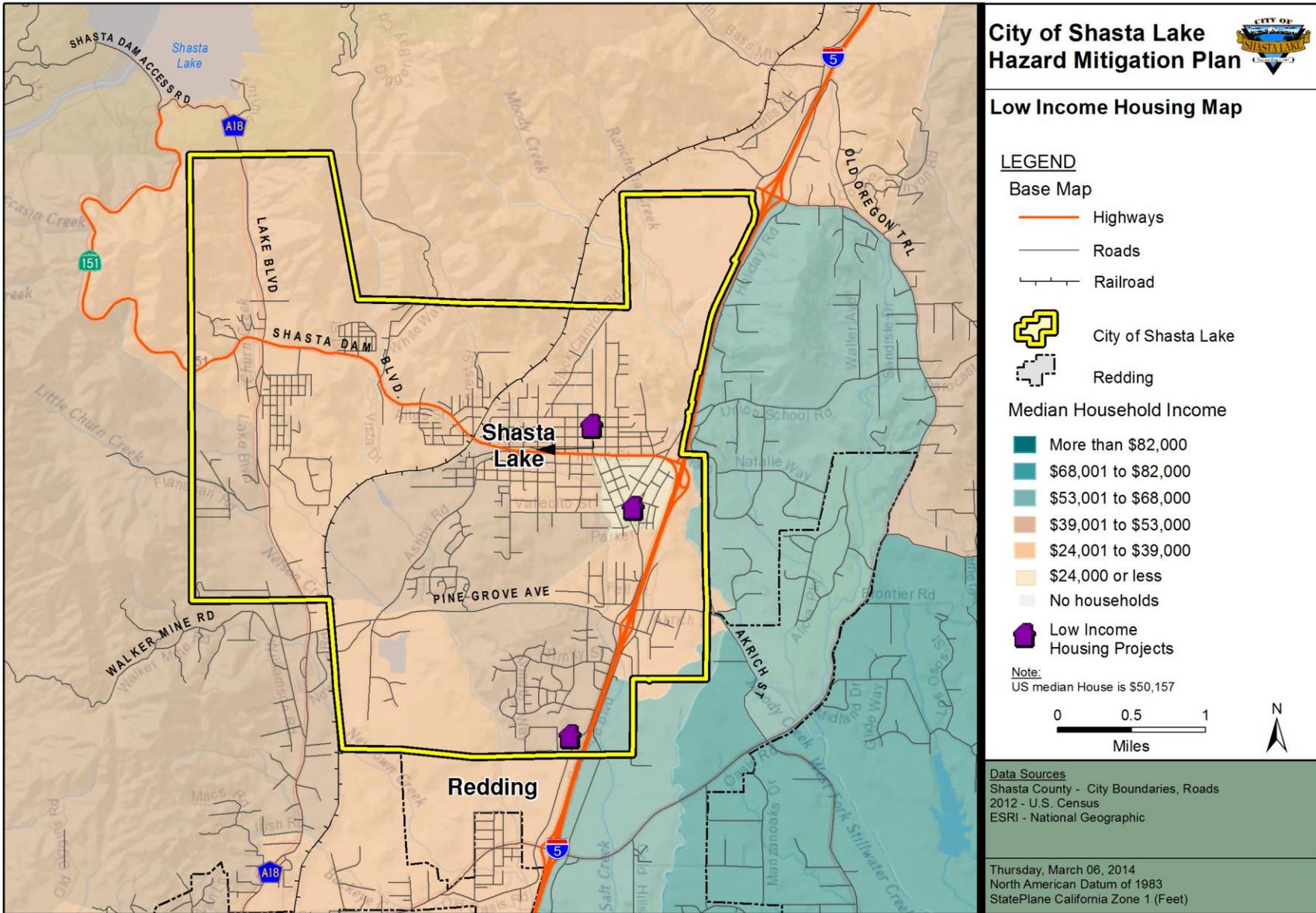


Figure 5-29: Low Income Heat Map

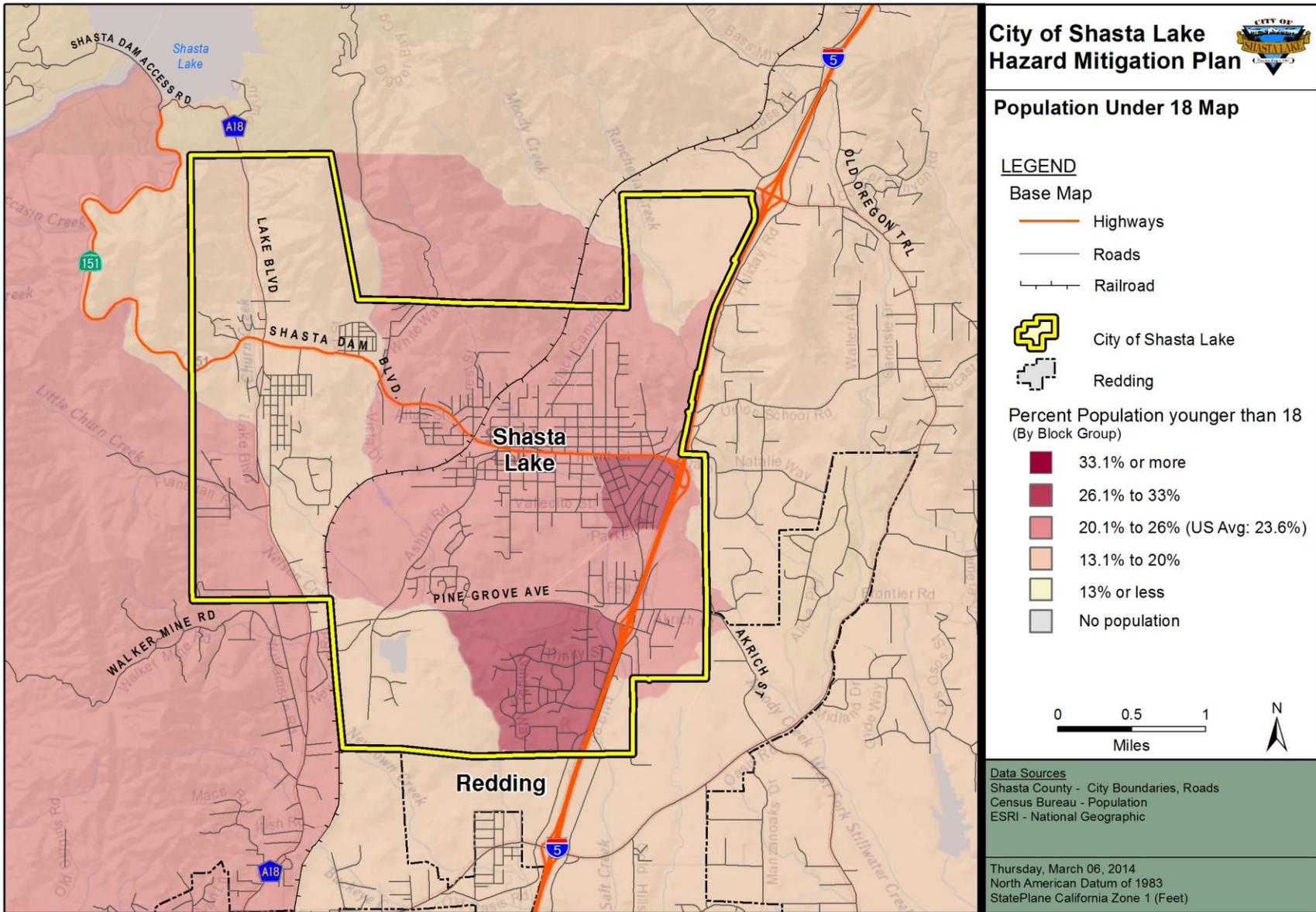


Figure 5-30: Percentage of Population Younger than 18 Years of Age

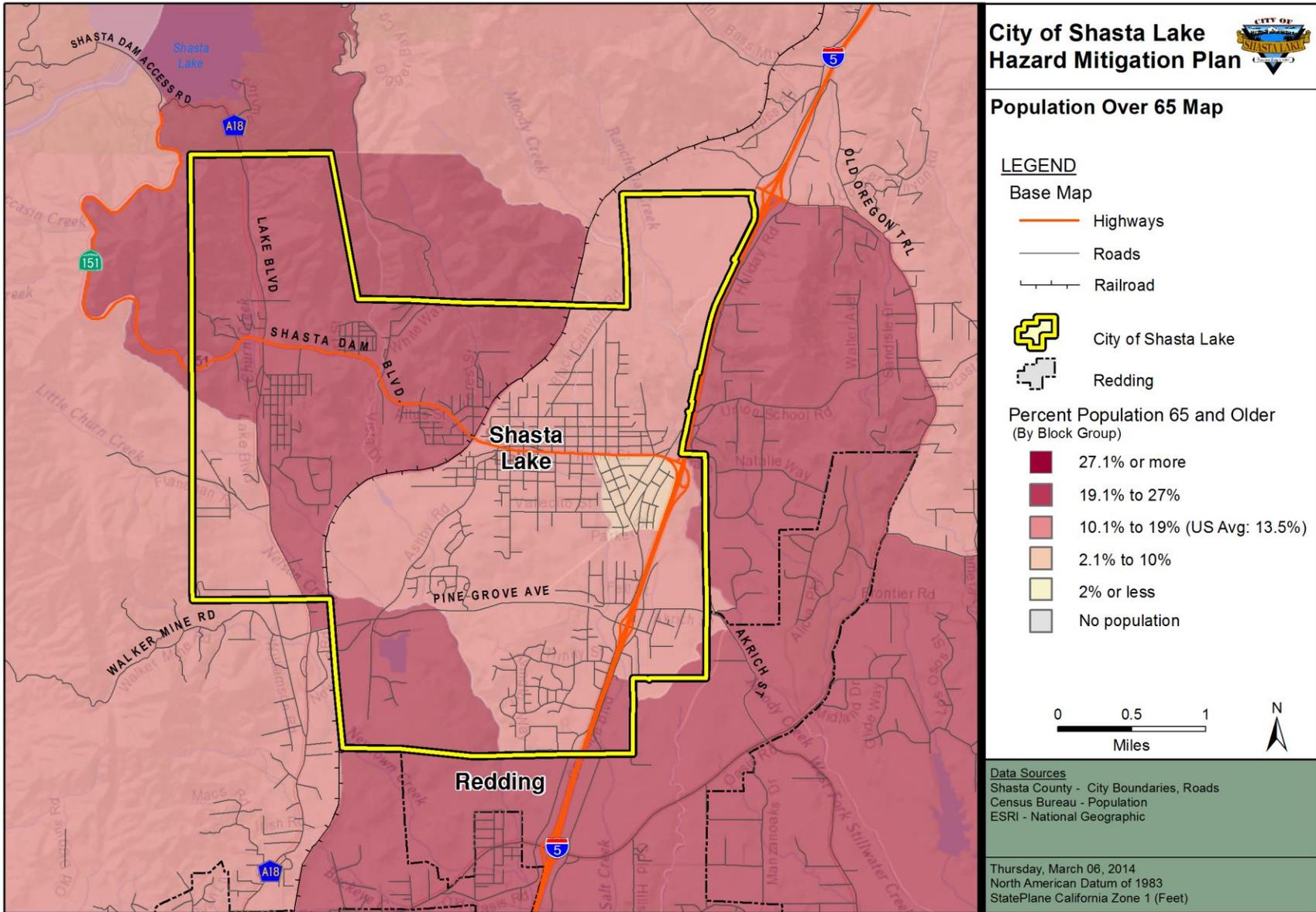


Figure 5-31: Percentage of Population 65 Years of Age and Older

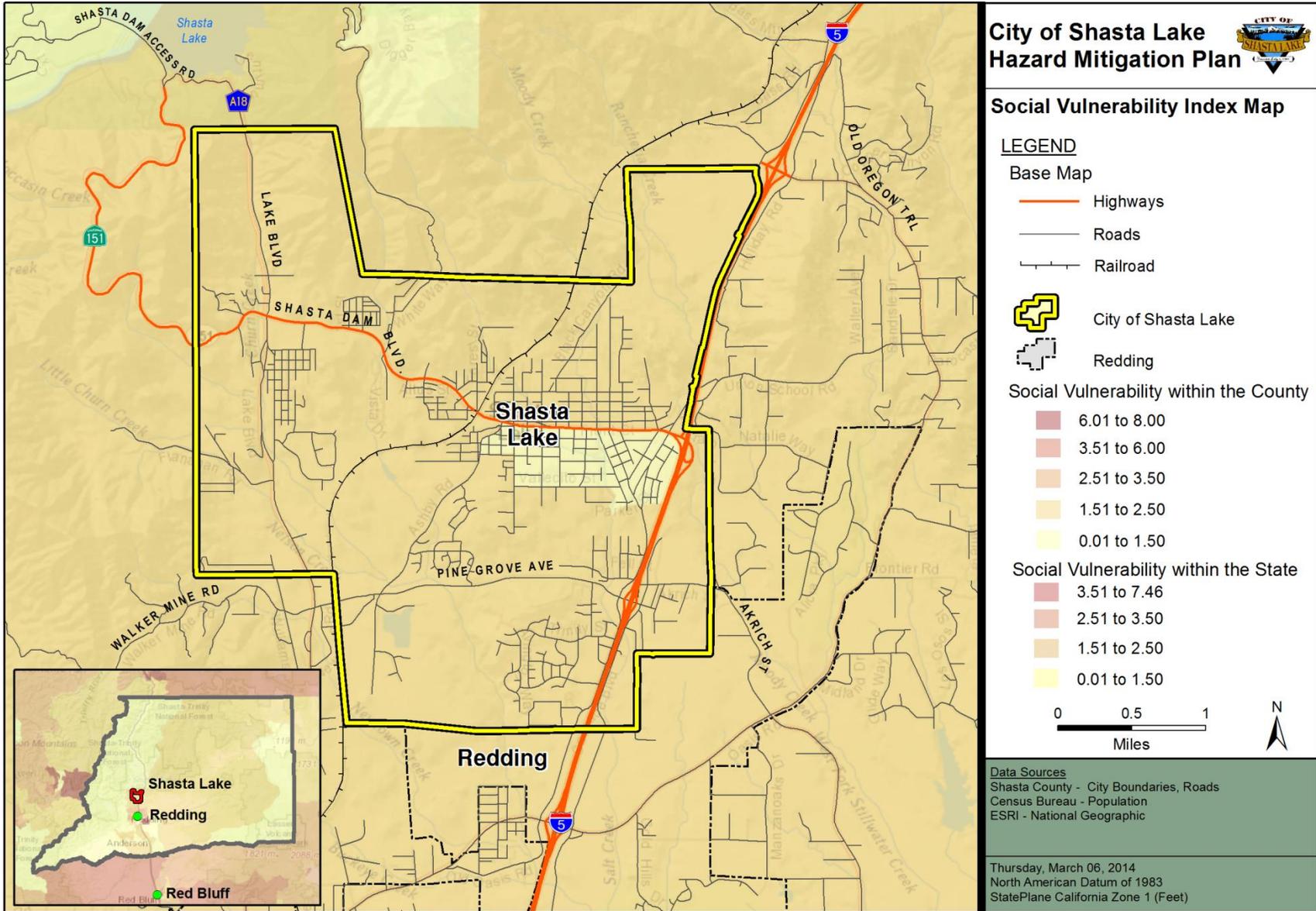


Figure 5-32: Social Vulnerability Index Map

5.8.2.3 Critical Facilities Exposure

Critical facility exposures to hazards are of particular concern when conducting hazard mitigation planning. Critical facilities are defined as providing essential services, and if damaged, would result in severe consequences to the health, safety, and welfare of the public. An inventory of critical facilities was developed based on data from the City and other publicly sourced information. See Figure 5-33 for a summary of critical facility points including shelters, schools, emergency response buildings, healthcare, important private sector facilities (commercial and industrial), transportation, utilities, and City facilities.

Critical Facilities by Type

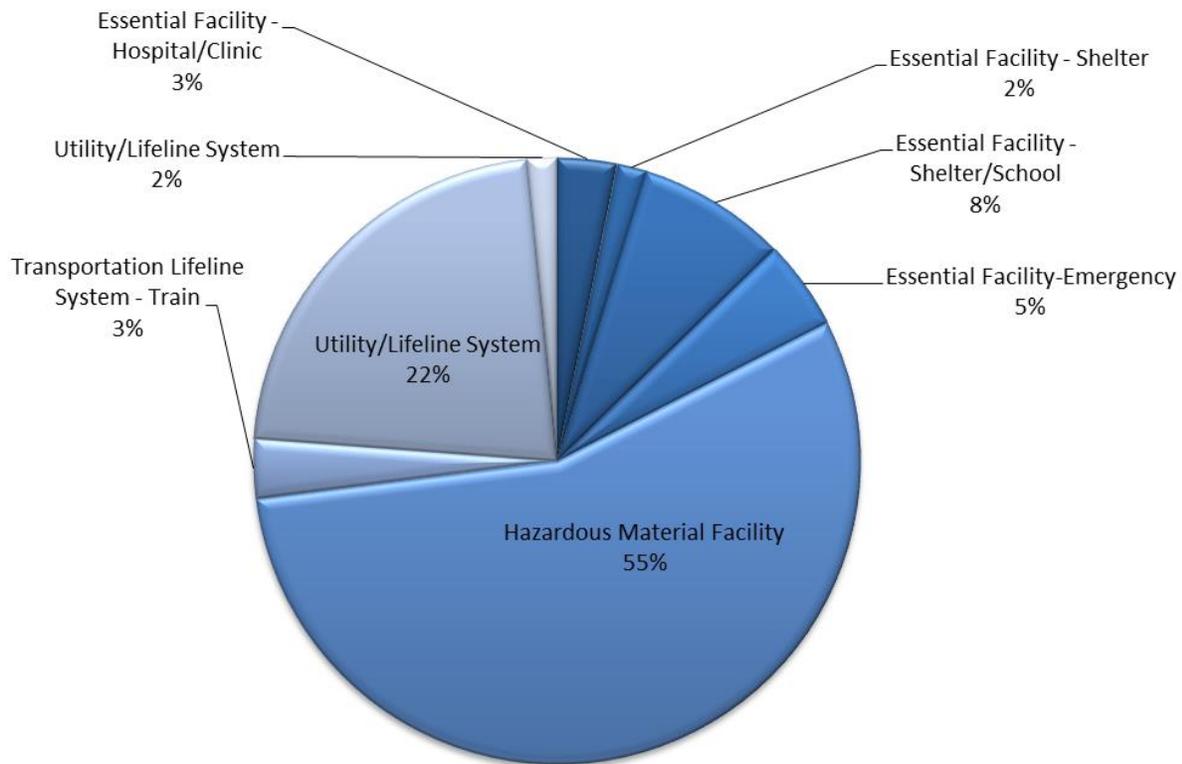


Figure 5-33: City Critical Facilities Type

A current representation of the critical facilities and linear utilities are provided in Table 5-16. Some critical facility information has been omitted from documentation due to national security purposes. The City of Shasta Lake Development Services Department manages and maintains a complete list of critical facilities.

Table 5-16: Critical Facility Inventory Summary Table

Critical Facility Type	Count of Facility Type
Essential Facility - Hospital/Clinic	2
Essential Facility – Shelter	1
Essential Facility - Shelter/School	5
Essential Facility-Emergency	3
Hazardous Material Facility	35
Transportation Lifeline System – Train	2
Utility/Lifeline System	15
Total	63

5.8.2.4 Improved Parcel Exposure

A standardized hazard overlay was conducted to develop hazard exposure results for improved city parcels. The Shasta County Assessor’s data is pivotal to developing the total parcel value (Land and Improvement Value) exposed to each hazard – the value of parcels exposed to each hazard within the study area is referred to as parcel exposure. The spatial overlay method identifies parcels and the associated value of each to a particular hazard, which allows parcel exposure results to be compared for each hazard.²⁹ The structure value, fixture value, and personal property value for each parcel is summed and provided in Table 5-17. Table 5-17 represents the total parcel count and associated value in Shasta Lake.

Table 5-17: City Parcel Count and Value

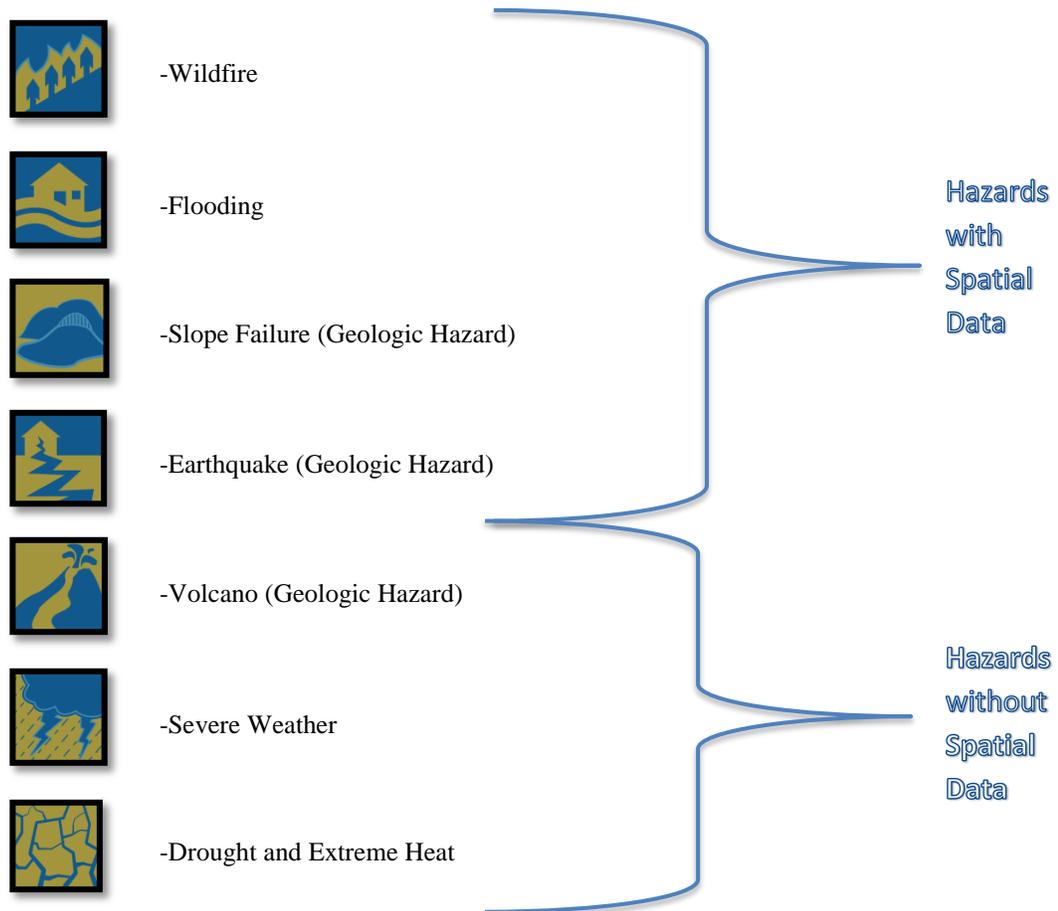
Parcel Count	Land Value	Improvement Value	Total Value
4,966	\$154,195,361	\$370,581,515	\$615,956, 279

Source: Shasta County Assessor’s Roll 2013

²⁹ For City parcel data, it is important to note that replacement cost is different than assessed market value for taxation purposes. In the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a total loss and structures can be rebuilt.

5.8.3 Hazard Specific Vulnerability

FEMA Disaster Mitigation Act regulations require that the City of Shasta Lake evaluate the risks associated with each of the hazards identified in the hazard mitigation planning process. This section summarizes the possible impacts and quantifies, where data permits, the City’s vulnerability to each of the priority hazards identified in earlier in Section 5. Estimated community vulnerability from each hazard is provided in each hazard-specific section that follows. Vulnerability can be quantified in instances where there is a known hazard area, such as a mapped floodplain or high fire hazard area. The Planning Committee identified four hazards in the planning area for which specific geographical hazard areas have been defined and for which sufficient data exists to support a vulnerability analysis. The hazards evaluated as part the vulnerability assessment include:



Hazards with known geographical extents include wildfire, flooding, earthquake, and slope failure. Hazards with spatial extents have discrete hazard risk areas; their risk varies and will affect people and assets differently. For hazards with spatial extents, “at risk” population and assets were inventoried by hazard area. To the extent possible, population and assets are quantified to define vulnerability in identified hazard areas. The vulnerability analysis includes general hazard-related impacts, overall community impact, exposed population, assets and critical facilities at risk (i.e., types, numbers, and value of land and improvements). Together, this information conveys the vulnerability of particular populations and assets allowing hazard mitigation planners to prioritize resources accordingly.

5.8.4 Assigning Risk Factors

The HMP Planning Committee assigned risk factors for each hazard profiled through a facilitated group exercise. During the group exercise, risk factor (RF) criteria worksheets were used to examine each identified hazard for potential risk. This methodology produces RF numerical values that allow identified hazards to be ranked against one another (the higher the RF value, the greater the hazard risk). Final RF values are obtained by assigning numerical criteria index values to five risk assessment categories. Risk assessment categories include *probability, impact, spatial extent, warning time, and duration*.

To obtain RF for each hazard the Planning Committee assigned a numerical range (1-4) to each risk assessment category. Based upon unique concerns for the planning area, a weighting factor can be agreed upon for each RF category. The RF weighting scheme is used to establish a higher degree of importance to selected risk assessment categories. To calculate the RF value for a given hazard the Planning Committee developed the RF weighting scheme below:

$$\text{RF Value} = [(\text{Probability} \times .30) + (\text{Impact} \times .30) + (\text{Spatial Extent} \times .20) + (\text{Warning Time} \times .10) + (\text{Duration} \times .10)]$$

The sum of all five categories shown in the equation above equals the RF final risk factor values presented in Table 5-19. Table 5-18 provides a summary of the RF criteria the Planning Committee used to assign *criteria index values* during a group exercise. This RF approach uses hazard data, local knowledge, and consensus opinions to produce numerical values that allow identified hazards to be ranked against one another. The final RF developed can be used to evaluate hazards and classify perceived hazard risk in the City.

Table 5-18: Risk Factor Criteria

Risk Assessment Category	Degree of Risk	Level	Criteria Index	Weight Value
PROBABILITY What is the likelihood of a hazard event occurring in a given year?	UNLIKELY	LESS THAN 1% ANNUAL PROBABILITY	1	30%
	POSSIBLE	BETWEEN 1 & 10% ANNUAL PROBABILITY	2	
	LIKELY	BETWEEN 10 & 100% ANNUAL PROBABILITY	3	
	HIGHLY LIKELY	100% ANNUAL PROBABILITY	4	
IMPACT In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?	MINOR	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION ON QUALITY OF LIFE. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.	1	30%
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE DAY.	2	

Risk Assessment Category	Degree of Risk	Level	Criteria Index	Weight Value
	CRITICAL	MULTIPLE DEATHS / INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE WEEK.	3	
	CATASTROPHIC	HIGH NUMBER OF DEATHS / INJURIES POSSIBLE. MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR 30 DAYS OR MORE.	4	
SPATIAL EXTENT How large of an area could be impacted by a hazard event? Are impacts localized or regional?	NEGLIGIBLE	LESS THAN 1% OF AREA AFFECTED	1	20%
	SMALL	BETWEEN 1 & 10% OF AREA AFFECTED	2	
	MODERATE	BETWEEN 10 & 50% OF AREA AFFECTED	3	
	LARGE	BETWEEN 50 & 100% OF AREA AFFECTED	4	
WARNING TIME Is there usually some lead time associated with the hazard event? Have warning measures been implemented?	MORE THAN 24 HRS.	SELF DEFINED	1	10%
	12 TO 24 HRS.	SELF DEFINED	2	
	6 TO 12 HRS.	SELF DEFINED	3	
	LESS THAN 6 HRS.	SELF DEFINED	4	
DURATION How long does the hazard event usually last?	LESS THAN 6 HRS.	SELF DEFINED	1	10%
	LESS THAN 24 HRS.	SELF DEFINED	2	
	LESS THAN 1 WEEK	SELF DEFINED	3	
	MORE THAN 1 WEEK	SELF DEFINED	4	

Table 5-19 displays RF index criteria and weighting determinations from the HMP Planning Committee. Final RF scores determine *High, Moderate, or Low* risk designations based upon the conclusion index. It should be noted that although some hazards are classified as posing “Low Risk”, their occurrence of varying or unprecedented magnitudes is still possible and will continue to be re-evaluated during future updates of this plan. Due to the inherent errors possible in any disaster risk assessment, the results of the risk assessment should only be used for planning purposes and in developing projects to mitigate potential losses.

5.8.5 Hazard Risk Factor

Table 5-19: Risk Factor Results Table

Rank	Natural Hazards	Probability Index	Wt. Value 1	Impact Index	Wt. Value 2	Spatial Extent Index	Wt. Value 3	Warning Time Index	Wt. Value 4	Duration Index	Wt. Value 5	RF Factor
1	Wildland Fires	3	0.9	2	0.6	2	0.4	4	0.4	4	0.4	2.7
2	Earthquake	1	0.3	2	0.6	4	0.8	4	0.4	4	0.4	2.5
3	Drought & Extreme Heat	4	1.2	1	0.3	2	0.4	1	0.1	4	0.4	2.4
4	Severe Storms	2	0.6	2	0.6	2	0.4	1	0.1	4	0.4	2.1
5	Volcanic Activity	1	0.3	1	0.3	4	0.8	1	0.1	4	0.4	1.9
6	Flooding	2	0.6	1	0.3	2	0.4	3	0.3	3	0.3	1.9
7	Slope Failure	1	0.3	1	0.3	1	0.2	4	0.4	2	0.2	1.4
Risk Factor Conclusion												
HIGH RISK (3.0 – 4.0)				N/A								
MODERATE RISK (2.0 – 2.9)				Wildfire, Earthquake, Drought & Extreme Heat, Severe Storms,								
LOW RISK (0.1 – 1.9)				Volcanic Activity, Flooding, Slope Failure								

Wt. Value = Wt. Value 1 = PROBABILITY INDEX x .30

Wt. Value 2 = IMPACT INDEX x .30

Wt. Value 3 = SPATIAL EXTENT INDEX x .20

Wt. Value 4 = WARNING TIME INDEX x .10

Wt. Value 5 = DURATION INDEX x .10

RF Value = (Wt. Value 1) + (Wt. Value 2) + (Wt. Value 3) + (Wt. Value 4) + (Wt. Value 5)

Low Risk—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.

Moderate Risk —Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.

High Risk—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.

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5.8.6 Wildfire

Risk to residents and property from wildfire is of significant concern. With the exception of the urban core of Shasta Lake, wildfire danger is a major threat across the mountainous and fuel rich area. High fuel loads in the rolling hills, along with geographical and topographical features create the potential for both natural and human-caused fires that can result in loss of life and property damage. These factors, combined with natural weather conditions common to the area, including periods of drought, low relative humidity, and significant winds can result in frequent and sometimes catastrophic fires. Any fire, once ignited, has the potential to quickly become large and out-of-control. Table 5-20 provides a risk factor snap shot and a summary of community vulnerability in terms of total assets vs. assets exposed to wildfire hazards.



Table 5-20: Wildfire Vulnerability Analysis Summary

Wildfire Vulnerability Analysis		
Community Vulnerability Rating	2.7	Moderate Risk —Moderate potential impact.

Exposure Type	Total Assets	Assets or Value at Risk	% of Total Asset	Assets in Very High Hazard Areas	Asset % in Very High Hazard Areas
Population	9,344	8,192	87%	4,818	52%
Critical Facilities	63	50	79%	20	32%
Parcels Count	4,966	4,206	85%	1,492	52%

Potential losses from wildfire include human life, structures and other improvements, natural and cultural resources, and recreational opportunities. Short and long-term economic losses could result due to loss of business and other economic drivers associated with summer seasonal activities. Smoke and air pollution from wildfires can be a severe health hazard. Catastrophic wildfire can create favorable conditions for other hazards like flooding, landslides, and erosion during the rainy season.

5.8.6.1 Population at Risk

City census block groups were used to estimate populations within the state produced Fire Hazard Severity Zones geospatial layer available from CAL FIRE. Wildfire risk is of greatest concern to populations residing in the moderate, high, and very high wildfire hazard severity zones. The analysis shows that 4,818 city residents live within areas considered very high hazard areas and more than 1,600 residents are shown to live within a high hazard severity area. Figure 5-34 shows U.S. census populations in Shasta Lake who live within a very high, high, or moderate hazard severity zone.³⁰

³⁰ High and very high Fire Hazard Severity Zones as defined by the California Department of Forestry and Fire Protection (CAL FIRE).

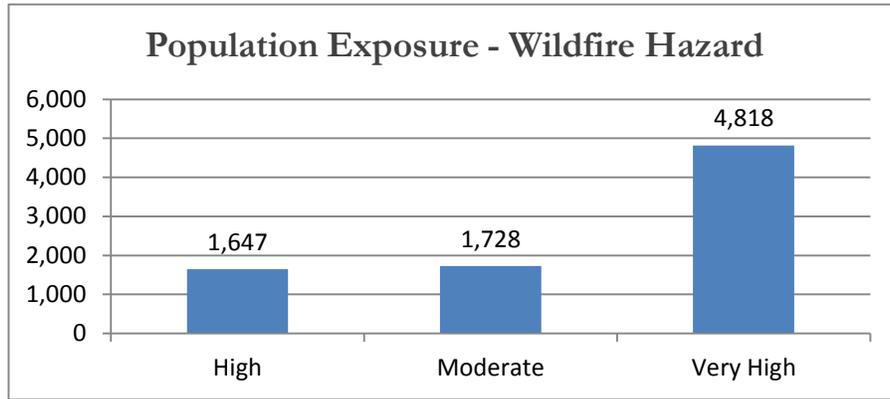


Figure 5-34: Population at risk from Wildfire Hazards

5.8.6.2 City Parcel Value at Risk

The City’s parcel layer was used as the basis for the inventory of improved residential parcels. In some cases a parcel will be within multiple fire threat zones. GIS was used to create centroids, or points, to represent the center of each parcel polygon – this is assumed to be the location of the structure for analysis purposes. The centroids were then overlaid with the fire threat layer to determine the risk for each parcel. The fire threat zone in which the centroid was located was assigned to the entire parcel, and only improved parcels were analyzed. This analysis shows that 4,206 parcels (or 84%) are exposed to wildfire threat. See Table 5-21 for more information on parcel values exposed to wildfire.

Table 5-21: Parcel Value Exposed to wildfire

WILDFIRE HAZARD	Values Parcel Count	% City Total	Sum of Land Value	Sum of Improved Value	Sum of Total Value	% City Value
High	1,492	30.04%	\$37,195,792	\$94,129,199	\$131,916,873	21.42%
Moderate	1,041	20.96%	\$28,161,052	\$72,922,292	\$106,666,329	17.32%
Very High	1,673	33.69%	\$72,181,967	\$164,963,937	\$321,662,123	52.22%
Exposure Total	4,206	84.70%	\$137,538,811	\$332,015,428	\$560,245,325	90.96%

5.8.6.3 Critical Facilities at Risk

Critical facilities data were overlaid with fire hazard severity zone data to determine the type and number of facilities within each risk classification. Table 5-22 provides a summary of critical facilities located within each wildfire severity zone. Mountain Lakes High School, SLFPD Station 3, and multiple water tanks and pumps stations are with the “Very High” Severity classes within Shasta Lake.

Table 5-22: Critical Facility Exposure to Wildfire

Count of Facilities by Fire Severity Classes	Moderate	High	Very High	Grand Total
Essential Facility - Hospital/Clinic	1			1
Shasta Dam Clinic - no DBA	1			1
Essential Facility - Shelter	1			1
John Beaudet Senior Community Center	1			1
Essential Facility - Shelter/School	2	2	1	5
Central Valley High School	1			1
Grand Oaks Elementary School		1		1
Mountain Lakes High School			1	1
Shasta Lake Middle School		1		1
Toyon Elementary School	1			1
Essential Facility-Emergency		1	1	2
SLFPD Station 2		1		1
SLFPD Station 3			1	1
Hazardous Material Facility	10	9	6	25
A.G. Termite Control	1			1
Bill Dalke's Fiberglass Repair	1			1
Buddies Auto Body	1			1
CA-MIL, Inc.		1		1
Cascade Texaco Station	1			1
Cousin Gary's RV Service		1		1
Hobbs Auto Body	1			1
KMF Construction			1	1
Knauf Insulation			1	1
M P Custom Iron		1		1
Marvin Lachney Excavating and Paving		1		1
Northern Automotive			1	1
Pine Grove Exxon	1			1
Premiere Brand Meats		1		1
River City Construction			1	1
Ron Young and Son Automotive		1		1
Shasta Lake Chevron	1			1
Sierra Pacific Industries, Inc.	1			1
Stanley Mfg./Lumber Transport			1	1
Surbore, Inc.		1		1
Walkers Custom Chrome		1		1
Wesflex Pipe Manufacturing		1		1
Transportation Lifeline System - Train		1	1	2

SPRR Tunnel 1			1	1
SPRR Tunnel 2		1		1
Utility/Lifeline System		3	10	13
Central Valley Substation and Corporate Yard			1	1
Ejector Station 1		1		1
Ejector Station 2		1		1
Pump Station 4			1	1
Pump Station 5 (Relief)		1		1
Pump Station 6 (Ind. Park)			1	1
Reclaimed Water Pump Station			1	1
Wastewater Treatment Plant			1	1
Water Plant			1	1
Water Tank 2			1	1
Water Tank 3			1	1
Water Tank 4			1	1
Water Tank- Summit City/Toyon			1	1
Knauf Insulation Substation			1	1
EXPOSURE TOTAL	14	16	20	50

5.8.7 Earthquake (Geologic Hazard)

Major impacts from earthquakes are primarily the probable number of casualties and damage to infrastructure occurring from ground movement along a particular fault (USGS 2009). The degree of infrastructure damage depends on the magnitude, focal depth, distance from fault, duration of shaking, type of surface deposits, presence of high groundwater, topography, and the design, type, and quality of infrastructure construction.



The City is not located within an Alquist-Priolo Earthquake Fault Zone³¹. One inactive fault passes through southern portions of Shasta County named the Battle Creek Fault. While there are no known active faults residing within or near the City limits, seismic-related events (i.e., ground shaking, etc.) are possible to City residents and property.

Seismic hazard mapping indicates that the City has low seismic hazard potential. To analyze the seismic risk in Shasta Lake, USGS shake maps³² and Probabilistic Seismic Hazards Maps (described in Section 5.5.8.1) were used in an overlay method. Exposure results for population, critical facilities, and City parcel values were developed to provide a tool for planners to describe community vulnerability. Table 5-23 provides a risk factor snap shot and a summary of community vulnerability in terms of total assets vs. assets exposed to earthquake hazards.

Table 5-23: Earthquake Vulnerability Analysis Summary

Earthquake Vulnerability Analysis		
Community Risk Factor Rating	2.5	Moderate Risk, Moderate potential impact.

Exposure Type	Total Assets	Assets or Value with Hazard	% of Total Asset	Assets in Moderate Shake Areas	% Very High Hazard Areas
Population	9,344	9,344	100%	6,161	65.9%
Critical Facilities	63	63	100%	46	73%
Parcels Count	4,966	4,944	100%	3,958	79.7%

³¹ The Alquist-Priolo Earthquake Fault Zoning (AP) Act was passed into law following the destructive February 9, 1971 Mw 6.6 San Fernando earthquake. The AP Act provides a mechanism for reducing losses from surface fault rupture on a statewide basis. The intent of the AP Act is to ensure public safety by prohibiting the siting of most structures for human occupancy across traces of active faults that constitute a potential hazard to structures from surface faulting or fault creep.

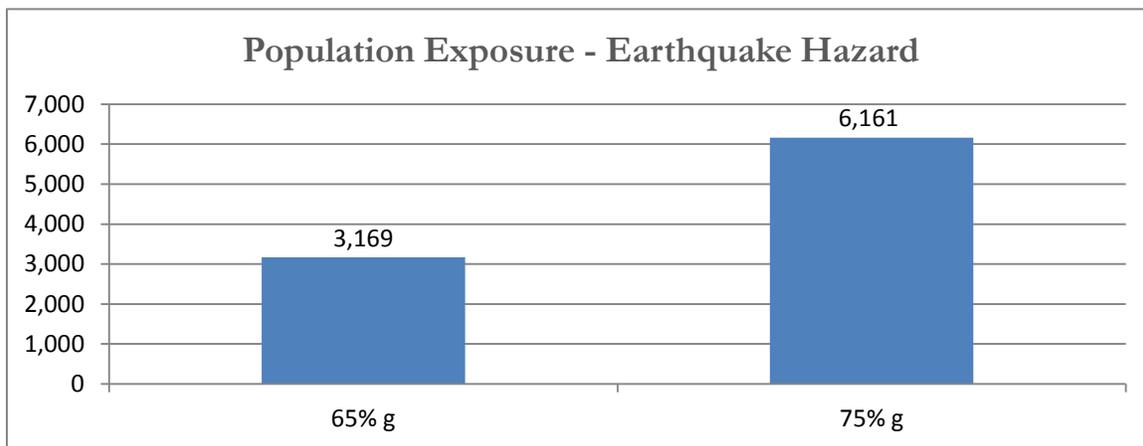
³² One USGS shake map was used to develop the potential damage spatial layers. Shake maps from USGS replicated a 5.37 Magnitude event on November 26th, 1998. From this event GIS analysts used Peak Spectral Acceleration (PSA) and Peak Ground Velocity (PVG) from those events to provide potential damage estimates based on building type and local soil conditions.

5.8.7.1.1 Population at Risk

According to the 2010 U.S. Census, the City’s total population is 10,164 residents and has population density of approximately 932.5 people per square mile. A small dense urban core with various large building masses are located on Shasta Blvd, while the remaining portion of the population resides in residential dwelling units in a semi-rural setting. Though rural residential construction is not particularly vulnerable to earthquakes, an earthquake could directly or indirectly expose the entire population of the City to ground shaking. Depending on the time of day and year (the population differs significantly from day and night based localized and regional employment centers) and exact location of an earthquake epicenter, population could experience strong ground shaking.

Figure 5-35 exhibits the population exposure to probabilistic seismic shaking. Probabilistic seismic shaking maps are prepared using information on historical earthquakes, faults, and geologic materials. Historic earthquakes, areas damaged, the slip rates of major faults, and geologic materials were combined to calculate the shaking hazard at peak ground acceleration (PGA). The shaking hazard maps show the level of ground motion that has 1 chance in 475 of being exceeded each year, which is equal to a 10% probability of being exceeded in 50 years.

Shasta Lake planners are most concerned with shaking hazards for low structures. Shake hazards for this type of building occur at spectral accelerations with a 0.2-second periods. According to the USGS, residents living within Shasta Lake are expected to experience between 65 and 75 percent of gravity (ground acceleration in % gravity), which is low on the ground motion spectrum. Figure 5-35 shows population in each ground motion spectrum.



The unit here is in % g (gravity) – i.e. 100% g is the same as the acceleration due to gravity.

Figure 5-35: Population Exposure to Earthquake Hazard Probability

5.8.7.1.2 Improved Parcel Value at Risk

Similar to the population exposure analysis, the County’s parcel layer was used as the basis for the inventory of improved residential parcels. GIS was used to create centroids, or points, to represent the center of each parcel polygon – this is assumed to be the location of the structure for analysis purposes. The centroids were then overlaid with the shake probability maps to determine the at-risk structures. This methodology assumed that every parcel with a square footage value greater than zero was

developed in some way. See Table 5-24 for more information on parcel values exposed to earthquake shaking hazards.

Table 5-24: Parcel Value Exposed to Earthquake Damage Potential

EARTHQUAKE HAZARD	Parcel Count	% City Total	Sum of Land Value	Sum of Improved Value	Sum of Total Value	% City Value
65 %g	1,008	20.30%	\$43,447,206	\$101,837,067	\$146,041,192	23.71%
75 %g	3,958	79.70%	\$110,748,155	\$268,744,448	\$469,915,087	76.29%
Total	4,966	100.00%	\$154,195,361	\$370,581,515	\$615,956,279	100.00%

The unit here is in % g (gravity) – i.e. 100% g is the same as the acceleration due to gravity.

5.8.7.1.3 Critical Facilities at Risk

Critical facilities data was spatially overlaid with earthquake hazard data to determine the type and number of facilities vulnerable to earthquake hazard classifications. Earthquakes pose numerous risks to critical facilities and infrastructure since the footprint of the earthquake hazard covers the entire county. However, most of the City’s critical facilities have been built since the California Unified Building Code (UBC) was amended to include provisions for seismic safety. Seismic risks, or the harm or losses, that are likely to result from exposure to seismic hazards include:

- Casualties (fatalities and injuries).
- Utility outages.
- Economic losses for repair and replacement of critical facilities, roads, buildings, etc.
- Indirect economic losses such as income lost during downtime resulting from damage to private property or public infrastructure.
 - Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to reach vulnerable populations or to make repairs.

Table 5-25 provides an inventory of critical facilities in each earthquake hazard category for the City. The impact to the community could be great if these critical facilities were damaged or destroyed during a large earthquake event.

Table 5-25: Critical Facilities with Earthquake Damage Potential

Count of Facilities by Potential Ground Shaking, (spectral accelerations with a 0.2-second return period)	65% g	75% g	Total
Essential Facility - Hospital/Clinic		2	2
Shasta Community Health Center		1	1
Shasta Dam Clinic - no DBA - now under Dr. Harold Budhram		1	1
Essential Facility - Shelter		1	1
John Beaudet Senior Community Center		1	1
Essential Facility - Shelter/School		5	5
Central Valley High School		1	1
Grand Oaks Elementary School		1	1
Mountain Lakes High School		1	1

Count of Facilities by Potential Ground Shaking, (spectral accelerations with a 0.2-second return period)	65% g	75% g	Total
Shasta Lake Middle School		1	1
Toyon Elementary School		1	1
Essential Facility-Emergency		3	3
SLFPD Station 1		1	1
SLFPD Station 2		1	1
SLFPD Station 3		1	1
Hazardous Material Facility (all facilities)	5	30	35
Transportation Lifeline System - Train	2		2
SPRR Tunnel 1	1		1
SPRR Tunnel 2	1		1
Utility/Lifeline System	9	5	14
Central Valley Substation and Corporate Yard	1		1
Ejector Station 1		1	1
Ejector Station 2		1	1
Pump Station 3		1	1
Pump Station 4	1		1
Pump Station 5 (Relief)		1	1
Pump Station 6 (Ind. Park)	1		1
Reclaimed Water Pump Station	1		1
Wastewater Treatment Plant	1		1
Water Plant		1	1
Water Tank 2	1		1
Water Tank 3	1		1
Water Tank 4	1		1
Water Tank- Summit City/Toyon	1		1
Knauf Substation	1		1
EXPOSURE TOTAL	17	46	63

The unit here is in % g (gravity) – i.e. 100% g is the same as the acceleration due to gravity.

Earthquake events can significantly impact roads, overpasses, and bridges which often provide the only access to some neighborhoods. Since soft soil regions generally follow floodplain boundaries, bridges that cross water courses are considered vulnerable. Since most of the City’s bridges provide access across water courses, most are at least somewhat vulnerable to earthquakes. Key factors in the degree of vulnerability are the bridge’s age and type of construction based on the standards to which the bridge was built.

Linear utilities and transportation infrastructure would likely suffer considerable damage in the event of a very strong earthquake. During these events major water and waste water lines running through the City may be damaged. Due to the sensitivity of linear utilities to seismic shaking, local infrastructure is difficult to analyze without further investigation of individual system components.

5.8.7.1.4 Loss Estimation

The Hazus Level 2³³ analysis was used to assess the risk from and vulnerability to earthquake shaking in Shasta Lake. Hazus buildings data is aggregated to the building type, which has an accuracy level acceptable for planning purposes. Where possible the general building stock was enhanced using GIS data from the City. The following sections describe risk and vulnerability to building stock within the City.

Hazus software calculates losses to structures from earthquake shaking by considering the amount of ground displacement and type of structures in a shake scenario. Software modeling processes estimate the percentage of damage to structures and their contents by applying established building fragility curves. Damage estimates are then translated to estimated dollar losses for each structure.

For the modeled earthquake scenario, ground shaking data (shake maps) were acquired from the California Integrated Seismic Network (CISN) and imported into the Hazus software using the earthquake module. The CISN shake map data consist of peak ground velocity, peak ground acceleration, peak spectral acceleration at 0.3 seconds, and peak spectral acceleration at 1.0 seconds for each earthquake scenario.

To understand building damage, damage outputs from Hazus are categorized into slight, moderate, and extensive damage. Ranges of damage are used to provide the user with an understanding of the building’s physical condition. Table 5-26 provides a physical description of each damage state.

Table 5-26: Hazus Building Damage Descriptions

Damage State	Damage Description
Slight	Small plaster cracks at corners of door and window openings and wall/ceiling intersections; small cracks in masonry chimneys and masonry veneers. Small cracks are assumed to be visible with a maximum width of less than 1/8 inch (cracks wider than 1/8 inch are referred to as “large” cracks).
Moderate	Large plaster or gypsum-board cracks at corners of door and window openings; small diagonal cracks across shear wall panels exhibited by small cracks in stucco and gypsum wall panels; large cracks in brick chimneys; toppling of tall masonry chimneys.
Extensive	Large diagonal cracks across shear wall panels or large cracks at plywood joints; permanent lateral movement of floors and roof; toppling of most brick chimneys; cracks in foundations; splitting of wood sill plates and/or slippage of structure over foundations.
Complete	Structure may have large permanent lateral displacement or be in imminent danger of collapse due to cripple wall failure or failure of the lateral load resisting system; some structures may slip and fall off the foundation; large foundation cracks. Three percent of the total area of buildings with Complete damage is expected to be collapsed, on average.

While there are several limitations to the FEMA Hazus earthquake model, it does allow for potential loss estimation. The loss estimation results are summarized in Table 5-27. It is important to understand that

³³ More accurate loss estimates are produced by including detailed information on local hazard conditions and/or by replacing the national default inventories with more accurate local inventories of buildings, essential facilities and other infrastructure.

the Hazus loss estimation values for earthquake are much higher than those of flooding, as the earthquake hazard footprint is much larger.

Table 5-27 demonstrates building loss estimation results from the earthquake scenario are approximately \$37.2 million dollars, or 6 percent of the total value of the all buildings within Shasta Lake. In comparison, residential losses from earthquake are approximately \$1.1 Million, or 1.9 percent of the total value of total parcel value.

Note: Important concept in loss data is the “probability” of damage to exceed a certain degree. It is highly unlikely that any building in Shasta Lake would receive “extensive” damage from earthquake shaking.

Table 5-27: Lost Estimation Summaries for Earthquake

Building Type	Sum of Economic Loss	% of City total Value*	Avg. Probability of damage to exceed "Slight"	Avg. Probability of damage to exceed "Moderate "	Avg. Probability of damage to exceed "Extensive"
Agriculture	\$1,106,881	0.2%	28%	7%	1%
Commercial	\$1,509,881	0.2%	26%	6%	1%
Education	-	N/A	27%	6%	1%
Government	-	N/A	27%	6%	1%
Industrial	\$12,425,586	2.0%	27%	6%	1%
Residential	\$22,241,452	3.6%	29%	8%	1%
Total	\$37,283,801	6.1%	28%	7%	1%

*Total City Building Stock Value = \$615,956,279

5.8.8 Flooding

As described in the flood hazard profile, flooding and stormwater management is a substantial problem in Shasta Lake. Vulnerability to flooding is primarily during the winter months when drainage systems are overwhelmed and soil is saturated from heavy rainfall. During the winter rains, storm drainage and flood control devices have difficulty moving water away from structures and roadways.



Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage to property. In residential areas, flooding in low lying areas is a persistent problem due to the lack of curb and gutter and other flood control structures. Flooding occurs on a continual basis throughout the City both within the FEMA identified 100-year floodplain (1% annual chance of flooding) and in other localized areas.

In order to determine the possible vulnerability to flood damage, GIS was used to estimate the possible impact across the City. FEMA regulatory Digital Flood Insurance Rate Map (DFIRM) data along with U.S. Census and City asset data was utilized to quantify possible losses as a result of flooding. The information in this section describes flood vulnerability methodologies for determining people and assets at risk to the 100- and 500-year flood events. Table 5-28 provides a risk factor snap shot and a summary of community vulnerability in terms of total assets vs. assets exposed to flooding hazards.

Table 5-28: Slope Failure Vulnerability Analysis Summary

Flood Vulnerability Analysis		
Community Risk Factor Rating	1.9	Low Risk—Minimal potential impact.

Exposure Type	Total Assets	Assets at Risk	% of Total Asset	Assets in 100-YR. Flood Zone	% of Assets in 100-YR. Flood Zone
Population	9,344	731	14.5%	586	6.3%
Critical Facilities	63	5	7.9%	4	6.3%
Parcels Count	4,966	238	4.7%	180	2.52%

5.8.8.1 Population at Risk

Using 2012 population data aggregated by census blocks, an estimate was made of the population within the 100- and 500-year floodplain. To account for census blocks that were partially within the floodplain, a weighted average was employed to calculate the proportion of the population within the floodplain. The results of the population overlay are shown in Figure 5-36. Approximately 586 people live within the 100-year floodplain and 145 people live within the 500-year floodplain.

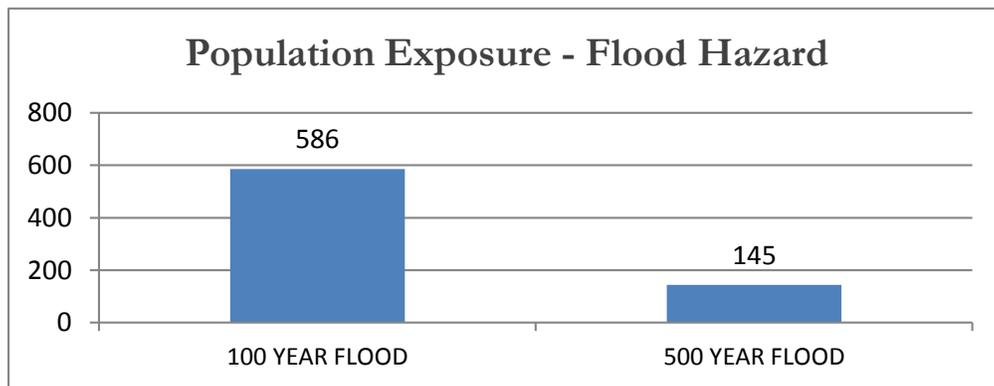


Figure 5-36: Population Exposed to Potential Flood Risk

5.8.8.2 City Parcel Value at Risk

The County Assessor’s parcel layer was used as the basis for the inventory of improved residential parcels. GIS was used to create centroids, or points, to represent the center of each parcel polygon. The parcel point centroid was then moved to the location of the largest structure on the lot for analysis purposes. The parcel centroids were overlaid with the floodplain layer to determine flood risk for each structure and assigned values based upon flood zone classification. Through this analysis, 180 parcels were found to be within a 100-Year flood zone, and 58 parcels within a 500-Year flood zone. Therefore, the total parcel exposure equals 238 parcels. See Table 5-29 for more information on parcel values exposed to flooding hazards.

Table 5-29: Parcel Value Exposed to Flooding

FLOOD HAZARD	Values Parcel Count	City Total %	Sum of Land Value	Sum of Improved Value	Sum of Total Value	Total City Value %
100-YR. (1 PCT. / YR.)	180	3.62%	\$6,399,403	\$8,771,903	\$15,549,129	2.52%
100-YR. (AE)	174	3.50%	\$5,309,900	\$7,710,065	\$13,063,218	2.12%
100-YR. (AO)	6	0.12%	\$1,089,503	\$1,061,838	\$2,485,911	0.40%
500-YR. (0.2 PCT. / YR.)	58	1.17%	\$2,614,237	\$6,133,066	\$8,816,264	1.43%
EXPOSURE TOTAL	238	4.79%	\$9,013,640	\$14,904,969	\$24,365,393	3.96%

5.8.8.3 Critical Facilities at Risk

Similar to population and parcel data, critical facilities information was used in a spatial overlay analysis to determine the type and number of facilities within the 100- and 500-year floodplain. Flooding poses numerous risks to critical facilities and infrastructure:

- Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to reach vulnerable populations or to make repairs.
- Bridges washed out or blocked by floods or debris from floods also can cause isolation.
- Creek or river floodwaters can back up drainage systems causing localized flooding.
- Floodwaters can get into drinking water supplies causing contamination.

- Sewer systems can be backed up causing waste to spill into homes, neighborhoods, rivers, and streams.
- Underground utilities can also be damaged.

Table 5-30 provides an inventory of the City’s critical facilities within the 100- and 500-Year flood zones. Facilities that contain hazardous material account for most of “at risk” facilities. One City-owned utility (Ejector Station 2) may have some degree of flood risk during a major flood event. A minor impact to the community could be experienced if the Ejector Station was damaged or destroyed during a flood event.

Table 5-30: Critical Facilities Exposed to Potential Flood Risk

County of Facilities by Flood Hazard Class	100-YR. Flood Zone (1 PCT. ANNUAL CHANCE FLOOD)	500-YR. Flood Zone (0.2 PCT. ANNUAL CHANCE FLOOD)	Total
Hazardous Material Facility	3	1	4
CA-MIL, Inc.	1		1
Circle K # 270 II 02	1		1
Cousin Gary's RV Service	1		1
Walkers Custom Chrome		1	1
Utility/Lifeline System	1		1
Ejector Station 2	1		1
EXPOSURE TOTAL	4	1	5

5.8.8.4 Loss Estimation

Similar to the earthquake loss estimation method, a FEMA Hazus analysis was used to estimate losses from flooding. The Hazus software calculates losses to structures from flooding by considering the depth of flooding and type of structure. The Hazus flood module uses estimates of flood depth along with depth-damage functions to compute the possible damage to buildings and infrastructure that may result from flooding. Important inputs to the damage Hazus flood module required to estimate building damage include:

- Building occupancy type
- First floor elevation; and
- Depth of flooding, where the building is located.

Using historical flood insurance claim data, the Hazus software estimates the percentage of damage to structures and their contents by applying established depth-damage curves. Damage estimates are then translated to estimated dollar losses.

Estimated building and content losses within the City’s limits was generated using Hazus and the results are summarized in Table 5-31. An estimated \$1.9 million of damage could occur in the City’s regulatory floodplain if all flooding sources experienced a 100-year flood event. An “all-encompassing” event could cause losses of 0.3 percent of the total value of City parcel value.

While there are several limitations to the FEMA Hazus model, it does allow for potential loss estimation. It should be noted the analysis may include structures in the floodplain that are elevated at or above the level of the base flood elevation, which will likely mitigate flood damage. Also, it is important to

remember that the replacement costs are much higher than the assessor values demonstrated in Table 5-31, thus, the actual value of assets at risk may be significantly higher than those included herein.

Table 5-31: Flood Loss Estimation Summary

Building Category	Sum of Estimated Building Loss	Avg. Probability of Building Damage	Sum of Estimated Content Loss	Avg. Probability of Content Damage	Sum of Estimated Inventory Loss	Sum of Total Estimated Loss
Agriculture	\$ 55,311	5.48%	\$ 201,005	19.65%	\$ 254,579	\$ 510,894
Commercial	\$ 83,152	3.83%	\$ 340,943	11.04%	\$ 227,831	\$ 651,927
Government	\$ -	4.49%	\$ -	25.54%	\$ -	\$ -
Industrial	\$ 44,522	8.90%	\$ 129,595	16.31%	\$ 104,487	\$ 278,604
Residential	\$ 318,480	5.56%	\$ 146,600	5.18%	\$ -	\$ 465,079
EXPOSURE TOTAL	\$ 501,465	5.23%	\$ 818,144	12.77%	\$ 586,896	\$ 1,906,504

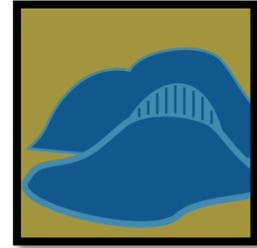
According to the FEMA Flood Insurance Study (FIS) text for Shasta County and the City of Shasta Lake, there are two areas that are subject to inundation from split flow during a 100-year storm event. These areas include:

- The Hilltop Circle crossing on Churn Creek (in the Twin Lakes Mobile Home Park), where the four 4-ft. by 4-ft. box culverts do not provide adequate conveyance of the 100-year flow, which leads to shallow flooding in the areas adjacent to the crossing.
- The Interstate 5 crossing on Moody Creek, where the existing pair of 9.5-foot-diameter culverts do not have capacity to convey the 100-year storm. During the 100-year storm, water backs up behind the highway and Shasta Dam Boulevard, eventually overtopping Shasta Dam Boulevard and spilling southward parallel to Shasta Street and Cascade Boulevard.

According the Hazus loss estimation mentioned previously, there are approximately 20 parcels in these areas that have flood damage risk during a 100-year storm event. Total estimated damages in these areas could exceed approximately \$630,000 dollars in both areas. The parcels near the Interstate 5 crossing have a far greater damage potential due the commercial property values in the area however the mobile home park is occupied by senior residents..

5.8.9 Slope Failure (Geologic Hazard)

Vulnerability to landslide hazards is a function of location, type of human activity, use, and frequency of landslide events. The effects of landslides on people and structures can be lessened by total avoidance of landslide hazard areas or by restricting, prohibiting, or imposing conditions on hazard-zone activity.



Shasta Lake can reduce landslide effects through land-use policies and regulations. City residents can reduce their exposure to hazards by educating themselves on the past hazard history of a site and by making inquiries to the Development Services and Public Works Departments.

The steepest slopes are found in the northwestern portion of the City, suggesting a greater susceptibility to slope failure at these locations. Human activities also contribute to landslide events such as altering the natural slope gradient, increasing soil water content, and removing vegetation cover. The best available predictor of where landslides may occur is the location of previous occurrences.

Landslides are most likely to occur during severe weather events. The ground must be saturated prior to the onset of a severe weather event for a significant landslide to occur. Transportation routes throughout the City at the base or crest of cliffs should be considered vulnerable to landslide hazard. Table 5-32 provides a risk factor snap shot and a summary of community vulnerability in terms of total assets vs. assets exposed to flooding hazards.

Table 5-32: Slope Failure Vulnerability Analysis Summary

Slope Failure Vulnerability Analysis		
Community Risk Factor Rating	1.4	Low Risk—Minimal potential impact.

Exposure Type	Total Assets	Assets or Value at Risk	% of Total Asset	Assets in High Hazard Areas	% Very High Hazard Areas
Population	9,344	2,668	28.6%	287	3.0%
Critical Facilities	63	9	1.4%	1	.02%
Parcels Count	4,966	1,507	30.7%	163	.03%

5.8.9.1 Population at Risk

Of greatest concern in the event of a landslide is the potential for loss of life. Using 2012 population data aggregated by census blocks, an estimate was made of the population within the low, moderate, and high landslide susceptibility areas. To account for census blocks that were partially within a slope failure susceptibility area, a weighted average was employed to calculate the proportion of the population within the each slope failure potential zone. The results of the population overlay are shown in Figure 5-37. Approximately 87 people live within the very high landslide susceptibility areas and 200 people live within high landslide susceptibility areas.

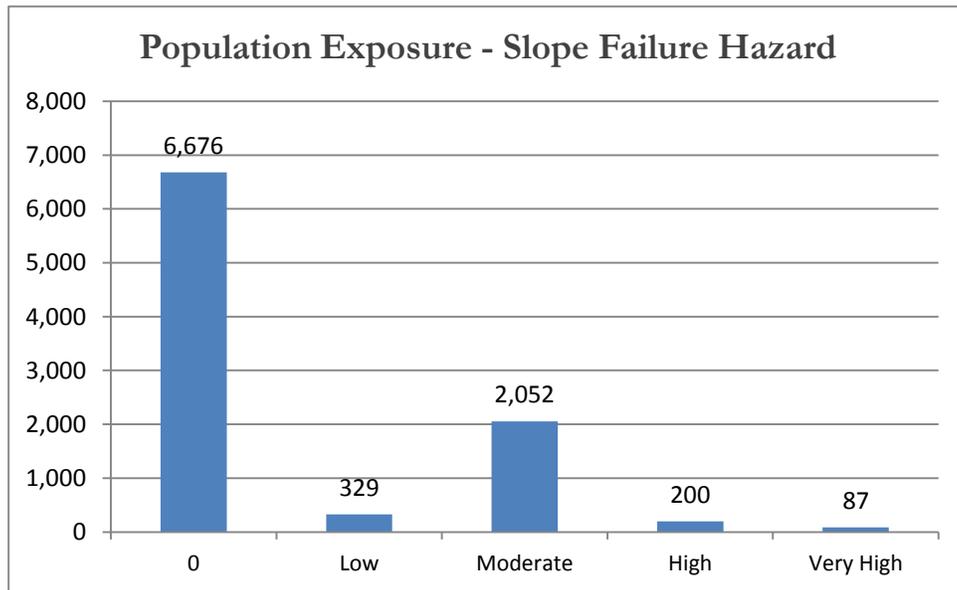


Figure 5-37: Population Exposure to slope failure susceptibility.

5.8.9.2 City Parcel Value at Risk

The County’s parcel layer was used as the basis for the inventory of improved residential parcels. GIS was used to create centroids, or points, to represent the center of each parcel polygon – this is assumed to be the location of the structure for analysis purposes. The parcel centroids are overlaid with landslide susceptibility classes produced by the California Geological Survey to determine at-risk parcels. The results of the analysis show that less than two percent of the City’s parcels (163 or 1.72%) are located in a “high” or “Very High” slope failure susceptibility areas. The remaining 1,364 parcels with land slide hazards are located in a low to moderate slope failure susceptibility areas. See Table 5-33 for more information on parcel values exposed to slope failure risks.

Table 5-33: Parcel Value Exposed to Slope Failure Hazard

Landslide Susceptibility	Parcel Count	% City Parcel Count	Sum of Land Value	Sum of Improvement Value	Sum of Total Value	% City Parcel Value
Low	113	2.28%	\$4,332,138	\$9,121,518	\$13,649,556	2.22%
Moderate	1,251	25.19%	\$31,748,536	\$66,979,787	\$99,349,290	16.13%
High	134	2.70%	\$2,830,134	\$6,304,463	\$9,217,462	1.50%
Very High	29	0.58%	\$579,372	\$773,331	\$1,368,703	0.22%
EXPOSURE TOTAL	1,527	30.7%	\$39,490,180	\$83,179,099	\$123,585,011	20.06%

5.8.9.3 Critical Facilities at Risk

Critical facilities data was spatially overlaid with slope failure hazard data to determine the type and number of facilities within the low, moderate, and high and very high slope failure susceptibility areas. Slope failure areas pose a small risk to critical facilities and infrastructure as compared to other hazards

in the City. However, if slope failures were to occur the potential damage could consume City resources and equipment. Some of the potential outcomes of a slope failure could include:

- Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to reach vulnerable populations or to make repairs.
- Rock falls could potentially present danger to nearby people and structures.
- Disrupts water mains, sewers, power lines and other utility lines.

Critical facilities data were spatially intersected or overlaid with slope failure susceptibility data to determine the type and number of facilities within the Low, Moderate, High, and Very High susceptibility areas. Table 5-34 provides an inventory of these critical facilities in the Low, Moderate, and High landslide hazard area. Only one known facility (a city owned water plant) may be in an area of High slope failure susceptibility.

Table 5-34: Critical Facilities with Landslide Risk

Count of Facilities by Slope Failure Susceptibility	Low	Moderate	High	Total
Essential Facility - Hospital/Clinic		1		1
Shasta Dam Clinic - no DBA		1		1
Essential Facility-Emergency		1		1
SLFPD Station 2		1		1
Hazardous Material Facility		4		4
John M. Frank, Inc.		1		1
KMF Construction		1		1
M P Custom Iron		1		1
Ron Young and Son Automotive		1		1
Utility/Lifeline System	1	1	1	3
Pump Station 5 (Relief)		1		1
Water Plant			1	1
Water Tank 2	1			1
EXPOSURE TOTAL	1	7	1	9

5.8.10 Summary of Spatial Hazards

Hazards with known spatial characteristics can be analyzed by comparing percentages of population, parcels, and critical facilities at risk. Results for each hazard category are provided below. A side-by-side comparison allows mitigation planners to evaluate the impacts of potential hazards to determine what hazards to direct energy and financial resource for mitigation activities.

5.8.10.1 Population at Risk Summary

Table 5-35 and Figure 5-38 exhibit the amount of people living within wildfire, earthquake, flood, landslide susceptibility zones. Though the earthquake hazard overlay has a large spatial footprint, the probability of "Extensive or Moderate" damage to buildings is very slight, and therefore very little of the exposed population in danger. The potential for casualties is somewhat low due to the date of building construction and type of structures within City.

Wildfire poses a risk for more than 4,800 people (over 50% of the population); this statistic confirms the City's need and desire to prioritize the mitigation of wildfire hazards. For detailed vulnerability assessment information on affected populations, see the individual hazard specific sections presented previously in this section.

Table 5-35: Population Exposure Summary

Hazard	Population Exposure Summary for High and Very High Hazards Zones	Percent of Total City Population
Landslide (High / Very High)	287	3.07%
Flood (100-YR. & 500-YR. Flood Zones)	731	7.83%
Fire (Very High and High Hazard Class)	4,818	51.63%
Earthquake (75% g)	6,161	66.04%

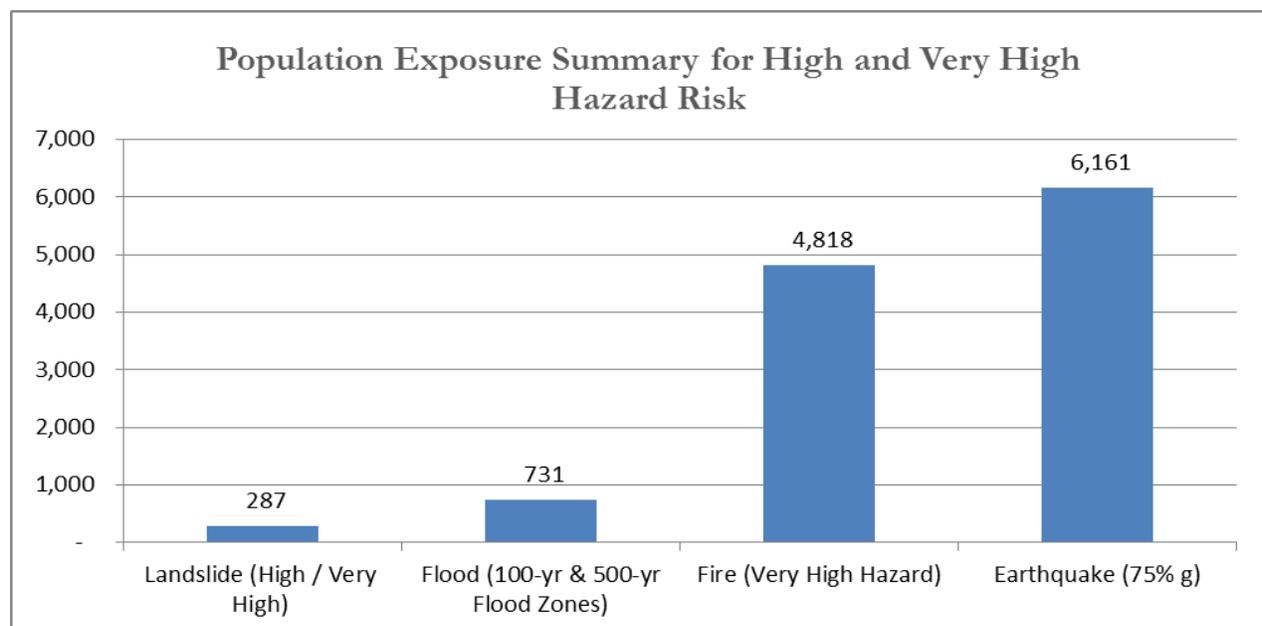


Figure 5-38: Population Exposure Summary

5.8.10.2 Parcel at Risk Summary

Table 5-36 and Figure 5-39 provide a summary of at-risk parcels with high and very high hazard risk. Wildfire’s very high hazard classification creates approximately five times the amount exposed parcels compared to any other high hazard severity zone. For detailed vulnerability assessment information see the individual hazard specific sections presented previously in this section.

Table 5-36: Parcel Exposure Summary

Hazard	Parcel Count	Percent at Risk	Total Value at High Risk	% of City Total Parcel Value
Slope Failure (High/Very High Susceptibility)	163	3.28%	\$7,077,794	1.72%
Flood (100-YR. & 500-YR. Flood Zones)	238	4.79%	\$15,549,129	3.96%
Earthquake (Moderate Shaking)	3,958	79.7%	\$469,915,087	76.29%
Wildfire (Very High)	1,673	33.6%	\$321,662,123	52.22%

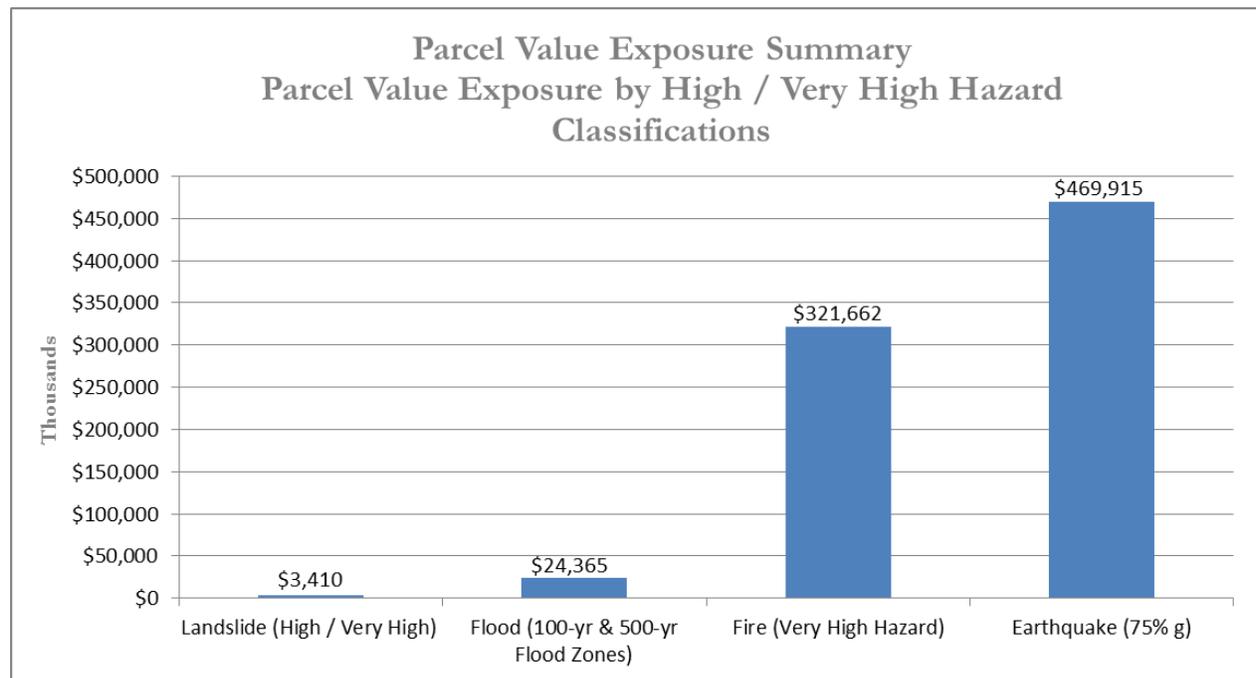


Figure 5-39: Parcel Exposure by High / Very High Hazard Classifications

5.8.10.3 Critical Infrastructure at Risk Summary

Figure 5-40 provides a summary of at-risk critical infrastructure points for each hazard. Critical infrastructure points include essential facilities, utility/lifeline system points, facilities containing hazardous materials, and transportation points. The City Development Services Department retains a complete record of all facilities in each hazard areas. For detailed vulnerabilities assessment information on critical infrastructure see the individual hazard specific sections presented previously in this section.

Facility Hazard Exposure Summary by Hazard

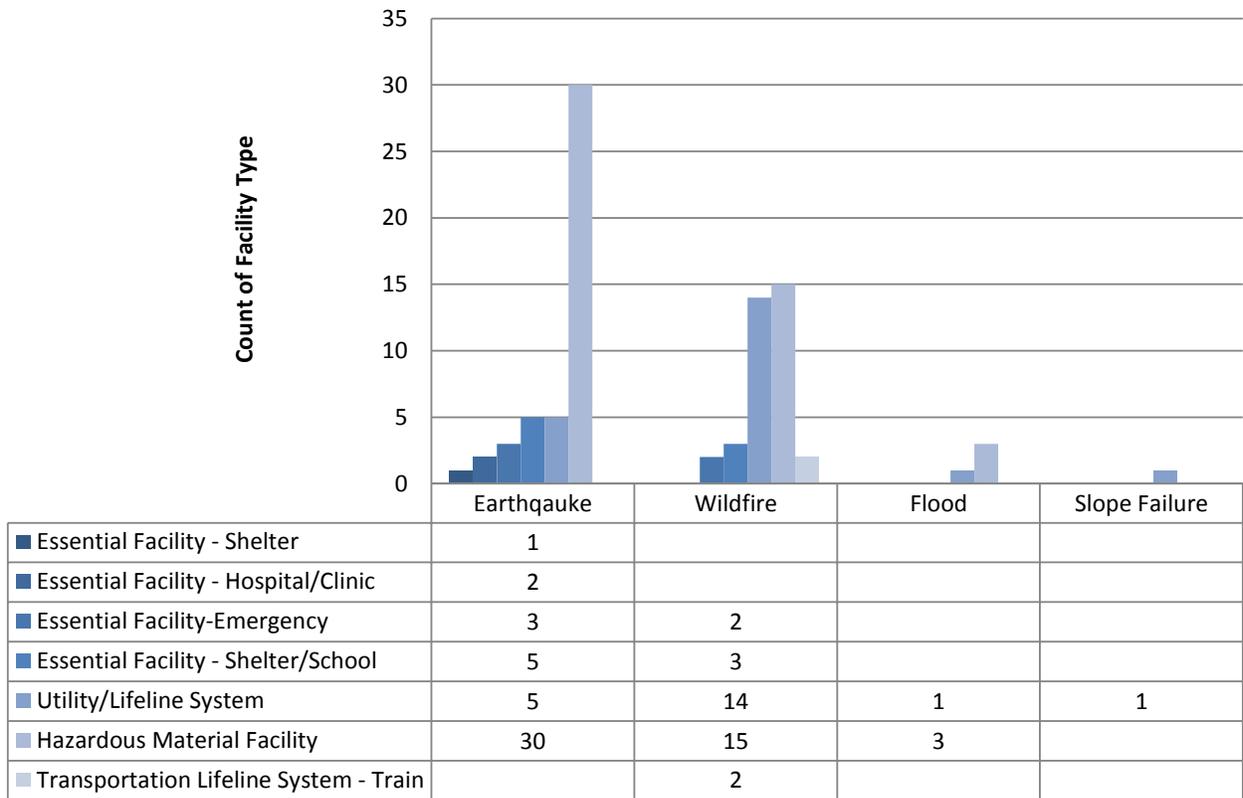
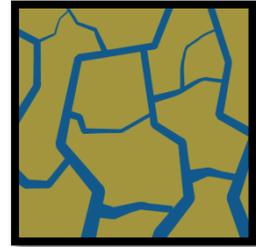


Figure 5-40: Critical Facility Hazard Exposure Summary by Hazard

5.8.11 Drought and Extreme Heat

Drought and Extreme Heat should not be viewed as merely a physical phenomenon or natural event. Its impacts on society result from the interplay between a natural event (less precipitation than expected) and the demand humans place on the water supply. Extreme heat can increase water supply demands and cause health risks to vulnerable populations. During periods of extreme heat emergencies, the elderly and the very young are more vulnerable to the loss of cooling systems requiring power sources.



Drought and Extreme Heat Vulnerability Analysis		
Community Risk Factor Rating	2.4	Moderate Risk, Moderate potential impact.

5.8.11.1 Drought

Due to the lack of defined geographical boundaries, the vulnerability assessment for drought differs from other natural hazards discussed earlier. The impacts of drought can be categorized as economic, environmental, or social. The incidence of forest and range fires increases substantially during extended droughts, which in turn places human and critical facilities, at higher levels of risk. Drought vulnerability is primarily measured by its potential impact to sectors of the City’s economy and natural resources. Some of the potential impacts to the economy include the following:

- Decreased municipal and industrial water supply; and
- Loss of recreation/tourism.

Direct costs such as increased pumping due to lowering of groundwater levels and costs to expand water infrastructure to compensate for reduced yields or to develop alternative water sources are a significant factor. Social impacts mainly involve public safety, health, conflicts between water users, reduced quality of life, and inequities in the distribution of impacts and disaster relief. Below is a summary of vulnerable water deliveries provided to the City of Shasta Lake from USBR.

5.8.11.1.1 Vulnerable Water Deliveries

City of Shasta Lake

Water for the City of Shasta Lake comes from Shasta Lake via a pump station at Shasta Dam with a maximum diversion of 5.0 MGD (million gallons per day). Water is pumped from an intake in the face of Shasta Dam to a storage/treatment facility immediately east of the Shasta Dam compound. From there it is delivered to the City of Shasta Lake. An interim contract with the U.S. Bureau of Reclamation (Contract No. 4-7-20-W1134-IR10) provides an allocation of 4,400 acre-feet per year from this source. Reclaimed water is also available for industrial and landscaping use. Groundwater use is limited because of low aquifer yields (Bureau of Reclamation 2011).

The City of Shasta Lake provides water service to 3,800 connections for primarily urban and residential uses, although industrial use has increased over the past decade. The City of Shasta Lake also provides water service to Reclamation’s Northern California Area Office (Bureau of Reclamation 2011).

Historically the City has not experienced long-term drought conditions. The increase of demands on the downstream water supply, climate change and land use change, continue to have unpredictable effects

to the City. The City may face secondary impacts as a result of the recreation and tourism industry slowdown on Lake Shasta from regional drought conditions. Retailers and others who provide goods and services to the Shasta Lake tourism industry may face reduced business due to lower lake levels or mandatory recreational restrictions. This may lead to unemployment, and loss of tax revenue for local, state, and federal governments.

5.8.11.2 Extreme Heat

Extreme heat emergencies are often slow to develop. It could take a number of days of oppressive heat for a heat wave to have a significant or quantifiable impact. Heat waves do not strike victims immediately, but rather their cumulative effects slowly take the lives of vulnerable populations. As temperatures rise, City residents will face greater risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat. By mid-century, extreme heat events in urban centers could cause two to three times more heat-related deaths than occur today (California Climate Change Center 2006).

Though heat does not cause much economic damage or damage to the built environment, the number of people it has killed underscores the importance of mitigating its impacts. Extreme heat events highlight the importance of social vulnerability. While changes to the built environment can greatly alter vulnerability to different hazards, social vulnerability and resiliency are especially important during heat events.

Socially isolated elderly persons are especially vulnerable. Increased use of air conditioners during heat waves can lead to power outages, which makes the events even more deadly due the loss of cooling systems requiring power sources. Those who rely on electric power for life-saving medical equipment, such as respirators, are extremely vulnerable to power outages. Any mitigation efforts aimed at reducing heat losses will focus on ways to reduce social isolation as well as changes to the built environment.

5.8.12 Severe Weather

Severe weather includes heavy rains or heavy snow and ice, often accompanied by strong winds, or hail. Heavy rains or snow, coupled with low temperatures or other severe weather conditions, can result in increases in traffic accidents, disruptions in transportation, government, education, and cause damage to buildings, and communication towers. Most commonly severe weather incidents can cause prolonged utility outages due to falling trees or other debris.



Environmental impacts of cold temperatures and heat include damage to shrubbery and trees and other vegetation. Personal property such as cars, RVs, and small equipment is extremely vulnerable to severe weather hazards especially hail and damage as a result of fallen trees and other storm debris.

Severe Weather Vulnerability Analysis		
Community Risk Factor Rating	2.1	Moderate Risk, Moderate potential impact.

Unusual heavy snow and high wind have resulted in broken tree limbs, fallen telephone lines, and a heavy accumulation of debris. Large amounts of downed, suspended, and standing vegetation has created a fuel hazard and left the area subject to an extreme fire threat in the past.

According to historical hazard data, severe weather is an annual occurrence in Shasta County. Many of the historical severe weather events were state and federally declared disasters and have resulted in damages. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future. Heavy rain, hail, and snow are the most frequent type of severe weather occurrences in the region. The secondary hazards caused by severe weather such as floods, landslides, and tree and utility damage have had impacts in Shasta Lake.

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5.8.13 Volcanic Activity

Future eruptions of Mount Shasta and Lassen Volcanic Field are virtually certain to occur and can neither be prevented nor stopped. Diversion or control of lava flows, pyroclastic flows, mudflows, and other products of eruptions from volcanoes like Mount Shasta and Lassen Volcanic Field is generally not feasible. Instead, reduction of loss of life and damage to property requires that the products of eruptions be avoided when possible and that plans be made to reduce the effects when and where they cannot be avoided. Mitigation efforts to reduce life loss and injury from volcanoes include monitoring, warning, evacuation, and emergency public information.



Severe Weather Vulnerability Analysis		
Community Risk Factor Rating	1.9	Moderate Risk, Moderate potential impact.

There is a four-tiered Volcano Alert Level that uses the terms Normal, Advisory, Watch, and Warning (from background levels to highest threat). The Volcano Alert Levels are intended to inform people on the ground about a volcano's status and are issued in conjunction with the Aviation Color Code³⁴. Notifications are issued for both increasing and decreasing volcanic activity and are accompanied by text with details about the nature of the unrest or eruption and about potential or current hazards and likely outcomes. Table 5-37 illustrates the Alert Level as well as the associated volcanic state.

Table 5-37: Volcano Alert State

Level	Volcanic State
Normal	Volcano is in typical background, non-eruptive state or, after a change from a higher level, volcanic activity has ceased and volcano has returned to non-eruptive background state.
Advisory	Volcano is exhibiting signs of elevated unrest above known background level or, after a change from a higher level; volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase.
Watch	Volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe uncertain, OR eruption is underway but poses limited hazards.
Warning	Hazardous eruption is imminent, underway, or suspected.

5.8.13.1 Potential Effects of Volcanic Ash (Tephra)

Volcanic ash is highly disruptive to economic activity because it covers most surfaces, infiltrates most openings, and is highly abrasive. Airborne ash can obscure sunlight to cause temporary darkness and reduce visibility to zero (U.S. Geological Survey 2009). City residents in an ash fall zone can be exposed

³⁴ Aviation Color Codes are based on four colors and are intended for quick reference only in the international civil aviation community; they are part of the ICAO International Airways Volcano Watch system (IAVW). The Aviation Color Code reflects conditions at or near a volcano and are not intended to pertain to hazards posed at a distance or downwind by drifting ash. The codes range from GREEN to RED.

to the effects of volcanic ash. Tiny volcanic ash can infiltrate the most tightly sealed buildings and machinery and is often small enough (less than 10 microns) to be inhaled deeply into the lungs (U.S. Geological Survey 2009). Ash fall over extensive areas can prevent travel for days because of poor visibility, slippery roads, and damage to vehicles. Power outages may occur before, during, and after an ash fall either due to equipment failure or because power facilities are temporarily shut down to prevent damage. Afterwards, wind and human activity can stir up ash for weeks to years. Other effects of volcanic ash include:

- Darkness
- Collapsed roof structures
- Machinery and vehicle break down
- Road hazards
- Power system shutdown
- Waste-water system shut down
- Gutter system fill and collapse

Section 6. Mitigation Strategy

The intent of the mitigation strategy is to provide City of Shasta Lake a guidebook to future hazard mitigation administration. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section with a prescription of policies and physical projects. This will help City staff to achieve compatibility with existing planning mechanisms, and ensures that mitigation activities provide specific roles and resources for implementation success.

6.1 Planning Process for Setting Hazard Mitigation Goals and Objectives

The mitigation strategy represents the key outcomes of the 2013 Shasta Lake HMP planning process. The hazard mitigation planning process conducted by the Planning Committee is a typical problem-solving methodology:

- Estimate the impacts the problem could cause (*See Section 5, Vulnerability Assessment*);
- Describe the problem (*See Section 6.2, Problem Statements*);
- Assess what safeguards and resources exist that could potentially lessen those impacts (*See Section, 6.3 Capability Assessment,*);
- Develop Goals and Objectives with current capabilities to address problem (*See Section 6.4.1 Goals and Objectives*)
- Using this information, determine what, if anything, can be done, and select those actions that are appropriate for the community (*See Section 6.4.3.2, Mitigation Action Matrix*).

6.2 Identifying the Problem

As part of the mitigation actions identification process, the HMP Planning Committee identified issues and/or weaknesses as a result of the risk assessment and vulnerability analysis. By combining common issues and weaknesses developed by the Planning Committee, the realm of resources needed for mitigating each can be understood. Community issues and weaknesses are presented by individual hazard in Table 6-1.

Table 6-1: Identified Issues/Weaknesses to be addressed by Mitigation Actions

Hazard ID	Issues / Weakness Statements
Wildfire	<ul style="list-style-type: none"> ▪ Continued management or responsibility of existing shaded-fuel breaks; e.g. herbicide, annual trimming. ▪ Need for fire fuel reduction on vacant properties ▪ Keeping properties clear of fuel (including trash) and tree canopies above house roof lines ▪ Lack of street addressing visible for emergency services ▪ Lack of secondary access in several neighborhoods ▪ Poor water supply/pressure in some areas east of Lake Blvd. ▪ Continuous/heavy fuel build-ups near on the northern and western portions of the city; areas of Duval Street, Manor Drive, Linda Vista Drive and Black Canyon Road ▪ Resources for educating residents about property maintenance and reducing wildfire risk ▪ Inadequate road infrastructure (and turnarounds) to support emergency vehicles

Severe Storms	<ul style="list-style-type: none"> ▪ Residents are unaware of what to do when severe storms strike ▪ Weakness of essential facilities to severe rain and snow ▪ Lack of debris refuse facilities ▪ Blocked roads and power outages resulting from downed tree limbs ▪ Short periods of extreme events overwhelm city resources
Flood	<ul style="list-style-type: none"> ▪ Property owners unaware of their responsibility to maintain drainage ways ▪ Inconsistent sizing of culverts on private property ▪ No drainage system in urban core and older parts of the City ▪ Residents are unaware of flood insurance and/or flood proofing concepts or measures ▪ Property owners are unaware of their flood risks
Geo Hazards	<ul style="list-style-type: none"> ▪ Landslides cause blocked roadways ▪ Property owners are unaware that illegal grading can result in property damage, erosion, and stormwater runoff ▪ Lack of resources for volcanic ash recovery resulting from Mount Shasta eruption; e.g. poor air quality response in health sector , secondary effects of regional evacuation and mechanical failure due to ash. ▪ Residents are unaware of how to protect themselves in the event of a volcanic eruption ▪ Buildings that do not meet building code standards for seismic safety; e.g. (unreinforced masonry construction) ▪ Buried pipes or above ground storage that are vulnerable to the affected of large seismic events
Drought & Extreme Heat	<ul style="list-style-type: none"> ▪ Brownouts and loss of electricity ▪ Economic losses from lack of tourism during low lake levels ▪ Need for cooling centers resulting from brownouts ▪ Lack of information getting out to people about the cooling centers.

6.3 Capabilities Assessment

The mitigation strategy includes an assessment of the City’s planning and regulatory, administrative/technical, fiscal, and political capabilities to augment known issues and weaknesses from identified natural hazards.

6.3.1 Local Planning and Regulatory Mitigation Capabilities

The information in Table 6-2 is used to construct mitigation actions aligned with existing planning and regulatory capabilities of the City. Planning and regulatory tools typically used by local jurisdictions to implement hazard mitigation activities are building codes, zoning regulations, CWPP(s), Floodplain management policies, and other municipal planning documents.

Table 6-2: Planning and Regulatory Mitigation Capabilities Summary

Hazard	Plan/Program/Regulation	Responsible Agency	Comments
Multi-Hazard	COSL Building Codes	COSL Building Division	Per Chapter 15.01 of the COSL Municipal Code, the City adopts the latest edition of the California Building Codes. The California Building codes protect buildings from to the extent possible from natural occurring hazards.
Multi-Hazard	Zoning Regulations	COSL Development Services	COSL Municode Title 17- Zoning Regulations.
Multi-Hazard	Subdivision Regulations	COSL Development Services	COSL Municode Title 15- Subdivision.
Multi-Hazard	2013-2015 On-Call Professional Services Contract	COSL Engineering	Professional and technical services contract for the delivery of various types of Architectural and Engineering projects.
Multi-Hazard	City of Shasta Lake General Plan Safety Element	COSL Development Services	General Plan Safety Element Update under development.
Multi-Hazard	Statutory Exemption – Affordable Housing CCR Section 15192 and 15194 – California Environmental Quality Act Guidelines	COSL Development Services Dept.	For future development of affordable housing. CCR Section 15192 and 15194 provides CEQA exemption status for property owners wishing to develop affordable housing with State initiated grant funding.
Wildfire	Community Wildfire Protection Plans (CWPP)	COSL Fire Safe Council (Future)	Upon Competition of funding and initiating the COSL Fire Safe Council, CWPP(s) will be coordinated and reported on by Fire Safe Council Staff for Stillwater-Churn Creek CWPP and the Keswick Basin CWPP.
Wildfire	City Health and Safety Code	COSL Development Services Dept.	COSL Municipal Code Chapter 15.10.050 - Elements of Landscape Documentation Package. COSL Municipal Code Chapter 12.36.062 requires a Pre-Development Review (including hazard mitigation) on Major Projects.
Wildfire	California State Wildland Fire Codes	Cal Fire	California Public Resources Code (P.R.C.) Section 4251-4290 and P.R.C. Section 4291
Flood	COSL Capital Improvement Plans	Public Works	This can be used to catalog and fund hazard mitigation projects throughout the city.
Flood	Floodplain Management Policies	COSL Development Services	Chapter 15.04 of the COSL Municipal Code stipulates existing floodplain management regulation.

Hazard	Plan/Program/	Responsible	Comments
Flood	NFIP Administration	COSL Development Services	NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. As a participating member of the NFIP, the City is dedicated to protecting homes of more than 60 policies currently in force.
Flood	Central Valley Flood Protection Plan	DWR	State legislative requirements give the City local planning responsibilities for floodplain management (e.g., general plans, zoning ordinances, development agreements, tentative maps, and other actions). Government Codes of particular importance to hazard mitigation planning are: Government Code 65302 & Government Code 8685.9
Earthquake	Commercial Reuse Study	COSL Development Services	The study includes an examination of commercial properties located on Shasta Dam Boulevard. The study will identify barriers to development including seismic deficiencies. It will also identify potential solutions to remediate the barriers and potential assistance for property and business owners.
Slope Failure	COSL Grading, Erosion Control and Hillside Development Ordinance	COSL Development Services	See COSL Municode Chapter 15.08 - Grading, Erosion Control and Hillside Development.
Drought	COSL Urban Water Management Plan (UWMP)	COSL Development Services	Usually, UWMPs are due on December 31 of years ending in 0 and 5, but a 6-month extension has been granted for submittal of the 2010 UWMPs to provide additional time for water suppliers to address the SB X7-7 ³⁵ requirements

6.3.2 Administrative and Technical Capabilities

Table 6-3 provides a summary of administrative and technical capabilities organized by staff type and department. It is important to understand current administrative and technical capabilities before developing a myriad of mitigation activities.

³⁵ Existing California Water Code law requires the state to achieve a 20% reduction in urban per capita water use in California by December 31, 2020. The state would be required to make incremental progress towards this goal by reducing per capita water use by at least 10% on or before December 31, 2015. The bill would require each urban retail water supplier to develop urban water use targets and an interim urban water use target, in accordance with specified requirements.

Table 6-3: City Administrative and Technical Mitigation Capabilities

Staff/Personnel Resources	Department / Agency	Comments
Planners (with land use / land development knowledge)	COSL Development Services	Close to 50 years of experience in department.
Planners or engineers (with natural and/or human caused hazards knowledge)	COSL Engineering and Contracted Geologist / Soils Engineers	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	COSL Building Division, COSL City Engineer COSL Public Works Dept.	
Floodplain Management	COSL Development Services Dept.	Development Services Director is Floodplain Administration.
Land / Building surveyors	City Contracted Services	
Personnel skilled in Geographic Information Systems (GIS) and/or FEMA's HAZUS program	COSL Utilities Dept.	Electric Dept. has a person assigned to GIS. The Public Works Dept. seeking funding for part-time GIS staffperson.
Grant writers or fiscal staff to handle large/complex grants	COSL Grant Writing Dept.	Numerous types of federal, state, local, and private grants have been administered by City staff.
Construction Equipment	COSL Public Works Dept.	Public Works owns and maintains large pieces of equipment available for construction and land moving and removal.
County Emergency Management Personnel	SLFPD, Shasta County Sheriff's Dept., Shasta County Health Dept.	State OES Access Mobile Emergency Personnel Cooling Center Coordination
Care and Sheltering	Regional Red Cross Personal (local office in Redding CA)	Care and Sheltering during Extreme Heat conditions.
Weather Surveying	National Weather Service Weather Watchers	SKYWARN Weather Spotters Spotter training classes are by the NWS. Volunteers attending these classes to become weather spotter for the NWS.

6.3.3 Fiscal Capabilities

This section identifies the financial tools or resources that the City could potentially use to help fund mitigation activities. Fiscal capabilities include City-specific as well as state and federal resources.

6.3.3.1 Local Fiscal Resources

Table 6-4 provides summary local fiscal capabilities. From the table, one can see a number of governmental funds, and revenue raising activities that can be allocated for hazard mitigation activities.

Table 6-4: Fiscal Capabilities Table

Financial Resources	Department / Agency	Comments
General obligation, revenue, and/or Capital Project funds	COSL City Council	Funds have been committed for Capital Project Funds in 2005-2013 But no Capital Improvement Plan exists.
Electric utility service fees	COSL City Council / COSL Electric	Fees must be based upon fee studies and approved by the City Council
Water / Waste Water service fee	COSL City Council / COSL Water / Waste Water	The City has had prior fee studies to establish water and wastewater rates that are currently in place.
Community Development Block Grants (CDBG)	California Department of Housing and Community Development (HCD)	City is a non-entitlement city and must apply competitively for grant funds.
Home Investments Partnership Program	California Department of Housing and Community Development	City is a non-entitlement city and must apply competitively for grant funds.
EDI Special Project Grant	U.S. Department of Housing and Urban Development	The City has had one EDI project. Funding is no longer available.
Safe Routes to School Program	California Department of Transportation	Federal funding administered via Caltrans and the Shasta Regional Transportation Agency (SRTA)
American Recovery and Reinvestment Act (ARRA)-Public Transportation for Urban Areas	U.S. Department of Transportation	Administered through Shasta County or Cal Trans in the past 5 years. No current ARRA funds exist.
Public Transportation for Urban Areas	U.S. Department of Transportation	Administered through Shasta Transportation Agency (SRTA)
ARRA- Energy Efficiency Block Grant	<i>U.S. Department of Energy</i>	Administered through California Energy Commission. No funds currently available.

Source: City's Annual Financial Report, Fiscal Year Ended June 30, 2011

6.3.3.2 State and Federal Fiscal Resources

To augment local resources, Table 6-5 provides a list of potential funding programs and resources provided by state and federal agencies and programs which can be used for local hazard mitigation activities.

Table 6-5: Potential Funding Programs/Grants from State and Federal Agencies

Agency	Potential Programs/Grants
U.S. Department of Agriculture; Natural Resources Conservation Service (NRCS) NRCS	NRCS funds improve floodplain functions and reduces effects of flooding on private lands. To help reduce this flooding danger, NRCS provides financial help through its Emergency Watershed Protection Program (EWP) and Environmental Quality Incentive Program (EQIP).
California DWR Proposition 50/84: Integrated Regional Water Management (IRWM) Program. Emergency Management Planning and Hazard Mitigation.	DWR has a number of IRWM grant program funding opportunities. Current IRWM grant programs include planning, implementation, and stormwater flood management. http://www.water.ca.gov/irwm/grants/index.cfm Proposition 84, the Safe Drinking Water, Water Quality, and Supply, Flood Control, River and Coastal Protection Bond Act, which provides \$1,000,000,000 (P.R.C. §75001-75130) for IRWM Planning and Implementation. CA Department of Water Resources' Flood Emergency Response Projects are posted on the webpage at: http://www.water.ca.gov/floodmgmt/hafo/fob/floodER/
California State Office of Historic Preservation	Statewide Historic Preservation Plan: Local Government; OHP's Local Government Unit (LGU) offers guidance and assistance to city and county governments to preserve historic properties including damage from natural hazards.
Department of Homeland Security (DHS) and FEMA Grants	For more information on current grants visit: http://www.fema.gov/grants
US Department of Health and Human Services/California Department of Health Services	Grants for Public Health Emergency Preparedness
California Emergency Management Agency (Cal EMA)	Emergency Management, Homeland Security and Proposition 1B Grants Programs http://www.calema.ca.gov/EMS-HS-HazMat/Pages/Emergency-Management-Homeland-Security-and-Hazard-Mitigation-Grant-Programs.aspx
California Department of Housing and Community Development	Disaster Recovering Initiative Grant Funding
California Fire Alliance	For more information on current grants visit: http://www.cafirealliance.org/grants/.

6.4 Mitigation Goals, Objectives and Actions

Goals and objectives discussed in this section help describe what actions should occur, using increasingly narrow descriptors. Long-term goals are developed which can be accomplished by objectives. To achieve the stated objectives “mitigation actions” provide specific measurable descriptors on how to accomplish the objective. The goals, objectives, and actions form the basis for the development of a Mitigation Action Strategy and specific mitigation projects to be considered for implementation.

The process consists of 1) setting goals and objectives, 2) considering mitigation alternatives, 3) identifying strategies or “actions”, and 4) developing a prioritized action plan resulting in a mitigation strategy.

6.4.1 Goals and Objectives

The Planning Committee discussed goals and objectives for this plan update at distinct points in the planning process. In October 2013 (Planning Committee Meeting #3), the Planning Committee discussed the results of the risk assessment and the identified issues/weaknesses to be addressed by Mitigation Actions. During that time the HMP Planning Committee opted to develop an entirely new set of goals and objects based as a result of new community analysis and priorities. More details of this particular meeting are provided in Appendix B. The following goals and objectives have been developed as part the 2013 planning effort:

GOAL 1: *Protect people and property from the effects of wildfire.*

- *OBJECTIVE 1.1: Improve infrastructure for fire suppression in high risk areas to minimize impact of Wildland-Urban Interface fires (WUI).*
- *OBJECTIVE 1.2: Provide resources to reduce wildfire risk.*
- *OBJECTIVE 1.3: Reduce continuous fuel load in/ near the Wildland Urban Interface*

GOAL 2: *Promote an earthquake safe community.*

- *OBJECTIVE 2.1: Educate the residents on how to minimize the effects of earthquakes.*
- *OBJECTIVE 2.2: Identify resources and provide assistance to vulnerable populations residing in high-risk structures.*
- *OBJECTIVE 2.3: Ensure the ability of government to function in a post-quake environment; upgrade city essential facilities to reduce loss from seismic events.*
- *OBJECTIVE 2.3: Upgrade high occupancy and commercial structures to reduce loss from seismic events*

GOAL 3: *Reduce impacts related to drought & extreme heat.*

- *OBJECTIVE 3.1: Reduce impacts related to drought & high temperature.*
- *OBJECTIVE 3.2: Provide adequate infrastructure to address impacts.*

GOAL 4: *Reduce the impact from the effects of severe storms.*

- *OBJECTIVE 4.1: Provide resources to respond to the after effects of severe storms*
- *OBJECTIVE 4.2: Improve critical infrastructure in order to increase resilience to severe storms*

GOAL 5: *Reduce the impact from secondary effects of volcanic activity.*

- *OBJECTIVE 5.1: Educate the public about volcanic hazards in the Southern Cascade Mountain Range.*

GOAL 6: Protect people and property from flood hazards.

- *OBJECTIVE 6.1: Educate the public about flood risk and appropriate and feasible flood mitigation measures.*
- *OBJECTIVE 6.2: Improve upon the City’s flood risk assessment and flood risk reduction efforts.*
- *OBJECTIVE 6.3: Maintain and improve drainage systems.*

GOAL 7: Protect the people and property from the effects of slope failure.

- *OBJECTIVE 7.1: Educate the public to the risks of grading and earth movement.*
- *OBJECTIVE 7.2: Update city codes and ordinances to protect property and people from slope failure.*

6.4.2 Mitigation Action Development

To begin the process of identifying mitigation actions, the HMP Planning Committee reviewed existing mitigation actions from the 2005 LHMP in November of 2013. Based upon new priorities and risk assessment results, mitigation actions were edited and removed. Most importantly, the newly developed mitigation actions acknowledge updated risk assessment information outlined in Section 5.

6.4.2.1 Considering Mitigation Alternatives

During November 2013, the HMP Planning Committee participated in the development and review of mitigation actions with a wide range of alternatives. To narrow mitigation alternatives for inclusion, FEMA’s six broad categories of mitigation alternatives were used. Each FEMA category is described below:

Prevention (PRV): Preventative activities are intended to keep hazard problems from getting worse, and are typically administered through government programs or regulatory actions that influence the way land is developed and buildings are built. They are particularly effective in reducing a community’s future vulnerability, especially in areas where development has not occurred or capital improvements have not been substantial. Examples of preventative activities include:

- Planning and zoning ordinances;
- Building codes;
- Open space preservation;
- Floodplain regulations;
- Stormwater management regulations;
- Drainage system maintenance;
- Capital improvements programming; and
- Riverine / fault zone setbacks.

Property Protection (PP): Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard, or removal of the structures from hazardous locations. Examples include:

- Building elevation;
- Critical facilities protection;
- Retrofitting (e.g., wind proofing, flood proofing, seismic design techniques, etc.);
- Safe rooms, shutters, shatter-resistant glass; and
- Insurance.

Public Education and Awareness (PE&A): Public education and awareness activities are used to advise residents, elected officials, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include:

- Outreach projects including neighborhood and community outreach;
- Speaker series / demonstration events;
- Hazard mapping;
- Real estate disclosures;
- Materials Library;
- School children educational programs; and
- Hazard expositions.

Natural Resource Protection (NRP): Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their protective functions. Such areas include floodplains, wetlands, steep slopes, and sand dunes. Parks, recreation, or conservation agencies and organizations often implement these protective measures. Examples include:

- Floodplain protection
- Watershed management;
- Vegetation management (e.g., fire resistant landscaping, fuel breaks, etc.);
- Erosion and sediment control;
- Wetland and habitat preservation and restoration;

Structural Projects (SP): Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event through construction. They are usually designed by engineers and managed or maintained by public works staff. Examples include:

- Stormwater diversions / detention / retention infrastructure;
- Utility Upgrades
- Seismic Retrofits
- New Construction

Mitigation actions presented in Table 6-6 establish 30 possible actions. Some actions support ongoing city activities, while other actions are intended to be completed when funding is available. Regardless, mitigation actions will be part of an annual review, described in the Section 7.

Table 6-6: Mitigation Action Abbreviated List

Hazard Goal	Specific Mitigation Action	Mitigation Type
Wildfire	Action 1.1.1: Develop a city wide implementation plan, in collaboration with SLFPD, for defensible space code administration and enforcement.	PRV
Wildfire	Action 1.1.2: Improve road clearances, addressing, and signage in wildfire hazard areas.	SP
Wildfire	Action 1.1.3: Construct alternative community escape routes for high risk neighborhoods.	SP
Wildfire	Action 1.1.4: Construct and upgrade city water supply for fire suppression in Wildland Urban Interface (WUI) areas.	SP
Wildfire	Action 1.2.1: Develop and maintain a defensible space community education program.	PE&A
Wildfire	Action 1.2.2: Develop an insurance incentive program for homeowners in Wildland Urban Interface (WUI) areas in collaboration with insurance companies and the SLFPD.	PRV
Wildfire	Action 1.2.3: Insure properties are cleared in accordance with weed abatement ordinance for Seniors, disabled and low income populations.	PP
Wildfire	Action 1.2.4: Establish a City of Shasta Lake Fire Safe Council to protect homes, the community, and environment from wildfires.	PRV
Wildfire	Action 1.3.1: Maintain mitigation actions in local CWPP(s) and Cal Fire Shasta-Trinity Unit Plan.	PRV
Earthquake	Action 2.1.1: Develop and maintain an earthquake hazard community education program.	PE&A
Earthquake	Action 2.2.1: Assist homeowners with resources to seismically retrofit homes with earthquake vulnerability.	PP
Earthquake	Action 2.3.1: Strengthen essential facilities and infrastructure from earthquake hazards.	PP
Earthquake	Action 2.4.1: Assist property owners with resources to seismically retrofit high-occupancy commercial buildings with EQ vulnerability.	PP
Drought	Action 3.1.1: Increase awareness of drought risk by creating a program of public information.	PE&A
Extreme Heat	Action 3.1.2: Improve HVAC and other weatherization items (insulation, windows/doors) in homes and businesses.	PP
Extreme Heat	Action 3.2.1: Construct shaded walkways and parking lots to curb heat island effects from urban development.	NRP
Extreme Heat	Action 3.2.2: Construct back-up power facilities for community based cooling Centers.	SP
Severe Storms	Action 4.1.1: Develop mutual aid agreements with nearby communities	PRV
Severe Storms	Action 4.1.2: Develop contractual agreements with private companies for debris clean up.	PRV
Severe Storms	Action 4.2.1: Harden critical facilities to the effects of a severe storm.	PP
Volcano	Action 5.1.1: Develop a comprehensive public education and outreach program in concert with USGS Volcano Hazards Program	PE&A

Hazard Goal	Specific Mitigation Action	Mitigation Type
Flood	Action 6.1.1: Increase Awareness of Flood Risk and Safety.	PE&A
Flood	Action 6.2.1: Improve Compliance with NFIP and manage the floodplain beyond minimum requirements with building codes and development standards.	PRV
Flood	Action 6.2.2: Develop and maintain a flood risk database to track community exposure to flood risk and conduct verification studies for residents seeking explanation of flood risk.	PRV
Flood	Action 6.3.1: Routinely inspect storm water channels, inlets and outfalls for vegetation build up or encroachment, trash and debris, silt and gravel build up, and erosion or bank failure, structural damage and vandalism.	PRV
Flood	Action 6.3.2: Implement Drainage Improvements from the City of Shasta Lake 2008 Drainage Master Plan.	SP
Flood	Action 6.3.3: Develop program for temporary drainage easement permitting for watercourse maintenance improvements on private property for low-income, elderly, and other functional needs populations.	PRV
Flood	Action 6.3.4: Increase Culvert and Bridge Capacity at Hilltop Circle Crossing on Churn Creek and the Interstate 5 Crossing on Moody Creek.	SP
Slope failure	Action 7.1.1: Provide information on properly shoring slope during and after earth movement activities. This includes methods to reduce debris from storm water runoff as a result of grading in sloped areas.	PE&A
Slope failure	Action 7.2.1: Strengthen enforcement of grading ordinances.	PRV

Note: As a living document, project descriptions and actions in Table 6-6 will be modified to reflect current conditions over time.

6.4.2.2 Mitigation Costs

Cost effectiveness of each measure was a primary consideration when developing mitigation actions. Because mitigation is an investment to reduce future damages, it is important to select measures for which the reduced damages over the life of the measure are likely to be greater than the project cost. For structural projects, the level of cost effectiveness is primarily based on the likelihood of damages occurring in the future, the severity of the damages when they occur, and the level of effectiveness of the selected measure.

While detailed analysis was not conducted during the mitigation action development process, these factors were of primary concern when selecting measures. For measures that do not result in a quantifiable reduction of damages, such as public education and outreach, the relationship of the probable future benefits and the cost of each measure was considered when developing the mitigation actions. Costs are made available in individual Implementation Plans described in Section 7.

6.4.3 Prioritization of Mitigation Actions

Common failures of a mitigation plan involve the prioritization of mitigation action for future implementation. Implementing the identified mitigation actions in Table 6-6 can be overwhelming for any community, especially with limited staffing and fiscal resources. To ensure that the City of Shasta Lake HMP reflects a reality of what the City can do with its available resources, mitigation actions are

prioritized with public input, risk factor scores, and HMP Planning Committee agreement. This method assists the City to direct resources appropriately during particular planning windows.

6.4.3.1 Public Input

Public surveys were used to aid city staff in developing a prioritized list of mitigation actions. Fifteen questions were developed to provide public input data point. 54 surveys were completed by the public. Figure 6-1 provides a summary of question 1B. Sixty percent of polled residents indicated that wildfire is their highest perceived risk, while two percent indicated extreme heat.

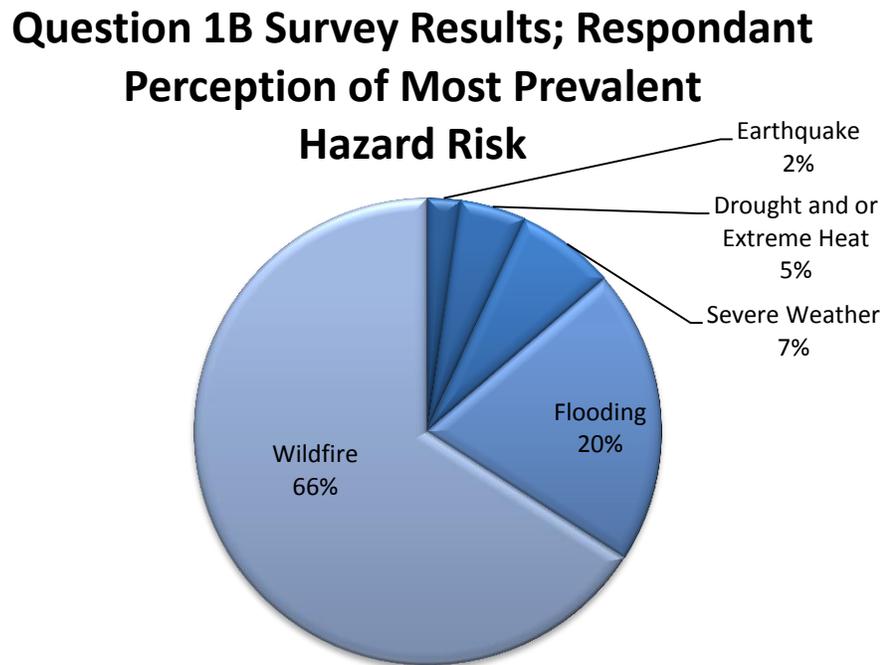


Figure 6-1: Question 1B Survey Results

Figure 6-2 provides a summary of public opinion on preferred mitigation incentive types. Mitigations incentives include technical assistance, labor assistance, discounts or low interest loans, rebates, financial assistance for property upgrades and insurance premium discounts. Polled residents indicated insurance premium discounts are the preferred incentive for residents to fulfil mitigation goals initiated with City provided resource or programs.

Question 8 Survey Results; Response to most likely incentive for personal property protection against natural hazards

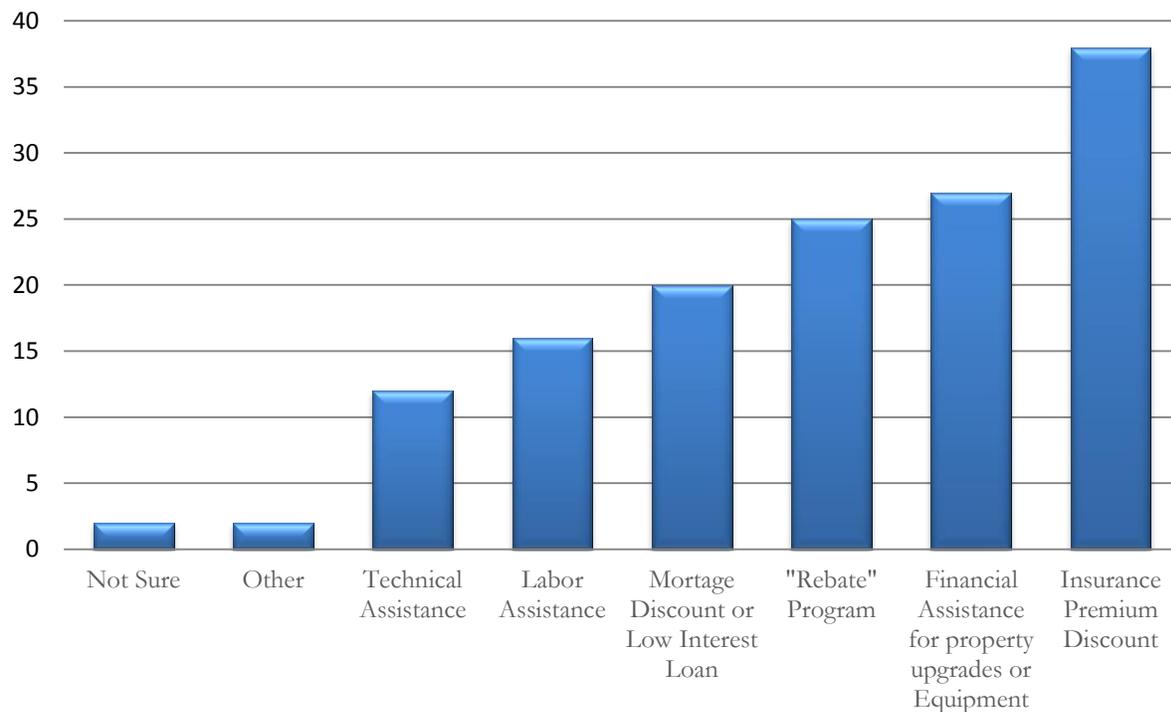


Figure 6-2: Question 8 Survey Results

Note: Results of the survey were used develop mitigation actions with the public interest and desires in mind.

6.4.3.2 Goal, Objective, and Mitigation Action Matrix

Based upon the City’s capabilities, public input, and HMP Planning Committee agreement, Table 6-7 shows the eight primary objectives and thirteen corresponding mitigation actions selected for further implementation and development during the next planning cycle. Table 6-8 provides details for each mitigation action with mitigation action descriptions, FEMA mitigation category, responsible party, and timeframe. Implementation Action Plans for each action number highlighted in Table 6-7 are shown in Section 7.7.

Table 6-7: Goal, Objective, and Mitigation Action Matrix

Goal	Hazard	RF Factor	Mitigation Action Objectives	Primary Objective	Action No.
1	Wildfire	2.7	OBJECTIVE 1.1: Improve infrastructure for fire suppression in high risk areas to minimize impact of Wildland-Urban Interface fires (WUI).	Y	1.1.1
			OBJECTIVE 1.2: Provide resources to the community to reduce wildfire risk.	Y	1.2.1, 1.2.4
			OBJECTIVE 1.3: Reduce continuous fuel load in/near the Wildland Urban Interface	Y	1.3.1
2	Earthquake	2.5	OBJECTIVE 2.1: Educate the public on how to minimize the effects of earthquakes.	Y	2.1.1
			OBJECTIVE 2.2: Identify resources and provide assistance to vulnerable populations residing in high-risk structures.	N	
			OBJECTIVE 2.3: Ensure the ability of government to function in a post-quake environment; upgrade city essential facilities to reduce loss from seismic events.	N	
3	Drought and Extreme Heat	2.4	OBJECTIVE 2.3: Upgrade high occupancy and commercial structures to reduce loss from seismic events	Y	2.3.1
			OBJECTIVE 3.1: Reduce impacts related to drought & high temperature.	N	
4	Severe Storm	2.1	OBJECTIVE 3.2: Provide adequate infrastructure to address impacts.	N	
			OBJECTIVE 4.1: Provide resources to respond to the after effects of severe storms.	N	
5	Volcanic Activity	1.9	OBJECTIVE 4.2: Improve critical infrastructure in order to increase resilience to severe storms.	Y	4.2.1
			OBJECTIVE 5.1: Educate the public about volcanic hazards in the Cascade Mountain Range.	N	
6	Flooding	1.9	OBJECTIVE 6.1: Educate the public about flood risk and appropriate and feasible flood mitigation measures.	Y	6.1.1
			OBJECTIVE 6.2: Improve upon the City's flood risk assessment and flood risk reduction efforts.	N	
			OBJECTIVE 6.3: Maintain and improve drainage systems.	Y	6.3.2
7	Slope Failure	1.4	OBJECTIVE 7.1: Educate the public to the risks of grading and earth movement.	N	
			OBJECTIVE 7.2: Update city codes and ordinances to protect property and people from slope failure.	N	
Risk Factor Conclusion					
HIGH RISK (3.0 – 4.0)			N/A		
MODERATE RISK (2.0 – 2.9)			Wildfire, Earthquake, Drought & High Temperature, Severe Storms,		
LOW RISK (0.1 – 1.9)			Volcanic Activity, Flooding, Slope Failure		

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Table 6-8: 2013-2018 Prioritized Mitigation Strategy

OBJECTIVE	ACTION	DESCRIPTION / BACKGROUND	RESPONSIBLE PARTY	ACTION TYPE	TIME FRAME	IMPLEMENTATION PLAN
Objective 1.1: Improve infrastructure for fire suppression in high risk areas to minimize impact of Wildland-Urban Interface fires (WUI).	Action 1.1.1: Develop a city wide implementation plan, in collaboration with SLFPD, for defensible space code administration and enforcement.	<p>Defensible Space ordinance enforcement (0-100 feet minimum) in communities is often difficult to administer on private property. While there are state requirements for defensible space ordinances in unincorporated areas of California, there are seldom standardized mechanisms in place for uniform inspection in municipal areas. Steps to implementation may include:</p> <ul style="list-style-type: none"> Develop voluntary Defensible Space inspection program. Implement Defensible Space measures into all Interface Zone building permit processes Provide incentives for Defensible Space compliance-specifically fire safe landscapes adjacent to homes. Provide authority to SLFPD to enforce the Health and Safety Code and enforce as weed abatement. Distribute official enforcement letters to residents before fire season. Visit properties with weed abatement issues and discuss methods to bring property up to code. <p>Example programs: http://www.marincounty.org/depts/fr/divisions/fire-prevention-investigation/defensible-space http://www.poway.org/Index.aspx?page=1045</p>	COSL City Council / Development Services Dept.	PRV	1-5 Years	Y See Section 7.7
	Action 1.1.2: Improve road clearances, addressing, and signage in wildfire hazard areas.	<p>Road, Address & House Signage: this factor is critical to agencies providing emergency services, not only for wildland fire purposes, but all emergency vehicle access. The city will strive to have all residences and communities meet CA Fire Safe Standards (PRC 4290) for road and address signage requirements.</p> <ul style="list-style-type: none"> Implement Public Road Clearance and Improvement Program and create homeowner incentives for fire safe house signing - to meet CA Fire Safe Standards (PRC 4290) criteria. Implement funding for "Community Patrol"; provide address plaques or other address signage to city residents 	COSL Citizens Patrol	SP	5-10 Years	N
	Action 1.1.3: Construct alternate community escape routes for high risk neighborhoods.	<p>A number of existing "at risk" neighborhoods in the City presently only have "one way" in and out. As part of the mitigation effort, the City has identified and assessed communities for evacuation egress. For neighborhoods in the Wildland Urban Interface (WUI) the City (along with local, state, and federal agencies) should work collaboratively to identify and pursue funding to improve access for wildfire evacuations and fire suppression vehicles.</p> <p>Evacuation planning (a preface to mitigation) - many of the City's neighborhoods do not have evacuation plans and identified evacuation assembly areas. Efforts by the City / District will provide plans to neighborhoods without standardized evacuation routes. Based upon final evacuation planning efforts, the City will provide alternatives to constructing and/or re-purposing existing routes to mitigate wildfire risk to individual neighborhoods.</p>	COSL Public Works Dept. SLFPD	PRV	5-10 Years	N
	Action 1.1.4: Construct and upgrade city water supply for fire suppression in Wildland Urban Interface (WUI) areas.	<p>Due to the wide variety of situations and levels of fire protection that exist across the City, the location of each development/neighborhood presents a unique set of challenges for water related fire suppression. Regardless of the delivery method or source water, for the purposes of wildfire protection the water system should be capable of being supplied on site at a minimum of 1,000 gpm for a minimum of 30 minutes. . The SLFPD will determine location or locations of tanks and hydrants as necessary to meet the threat from wildland fire.</p> <p>Water Supply Needs- Water supply needs may be satisfied by the use of:</p> <ul style="list-style-type: none"> pressurized water systems with hydrants as approved; draft sites from natural water sources such as ponds and streams; storage tanks with dry hydrants; and warning alarms in the event of lower than required water supplies. 	COSL Development Services Dept. SLFPD	SP	1-5 Years	Y See Section 7.7

OBJECTIVE	ACTION	DESCRIPTION / BACKGROUND	RESPONSIBLE PARTY	ACTION TYPE	TIME FRAME	IMPLEMENTATION PLAN
Objective 1.2: Provide resources to the community to reduce wildfire risk.	Action 1.2.1: Develop and maintain a defensible space community education program.	<p>Community education is the key to defensible space concept success. Understanding the attitudes and perceptions of homeowners who live in the Wildland/Urban Interface (WUI) is the key to more effective outreach and education efforts to residents. There are many resources available to homeowners and renters that explain how they can reduce wildfire risk. Key to outreach and education programs may include:</p> <ul style="list-style-type: none"> ▪ Informal social networks (e.g., talking amongst neighbors) to promote Firewise³⁶ mitigation actions. ▪ Wildfire information received from the SLFPD, CALFIRE, Western Shasta RCD, and neighbors ▪ “Piggy backing” outreach efforts after a major wildfire in the area. Risk awareness will raise level of concern of WUI residents for their health and property compared to pre-fire levels. ▪ WUI residents tend to underestimate their levels of wildfire risk when their self-assessment is compared to an assessment by a professional. E.g. Fire Protection Districts <p>For more information on what motivates homeowners to reduce their wildfire risk see here: http://wildfire.blog.nfpa.org/2013/10/article-what-motivates-homeowners-to-reduce-their-wildfire-risk.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+firebreak+%28Fire+Break+%E2%80%93+Wildfire+Safety+Blog%29</p>	SLFPD	PE&A	1-5 Years	Y See Section 7.7
	Action 1.2.2: Develop an insurance incentive program for homeowners in Wildland Urban Interface (WUI) areas in collaboration with insurance companies and the SLFPD.	<p>Unlike flood, fire (including wildfire) is currently covered as part of a standard homeowner’s insurance policy. Insurance markets are increasingly moving from the standards (pooled) contracts (non-contingent on mitigation effort) to insurance contracts contingent upon mitigation. (States participating in pilot programs in western states include; New Mexico, Arizona, Colorado, Utah.)</p> <p>Insurance companies currently have fire mitigation programs in place that may require individual property owners to take scientifically proven, and fire-official recommended steps, to reduce their risk and maintain insurance. These mitigation requirements maybe part of individual companies underwriting guidelines and or discounts on insurance premiums.</p> <p>The SLFPD will work with local insurance agents by providing defensible space inspections/surveys. This will be especially beneficial when work is needed on adjacent properties. The Fire District’s alliance with the insurance companies will help residents either “obtain” insurance or reduce rates. State Farm Insurance started a wildfire hazard inspection program in 2003, designed to educate homeowners about risks and identify simple and inexpensive actions that can reduce fire hazard and risk to firefighters. If a State Farm insured homeowner is willing to take action to mitigate fire hazard, State Farm rates may be reduced to reflect similar rates as properties in areas with lower fire risk.</p> <p>According to Headwater Economics, other companies, like Chubb Group, are going one step further and contracting with fire suppression companies to create defensible space and to protect homes during fires. There is no policy premium or charge for the wildfire defense service; all homeowners have to do is indicate that they desire the Wildfire Defense Coverage. (Other companies, including AIG, do charge a premium for similar wildfire defense services.)</p> <p>California’s FAIR Plan Property Insurance law essentially offers subsidized insurance to homeowners living in the state’s designated brushfire hazard zones in the cases where private insurance companies refuse coverage.</p> <p>http://www.wildfireprograms.usda.gov/search.html http://headwaterseconomics.org/wphw/wp-content/uploads/HeadwatersFireCosts.pdf http://www.cfpnet.com/</p>	SLFPD COSL Development Services Dept.	PP	5-10 Years	N

36 Firewise Communities Program encourages local solutions for safety by involving homeowners in taking individual responsibility for preparing their homes from the risk of wildfire. Firewise is a key component of Fire Adapted Communities – a collaborative approach that connects all those who play a role in wildfire education, planning and action with comprehensive resources to help reduce risk. The program is co-sponsored by the USDA Forest Service, the US Department of the Interior, and the National Association of State Foresters.

OBJECTIVE	ACTION	DESCRIPTION / BACKGROUND	RESPONSIBLE PARTY	ACTION TYPE	TIME FRAME	IMPLEMENTATION PLAN
	<p>Action 1.2.3: Insure properties are cleared in accordance with defensible space (PRC 4291) for Seniors, Disabled and Low Income populations.</p>	<p>For residences in "at risk" neighborhoods and living within the Cal FIRE "very high" wildfire risk category, Defensible Space prevention efforts will be made to help reduce threat to structures owned and rented by full time City residents.</p> <p>The city has a significant population of senior, low income, and disabled residents who are not physically or financially capable of creating and maintaining the legally mandated clearances around their homes, nor are many of the residents aware of the extreme dangers they face while living in the Wildland Urban Interface.</p> <p>The city will assist low income, senior, disabled, and deployed residents with clearing small debris and ladder fuels from around their homes (defensible space), through completing the work for those residents. For the residents who do not fall under the aforementioned circumstances, the City may assist those residents with removing piles of small debris already piled by the resident. Mitigation efforts can include the following:</p> <ul style="list-style-type: none"> ▪ Using HUD Section 8 program administered by Shasta County, coordinate annual housing inspections to perform defensible space consultations. ▪ SLFPD may assist needy property owners with chipping projects. These involve cut and stacked vegetation resulting from mitigation projects. Chippers may need to be acquired through rental service or Western Shasta RCD. ▪ Chipping/biomass collection assistance is limited to projects that support the overall hazard mitigation plan and show a benefit to the entire community. <p>Assistance for hazardous fuel removal will be available primarily on a cost-share basis. However, past grants have enabled other Fire Protection Districts to conduct some fuels mitigation work for homeowner's free-of-charge.</p>	<p>SLFPD Faith Based Community</p>	<p>PP</p>	<p>5-10 Years</p>	<p>N</p>
	<p>Action 1.2.4: Establish a City of Shasta Lake Fire Safe Council to protect homes, the community, and environment from wildfires.</p>	<p>Members of the City and Fire Protection District have recognized that a Fire Safe Council could assist in reducing the risk of wildland fire through public awareness and participation. A volunteer Fire Safe Council would promote fire hazard public awareness, facilitate fire mitigation activities, and ensure community involvement. Detailed guidance for the start-up, methods to improve and maintain participation, and a process to meet the objectives of a local Fire Safe Council is provided in Appendix D of the 2005 Plan. This Fire Safe Council would be for the City of Shasta Lake.</p>	<p>SLFPD</p>	<p>PE&A</p>	<p>1-5 Years</p>	<p>Y See Section 7.7</p>
<p>Objective 1.3: Reduce continuous fuel load in near the Wildland Urban Interface</p>	<p>Action 1.3.1: Maintain mitigation linkages to local CWPP(s) and Cal Fire Shasta-Trinity Unit Plan.</p>	<p>Maintaining connections with existing planning mechanism are important to reducing resource burden and mitigation planning overlap. Wildfire fuel treatments, fuel breaks, and other risk reduction methods outlined in CWPP(s) and the Cal Fire Shasta-Trinity Unit Plan will be coordination with the City's Department of Development Services, the City General Plan, and the SLFPD.</p> <p>The City of Shasta Lake is covered by two Community Wildfire Protection Plans (CWPP(s)), the Keswick Basin CWPP (2009) and the Stillwater/Churn Creeks CWPP (2010). Each contains an accurate description of the fuel situation in the City. The fuel reduction projects proposed in both CWPP(s) are the result of a risk assessment involving local fire fighting personnel and residents. After the risk assessments were completed, a list of proposed projects was developed and prioritized by these same groups. Proposed fuel reduction projects were the result of meetings held at different locations throughout both CWPP planning areas. The CWPP(s) should be used as a foundation for plan integration, and should be expanded on to cover changes since 2009-2010.</p>	<p>SLFPD</p>	<p>PRV</p>	<p>1-5 Years</p>	<p>Y See Section 7.7</p>
<p>Objective 2.1: Educate the public on how to minimize the effects of earthquakes</p>	<p>Action 2.1.1: Develop and maintain an earthquake hazard community education program.</p>	<p>Use a suite of partnerships, activities, and products to educate the public about earthquake science and motivating them to become prepared for earthquakes. The following can be used as part of a Program for Public Information (PPI) for earthquake awareness and mitigation:</p> <ul style="list-style-type: none"> ▪ Earthquake month public education program: http://www.calema.ca.gov/NewsandMedia/Pages/Current%20News%20and%20Events/Earthquake-Preparedness.aspx ▪ http://www.shakeout.org/ Participate in 'The Great Shake Out' Statewide Drill ▪ Earthquake insurance education information ▪ Earthquake Country Alliance: Public-private partnership led by SCEC ▪ Great ShakeOut Earthquake Drills: Coordinated globally by SCEC 	<p>Gateway School District SLFPD COSL Development Services Dept.</p>	<p>PE&A</p>	<p>1-5 Years</p>	<p>Y See Section 7.7</p>

OBJECTIVE	ACTION	DESCRIPTION / BACKGROUND	RESPONSIBLE PARTY	ACTION TYPE	TIME FRAME	IMPLEMENTATION PLAN
		<ul style="list-style-type: none"> ▪ ECA EPI center (Education and Public Information Center) Network: Museums, Parks, Libraries and other venues for learning about earthquakes ▪ Putting Down Roots in Earthquake Country: Booklets for many regions for learning about earthquake hazards and safety recommendations) ▪ Recent earthquakes 				
Objective 2.2: Identify resources and provide assistance to vulnerable populations residing in high-risk structures.	Action 2.2.1: Assist homeowners with resources to seismically retrofit homes with earthquake vulnerability.	<p>Most of the property damage caused by earthquakes ends up being handled and paid for by the homeowner or renter. As a homeowner or renter, you can significantly reduce risk of damage to your home by fixing a number of known and common weaknesses, including interior falling hazards.</p> <p>There are no guarantees of safety during earthquakes, but properly constructed and strengthened homes are far less likely to collapse or be damaged during earthquakes. A “Home” within the City boundaries includes single family residences, duplexes, triplexes, four-plexes, and mobile homes. The City will provide the following as resources to citizens residing in high risk areas:</p> <ul style="list-style-type: none"> ▪ City consultation services for compliance to local building codes to ensure that homes meet current seismic safety standards. ▪ Mobile home tie-down program. Encourage mobile home residents to better secure their homes by installing structural support bracing systems, leaving wheels on homes, rather than removing them, and securing awnings. A list of state-certified bracing systems is available from the California Department of Housing and Community Development. ▪ Encourage Elderly to take steps at reducing their vulnerability to earthquakes 	COSL Development Services Dept.	PP	5-10 Years	N
Objective 2.3: Ensure the ability of government to function in a post-quake environment; upgrade city essential facilities to reduce loss from seismic events	Action 2.3.1: Strengthen essential facilities and infrastructure from earthquake hazards.	<p>Essential facilities are those facilities and parts of a community's infrastructure that must remain operational or can be restored quickly after an earthquake for a community to respond effectively. Fire stations, police stations, ambulance services, and emergency/City operation centers must have the ability to provide immediate response during an earthquake or other disaster.</p> <p>Those existing essential facilities which are identified as being potentially non-operable after an earthquake must be strengthened and their equipment secured so they will function after an earthquake. The overall impact and cost of a disaster is strongly influenced by how long it takes to recover. The time needed to recover depends on the level of damage sustained by essential facility buildings, the availability of utilities, and how quickly the City can return to fully functioning status.</p> <p>The City will harden and seismically retrofit city owned and or operated essential facilities. This will include development of a seismic retrofit program based upon rapid visual screening assessments conducted during the 2013 Risk Assessment. The City’s Seismic Safety Program will include:</p> <ul style="list-style-type: none"> ▪ Preparing recommended improvements to current construction aimed at improving the seismic safety existing buildings and life-lines. ▪ Helping local government decision-makers by providing estimates of potential losses due to earthquake hazards i.e. what happens if the SLFPD building collapses on fire trucks. ▪ Estimate seismic upgrade costs, and develop benefit-cost models for upgrading City essential facilities. ▪ Determine what needs to be done to bring each facility up to an acceptable level. ▪ Determine funding streams/grants available to perform needed upgrades ▪ Determine responsibility and schedule for remedial action. 	SLFPD	PP	1-5 Years	Y See Section 7.7
Objective 2.4: Upgrade high occupancy and commercial structures to reduce loss from seismic events	Action 2.4.1: Assist property owners with resources to seismically retrofit high-occupancy commercial buildings with EQ vulnerability.	<p>Failure of a single high-occupancy structure can result in death and injuries. Seismic design is particularly important when the occupancy is involuntary, or when the occupants are in some way disabled, such as in hospitals, nursing homes and mental institutions. Unlike essential facilities necessary for emergency response, high-occupancy buildings do not have to function after an earthquake, however, it is critical that they do not collapse completely or catch on fire. The City will implement the following:</p> <ul style="list-style-type: none"> ▪ High occupancy buildings should be identified as part of a hazardous building inventory. ▪ Potentially hazardous buildings (including City multi-family residential units and functional care) should be individually evaluated by a structural engineer and, if found hazardous, strengthened under hazardous building abatement program. ▪ Determine what needs to be done to bring each facility up to an acceptable level. ▪ Determine funding streams/grants available to perform needed upgrades ▪ Determine responsibility and schedule for remedial action. 	City of Shasta Lake Development Services	PP	5-10 YEARS	N

OBJECTIVE	ACTION	DESCRIPTION / BACKGROUND	RESPONSIBLE PARTY	ACTION TYPE	TIME FRAME	IMPLEMENTATION PLAN
Objectives 3.1: Reduce impacts related to drought & high temperature	Action 3.1.1: Increase awareness of drought risk.	Public education and outreach programs are an efficient and cost-effective way to promote meaningful changes within a community. The City of Shasta Lake Development Services Department will establish a public information program with the following offerings: <ul style="list-style-type: none"> Information on low or no-flow water fixtures and their benefit (Fixtures labeled with EPA WaterSense certification). Promote the use of drought-resistant landscaping features. Promote the use of covers on swimming pools to reduce evaporation and the need to refill. Promote the use of hot water on-demand fixtures that not only reduce water consumption, but will also reduce costs to the homeowner. Use Wintu Center as outreach example on low water use native plant treatment. Implement state law which requires the replacement of fixtures with building permit issuance (water efficient section in the Muni Code). Promote the use of low water use / natives plants in small and large development projects. 	COSL Development Services Dept.	PA&E	5-10 Years	N
	Action 3.1.2: Improve HVAC and other weatherization items (insulation, windows/doors) in homes and businesses.	Extreme heat occurrences can often have a greater impact on those people who have older homes and equipment not capable of responding to the demands in 100-plus degree days. By using preexisting rebate programs the City will encourage residence to take mitigation actions in preparation of high temperature days/seasons. The <i>Energy Upgrade California</i> rebate program can assist homeowners with rebates for making improvements to their homes. The rebates can be as high as \$4500 depending on the changes made to the home. These changes will not only make the home more energy efficient, but should also serve to make it able to better withstand extreme temperatures. Energy Upgrade California homepage: https://energyupgradeca.org/your_energy_page0	City of Shasta Lake Electric Department	PP	1-5 Years	Y
Objective 3.2: Provide adequate infrastructure to address impacts	Action 3.2.1: Construct shaded walkways and parking lots to curb heat island effects from urban development.	Changes to building codes and development ordinances can be a very effective way to address certain issues, including extreme heat. The City of Shasta Lake Development Services Department can use building codes and development standards to ensure new and retrofit construction will follow guidelines meant to reduce the heat island effect. Actions can include: <ul style="list-style-type: none"> Requiring the installation of trees around large asphalted areas in order to offset the heat created from the reflection off of the pavement. Providing tree shaded walk ways for pedestrians. The US EPA has published a guidebook for reducing the heat island effect with a variety of strategies outlined and described within here: http://www.epa.gov/hiri/resources/pdf/TreesandVegCompendium.pdf	City of Shasta Lake Development Services CAL Trans	NRP	5-10 Years	N
	Action 3.2.2: Construct back-up power facilities for community based cooling centers.	Cooling centers are generally called for when high temperatures persist in an area, and residents are unable to cope with them. The elderly and the young are particularly sensitive to extreme temperatures. In addition, older homes are less likely to be properly insulated and offer protection for inhabitants from the heat. In these cases, the City may seek to set up cooling centers as a method of counteracting the effects of extreme heat. In order to ensure the operation of these centers, backup power is critical, especially if brownouts are causing the need. Funding the purchase and installation of backup power supplies (generators) at identified cooling centers throughout the city will help area residents escape the effects of extreme temperatures.	COSL Public Works Dept. School District	SP	1-5 Years	Y See Section 7.7
Objective 4.1: Provide resources to respond to the after effects of severe storms	Action 4.1.1: Develop mutual aid agreements.	Mutual assistance agreements can help the City by providing having outside resources available in the event that City resources become overwhelmed and are unable to contend with the event. Steps to mutual aid agreement is as follows: <ul style="list-style-type: none"> Establish mutual aid partners Establish obligations of each party Establish mutual aid agreement template 	City of Shasta Lake City Agreements	PRV	5-10 Years	N
	Action 4.1.2: Develop contractual agreements with private companies for debris clean up.	There are response activities that the City may not be equipped to address. These activities may include debris cleanup on a large scale or extensive tree-trimming programs. In that case, there are companies in the area with the equipment and staff to assist the City. Developing contracts with these companies ahead of time will not only ensure that their resources are available when needed; it can also help in securing a better cost structure.	City of Shasta Lake City Agreements	PRV	5-10 Years	N

OBJECTIVE	ACTION	DESCRIPTION / BACKGROUND	RESPONSIBLE PARTY	ACTION TYPE	TIME FRAME	IMPLEMENTATION PLAN
Objective 4.2: Improve critical infrastructure in order to increase resilience to severe storms	Action 4.2.1: Harden critical facilities to the effects of a severe storm.	Ensuring that critical facilities are equipped to handle the effects of severe storms can help ensure that services continue even during and after a severe storm. Hardening actions can include: <ul style="list-style-type: none"> Installation of backup generators that will provide power in case the power grid loses power. Ensuring that roofs are capable of withstanding the potential snow load that can result from a severe winter storm. 	COSL Public Works Dept.	PP	1-5 Years	Y See Section 7.7
Objective 5.1: Educate the public about volcanic hazards in the Cascade Mountain Range.	Action 5.1.1: Develop a comprehensive public education and outreach program in concert with USGS Volcano Hazards Program.	The USGS has developed a volcanic activity alert-notification system. This four-tiered system is designed to provide notice and warning about volcanic conditions. The “Watch” level (color-coded orange) indicates that a volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe uncertain. The “Watch” level is the last step before the USGS believes that an eruption is imminent, underway, or suspected. The City of Shasta Lake Development Services Department will establish a public information program with the following offerings: <ul style="list-style-type: none"> Promote individual preparedness for residents by way of having critical provisions to last for at least 72 hours, including protective measures like dust masks Promote measures to keep ash out of buildings, machinery, vehicles, and wastewater systems as much as possible. Promote the coordination of clean-up efforts in order to prevent areas from needing to be repetitively cleaned. Encourage residents to stay informed about the potential hazard in the area, so that they are fully prepared for any sort of event. 	COSL Development Services Dept.	PA&E	5-10 Years	N
Objectives 6.1: Educate the public about flood risk and appropriate and feasible flood mitigation measures.	Action 6.1.1: Increase Awareness of Flood Risk and Safety.	Public education and outreach is one of the most efficient and cost effective methods of improving a community’s resilience to a flood hazard. Citizens who fully understand the dangers they face are more likely to undertake mitigation actions and be more invested in protecting themselves against future hazards. The City of Shasta Lake Development Services Department will establish public information program with the following offerings: <ul style="list-style-type: none"> Hazard mapping services for residents and development professionals. Mapping service can include establishing and publicizing a user-friendly, publicly-accessible repository for inquirers to obtain Flood Insurance Rate Maps and other information about flood risk mapping. Distribution of flood protection safety pamphlets or brochures to the owners of flood-prone property. Education for citizens about safety during flood conditions, including the dangers flood water contamination and dangers of drainage systems. Using outreach activities to facilitate technical assistance programs to address measures citizens can take or facilitate funding for mitigation measures and annually notifying the owners of high risk properties of Flood Mitigation Assistance funding. Conducting NFIP community workshops to provide information and incentives for property owners to acquire flood insurance. Education about securing debris, propane tanks, yard items, or stored objects that may otherwise be swept away, damaged, or pose a hazard if picked up and washed away by floodwaters. Asking residents to help keep storm drains clear of debris during storms (not to rely solely on Shasta Lake Public Works). 	COSL Development Services Dept.	PE&A	1-5 Years	Y See Section 7.7
Objective 6.2: Improve upon the City’s flood risk assessment and flood risk reduction efforts.	Action 6.2.1: Improve Compliance with NFIP and manage the floodplain beyond minimum requirements with building codes and development standards.	Regulatory changes are one of the most effective ways to prevent future losses from a flood hazard. By ensuring that all new construction and significant (more than 50%) upgrades exceed minimum requirements, the City of Shasta Lake should see fewer losses due to flood damages. In addition, strengthened regulations can assist a community in improving its NFIP compliance and reduce flood insurance losses. <p>The City of Shasta Lake Development Services will use building codes and development standards to ensure structures are able to withstand flooding. Actions will include:</p> <ul style="list-style-type: none"> Using subdivision design standards to require elevation data collection during platting and to have buildable space on lots above the base flood elevation. Requiring standard tie-downs of propane tanks. Prohibiting all first floor enclosures below base flood elevation for all structures in flood hazard areas. <p>The City of Shasta Lake Development Services will establish floodplain management techniques that exceed minimum requirements can help minimize flood losses. Examples include:</p> <ul style="list-style-type: none"> Adopting a “no-rise” in base flood elevation clause for the flood damage prevention ordinance. Incorporating the American Society Floodplain Manager (ASFPM)’s “No Adverse Impact” policy into local floodplain management program. Establish requirements/opportunities in the local floodplain ordinance for homeowners to sign non-conversion agreements for areas below base 	COSL Development Services Dept.	PP	5-10 Years	N

OBJECTIVE	ACTION	DESCRIPTION / BACKGROUND	RESPONSIBLE PARTY	ACTION TYPE	TIME FRAME	IMPLEMENTATION PLAN
		<p>flood elevation.</p> <ul style="list-style-type: none"> Completing and maintaining FEMA elevation certificates for pre-FIRM and/or post-FIRM buildings. Requiring and maintaining FEMA elevation certificates for all new and improved buildings located in floodplains. Offering incentives for building above the required freeboard minimum (code plus); possibly permitting fee discounts 				
	Action 6.2.2: Develop and maintain a flood risk database to track community exposure to flood risk and conduct verification studies for residents seeking explanation of flood risk.	<p>Development of a flood risk database can provide information on demand when needed most. Electronic mapping will allow the city to be able to accurately predict future losses based on possible events.</p> <ul style="list-style-type: none"> Using GIS to map areas that are at risk of flooding. Use depth grid data from 2013 Hazard Mitigation Plan and illustrate flood risk to citizens. Incorporating 2013 Hazard Mitigation digital floodplain and topographic data into GIS, in conjunction with Hazus loss information to assess risk. Regularly calculating and documenting the amount of flood-prone property preserved as open space 	COSL City Manager / GIS Staff	PRV	5-10 Years	N
Objective 6.3: Maintain and improve drainage systems.	Action 6.3.1: Routinely inspect storm water channels, inlets and outfalls for vegetation build up or encroachment, trash and debris, silt and gravel build up, and erosion or bank failure, structural damage and vandalism.	<p>The City of Shasta Lake’s storm water system is critical to moving large volumes of water out of the city in the event of powerful storms. Accurately cataloguing and recording problem areas, areas of mitigation interest and annual maintenance needs will allow the City to keep this critical system operating at its maximum efficiency.</p> <ul style="list-style-type: none"> Update and maintain GIS database and mapping system to include information on various infrastructure and systems/areas that are of benefit in pre-planning for emergencies or mitigation. Data can include: drainage inlets, culvert diameter, lengths material, invert elevations, crossings etc. Develop an inventory of drainage channels that require annual maintenance. This includes maintenance conducted by the Californian Conservation Corps and other partner agencies. Creating and maintaining a record of this flood channel maintenance activity will provide true operational need and budgets required to implement drainage clearing program across the city. Develop and maintain drainage maintenance public information pamphlet / tri-fold or other outreach media to inform residence of allowable drainage / tributary maintenance processes. 	COSL Public Works Dept.	PRV	1-5 Years	Y See Section 7.7
	Action 6.3.2: Implement Drainage Improvements from the City of Shasta Lake 2008 Drainage Master Plan.	<p>The 2008 Drainage Master Plan identified the existing drainage facilities, provided updated sub-basin information, and more accurately described existing conditions, and addressed identified drainage deficiencies that create localized flooding.</p> <p>Six specific locations that regularly experience severe flooding problems were identified during the 2008 effort. The flood issues range from flows overtopping the street crown to inundation of the street shoulder and the travel lane. The plan specifies the location of the problem street or allies, and suggested local drainage system improvements to mitigate the flooding. Improvements include the following:</p> <ul style="list-style-type: none"> The intersection of Red Bluff Street and Washington Avenue Retention Pond near Moon Shadow Court and Chico Street Alley between San Gorgonio and Montana Grand Coulee Blvd. near Morning Star Way Leona Avenue near Webster Street Indian Avenue south of detention pond 	COSL Public Works Dept.	SP	1-5 Years	Y See Section 7.7
	Action 6.3.3: Develop program for temporary drainage easement permitting for watercourse	<p>The City of Shasta Lake’s drainage system is a city-wide utility maintained by private property owners and the city alike. All properties contribute to the problem of runoff and benefit from drainage maintains done on a regular basis. Flood control and improvement of water quality can increase with better flow and drainage control. Unregulated obstruction, modification, use, and neglect of watercourses create conditions of: (1) reduce water quality; (2) blight and deterioration of property; (3) property losses from flooding and poor drainage; and (4) increased risks to public health, safety, and general welfare. New language to City Municipal code should include:</p>	COSL Public Works Dept.	PRV	5-10 Years	N

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	<p>maintenance improvements on private property for low-income, elderly, and other functional needs populations.</p>	<ul style="list-style-type: none"> ▪ A clear articulation of responsibility for the maintenance, repair, and replacement of watercourses. The City is responsible for all watercourses with City ROW(s) as part of on-going operations. In all other cases, the property owner is responsible for watercourse maintenance. ▪ Support for the City to mechanically clear privately owned watercourses where the malfunction of the watercourse could cause a hazard or where equipment is required which a private citizen may not have available. ▪ Support for the City to make improvements to watercourses as necessary to protect life, health, and property. Any such voluntary and isolated efforts by the City shall not be deemed to relieve the private property owner of continuing responsibility and liability for such watercourses. <p>Note: Language should also state, in all cases other than watercourses routinely maintained by the city, the responsibility for maintenance and repair of watercourses or portions of them, shall belong to the property owner on whose property the watercourse, or portion of a watercourse, is located.</p> <p>Assistance for drainage maintenance will be available primarily on a cost-share basis. However, past grants have enabled other cities to conduct some mitigation work for homeowners free-of-charge.</p>				
	<p>Action 6.3.4: Increase Culvert and Bridge Capacity at Hilltop Circle Crossing on Churn Creek and the Interstate 5 Crossing on Moody Creek.</p>	<p>In the FEMA Flood Insurance Study (FIS) for Shasta County, there are two residential areas that are subject to inundation from split flow during a 100-year storm event. These areas include:</p> <ul style="list-style-type: none"> ▪ The Hilltop Circle crossing on Churn Creek (in the Twin Lakes Mobile Home Park), where the four 4-ft. by 4-ft. box culverts do not provide adequate conveyance of the 100-year flow, which leads to shallow flooding in the areas adjacent to the crossing. ▪ The Interstate 5 crossing on Moody Creek, where the existing pair of 9.5-foot-diameter culverts do not have capacity to convey the 100-year storm. During the 100-year storm, water backs up behind the highway and Shasta Dam Boulevard, eventually overtopping Shasta Dam Boulevard and spilling southward parallel to Shasta Street and Cascade Boulevard <p>A major constraint at the Hilltop Circle crossing on Churn Creek is that the channel slope is fairly shallow, which requires relatively large increases in conveyance capacity to influence the water surface elevation in the channel. To mitigate the flooding condition at the Interstate 5 crossing on Moody Creek, the capacity of the Interstate 5 crossing could be increased. Adding a single 102-inch-diameter Reinforced Concrete Pipe (RCP) would be sufficient to convey the 100-year storm without spilling over Shasta Dam Boulevard. Increasing the conveyance capacity of the crossing results in generally higher downstream water surfaces. Implementing this improvement would likely involve a bore and jack operation so as not to disrupt the utility of the highway and would cost approximately \$1.3 million (2005 HMP).</p>	<p>COSL Public Works Dept.</p>	<p>SP</p>	<p>10-15 Years</p>	<p>N</p>

OBJECTIVE	ACTION	DESCRIPTION / BACKGROUND	RESPONSIBLE PARTY	ACTION TYPE	TIME FRAME	IMPLEMENTATION PLAN
Objective 7.1: Educate the public to the risks of grading and earth movement.	Action 7.1.1: Provide information on properly shoring slope during and after earth movement activities. This includes methods to reduce debris from storm water runoff as a result of grading in sloped areas.	<p>Slope failure mitigation is influenced by a myriad of factors such as the geology of the slope, the composition of the soil, the project budget, the frequency of occurrence of natural phenomena (e.g., floods and earthquakes), and the amount of average precipitation and vegetative cover. Educate citizens about mitigation techniques necessary to stabilize slopes. Typical slope mitigation techniques that are used include:</p> <p>Drainage Improvements - Since water is the biggest culprit in failing slopes, drainage improvements should be the first priority. Some drainage improvements may include:</p> <ul style="list-style-type: none"> ▪ Collect or divert surface water from the problem slope. This may include catch basins, swales, or sealing tension cracks to prevent infiltration. ▪ Collect and remove subsurface water. This may include drains constructed within the subsurface to remove excess seepage, or lower ground water. <p>Earthwork - The steeper the slope, the more prone it is to fail. Some earthwork mitigation techniques are as follows:</p> <ul style="list-style-type: none"> ▪ Remove the upper soils of the slope to create a flatter slope. This is frequently done for existing landslides. ▪ Buttress the slope toe by filling with rock, gravel, or soil. ▪ Benching the slope if each bench is on competent subgrade. ▪ Structural Improvements - Structural improvements include: <ul style="list-style-type: none"> ▪ Friction Piles ▪ Retaining walls ▪ Geo Grid ▪ Sheet Piles ▪ Rock Bolts ▪ Vegetative Cover 	COSL Development Services Dept.	PRV	5-10 Years	N
Objective 7.2: Update city codes and ordinances to protect property and people from slope failure.	Action 7.2.1: Strengthen enforcement of grading ordinances.	<p>Typical grading violations occur when private property owners or developers begin clearing vegetation on slopes, have large equipment on site that is altering the landform and/or impacting existing drainage conditions, and/or when soil is being deposited or excavated on site. In general, grading work is:</p> <p>Excavation or fill which results in a slope gradient of 25 percent or greater (4 horizontal feet to 1 vertical foot), and which the depth or height at any point is more than 5 feet measured vertically.</p> <p>Altering the drainage patterns on an existing lot impacts adjacent properties. This can include a cut into the slope bank on a property or importing fill to increase the level portion of a yard which causes dirt to be distributed on an existing slope bank. These activities could lead to unstable slope on a property.</p> <p>The City of Shasta Lake requires property owners to obtain a grading permit prior to conducting any grading activity. Strengthening code enforcement of grading ordinances will help the City reduce the effects of slope failure due to non-permitted grading. Examples of Code Enforcement can include:</p> <ul style="list-style-type: none"> ▪ Fines and Penalties ▪ Reporting Program for Grading Violations <p>Example enforcement program can be found in Monterey California here: http://www.co.monterey.ca.us/building/grade/grading_Code_040805.htm</p>	COSL Development Services Dept.	SP	5-10 Years	N

Section 7. Plan Implementation and Maintenance

As a living document it is important that this plan becomes a tool in the City's resources to ensure reductions in possible damage from a natural hazard event. This section discusses plan adoption, implementation, monitoring, evaluating, and updating the HMP. Plan implementation and maintenance procedures will ensure that the HMP remains relevant and continues to address the changing environment in the City. This section describes the incorporation of the HMP into existing City planning mechanisms, and how the city staff will continue to engage the public.

7.1 Plan Adoption

To comply with DMA 2000, the City Council has officially adopted the 2014 City of Shasta Lake HMP. The adoption of the 2014 HMP recognizes the City's commitment to reducing the impacts of natural hazards within the city limits. A copy of the 2014 HMP adoption resolution is included in Appendix A.

7.2 Implementation

Over time, Implementation Strategies will become more detailed and the City's mitigation planners will work to provide more detail for priority mitigation actions. In conjunction with progress report processes outlined in Section 7.4.2, implementation strategy worksheets provided in Section 7.7, will be extremely useful as a plan of record tool for updates. Each implementation strategy worksheet provides individual steps and resources need to complete each mitigation action. The following provides several options to consider when developing implementation strategies in the future:

- **Use processes that already exist;** initial strategy is to take advantage of tools and procedures identified in the capability assessment in Section 6. By using planning mechanisms already in use and familiar to City departments and organizations, it will give the planning implementation phase a strong initial boost, especially if a mitigation strategy calls for expanding existing programs, or creating new programs or processes at a later date. Section 6 provides more information on existing planning mechanisms.
- **Updated work plans, policies, or procedures;** hazard mitigation concepts and activities can help integrate the 2014 HMP into daily operations. These changes can include how major development projects and subdivision reviews are addressed in hazard prone areas or ensure that hazard mitigation concerns are considered in the approval of major capital improvement projects.
- **Job descriptions;** working with department or agency heads to revise job descriptions of government staff to include mitigation-related duties could further institutionalize hazard mitigation. This change would not necessarily result in great financial expenditures or programmatic changes.

7.3 Future Participation

The City of Shasta Lake HMP Steering Committee, established for this update, will become a permanent advisory body to administer and coordinate the implementation and maintenance of the 2014 HMP. The Development Services Department will lead the 2014 HMP plan development and updates and all associated HMP maintenance requirements. On an annual basis, the HMP Steering Committee will report to the City Council and the public on the status of plan implementation and mitigation opportunities in the City. Other duties include reviewing and promoting mitigation opportunities,

informing and soliciting input from the public and developing grant applications for hazard mitigation assistance.

7.4 Monitoring, Evaluating, and Updating the HMP

This section describes the schedule and process for monitoring, evaluating, and updating the 2014 HMP.

7.4.1 Schedule

Monitoring the progress of the mitigation actions will be on-going throughout the five-year period between the adoption of the 2014 HMP and the next update effort. The HMP Planning Committee will meet on an annual basis to monitor the status of the implementation of mitigation actions and develop updates as necessary.

Meetings will be held two months before City pre-budget planning meetings. The HMP Planning Committee will meet during this time to prepare an evaluation report on the success and failures of the 2014 HMP and provide formal budget request for approval by the City at a later date.

The HMP will be updated every five years, as required by DMA 2000. The update process will begin at least one year prior to the expiration of the 2014 HMP. However, should a significant disaster occur within the City, the HMP Planning Committee will reconvene within 30 days of the disaster to review and update the HMP as appropriate. The City Council will adopt written updates to the HMP.

7.4.2 Process

The HMP Planning Committee will coordinate with responsible agencies/organizations identified for each mitigation action. These responsible agencies/organizations will monitor and evaluate the progress made on the implementation of mitigation actions and report to the HMP Planning Committee on an annual basis. Working with the HMP Planning Committee, these responsible agencies/organizations will be asked to assess the effectiveness of the mitigation actions and modify the mitigation actions as appropriate. A HMP Mitigation Action Progress Report worksheet, provided in Appendix D, developed as part of this HMP to assist mitigation project managers in reporting on the status and assessing the effectiveness of the mitigation actions.

Information culled from the mitigation leads or “champions” will be used to monitor mitigation actions and annual evaluation of the HMP. The following questions will be considered as criteria for evaluating the effectiveness of the HMP:

- Has the nature or magnitude of hazards affecting the County changed?
- Are there new hazards that have the potential to impact the County?
- Do the identified goals and actions address current and expected conditions?
- Have mitigation actions been implemented or completed?
- Has the implementation of identified mitigation actions resulted in expected outcomes?
- Are current resources adequate to implement the HMP?
- Should additional local resources be committed to address identified hazards?

An Annual HMP Review Questionnaire worksheet, provided in Appendix D, has been developed as part of this HMP to provide guidance to the HMP Planning Committee on what should be included in the evaluation. Future updates to the HMP will account for any new hazard vulnerabilities, special circumstances, or new information that becomes available. Issues that arise during monitoring and evaluating the HMP, which require changes to the risk assessment, mitigation strategy and other

components of the HMP, will be incorporated into the next update of the 2014 HMP in 2019. The questions identified above would remain valid during the preparation of the 2018 updated.

7.5 Incorporation into Existing Planning Mechanisms

An important implementation mechanism is to incorporate the recommendation and underlying principles of the HMP into community planning and development such as capital improvement budgeting, building and zoning codes, general plans and regional plans. Mitigation is most successful when it is incorporated within the day-to-day functions and priorities of the jurisdiction attempting to implement risk reducing actions. The integration of a variety of City departments on the HMP Planning Committee provides an opportunity for constant and pervasive efforts to network, identify, and highlight mitigation activities and opportunities at all levels of government. This collaborative effort is also important to monitor funding opportunities which can be leveraged to implement the mitigation actions. HMP mitigation planners will actively incorporate information from include:

- **City Building / Development Codes and Zoning Ordinances:** The 2014 HMP will provide information to enable the City to make decisions on appropriate building/development codes and ordinances. Appropriate building codes and ordinances can increase the City's resilience against natural disasters.
- **City of Shasta Lake General Plan:** The 2014 HMP will provide information that can be incorporated into the Land Use and Public Safety Elements during the next general plan update. Specific risk and vulnerability information from the Shasta Lake HMP will assist to identify areas where development may be at risk to potential hazards.
- **Community Wildfire Protection Plan (CWPP):** The 2014 HMP highlights wildfire areas of concerns in Shasta Lake. Suitable mitigation actions from the HMP can be included in the CWPP.

7.6 Continued Public Involvement

During the five year update cycle (2014-2019), City staff will involve the public using public workshops and meetings. Information on upcoming public events related to the HMP or solicitation for comments will be announced via newspapers, mailings, and on the City website (<http://www.ci.shasta-lake.ca.us/>). An electronic copy of the current HMP document will be accessible through the City website, with a hard copy available for review at the City of Shasta Lake Development Services Department. The HMP Planning Committee will, as much as practicable, incorporate the following concepts into its public outreach strategy to ensure continued public involvement in the HMP planning process:

- Collaborate with Shasta County on hazard mitigation efforts
- Collaborate with newly formed Shasta Lake Fire Safe Council (Mitigation **Action 1.2.4**)
- Work with public service clubs, i.e., Lions, Rotary, and other NGOs(non-government organizations)
- Collaborate with faith based organizations
- Create story ideas for media outlets, such as newspapers, local radio, and TV
- Distribute emails and postcards/mailers to City residents about hazard mitigation updates
- Post meeting announcements at coffee houses, grocery stores, libraries, etc.
- Educate and collaborate with insurance companies.
- Piggy back on other existing local community meetings
- Distribute information through K-12 schools
- Continue to use the City website as a distribution point of hazard mitigation information

7.7 2014 HMP Mitigation Action Implementation Plans

7.7.1 Action 1.1.1:

Mitigation Action Implementation Plan	
Action 1.1.1: Develop a city wide implementation plan, in collaboration with SLFPD, for defensible space code administration and enforcement.	
Implementing Agencies	
Lead Agency (ies):	SLFPD
Roles and Responsibilities:	Project Management / Compliance with State Standards.
Support Agency (ies):	COSL Development Services, COSL City Council.
Roles and Responsibilities:	Adoption and Approval of Ordinance
Preliminary Identified Tasks: Shasta Lake Development Services Department – Planning Division	
1. Develop method to remind residents of their responsibilities in relation to PRC 4291	
2. Develop and Staff a Defensible Space inspection program.	
3. Begin property inspections based on weed abatement ordinance	
Implementation Costs	
Estimated Capital Costs:	\$3000 for administration and printing costs.
Estimated Maintenance Costs:	Annual Maintenance Costs of \$12,000. \$75/hour for engine and two personnel. Assume 40 HRS. a week for four weeks.
Implementation Resources	
Financial Resources (Funding):	Western Wildland Urban Interface Grant Program http://www.wflccenter.org/sapf/index.php
Technical Assistance Resources:	Fire Protection District, Western Shasta RCD
Required Equipment, Vehicles, and Supplies	
Office Supplies	Meeting Space
Vehicles	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	09/01/2014
Estimated Mitigation Action Completion Date:	09/01/2017

7.7.2 Action 1.1.4:

Mitigation Action Implementation Plan	
Action 1.1.4: Construct and upgrade city water supply for fire suppression in Wildland Urban Interface (WUI) areas.	
Implementing Agencies	
Lead Agency (ies):	SLFPD
Roles and Responsibilities:	Grant Writing / Project Management
Support Agency (ies):	City of Shasta Lake Public Works
Roles and Responsibilities:	Cost Estimating / Construction
Preliminary Identified Tasks: Shasta Lake Development Services Department – Planning Division	
1. Determine Areas with insufficient water supply/pressure needed for suppression purposes	
2. Examine Water Tanks for Seismic Standards and deficiencies	
3. Identify best possible solution for each fire suppression zone and supply area	
4. If there are capital costs associated with the solution, pursue funding opportunities to defray cost to the City	
Implementation Costs	
Estimated Capital Costs:	Startup Costs of \$100,000 (Supply and Risk Study)
Estimated Project Costs:	\$100,000 to \$2,000,000 for each upgrade project.
Implementation Resources	
Financial Resources (Funding):	Community Development Block Grant (CDBG) Program: http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs City General Fund
Technical Assistance Resources:	SLFPD, COSL Public Works
Required Equipment, Vehicles, and Supplies	
Water Pressure Testing Equipment	
Seismic Engineer	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	09/01/2014
Estimated Mitigation Action Completion Date:	09/01/2017

7.7.3 Action 1.2.1:

Mitigation Action Implementation Plan	
Action 1.2.1: Develop and maintain a defensible space community education program.	
Implementing Agencies	
Lead Agency (ies):	SLFPD
Roles and Responsibilities:	Development of Education Program
Support Agency (ies):	Shasta County Fire Prevention Officer, Western Shasta RCD, Gateway School District, COSL Development Services Dept.; Program Manager, BLM, Shasta College
Roles and Responsibilities:	Grant Writing, Project Management, Education Content
Preliminary Identified Tasks: Shasta Lake Development Services Department – Planning Division	
1. Coordinate with other related programs in the area (i.e. Fire Safe Council)	
2. Determine best approach to reach community and promote defensible space	
3. Seek funding opportunities to help support the outreach program	
4. Re-evaluate program after initial annual cycle to determine effectiveness	
Implementation Costs	
Estimated Capital Costs:	Startup costs of \$5,000 to cover staff time
Estimated Maintenance Costs:	Annual costs of \$5,000-\$10,000 depending on scope of outreach
Implementation Resources	
Financial Resources (Funding):	SLFPD General Fund
Technical Assistance Resources:	SLFPD, Western Shasta RCD
Required Equipment, Vehicles, and Supplies	
Office Supplies	Mailing Support
Graphics Support	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	09/01/2014
Estimated Mitigation Action Completion Date:	Ongoing / Yearly

7.7.4 Action 1.2.3:

Mitigation Action Implementation Plan	
Action 1.2.3: Insure properties are cleared in accordance with weed abatement ordinance for Seniors, disabled and low income populations.	
Implementing Agencies	
Lead Agency (ies):	SLFPD
Roles and Responsibilities:	Identification of project scope and prioritization
Support Agency (ies):	Western Shasta RCD, Faith Based Community Programs, COSL Public Works Dept., Gateway School District (students)
Roles and Responsibilities:	Supplyiesequipment, labor and other assistance
Preliminary Identified Tasks: Shasta Lake Development Services Department – Planning Division	
1. Develop a system that would allow residents to apply for this type of assistance	
2. Coordinate with Support Agencies Listed.	
3. Identify an initial list of applicants to serve as a test of this program	
4. Conduct a review of initial work completed to determine the program’s effectiveness	
Implementation Costs	
Estimated Capital Costs:	Initial Startup Costs of \$20,000
Estimated Maintenance Costs:	Annual Costs TBD
Implementation Resources	
Financial Resources (Funding):	City General Fund, Grant Programs
Technical Assistance Resources:	Fire Protection District for prioritization
Required Equipment, Vehicles, and Supplies	
Chipper (leased / borrowed)	Gas
Towing Vehicle	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	01/01/2015
Estimated Mitigation Action Completion Date:	Ongoing / Annually

7.7.5 Action 1.2.4:

Mitigation Action Implementation Plan	
Action 1.2.4: Establish a City of Shasta Lake Fire Safe Council to protect homes, the community, and environment from wildfires.	
Implementing Agencies	
Lead Agency (ies):	SLFPD
Roles and Responsibilities of Lead Agency (ies):	Funding and grant application sponsorship.
Support Agency (ies):	Western Shasta RCD
Roles and Responsibilities of Support Agency (ies):	Public Outreach for initial establishment
Preliminary Identified Tasks: Shasta Lake Development Services - Planning Division	
1. Recruitment; identify the potential public and private partners in your community who are at risk of loss from wildfire	
2. Use existing planning mechanisms including SLFPD and CWPP(s)	
3. Establish Meeting Logistics; speakers, location, agendas, appoint a facilitator, develop maps for the community, establish outreach material	
4. Meeting #1; develop membership roster, and appoint Executive Officers	
5. Identify projects the Council can accomplish and assign oversight responsibility to members.	
Implementation Costs	
Estimated Capital Costs:	\$ 2,000 for initial marketing and meeting material and labor
Estimated Maintenance Costs:	Meeting support for 4-6 Meetings a year and project support funding on a per project basis.
Implementation Resources	
Financial Resources (Funding):	California Fire Safe Council Grants Clearinghouse: http://www.grants.firesafecouncil.org/
Technical Assistance Resources:	SLFPD, Western Shasta Conservancy District, Cal Fire, Shasta County Fire Department, Bureau of Land Management, USDA Forest Service
Required Equipment, Vehicles, and Supplies	
Meeting Space	
Office Supplies	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	09/01/2014
Estimated Mitigation Action Completion Date:	Ongoing / Yearly

7.7.6 Action 1.3.1:

Mitigation Action Implementation Plan	
Action 1.3.1: Maintain mitigation linkages to local CWPP(s) and Cal Fire Shasta-Trinity Unit Plan.	
Implementing Agencies	
Lead Agency (ies):	SLFPD
Roles and Responsibilities	Identify Lead for coordination efforts
Support Agency (ies):	Future Fire Safe Council, Western Shasta RCD
Roles and Responsibilities:	Develop and maintain mitigation action cohesion between plans.
Preliminary Identified Tasks: Shasta Lake Development Services - Planning Division	
1. Develop Repository for Plans (Most Likely Fire Safe Council Website or part of SLFPD website)	
2. Develop update procedures with Fire Safe Council and agencies responsible for updating CWPP(s)	
3. Establish local Fire Safe responsibility for mitigation action maintenance.	
Implementation Costs	
Estimated Capital Costs:	\$5,000
Estimated Maintenance Costs:	\$5,000
Implementation Resources	
Financial Resources (Funding):	City General Fund
Technical Assistance Resources:	Western Shasta RCD, Cal Fire, Shasta County Fire Department, BLM, USDA Forest Service
Required Equipment, Vehicles, and Supplies	
Office Supplies	
Website Maintenance	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	06/01/14
Estimated Mitigation Action Completion Date:	On-Going

7.7.7 Action 2.1.1:

Mitigation Action Implementation Plan	
Action 2.1.1: Develop and maintain an earthquake hazard community education program.	
Implementing Agencies	
Lead Agency (ies):	Gateway School District / SLFPD
Roles and Responsibilities:	Development and execution of program
Support Agency (ies):	COSL Chamber of Commerce, SLFPD, COSL Development Services Dept.
Roles and Responsibilities:	Assist with secondary tasks (dispersal of materials, participation in events)
Preliminary Identified Tasks: Shasta Lake Development Services Department – Planning Division	
1. Use information from the mitigation plan to identify the initial target audience for this program	
2. Acquire materials to support the education program	
3. Plan to participate in the next statewide earthquake drill	
4. SLFPD to distribute at Back-to School/Open House nights OR host a Safety Night	
Implementation Costs	
Estimated Capital Costs:	Initial Cost of \$5,000 to gather and distribute materials
Estimated Maintenance Costs:	Annual costs of \$3,000 - \$5,000 to maintain program and participate in exercises
Implementation Resources	
Financial Resources (Funding):	Emergency Management Performance Grants Program http://www.fema.gov/fy-2012-emergency-management-performance-grants-program
Technical Assistance Resources:	Websites and agencies listed in Mitigation Table.
Required Equipment, Vehicles, and Supplies	
Earthquake publications from FEMA and Cal OES	
Training and Exercise Materials	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	06/01/14
Estimated Mitigation Action Completion Date:	Ongoing

7.7.8 Action 2.3.1:

Mitigation Action Implementation Plan	
Action 2.3.1: Strengthen critical facilities and infrastructure from earthquake hazards.	
Implementing Agencies	
Lead Agency (ies):	SLFPD.
Roles and Responsibilities:	Project Management
Support Agency (ies):	Building Division
Roles and Responsibilities:	Routine Inspections
Preliminary Identified Tasks: Public Works/City Engineer; Contracted Engineer	
1. Prioritize city-owned buildings and begin initial examinations	
2. Use inspection reports to develop upgrade plans for each structure	
3. Prioritize upgrades based on funding availability	
4. Complete initial project	
Implementation Costs	
Estimated Capital Costs:	\$50,000 to conduct building inspections and develop retrofit plan for SLFPD Fire Station.
Estimated Maintenance Costs:	\$100,000 - \$300,000
Implementation Resources	
Financial Resources (Funding):	Hazard Mitigation Grant Program http://www.fema.gov/hazard-mitigation-grant-program Pre-Disaster Mitigation Grant Program http://www.fema.gov/pre-disaster-mitigation-grant-program
Technical Assistance Resources:	Building Official, seismic engineers
Materials Needed	
TBD	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	06/01/2014
Estimated Mitigation Action Completion Date:	06/01/2019

7.7.9 Action 3.1.2:

Mitigation Action Implementation Plan	
Action 3.1.2: Improve HVAC and other weatherization items (insulation, windows/doors) in homes and businesses.	
Implementing Agencies	
Lead Agency (ies):	City of Shasta Lake Electric Department; City Program Manager
Roles and Responsibilities:	Promote rebate assistance programs for local residents and specifically low-income residents
Support Agency (ies):	City Program Manager; City of Shasta Lake Development Service
Roles and Responsibilities:	Public Outreach
Preliminary Identified Tasks: Shasta Lake Electric Department	
1. Determine rebate programs currently in effect and their eligibility requirements	
2. Promote the available programs to their target audiences	
3. Provide assistance to those residents seeking to apply for rebates	
Implementation Costs	
Estimated Capital Costs:	Staff time and resources
Estimated Maintenance Costs:	Staff time and resources
Implementation Resources	
Financial Resources (Funding):	Energy Upgrade California rebate program: https://energyupgradeca.org/your_energy_page0 Energy Efficiency and Conservation Block Grant Program: http://www1.eere.energy.gov/wip/eecbg.html
Technical Assistance Resources:	Paperwork assistance for interested residents
Required Equipment, Vehicles, and Supplies	
Office Supplies	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	09/01/2014
Estimated Mitigation Action Completion Date:	Ongoing

7.7.10 Action 3.2.2:

Mitigation Action Implementation Plan	
Action 3.2.2: Construct back-up power facilities for community based Cooling Centers.	
Implementing Agencies	
Lead Agency (ies):	COSL Public Works Dept. / City of Shasta Lake Electric Dept.
Roles and Responsibilities:	Determine the power needs for each Cooling Center location
Support Agency (ies):	Gateway School District, COSL Development Services Dept., City Program Manager
Roles and Responsibilities:	Provide on-site assistance, Apply for grant funding
Preliminary Identified Tasks: Shasta Lake Development Services Department – Planning Division	
1. Identify power needs for cooling center locations	
2. Find equipment capable of providing that power and determine costs	
3. Apply for grant funding to provide capital for power systems	
4. Coordinate with school district and local contractors to install units as they are purchased	
Implementation Costs	
Estimated Capital Costs:	\$5,000 to determine needs of each facility
Estimated Maintenance Costs:	\$250,000 - \$400,000 to complete each project
Implementation Resources	
Financial Resources (Funding):	Hazard Mitigation Grant Program http://www.fema.gov/hazard-mitigation-grant-program Community Development Block Grant (CDBG) Program http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs
Technical Assistance Resources:	Electrical contractors to help determine power levels
Required Equipment, Vehicles, and Supplies	
Large Generators	
Large equipment and equipment operators	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	09/01/2014
Estimated Mitigation Action Completion Date:	01/01/2019

7.7.11 Action 4.2.1:

Mitigation Action Implementation Plan	
Action 4.2.1: Harden critical facilities to the effects of a severe storm.	
Implementing Agencies	
Lead Agency (ies):	COSL Public Works Dept.
Roles and Responsibilities:	Coordinate with Building Official
Support Agency (ies):	COSL Development Services Dept., COSL Program Manager
Roles and Responsibilities:	Apply for and administer grant funds
Preliminary Identified Tasks: Shasta Lake Development Services Department – Planning Division	
1. Develop an inventory of critical facilities to be examined	
2. Coordinate with building inspector to examine these facilities	
3. Develop a list of suggested upgrades to the buildings to harden them to the effects of severe storms	
4. Prioritize actions and seek out funding options to help defray the costs associated with the upgrades	
Implementation Costs	
Estimated Capital Costs:	\$10,000 for initial inspections
Estimated Maintenance Costs:	\$50,000 - \$250,000 for each project
Implementation Resources	
Financial Resources (Funding):	Hazard Mitigation Grant Program http://www.fema.gov/hazard-mitigation-grant-program City General Fund
Technical Assistance Resources:	Building Inspectors, Contractors
Required Equipment, Vehicles, and Supplies	
TBD	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	06/01/2014
Estimated Mitigation Action Completion Date:	06/01/2019

7.7.12 Action 6.1.1:

Mitigation Action Implementation Plan	
Action 6.1.1: Increase Awareness of Flood Risk and Safety.	
Implementing Agencies	
Lead Agency (ies):	City of Shasta Lake Development Services
Roles and Responsibilities:	Organization of resources / implementation of program
Support Agency (ies):	Cal OES / FEMA
Roles and Responsibilities:	Education and Technical Guidance
Preliminary Identified Tasks: Shasta Lake Development Services Department – Planning Division	
1. Determine best method to provide hazard mapping services to the community	
2. Identify initial target audience based on information in the mitigation plan, as well as NFIP maps	
3. Schedule and conduct public outreach sessions, possibly paired with other publicly attended functions	
4. Assess the impact of the program and determine next steps	
Implementation Costs	
Estimated Capital Costs:	\$5,000 - \$10,000 for mapping portal for residents
Estimated Maintenance Costs:	Staff time and resources
Implementation Resources	
Financial Resources (Funding):	Emergency Management Performance Grants Program http://www.fema.gov/fy-2012-emergency-management-performance-grants-program
Technical Assistance Resources:	Cartographers
Required Equipment, Vehicles, and Supplies	
GIS Analyst	Large Scale Plotter
Arc GIS / ESRI Software	Flood Proofing Literature
Implementation Timeframe	
Estimated Mitigation Action Start Date:	06/01/2014
Estimated Mitigation Action Completion Date:	Ongoing

7.7.13 Action 6.3.1:

Mitigation Action Implementation Plan	
Action 6.3.1: Routinely inspect storm water channels, inlets and outfalls for vegetation build up /encroachment, trash / debris, silt/ gravel build up, / erosion or bank failure, structural damage and vandalism.	
Implementing Agencies	
Lead Agency (ies):	COSL Public Works Dept.
Roles and Responsibilities:	Lead inventory initiative
Support Agency (ies):	COSL Development Services Dept.
Roles and Responsibilities:	Mapping of utility system
Preliminary Identified Tasks: Shasta Lake Development Services Department – Planning Division	
1. Inventory infrastructure systems	
2. Input inventory into a GIS database with all pertinent information	
3. Ensure annual update of database	
4. Develop and distribute pamphlet to the public	
Implementation Costs	
Estimated Capital Costs:	\$15,000 - \$25,000 to develop GIS system and input initial datasets
Estimated Maintenance Costs:	\$5,000 to maintain datasets annually
Implementation Resources	
Financial Resources (Funding):	Public Works and Economic Development Facilities Program: http://www.eda.gov/ffo.htm
Technical Assistance Resources:	GIS Analysis
Required Equipment, Vehicles, and Supplies	
Computer	City Vehicles
GPS Unit	Large Scale Plotter
Implementation Timeframe	
Estimated Mitigation Action Start Date:	06/01/2014
Estimated Mitigation Action Completion Date:	Ongoing / Yearly

7.7.14 Action 6.3.2:

Mitigation Action Implementation Plan	
Action 6.3.2: Implement Drainage Improvements from the City of Shasta Lake 2008 Drainage Master Plan.	
Implementing Agencies	
Lead Agency (ies):	City of Shasta Lake Public Works
Roles and Responsibilities of Lead Agency (ies):	Selection of Solution, Supervision
Support Agency (ies):	City of Shasta Lake Development Services
Roles and Responsibilities of Support Agency (ies):	Grant Applications, General Fund
Preliminary Identified Tasks: COSL Development Services Dept. City Engineer, Public Works Dept.	
1. Choose from identified solutions for each of the problem areas in the Drainage Master Plan	
2. Estimate costs for chosen solution	
3. Complete Benefit-Cost-Analysis and apply for grant funding (if applicable)	
4. Coordinate with local contractors to execute improvements	
Implementation Costs	
Estimated Capital Costs:	\$50,000 - \$300,000 per project
Estimated Maintenance Costs:	Annual Maintenance of \$5,000
Implementation Resources	
Financial Resources (Funding):	Hazard Mitigation Grant Program: http://www.fema.gov/hazard-mitigation-grant-program
Technical Assistance Resources:	Benefit Cost Analysis
Required Equipment, Vehicles, and Supplies	
TBD by Project	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	06/01/2014
Estimated Mitigation Action Completion Date:	06/01/2019

Section 8. Works Cited

- Bureau of Reclamation. *Shasta Lake Water Resource Investigation*. Environmental Impact Statement, U.S. Department of Interior, 2011.
- Cal EMA. "State of California Multi-Hazard Mitigation Plan." 2010.
- Cal-Adapt. *Securing and Adequate Water Supply*. April 12, 2011. <http://cal-adapt.org/blog/2011/apr/12/securing-adequate-water-supply/> (accessed January 3, 2014).
- California Climate Action Team. *STATE OF CALIFORNIA EXTREME HEAT ADAPTATION INTERIM GUIDANCE DOCUMENT*. GUIDANCE DOCUMENT, California Climate Action Team (CAT), 2012.
- California Climate Change Center. *Our Changing Climate, Assessing the Risks to California*. California Climate Change Center, 2006.
- California Department of Forestry and Fire Protection. *Fire and Resource Assessment Program*. 2012. <http://frap.fire.ca.gov/> (accessed January 5, 2013).
- Lassen County. *Lassen County Hazard Mitigation Plan*. County Report, Lassen County, 2009.
- Lassen County. "Lassen County Multi-Jurisdictional Hazard Mitigation Plan." Hazard Mitigation Plan, March 2010.
- National Drought Mitigation Center. *Drought Basics*. 2014. <http://drought.unl.edu/DroughtBasics.aspx> (accessed February 16, 2014).
- National Weather Service. *Office of Climate, Water, and Weather Services*. 2012.
- Shasta Community Services District. *SHASTA COMMUNITY SERVICES DISTRICT REVISTED*. Grand Jury Report, N.A.: Shasta Community Services District, 2006.
- Shasta County. *Shasta County Hazard Mitigation Plan*. Shasta County, 2011.
- U.S. Geological Survey. *2009 Earthquake Probability Mapping*. 2009. <https://geohazards.usgs.gov/eqprob/2009/> (accessed December 19, 2013).
- . *Actions to take for ash fall?* February 3, 2009. <http://volcanoes.usgs.gov/ash/todo.html> (accessed January 5, 2013).
- . *The Eruption of Lassen Peak*. January 18, 2014. http://www.nps.gov/lavo/naturescience/eruption_lassen_peak.htm (accessed February 16, 2014).
- U.S. Geological Survey. *Volcanic Hazards at Mount Shasta, CA*. General Information, Washington D.C.: U.S. Geological Survey, 1987.
- . *Volcanic Hazards: Tephra, including volcanic ash*. n.d. <http://volcanoes.usgs.gov/hazards/tephra/> (accessed 12 18, 2013).

—. *Volcanic Hazards: Tephra, including volcanic ash.* December 20, 2009. <http://volcanoes.usgs.gov/hazards/tephra/> (accessed January 5, 2013).

United States Department of the Interior. *Shasta Lake Water Resources Investigation, California.* Technical Report, Mid-Pacific Region: Bureau of Reclamation , 2011.

USGS. 2009.

USGS. "Landslide Types and Processes." <http://pubs.usgs.gov/fs/2004/3072/pdf/fs2004-3072.pdf>, 2004.

Various Contributors. *Wikipedia.* n.d. http://en.wikipedia.org/wiki/Shasta_Lake,_California (accessed Decemeber 11, 2013).

Appendix A. City Adoption Resolution.

City Resolution to Be Inserted Here....

Appendix B. Planning Process Documentation

B.1 Planning Committee Meetings Documentation

B.2 Public Notices and Press Releases

B.1 Planning Committee Meeting Documentation

B.2 Public Notices and Press Releases

City of Shasta Lake

P.O. Box 777 • 1650 Stanton Drive
Shasta Lake, CA 96019
Phone: 530.275.7460
Fax: 530.275.7406
Website: ci.shasta-lake.ca.us



PRESS RELEASE FOR IMMEDIATE RELEASE

CONTACT:

Debbie Israel, Senior Planner

530-275-7469 – phone

530-275-7406 – fax

disrael@cityofshastalake.org

City of Shasta Lake to Host Hazard Mitigation Plan Open House

Shasta Lake, CA – On Monday, March 17th from 4 to 7 P.M., the City of Shasta Lake will host a Hazard Mitigation Plan Open House at the Wintu Cultural Resource Center at 4755 Shasta Dam Boulevard in Shasta Lake. Residents are encourage to come by to see maps of the area and learn what hazards will affect the City and what the City and residents can do to reduce those effects.

The Draft Hazard Mitigation Plan will be available for review as well as handouts for hazard preparation. Staff and a representative from the City’s consulting team will be available to answer questions and take comments from the public. Two Open Houses were held in October to receive comments from the public concerning natural hazards to assist in drafting the Hazard Mitigation Plan for the City. The Plan incorporates comments from the public.

The City will be transmitting the Draft for review to CalOES (Office of Emergency Services) and FEMA (Federal Emergency Management Agency) both of which must act before the City Council can adopt the Plan.

“We were very pleased with the turnout at the October Open Houses and hope to have a similar turnout for this Open House. The City is looking forward to proceeding with the process so we can move to adopt the document,” said City Manager John Duckett, Jr. For more information, call 275-7460 or 7469.



CITY OF SHASTA LAKE

NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that the City Council of the City of Shasta Lake, California will hold a public hearing at the City Council Chambers, 4488 Red Bluff Street, Shasta Lake, California, on Tuesday, March 18, 2014, with the session commencing at 6:00 P.M., or as soon thereafter as possible, to discuss and authorize the transmittal of the Draft Hazard Mitigation Plan to Cal OES (California Office of Emergency Services) and FEMA (Federal Emergency Management Agency) for the purposes of review and approval prior to further action by the City.

The purpose of the public hearing will be to give citizens an opportunity to make their comments known. The Hazard Mitigation Plan identifies natural hazards likely to affect the City, establishes goals and objectives to mitigate those effects and provides for implementation action plans to reduce the effects over time. Once the Plan is approved by CalOES, FEMA, and the City, it will allow the City to be eligible for additional funding to address needed mitigation and to assist the community and residents in the event of a disaster.

If you are unable to attend the public hearing, you may direct written comments to the City of Shasta Lake, Development Services Department, 1650 Stanton Drive, Shasta Lake, CA 96019.

A public information file is available for review at the Development Services Department, City Hall, 1650 Stanton Drive, Shasta Lake, California, between the hours of 7:00 A.M. and 4:00 P.M. weekdays, excluding holidays. A copy of the Plan can also be found at the Shasta Lake Gateway Library, 1646 Stanton Drive and on the City's webpage www.cityofshastalake.org.

For additional information, contact Debbie Israel, Senior Planner, Development Services at (530) 275-7469 or by email at disrael@cityofshastalake.org.

The City of Shasta Lake promotes fair housing and makes all programs available to low and moderate income families regardless of age, race color, religion, sex, national origin, sexual preference, marital status, or handicap.

Published: March 9, 2014 (Sunday)

City of Shasta Lake

P.O. Box 777 • 1650 Stanton Drive
Shasta Lake, CA 96019
Phone: 530.275.7469
Fax: 530.275.7406
Website: www.cityofshastalake.org



September 27, 2013

SANDRA A BERNARDINO

2619 OSTLING PL

SHASTA LAKE CA 96019

Dear SANDRA A BERNARDINO ,

The City of Shasta Lake invites you to an Open House in October that discusses hazards to people and property in the City. We are in the process of updating the Hazard Mitigation Plan for the City and are in the fact gathering stage. Your property has been identified by FEMA as being within the flood plain.

We will have a FEMA certified planner at the Open House(s) to answer questions you might have and information you can take home to read further. FEMA requirements will change for some of you on January 1, 2014 and we hope to assist you in having access to information about that change.

We will have 2 Open Houses available to you at the following places:

Mountain Lakes High School Cafeteria
17752 Shasta Dam Blvd. (NE corner of Shasta Dam Blvd. and Lake Blvd.)
Tuesday, October 8, 2013
5:00 P.M.-7:00 P.M.

Wintu Cultural Resources Center
4755 Shasta Dam Blvd. (next to North Valley Bank)
Wednesday, October 9, 2013
3:00 P.M.-7:00 P.M.

If you have any questions please feel free to call me at 530-275-7469. We look forward to seeing you there.

Sincerely,

Debbie Israel
Senior Planner, Development Services Department
disrael@cityofshastalake.org

Encl.



CITY OF SHASTA LAKE
CITY COUNCIL MEETING MINUTES

MINUTES OF THE REGULAR MEETING

HELD TUESDAY, MARCH 4, 2014 AT THE

CITY COUNCIL CHAMBERS, 4488 RED BLUFF ST, SHASTA LAKE, CALIFORNIA

1.0 CITY COUNCIL MEETING - 6:00 p.m.

Mayor Morgan called the meeting to order at 6:02 p.m.

Council Members present: Chapman-Sifers, Farr, Morgan, Watkins

Council Members absent: None

2.0 AWARDS AND RECOGNITIONS

Mayor Morgan presented former Council Member, Ron Dixon, with a plaque commending him for his service on the City Council.

3.0 COMMUNICATIONS

3.1 Presentations:

Mark Lascelles – Update on Economic Development Corporation activities.

Debbie Israel, Senior Planner – Presentation on the Hazard Mitigation Plan.

3.2 Public Comment Period:

Lola McMillan – spoke regarding code enforcement, larger fines, and increasing abatements.

Gracious Palmer spoke regarding Women’s History Month, March 16-22nd Sunshine Week, and the Commission on Aging appointment.

Janice Powell spoke regarding the EDC activities and asked what they are doing for Shasta Lake. She also announced that Dolores Lucero didn’t attend her last two court dates and spoke regarding the money Lucero has cost the public.

Gary Rogers spoke in support of Lola McMillan’s comments.

3.3 Commission and Committee Reports:

Ann Morningstar reported on the Shasta Lake Gateway Library

Steve Morgan, Shasta Mosquito and Vector Control Board Member – reported on recent mosquito activity.

4.0 CONSENT AGENDA

4.1 Acceptance of the regular meeting minutes of February 18, 2014.

4.2 Check Register Information Item:

2/06/2014 Checks 51302-51357, \$135,533.05

2/13/2014 Wires 1589-1591 & checks 51358-51410, \$729,791.53

2/20/2014 Checks 51411-51470, \$282,316.28

2/21/2014 Payroll \$110,744.46

Motion/Vote

By motion made/seconded (Watkins/Chapman-Sifers), and carried, the consent agenda was approved.

5.0 PUBLIC HEARINGS:

5.1 Public Hearing regarding a Resolution to declare a water shortage emergency by implementing water use restrictions and approving a water conservation penalty on excess water usage for all City of Shasta Lake water customers.

Janice Powell asked who was on the Ad Hoc Committee, expressed concerns regarding the inability of some customers to pay increased costs, and disagreed with the Bureau cut-back on the City's water supply.

Gracious Palmer clarified what an Ad Hoc Committee is.

Ann Morningstar spoke about conservation efforts and stated that if you use the water you should pay for it.

Steve Morgan stated that he would like to see the conservation monitored.

Rosie (last name not provided) expressed concerns regarding increased costs and how it will affect restaurants.

Ginny Seeley spoke about the use of reclaimed water and different ways to conserve.

Rick Fox stated that if people use the water they should be prepared to pay for it. He also suggested that people landscape with drought-resistant plants.

Rick Kern spoke regarding watering parks every other day.

Motion/Vote

By motion made/seconded (Chapman-Sifers/Watkins), and carried, Resolution CC14-12 was approved.

6.0 REGULAR AGENDA

6.1 Discussion and Council decision and/or direction to staff regarding filling a vacant City Council seat.

Rose Smith, Gracious Palmer, and Steve Morgan spoke regarding the appointment of a Council Member.

By Council consensus, staff was directed to post and advertise the vacancy and to bring back an item at the next council meeting for consideration of applicants for appointment.

6.2 Discussion and possible action on a Resolution authorizing the City to enter into a contract with Analytical Environmental Services for professional environmental services for the City of Shasta Lake Wastewater Treatment Facility Upgrade Project in the total amount of \$300,000.

Richard Kern made an inquiry regarding the scope of the project.

Motion/Vote

By motion made/seconded (Chapman-Sifers/Farr), and carried, Resolution CC14-13 was approved. No: Watkins

6.3 Jamie Kerr of the 530 Collective – presentation of two proposals related to Medical Marijuana.

There was no action taken on this item.

6.4 Mayor's appointment of Council Member and possible Alternate to serve on the Redding Area Bus Authority (RABA) Board.

Mayor Morgan appointed Council Member Lori Chapman-Sifers to the RABA Board and postponed the appointment of an alternate until the March 18th Council Meeting.

6.5 Mayor's appointment of a representative to serve on the Shasta County Committee on Aging.

Mayor Morgan postponed the appointment until the March 18th Council Meeting.

7.0 COUNCIL/STAFF REPORTS/COMMENTS

7.1 Staff Comments

Miscellaneous

7.2 Council Comments/Reports:

Miscellaneous

8.0 ADJOURNMENT

With no further business to come before the City Council, Mayor Morgan adjourned the meeting at 9:40 PM.

TONI M. COATES, CMC,

City Clerk

Appendix C. DWR General Safety Plan Element Review Crosswalk

Appendix D. Plan Maintenance

D.1 Blank Mitigation Action Implementation Plans

D.2 Blank Mitigation Action Reporting Forms

D.3 Blank Annual HMP Review Questionnaires

D.1 Blank Mitigation Action Implementation Plans

Mitigation Action Implementation Plan	
Action x.x.x	
Implementing Agencies	
Lead Agency (ies):	
Roles and Responsibilities:	
Support Agency (ies):	.
Roles and Responsibilities:	
Preliminary Identified Tasks:	
1.	
2.	
3.	
Implementation Costs	
Estimated Capital Costs:	
Estimated Maintenance Costs:	
Implementation Resources	
Financial Resources (Funding):	
Technical Assistance Resources:	
Required Equipment, Vehicles, and Supplies	
Office Supplies	
Vehicles	
Implementation Timeframe	
Estimated Mitigation Action Start Date:	
Estimated Mitigation Action Completion Date:	

D.2 Blank Mitigation Action Reporting Forms

Progress Report Period: _____ to _____
 (date) (date)

Project Title: _____ Project ID# _____

Responsible Agency: _____

Address: _____

City: _____

Contact Person: _____

Phone#: _____ Email address: _____

List Supporting Agencies and Contacts: _____

Total Project Cost: _____

Funding Source: _____

Anticipated Cost Overrun/Underrun: _____

Date of Project Approval: _____ Start date of the project: _____

Anticipated completion date: _____

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase): _____

Milestones	Completed (✓)	Projected Date of Completion

MHMP Goal Addressed: _____

Indicator of Success: _____

Project Status:

Project on schedule Cost unchanged

Project completed Cost overrun*

Project delayed*

*explain _____

Project cancelled*

*explain _____

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

B. What successes have you encountered, if any?

C. What obstacles, problems, or delays have you encountered, if any?

D. How was each problem resolved?

E. Based on the past experiences (successes and obstacles), what changes, if any, need to be made to ensure completion?

Next Steps: What are the next step(s) to be accomplished over the next reporting period?

Other Comments:

D.3 Annual HMP Review Questionnaires

PLAN SECTION	QUESTIONS	YES	NO	COMMENTS
PLANNING PROCESS	Have there been local staffing changes that would warrant inviting different members to the planning team?			
	Are there procedures (e.g., meeting announcements, plan updates) that can be done more efficiently?			
	Are there any representatives of essential organizations who have not fully participated in the planning and implementation of actions? If so, can someone else from this organization commit to the implementation team?			
	Has the Steering Committee undertaken any public outreach activities regarding the MHMP or implementation of mitigation actions?			
HAZARD PROFILES	Has a natural and/or human-caused disaster occurred in this reporting period?			
	Are there natural and/or human-caused hazards that have not been addressed in this MHMP and should be?			
	Are additional maps/data or new hazards studies available? If so, what have they revealed?			
VULNERABILITY ANALYSIS	Do any new critical facilities or infrastructure need to be added to the asset lists?			
	How will the vulnerability analysis be affected by additional maps/data or new hazard studies?			
	Have there been changes in development patterns that could influence the effects of hazards or create additional risks?			
	Has the vulnerability analysis changed as a result of the implementation of mitigation actions?			
MITIGATION STRATEGY	Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning?			
	Is the goal still applicable?			
	Should new mitigation actions be added to the Mitigation Action Plan?			
	During implementation of the mitigation actions, what has proven effective? What has proven not effective?			
	Do existing mitigation actions listed in the Mitigation Action Plan need to be reprioritized deleted, or revised?			
	Are the mitigation actions listed in the Mitigation Action Plan appropriate for available resources?			

PLAN SECTION	QUESTIONS	YES	NO	COMMENTS
	Has the Mitigation Action plan been incorporated into existing planning mechanisms? If yes, please list what other planning mechanisms and in what way.			
PLANNING MECHANISMS	Has the Mitigation Action plan incorporated existing planning mechanisms? If yes, please list these existing planning mechanisms and what elements were incorporated and how.			

Appendix I

WATER SHORTAGE CONTINGENCY PLAN



City of Shasta Lake

WATER SHORTAGE CONTINGENCY PLAN

FINAL | June 2021





City of Shasta Lake

WATER SHORTAGE CONTINGENCY PLAN

FINAL | June 2021

Digitally signed by Nicola A. Fontaine
Contact Info: Carollo Engineers, Inc.
Date: 2021.06.29 14:39:43-07'00'



Digitally signed by Brianna L. Barton
Contact Info: Carollo Engineers, Inc.
Date: 2021.06.29 14:41:55-07'00'



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Abbreviations

ADU	Accessory Dwelling Unit
AFY	acre-feet per year
AP	action plan
BMP	best management practice
BVWD	Bella Vista Water District
CCSD	Centerville Community Services District
CII	commercial, industrial, and institutional
City	City of Shasta Lake
County	Shasta County
CWC	California Water Code
DDW	Division of Drinking Water
DRA	drought risk assessment
EOC	Emergency Operations Center
ERP	Emergency Response Plan
gpcd	gallons per capita per day
I-5	Interstate 5
ICS	Incident Command System
MFR	multi-family residential
mgd	million gallons per day
PIO	Public Information Officer
RHNA	Regional Housing Needs Assessment
SCWA	Shasta County Water Agency
SFR	single-family residential
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
WSCP	Water Shortage Contingency Plan
WTP	Water Treatment Plant

Chapter 1

WATER SHORTAGE CONTINGENCY PLAN

1.1 Purpose

The City of Shasta Lake (City) Water Shortage Contingency Plan (WSCP) details the stages of action to be undertaken during a reduction in available water supply, either due to reductions in the City's available water supply during drought years, or due to catastrophic interruption due to flooding, major fire emergencies, earthquake, regional power outages, water contamination or other situations that could impact the City's water supply.

The goal is to have a procedure for managing and mitigating shortages allowing the City to respond in an efficient and timely manner. This WSCP may be amended as needed at any time.

In the event any provision of this WSCP conflicts or overlaps with any mandatory State regulation related to water conservation, the most stringent shall apply.

1.2 Application

The provisions of this WSCP shall apply to all persons, customers, and property served by the City, wherever situated, and for all types of water provided by the City. In situations where a property is serviced by both the City and a private well, no City water may be used for activities that are prohibited by any regulations set forth in this WSCP.

The prohibited uses of water are not applicable to water necessary for public health and safety.

1.3 Authorization

The WSCP will be adopted by City Council and authorize the City Manager to declare a water shortage emergency and impose voluntary or mandatory water conservation restrictions by identifying the applicable stage.

1.4 Enforcement

The City Manager, Building Official, Development Services Director, and Water Conservation Coordinator and each of their respective designees are each authorized to administer and enforce all provisions of this WSCP, including the issuance of citations.

1.5 Definitions

The following words and phrases as used in this WSCP have the following meanings:

1. "Available water supply" means the amount of potable water available to the city in any given water year, including water available through long-term water purchase agreements/contracts, taking into consideration reductions to the allocations during drought years, and any supplemental water purchased from other water purveyors under short-term agreements.
2. "Bubbler" means an irrigation device that bubbles water only a short distance from the device, generally used for watering trees and shrubs on a per-tree/shrub basis.

3. "City" means the City of Shasta Lake.
4. "Drip irrigation" means a landscape watering system using low water pressure and flexible tubing placed on the ground to target the roots of plants, thereby conserving moisture that would be lost to evaporation with sprinkler systems
5. "Emitter" means a drip irrigation emission device that delivers water slowly from the system to the soil.
6. "Landscape irrigation system" means an irrigation system with pipes, spray heads or sprinkling devices that are operated through an automated or manual valving system.
7. "Large water user" means schools, commercial, industrial, civic/social/fraternal and government customers with a one-inch meter or larger, or more than one meter serving a property or facility, and single-family residential users with a water use of over 10,000 cubic feet per month over the prior 12-month period.
8. "Ornamental pond" or "ornamental fountain" means a design element where open water performs solely an aesthetic function.
9. "Person" means property owners, occupants, tenants, lessees, sub-lessees, individuals, partnerships, corporations, joint ventures, receivers, limited liability companies, trust, estates, cooperatives, associations public or private agency, government agency or institution, school district or any other user of water provided by the city.
10. "Potable water" means water that is provided to customers through the city's water treatment and distribution system. This does not include reclaimed water.
11. "Reclaimed water" means former wastewater that is treated to remove solids and impurities pursuant to state water quality requirements and used for landscape irrigation and/or to meet commercial and industrial water needs.
12. "Retrofit kit" means water saving devices that can assist customers to save water, including, but not limited to, low-flow showerheads, faucet aerators, spray hose nozzles, and hose timers.
13. "Shut-off nozzle" shall mean a device attached to the end of a hose that must be manually operated, pressed or otherwise held in place to allow water to flow out of the hose.
14. "Soaker hose" means a garden hose with small holes that allow water to seep into the ground to the roots of plants, conserving moisture that would be lost to evaporation with sprinkler systems.
15. "Station" means a landscaped area served by one valve or by a set of valves that operate simultaneously.
16. "Unnecessary and wasteful use of water" means the application or usage of water for functions or activities which do not have any health or safety purpose, are not required by regulation, and are not part of the core function or business process at a site.
17. "Water year" means the period from and including March 1 of each calendar year through the last day of February of the following calendar year as established by the long-term water contract between the City and the United States Bureau of Reclamation (USBR).

Chapter 2

WATER SUPPLY RELIABILITY ANALYSIS

The City's water service area is located north of Redding in western Shasta County (County). The City is located along the Interstate 5 (I-5) corridor, south of Shasta Lake and the Shasta Dam. The City water supply is surface water diverted from Shasta Lake. Raw water is pumped to the Fisherman's Point Water Treatment Plant (WTP) via the USBR Raw Water Pumping Station located at the base of Shasta Dam. The Fisherman's Point WTP is capable of treating and distributing a maximum of approximately 9.72 million gallons per day (mgd).

In 2020, the population was estimated to be approximately 10,626. The population is anticipated to increase to 13,627 by the year 2045, which is based on an average annual growth rate of 1.0 percent. Water demands served by the City are primarily residential, including single-family residential (SFR) and multi-family residential (MFR), commercial, industrial, and institutional (CII), and landscape irrigation. All connections in the City are metered. The total volume supplied in 2020 was approximately 2,215 acre-feet per year (AFY). Demands are anticipated to increase to 3,282 AFY by the year 2045.

The per capita water demand was 186 gallons per capita per day (gpcd) in 2020. Although the City was able to meet the 2020 target of 215 gpcd, the year 2020 did not represent a typical year due to the impacts of the COVID-19 pandemic. However, since the 2020 per capita demand of 186 gpcd was below the 2020 goal, adjustments for extraordinary events were not made.

Supply availability was reviewed under a single-dry year and five-consecutive-year drought. In addition, a drought risk assessment (DRA) from 2021 through 2025 found that there is sufficient supply to meet projected demands within the next five years.

Chapter 3

ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

The annual water supply and demand assessment identifies key data and methods for determining the supply reliability each year. The annual assessment is due on or before July 1 of each year, as required by California Water Code (CWC) Section 10632.1. The assessment plans for the following calendar year assuming the year following the planning year is a dry year.

The annual supply and demand assessment will include:

- Anticipated shortage.
- Triggered shortage response actions.
- Compliance and enforcement actions.
- Communication actions.
- Review of assets.

3.1 Water Conservation Coordinator

As of 2014, the City has a designated Water Conservation Coordinator (Tony Thomasy, tthomasy@cityofshastalake.org) that supervises best management practice (BMP) implementation, evaluates effectiveness, and communicates program goals to the community. The Water Conservation Coordinator tasks may include, but are not limited to, managing implementation of water conservation efforts and programs, preparing conservation reports, promoting water conservation to agency staff, evaluating the results of efforts, monthly tracking of production versus consumption, and enforcement of water use restrictions.

The Water Conservation Coordinator shall review and evaluate the status, condition, and availability of the City's water supplies and recommend and advise the City Manager concerning the water supply reliability of surface water source (Shasta Lake), the City's ability to purchase or transfer water, the system's ability to produce and distribute water to its customers, shortage levels (also referred to as stages), declaration of a water shortage emergency, and other water conservation matters, including but not limited to the number of new service connections allowed annually.

The Water Conservation Coordinator shall compare the previous year assessment to the actual state of the water supply prior to the summer high use period. This procedure will help the City to refine the assessment process and make changes as needed.

In the event of a water shortage, emergency, or drought condition, the Water Conservation Coordinator shall review and evaluate the status, condition, and availability of the City's water supplies and recommend and advise the City Manager concerning conservation and other significant resource management constraints, including the declaration of a Water Shortage Emergency.

3.2 Timeline

The proposed timeline for the annual supply and demand assessment is listed below and is subject to change. The USBR water year is March 1 through February 28/29 of the following year. The City submits their annual assessment (due on or before July 1 of each year to the state) in February prior to the start of the USBR water year.

- Preparation of Draft Supply and Demand Analysis – December.
- Submit and Present Assessment to City Manager or his/her designee – January.
- Update and Finalize Assessment – February.
- Receive City Manager Approval – February.
- Annual Supply and Demand Assessment – February (Due to state July 1).

3.3 Decision-Making Process

The steps in the decision-making process that the City Water Conservation Coordinator will use each year to determine and subsequently report to the state are listed below.

1. Water Conservation Coordinator determines:
 - a. Previous calendar year water production.
 - b. Infrastructure constraints.
 - c. Expected demand.
2. Water Conservation Coordinator compares supply and demand and decides on the water supply reliability for the current year and one dry year.
3. Water Conservation Coordinator prepares and submits the Annual Assessment Report to the state.
4. Water Conservation Coordinator presents the findings and recommendations of the Annual Assessment Report to the City Council.
5. City Manager and Water Conservation Coordinator determines the shortage levels and other conservation matters, including but not limited to the number of new service connections allowed annually that are appropriate for all or portions of the City water system.
6. The City Manager, Building Official, Development Services Director, and Water Conservation Coordinator and each of their respective designees implements the provisions of this WSCP.

3.4 Key Data and Methodologies

The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, include the following:

- Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.
- Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.
- Existing infrastructure capabilities and plausible constraints.

- A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.
- A description and quantification of each source of water supply.

3.4.1 Water Supply

The annual assessment will evaluate the current year available and one subsequent dry year. The available water supplies for the City shall be quantified each year by summing the available water supplies. Potential production constraints, hydrological, and regulatory conditions will be considered. The long-term contract amount with USBR is sufficient to meet City demands when allocations are not reduced. During a single-dry year, the USBR allotments can be reduced by 50 percent or more.

3.4.2 Unconstrained Customer Demand

Water use for the previous year shall be quantified by summing the meter usage of each customer class for the previous year. Customer water demands shall be projected for the upcoming year based on the previous year's water usage and the number of anticipated new customer connections.

3.4.3 Planned Water Use for Current Year Considering Dry Subsequent Year

The planned water use for the current year is not impacted by an anticipated subsequent dry year. When USBR allocations are reduced, the City has emergency inter-ties with the City of Redding and Bella Vista Water District (BVWD) in which transfers of water can be made. The City also can purchase supplemental water under short-term contracts from the Shasta County Water Agency (SCWA), the McConnell Foundation, and the Centerville Community Services District (CCSD).

3.4.4 Infrastructure Considerations

Infrastructure projects anticipated for the upcoming year that could impact water supply will be evaluated for the timeframe the projects will impact supply. The available water supply will be increased or reduced accordingly for each month.

3.4.5 Other Factors

The Regional Housing Needs Assessment (RHNA) is mandated by State Housing Law as part of the periodic process of updating local housing elements of the General Plan. The RHNA for Shasta Lake for the 2018 to 2028 projection period is 238 new housing units, including 28 extremely low-income units, 28 very low-income units, 39 low-income units, 42 moderate-income units, and 101 above moderate-income units. It should also be noted, State legislation in 2017 made Accessory Dwelling Units (ADU) legal in all California cities. Homeowners can decide to build either a detached ADU in their backyard, an attached ADU that is part of a home addition, or an ADU conversion. Although the State has determined ADU's contribute no additional stress on utilities, the addition of another dwelling unit, another family occupant, on a single-family property does impact water usage.

3.4.6 Criteria

Evaluation of the appropriate shortage level will include, but not be limited to, the following considerations:

1. Current surface water level (Shasta Lake).
2. Recent trends in surface water level (Shasta Lake).
3. Other hydrological or other local conditions indicative of water supply available.
4. The previous winter's precipitations.
5. The previous year's water demand.
6. Current demand and anticipated demand for water by City Customers.
7. Current and anticipated supply of City water sources.
8. Damage to the City's water system.
9. Predicted weather patterns.
10. Water content of the snowpack.
11. Climate change impacts.

If the available water supply is greater than the anticipated customer demand for the upcoming year, then the City does not need to take any further action. If the anticipated customer demand for the upcoming year is greater than the available water supplies, the City can initiate water conservation actions as detailed in this WSCP.

Chapter 4

SIX STANDARD WATER SHORTAGE LEVELS

The following section describes the City water shortage levels and the conservation measures employed during each stage.

No Customer shall make, cause, use, or permit the use of water from the City for any residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner contrary to any provision of this WSCP or in an amount in excess of that use permitted by the Shortage Level then in effect.

The WSCP will be adopted by City Council and authorize the City Manager to declare the appropriate water shortage level utilizing the factors contained in the annual water supply and demand assessment. Any shortage level shall be effective on declaration.

4.1 Shortage Levels

There shall be six shortage levels in response to water supply shortages. The six levels, including greater than 50 percent reduction in water supply are summarized in Table 4.1. The percent shortage is from the normal reliability condition. The existence of each level conservation conditions may be declared and adopted by the City in accordance with California State law.

Table 4.1 Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Water Shortage Condition
1	10 percent	Water Shortage Alert
2	11 to 20 percent	Moderate Water Shortage
3	21 to 30 percent	Emergency Water Shortage
4	31 to 40 percent	Severe Water Shortage
5	41 to 50 percent	Critical Water Shortage Emergency
6	>50 percent	Catastrophic Interruption of Water Supplies ⁽¹⁾

Notes:

(1) Including flooding, major fire emergencies, earthquake, regional power outages, water contamination, and emergencies other than water shortage.

4.2 Triggering Mechanisms for Shortage Levels

The triggering mechanisms to use as guidelines for the shortage levels are summarized in Table 4.2. The City Manager may impose any of the following conservation stages based upon facts and circumstances which may not have been otherwise anticipated in this plan.

Table 4.2 Shortage Level Triggers

Shortage Level	Triggers
1 10 percent Water Shortage	<ul style="list-style-type: none"> • System malfunction resulting in 10 percent shortage. • City or State declaration due to drought. • Federal, state, or local disaster declaration that may impact water supplies. • Water Conservation Coordinator determination. • Unplanned City water system maintenance.
2 11-20 percent Water Shortage	<ul style="list-style-type: none"> • System malfunction resulting in 11 percent to 20 percent shortage. • City or State declaration due to drought. • Federal, state, or local disaster declaration that may impact water supplies. • Water Conservation Coordinator determination. • Unplanned City water system maintenance.
3 21-30 percent Water Shortage	<ul style="list-style-type: none"> • System malfunction resulting in 21 percent to 30 percent shortage. • City or State declaration due to drought. • Federal, state, or local disaster declaration that may impact water supplies. • Water Conservation Coordinator determination. • Unplanned City water system maintenance.
4 31-40 percent Water Shortage	<ul style="list-style-type: none"> • System malfunction resulting in 31 percent to 40 percent shortage. • City or State declaration due to drought. • Federal, state, or local disaster declaration that may impact water supplies. • Water Conservation Coordinator determination. • Unplanned City water system maintenance.
5 41-50 percent Water Shortage	<ul style="list-style-type: none"> • System malfunction resulting in 41 percent to 50 percent shortage. • City or State declaration due to drought. • Federal, state, or local disaster declaration that may impact water supplies. • Water Conservation Coordinator determination. • Unplanned City water system maintenance.
6 >50 percent Water Shortage	<ul style="list-style-type: none"> • System malfunction resulting in up to >50 percent shortage or catastrophic interruption of water supplies.⁽¹⁾ • City or State declaration due to drought. • Federal, state, or local disaster declaration that may impact water supplies. • Water Conservation Coordinator determination. • Unplanned City water system maintenance.

Notes:

(1) Including flooding, major fire emergencies, earthquake, regional power outages, water contamination, and emergencies other than water shortage.

Chapter 5

SHORTAGE RESPONSE ACTIONS

The following rules and regulations associated with the shortage levels, described below, will be effective immediately upon declaration and approval of the City Manager. Additional water shortage response actions and/or changes in shortage levels may be recommended by the Water Conservation Coordinator and approved by the City Manager, whenever they determine necessary, in accordance with the annual water supply and demand assessment methodologies.

The water shortage response actions include demand reduction, supply augmentation, operational changes, and mandatory prohibitions to address shortage levels. Violations are considered waste and an unauthorized use of water, which result in penalties as outlined in Section 7.2, as amended from time to time.

5.1 Permanent Restrictions

The City enforces permanent State water conservation restrictions that are required regardless of the water supply condition. There are no additional local permanent water conservation restrictions.

5.2 Shortage Restrictions

The mandatory reduction measures for each water shortage level are detailed in the following tables (Tables 5.1 through 5.6).

5.3 Stage 1 – Water Shortage Alert

In Stage 1, there is a 10 percent reduction in the City's available water supply. The City's water supply (treatment) and/or distribution system is able to meet much of or most of the water demands of its customers in the immediate future.

The water conservation requirements in Table 5.1 are state mandated regardless of drought stages in an effort to reduce water consumption.

Table 5.1 Stage 1 Restrictions

Type Use	Restriction	Compliance
Hose Use	Free-flowing hoses for any use shall be prohibited. Customers shall use automatic shutoff devices on any hose or filling apparatus.	Mandatory
Fixtures	Faulty sprinklers and/or breaks within the customer's plumbing system shall be repaired within twenty-four (24) hours after the customer is notified or discovers the break.	Mandatory

Type Use	Restriction	Compliance
Other	All large water users, such as industrial uses, schools, supermarkets, civic/government buildings, etc., shall develop a water conservation plan indicating a ten percent reduction in water usage and submit the plan to the City's Water Conservation Coordinator for approval within thirty (30) calendar days.	Mandatory
Landscape Irrigation	Use of landscape irrigation systems for all customers, including parks and school grounds, shall be limited to the hours between 9:00 p.m. and 9:00 a.m. to reduce evaporation.	Mandatory
Landscape Irrigation	Irrigated landscaped areas shall include efficient irrigation systems (e.g., drip irrigation systems, timed sprinklers, rain sensors, low-flow spray heads, etc.).	Mandatory
Fixtures	All new development shall be required to install low flow devices (i.e., toilets and shower heads) pursuant to California Building Code standards.	Mandatory
Construction	The use of potable water for dust control shall be reduced to the greatest extent possible.	Mandatory

5.4 Stage 2 – Moderate Water Shortage

In Stage 2, there is an 11 to 20 percent reduction in the City's available water supply. There is a probability that the City's supply (treatment) and/or distribution system will not be able to meet all water demands of City customers with the City's available water supply for the current water year.

The water conservation requirements in Table 5.2 apply during a declared Shortage Level 2 in an effort to increase conservation by 10 percent above Stage 1. All measures from Stage 1 become mandatory in Stage 2 unless noted as more restrictive.

Table 5.2 Stage 2 Restrictions

Type Use	Restriction	Compliance
Water Features	Water use for ornamental ponds and fountains shall be prohibited.	Mandatory
Other	All large water users, such as industrial uses, schools, supermarkets, civic/government buildings, etc., shall develop or update their water conservation plans and submit the plan to the City's Water Conservation Coordinator for approval within thirty (30) calendar days. ⁽¹⁾	Mandatory
Landscape Irrigation	Parks and school grounds shall be watered at night only between the hours of 9:00 p.m. and 9:00 a.m., no more than three nights per week, and shall achieve a twenty (20) percent reduction in water use. ⁽²⁾	Mandatory
Landscape Irrigation	Use of landscape irrigation systems for all other customers shall be limited between the hours of 9:00 p.m. and 9:00 a.m. no more than three nights per week. ⁽³⁾	Mandatory

Type Use	Restriction	Compliance
Other	All City water customers who do not comply with the reduced consumption amount shall be required to install retrofit kits. ⁽⁴⁾	Mandatory
Other	The City will implement excessive water use penalties or tier water rates to discourage excessive water use and shall penalize water customers who fail to meet the reduced consumption amount.	Mandatory
Restaurants	Restaurants and other food establishments shall only serve and refill water upon request.	Voluntary ⁽⁵⁾

Notes:

- (1) The plan shall address all rationing stages as follows: Stage 2: Demonstrate a twenty (20) percent reduction in water usage; Stage 3: Demonstrate a thirty (30) percent reduction in water usage; Stage 4: Demonstrate a forty (40) percent reduction in water usage; Stage 5: Demonstrate a fifty (50) percent reduction in water usage.
- (2) The reduction shall be measured based on the amount of water used in the previous calendar month compared to the same calendar month in the previous year.
- (3) The limitation for times does not apply to: (a) Drip, bubbler, or soaker irrigation hardware or emitters; (b) Use of an irrigation system for the express purposes of repairing or completing routine maintenance; (c) Watering by use of a hand-held bucket or similar container or a hand-held hose equipped with shut-off nozzle; and (d) Watering by use of a hose-end sprinkler with a radius of not more than ten feet if such sprinkler causes no overspray or runoff to adjoining property or to the roadside ditch or gutter.
- (4) Retrofit kits are water saving devices that can assist customers to save water, including, but not limited to, low-flow showerheads, faucet aerators, spray hose nozzles, and hose timers.
- (5) Unless mandated by State law.

5.5 Stage 3 – Emergency Water Shortage

In Stage 3, there is a 21 to 30 percent reduction in the City's available water supply. There is a probability that the City's supply (treatment) and/or distribution system will not be able to meet all water demands of City customers with the City's available water supply for the current water year.

The water conservation requirements in Table 5.3 apply during a declared Shortage Level 3 in an effort to increase conservation by 10 percent above Stage 2. All measures from Stages 1 and 2 become mandatory in Stage 3 unless noted as more restrictive.

Table 5.3 Stage 3 Restrictions

Type Use	Restriction	Compliance
Landscape Irrigation	Parks and school grounds shall be watered at night only between the hours of 9:00 p.m. and 9:00 a.m., no more than two nights per week, and shall achieve a thirty (30) percent reduction in water use.	Mandatory
Landscape Irrigation	Use of landscape irrigation systems for all other customers shall be limited between the hours of 9:00 p.m. and 9:00 a.m. no more than two nights per week for a maximum total run time of fifteen (15) minutes per station per night. ⁽¹⁾	Mandatory
Landscape Irrigation	Installation of irrigated landscaping for all new development shall be deferred pursuant to a written Agreement with the City.	Mandatory

Type Use	Restriction	Compliance
Landscape Irrigation	No new landscape irrigation systems shall be installed on developed parcels. This restriction shall not apply to the replacement of inefficient irrigation systems with systems that incorporate water-savings technologies, such as the installation of high efficiency sprinkler heads, weather-based irrigation controllers, and/or drip irrigation systems.	Mandatory
Hotels, motels, and bed and breakfasts	Must offer and clearly notify guests of a "limited linen/towel exchange" program.	Mandatory
Industrial and Commercial	Reduction of water use by any means is encouraged. Compliance with mandatory demand reduction measures is required for outdoor water uses including landscape irrigation, swimming pools, and vehicle washing.	Mandatory

Notes:

- (1) The limitation for times does not apply to: (a) Drip, bubbler, or soaker irrigation hardware or emitters; (b) Use of an irrigation system for the express purposes of repairing or completing routine maintenance; (c) Watering by use of a hand-held bucket or similar container or a hand-held hose equipped with shut-off nozzle; and (d) Watering by use of a hose-end sprinkler with a radius of not more than ten feet if such sprinkler causes no overspray or runoff to adjoining property or to the roadside ditch or gutter.

5.6 Stage 4 – Severe Water Shortage

In Stage 4, there is a 31 to 40 percent reduction in the City's available water supply. The City's supply (treatment) or distribution system will not be able to meet all demands of City customers with the City's available water supply for the current water year.

The water conservation requirements in Table 5.4 apply during a declared Shortage Level 4 in an effort to increase conservation by 10 percent above Stage 3. All measures from Stages 1, 2, and 3 become mandatory in Stage 4 unless noted as more restrictive.

Table 5.4 Stage 4 Restrictions

Type Use	Restriction	Compliance
General	Water use shall be restricted so as to meet the minimum requirements for personal health and safety. Priority shall be given to supplying adequate water to ensure public/community health and safety (i.e., fire suppression, medical, veterinarian, and educational institutions).	Mandatory
Swimming Pools	Swimming pools that have been filled prior to Stage 4 shall not be emptied and refilled.	Mandatory
Swimming Pools	Filling of new swimming pools is prohibited as of the effective date of the Stage 4 declaration.	Mandatory
Other	Flushing of sewers and fire hydrants shall be prohibited except in cases of emergency.	Mandatory

Type Use	Restriction	Compliance
Construction	No potable water from the City system shall be used for construction purposes, such as dust control, compaction, or trench jetting.	Mandatory
Hotels, motels, and bed and breakfasts	Must limit linen/towel changes to once every two (2) nights or for the entire stay, whichever is shorter, except for health and safety.	Mandatory

5.7 Stage 5 – Critical Water Shortage Emergency

In Stage 5, there is a 41 to 50 percent reduction in the City's available water supply. The City's supply (treatment) or distribution system will not be able to meet all demands of City customers with the City's available water supply for the current water year. In Stage 5, the City is experiencing a major failure of supply, storage, or distribution facilities. The City is not able to meet all customer water requirements with Stage 4 measures.

The water conservation requirements in Table 5.5 apply during a declared Shortage Level 5 in an effort to increase conservation by 10 percent above Stage 4. All measures from Stages 1, 2, 3, and 4 become mandatory in Stage 5 unless noted as more restrictive.

Table 5.5 Stage 5 Restrictions

Type Use	Restriction	Compliance
Residential Development	No new residential development shall be permitted unless the developer has submitted a complete building permit application to the City prior to the Stage 5 declaration. ⁽¹⁾	Mandatory
Landscape Irrigation	Use of landscape irrigation systems for lawns for all customers shall be prohibited. To the extent possible, the City will water all public parks and sports fields as needed for public use. Watering, including trees and shrubs, by use of a hand-held bucket or similar container or a hand-held hose equipped with shut-off nozzle is allowed.	Mandatory
Hotels, motels, and bed and breakfasts	Must limit linen/towel changes to once every three (3) nights or for the entire stay, whichever is shorter, except for health and safety.	Mandatory
Vehicle and Equipment Washing	Non-commercial washing of vehicles and mobile equipment is prohibited. Only commercial facilities with water recycling systems may be used.	Mandatory

Notes:

(1) Building permit applications may proceed with a deferral of landscape installation, until the water shortage level has been lifted. Issuance of Temporary Certificate of Occupancy will be allowed in the interim.

5.8 Stage 6 – Catastrophic Interruption of Water Supplies

In Stage 6, there is a greater than 50 percent reduction in the City's available water supply. The City's supply (treatment) or distribution system will not be able to meet all demands of City customers with the City's available water supply for the current water year. In Stage 6, the City is experiencing a catastrophic interruption of water supplies including flooding, major fire

emergencies, earthquake, regional power outages, water contamination, and emergencies other than water shortage. The City is not able to meet all customer water requirements with Stage 5 measures.

The water conservation requirements in Table 5.6 apply during a declared Shortage Level 6.

Table 5.6 Stage 6 Restrictions

Type Use	Restriction	Compliance
General	City may establish mandatory water use budgets, if needed.	Mandatory
General	Water use is restricted to essential water uses only. The term "essential water use" is defined to mean water necessary for human consumption, sanitation, and fire protection. All other uses of water that are not specifically required to meet these needs shall be considered non-essential.	Mandatory
Indoor Water Use	Wash only full loads of laundry and/or dishes.	Voluntary
Indoor Water Use	Shorten showers and turn off faucets while brushing teeth or shaving.	Voluntary
Landscape	No new landscape shall be installed until the appropriate water shortage level has been lifted. Exceptions are replacing landscaping with drought tolerant landscape material.	Mandatory
Swimming pools, hot tubs	All pools and tubs shall be covered when not in use to reduce evaporation.	Mandatory
Vehicle & Equipment Washing	Fleet managers are encouraged to only wash those vehicles as is necessary for health and safety.	Mandatory

5.9 Supply Augmentation and Other Methods

The methods to augment supply include the following:

- Transfers.
- Purchases.
- Emergency interties.

Actions the City can take to reduce consumption include the following:

- Expand public information campaign.
- Improve customer billing.
- Increase frequency of meter reading.
- Offer water use surveys.
- Provide rebates on plumbing fixtures and devices.
- Decrease line flushing.
- Reduce system water loss.
- Moratorium or net zero demand increase on new connections.
- Implement or modify drought rate structure or surcharge.

- Voluntary rationing.
- Mandatory rationing.

5.10 Operational Changes

During times of water supply shortage, the City can:

- Reduce system flushing.
- Monitor meter information to determine where water leaks may be.

5.11 Emergency Response Plan

During declared shortages, or when shortage declarations appear imminent, emergency regulations can be enacted by City Council.

The purpose of the City Emergency Response Plan (ERP) is to provide the City with a standardized response and recovery protocol to prevent, minimize, and mitigate injury and damage resulting from emergencies or disasters of man-made or natural origin. The ERP also describes how the City will respond to additional emergency response situations and includes specific action plans (APs) that will be used to respond to events and incidents.

The goals of the ERP are to:

- Rapidly restore water service after an emergency.
- Ensure adequate water supply for fire suppression.
- Minimize water system damage.
- Minimize impact and loss to customers.
- Minimize negative impacts on public health and employee safety.
- Provide emergency public information concerning customer service.

5.12 Hazard Mitigation Plan

The City's Hazard Mitigation Plan includes a seismic risk and vulnerability assessment and is included as an appendix in the Urban Water Management Plan (UWMP). The Hazard Mitigation Plan may be updated at any time. The most recent Hazard Mitigation Plan shall apply to the current WSCP.

5.13 Shortage Response Action Effectiveness

The effectiveness of the shortage response actions and the extent to which it reduces the gap between supply and demand can be determined through monitoring. The metered data will be analyzed on a month-by-month basis to monitor the effectiveness of reduction actions for each shortage level declarations.

Chapter 6

COMMUNICATION PROTOCOLS

The communication protocols contained herein for shortage level declarations reflect the procedures in the City ERP. Due to the sensitive nature of the information contained in the ERP only brief descriptions have been included. Communications will be provided to the customers, public, and partners established in the ERP for emergency planning and mutual aid.

The Water Conservation Coordinator will evaluate supply planning, operational, financial, and communication issues related to the WSCP as needed. The information provided to customers at each shortage level will answer the following:

1. What the customers need to do to save water.
2. Why they need to save water.
3. How long does the City estimate they will need to save water.
4. What the City is doing to correct/supplement the supply problem or address the situation.

The degree of communication will vary based on the shortage level, supply/regulatory conditions, seasonal impacts, and other factors. The key audiences the City will need to communicate with include:

- Public (water customers).
- Homeowners.
- Public officials.
- Multi-family property owners/managers.
- Commercial-industrial property managers.
- Landscape contractors/suppliers.
- Business/civic leaders.
- High-visibility or high-water-use industries (restaurants, hotels, construction, etc.).
- Land-use agencies.
- Environmental groups.
- Community-based service organizations.
- Non-English-speaking populations.
- Temporary residents (tourists, etc.).
- Coordinating agencies.

Depending on the conditions, some of these audiences may be prioritized for outreach.

6.1 Communication Protocol for Normal Water Supply Conditions

During normal water supply conditions, the City will promote water efficiency by sharing information on the City's website (www.cityofshastalake.org):

- Permanent water conservation restrictions.
- Water efficiency rebate and other efficiency programs.
- Water conservation tips.

6.2 Communication Protocol for Current and Predicted Shortages

The Water Conservation Coordinator and the City Manager will meet to review the outcome of the annual supply and demand assessment and determine steps to be taken for current and predicted shortages. The shortage levels will be communicated to the City Council and the City Manager or his/her designee will prepare for and establish timing for a declaration. Public notification is not part of this stage.

6.3 Communication Protocol for Stages 1 – 5 Declarations

In the event of a shortage level declaration the City shall:

- Mail or electronically mail information to every customer and reasonably available potential water user explaining the importance of significant water use reductions.
- Provide technical information to customers on ways to improve water use efficiency.
- Conduct media campaign to remind consumers of the need to save water.
- Enforce the permanent water conservation restrictions.

6.4 Communication of a Catastrophic Emergency and Stage 6 Declaration

The City uses the Incident Command System (ICS) for its command structure during water emergencies. In the event of a catastrophic emergency, the City will fully implement the Emergency Response Plan, immediately initiate appropriate APs and fully activate the City Emergency Operations Center (EOC).

6.5 Public Notice Procedures

The City's Public Information Officer (PIO) is the official spokesperson for the City and is authorized to speak directly to public media representatives. The PIO will contact the news media to broadcast the necessary information. As a follow-up measure, the local newspaper(s) that serves the service area will be contacted.

The City of Shasta Lake has prepared a series of public notices and press releases for use during various emergency situations in accordance with Division of Drinking Water (DDW) guidance. If the water system is experiencing power outages, water outages, or low-pressure problems, a consumer alert may be issued to the public. The notice provides consumers information on conserving water.

Chapter 7

COMPLIANCE AND ENFORCEMENT

A violation of any requirement set forth in this WSCP shall be subject to the water service termination procedures and penalties as outlined in Section 7.2, as amended from time to time.

7.1 Enforcement

The City Manager, Building Official, Development Services Director, and Water Conservation Coordinator and each of their respective designees are each authorized to administer and enforce all provisions of the WSCP, including the issuance of citations.

7.2 Penalties

It is unlawful for any person to violate or cause or permit the violation of any of the provisions of this WSCP or provide false information to the City in response to City requests for information. The penalties for violations of any provision of this WSCP are as follows:

- First Violation: No penalty shall be imposed. The City shall provide notice of the violation and a copy of this WSCP to the current property owner and/or billing address.
- Second Violation: No penalty shall be imposed. The City shall issue a written notice of the violation by certified mail to the current property owner and/or billing address and provide notice that additional violations may result in penalties or termination of service.
- Third Violation: A third violation within 12 calendar months of the second violation shall result in a penalty not to exceed \$100.00.
- Fourth Violation: A fourth violation within 12 calendar months of the third violation shall result in a penalty not to exceed \$200.00.
- Fifth and Subsequent Violations: A fifth violation and subsequent violations within 12 calendar months of the fourth violation shall result in a penalty not to exceed \$500.00.

For third and subsequent violations, the city shall issue a written notice of the violation by certified mail to the current property owner and/or billing address. The amount of the penalty shall be added to the next water bill 30 days after the date of the written notice of the violation, if not paid in full or protested pursuant to Section 7.2.4. If the penalty is added to the water bill, failure to pay the penalty shall be treated as nonpayment of the water bill and water service may be terminated as a result.

Each separate day or portion thereof in which any violation of this WSCP occurs or continues without a good faith effort by the customer to correct the violation shall constitute a separate violation.

7.2.1 Termination of Service

In addition to any penalties, the City may disconnect and/or terminate a customer's water service. If water service is disconnected, it shall be restored only upon payment of the connection charge fixed by City Council.

The City may not terminate service due to a customer's failure to comply with the rules and regulations unless the City first gives notice of the violation and the consequence of the violation.

7.2.2 Civil Enforcement

Violations of this WSCP may also be redressed by civil action. In addition to being subject to prosecution, any person who violates any of the provisions of this WSCP may be made the subject of a civil action. Appropriate civil action includes, but is not limited to, injunctive relief and cost recovery.

7.2.3 Remedies Cumulative

The remedies available to the City to enforce this WSCP are in addition to any other remedies available under the Shasta Lake Municipal Code or any state statutes or regulations and do not replace or supplant any other remedy but are cumulative thereto.

7.2.4 Protesting Penalties/Fines

A protest of penalties/fines shall be in writing on a form prescribed by the City and shall be filed with the City no later than 14 calendar days from the date of notice of a violation. The protest shall be accompanied by photographs, maps, drawings, or other information showing why the protest should be granted.

The City Manager or his/her designee shall consider all protests and make a determination on the request no later than 10 calendar days after submittal and may approve, conditionally approve, or deny the protest. The applicant shall be notified in writing of any action taken.

The decision of the City Manager or his/her designee may be appealed to the City Council by written notice within 10 calendar days of the date of action taken on the protest request. The appeal shall be scheduled for City Council consideration at the next possible City Council meeting. Upon granting any protest request, City Council may impose any conditions it determines to be appropriate. The decision of City Council shall be prepared in writing and provided to the applicant.

7.3 Hardship Variances

If, due to unique circumstances, a specific requirement of this WSCP would result in undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar properties or classes of water users, then the person may apply for a variance from the provisions of this WSCP.

An application for a variance shall be in writing on a form prescribed by the City. The application shall be accompanied by photographs, maps, drawings, or other information showing why the request should be granted.

The City Manager or his/her designee shall consider all variance applications and make a determination on the request no later than 10 calendar days after submittal and may approve, conditionally approve, or deny the variance request. The applicant shall be notified in writing of any action taken.

An application for a variance shall be denied unless the City Manager or his/her designee finds, based on the information provided in the application, supporting documents, or such additional

information as may be requested by the City, and on water use information for the property as shown by the records of the City, all of the following:

1. Due to unique circumstances a specific requirement would result in undue hardship.
2. The variance does not constitute a grant of special privilege inconsistent with the limitations upon other residents and businesses.
3. Because of special circumstances applicable to the property or its use, the strict application of this WSCP would have a disproportionate impact on the property or use that exceeds the impacts to residents and businesses generally.
4. Granting the variance will not be of substantial detriment to adjacent properties and will not be detrimental to the general welfare of the public.
5. The conditions of the subject property or the intended use of the property for which the variance is sought is not common, recurrent or general in nature.
6. Proposed alternative water use restrictions for the property would result in equal or greater water savings than the existing water use restrictions and the customer has achieved the maximum practical reduction in water consumption.

7.3.1 Appeal Process

Any interested person may appeal the decision of the City Manager or his/her designee to the City Council by written notice within 10 calendar days of the date of the decision on the variance request. The appeal shall be scheduled for City Council consideration at the next possible City Council meeting. Upon granting any appeal, City Council may impose any conditions it determines to be appropriate. City Council's decision on the variance request shall be prepared in writing and provided to the appellant. The decision of City Council shall be final.

7.3.2 Previous Violations.

Any approved or conditionally approved variance is valid from the date it was approved or conditionally approved. Any previous violations and subsequent penalties associated with those violations are final and will not be reimbursed.

Chapter 8

LEGAL AUTHORITIES

The City Manager, Building Official, Development Services Director, and Water Conservation Coordinator and each of their respective designees are each authorized to administer and enforce all provisions of this WSCP, including the issuance of citations. The City Manager or a designated representative shall likewise be authorized to grant hardship variances from any provision of the WSCP as they deem appropriate under the circumstances. Any interested person may appeal the decision of the City Manager or their designee to the City Council. The decision of the City Council shall be final.

The WSCP will be adopted by City Council and authorize the City Manager to declare and adopt a water shortage emergency condition in accordance with California State law (Water Code Section Division 1, Chapter 3, Section 350).

The City will coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code (California Emergency Services Act, Article 2, Section 8558). Coordination protocols and a list of contacts is contained in the City ERP.

Chapter 9

FINANCIAL CONSEQUENCES OF WSCP

The City is fully metered and all City customers are billed volumetrically. Therefore, the City may experience a decrease in revenue with reduced water sales during a water shortage. Annually during the budget process, the City forecasts the revenues expected for the upcoming year. At that time, shortfalls in revenues relating to water shortage will be identified and rate adjustments recommended. The City shall monitor water revenues and expenses closely to evaluate whether “water shortage” adjustments to water rates are required.

The City’s water rates and charges include drought surcharges for Stages 1 through 5. The drought surcharge for Stage 6 shall be the same as Stage 5. Additional costs are associated with increased monitoring during water shortage situations, namely due to an increase in the hours required to monitor customer accounts and enforce reduction actions. The additional costs associated with this effort, however, are not expected to significantly impact City revenues and expenditures.

The City does not expect to use financial reserves to address decreased water sales during a water shortage. The City will consider postponement of capital improvements to overcome impacts from water shortage contingency planning to revenues and expenditures. This evaluation would be considered during the annual supply and demand assessment.

Chapter 10

MONITORING AND REPORTING

The City is fully metered and all City customers are billed volumetrically. The City uses these meters to monitor City-wide use, individual customer use, and track actual reductions in water use. By periodic review of customer water use, the City is able to track the effectiveness of the shortage level reduction actions, educate customers regarding water use, and also identify leaks and other areas where additional conservation may be possible.

Monitoring will be used to ensure appropriate data is collected, tracked, and analyzed for purposes of determining:

- Customer compliance.
- Effectiveness of reduction actions.
- Potential leaks in the distribution system.
- Accurate monthly demand data for the annual supply and demand assessment.

Monitoring and reporting key water use metrics is fundamental to water supply planning and management and will be a critical part of the annual supply and demand assessment. Monitoring is also essential to ensure that the shortage level response actions achieve their intended water use reduction purposes or to determine if improvements or new actions are needed. Monitoring for customer compliance tracking is useful in enforcement actions. It should be noted that timing, frequency, and metrics will likely be variable, depending on the water shortage level and enforcement action logistics.

The City can compare meter data with water use in prior months and during non-drought years to determine if it is achieving specific percentage goals for water consumption associated with the drought response levels. If the goals are not being met, the City can implement additional shortage response actions at any time.

Chapter 11

WSCP REFINEMENT PROCEDURES

To evaluate the effectiveness of the WSCP and to ensure that procedures and practices developed under the WSCP are adequate and are being implemented properly, the Water Conservation Coordinator will perform audits of the program on a periodic basis, at least every five (5) years in coordination with the UWMP update. The Water Conservation Coordinator will also assess the effectiveness of the communication plan so that it may be modified as appropriate in the future.

The Water Conservation Coordinator will perform a thorough review of monitoring and reporting program data to determine the effectiveness of the reduction actions and whether the procedures and provisions of the WSCP need to be revised. The review will compare the expected percent demand reduction against actual reductions and shortage response actions.

City staff, customers, and other interested parties may have suggested actions or procedures to refine the WSCP. The Water Conservation Coordinator will evaluate these on a case-by-case basis for incorporation into the WSCP.

Chapter 12

SPECIAL WATER FEATURE DISTINCTION

The City restricts potable water use for the ornamental water features listed below unless the water is recirculated:

- Ponds.
- Lakes.
- Waterfalls.
- Fountains.

An ornamental or decorative water feature is defined as a design element where artificially supplied open water performs solely an aesthetic function. Ornamental water features do not include recreational water features, such as swimming pools and spas.

Chapter 13

PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

Per the CWC, the following steps shall be performed prior to adoption of the WSCP:

- The City will issue a notification of a public hearing to customers, the county, and public.
 - The City will publish notification of the public hearing in a local newspaper for two consecutive weeks.
 - The City shall hold a public hearing to obtain public input.
 - Following the public hearing or a subsequent meeting, the City Council shall formally adopt the WSCP.
 - Per CWC Section 10632 (a)(c), the City will make the WSCP available on the City's website (www.cityofshastalake.org) within 30 days of the adoption.
- The City may choose to amend the WSCP at any time. If so, each of the steps above must be followed.

Appendix J
2020 ANNUAL WATER CONSERVATION REPORT
SUMMARY



Description	Fee	January	February	March	April	May	June	July	August	September	October	November	December	Total Spent
Ongoing Monthly Program Admin	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$1,800.00
Water Audits	\$100.00	\$0.00	\$0.00	\$100.00	\$0.00	\$0.00	\$0.00	\$0.00	\$100.00	\$0.00	\$0.00	\$0.00	\$0.00	\$200.00
Water Audit/Irrigation Survey	\$150.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$150.00	\$0.00	\$0.00	\$150.00	\$0.00	\$300.00
School Education Program	varies													\$0.00
Customer Rebates*	varies	\$200.00	\$100.00	\$200.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$100.00	\$100.00	\$700.00
Product Orders	varies													\$0.00
Direct Install Program	varies	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Total		\$350.00	\$250.00	\$450.00	\$150.00	\$150.00	\$150.00	\$150.00	\$400.00	\$150.00	\$150.00	\$400.00	\$250.00	\$3,000.00

Site Visits	January	February	March	April	May	June	July	August	September	October	November	December	Total
Residential Audit, Water	0	0	1	0	0	0	0	1	0	0	0	0	2
Residential Audit, Water/Irrigation	0	0	0	0	0	0	0	1	0	0	1	0	2
Indoor Water Savings Kits (distributed at site visit)	0	0	0	0	0	0	0	0	0	0	0	0	0
Outdoor Water Savings Kits (distributed at site visit)	0	0	0	0	0	0	0	0	0	0	0	0	0

Measure Description	Annual Savings per Unit (gallons)	January	February	March	April	May	June	July	August	September	October	November	December	Total Units	Total Estimated Annual Savings (gallons)
Free Devices															
1.5 or 1.75 GPM Showerhead	5110	0	0	0	0	0	0	0	0	0	0	0	0	0	-
1.5 or 2.0 GPM Showerwand	4380	0	0	0	0	0	0	0	0	0	0	0	0	0	-
1.0 GPM Bath Aerator	700	0	0	0	0	0	0	0	0	0	0	0	0	0	-
1.5 GPM Kitchen Swivel Aerator	700	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Toilet Displacement Bag	1752	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Toilet Water Saver Fill Cycle Diverter	1752	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Dye Tabs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Teflon Tape	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Hose Watering Timer	2250	0	3	0	0	0	2	1	2	3	0	0	0	11	24,750
Water Saving Garden Hose Nozzle	0	0	12	2	0	3	1	3	6	5	3	0	0	35	-
"Stop in Time" Water Saving Timer (Shower)	550	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Dish Squeegee	100	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Lady Bug Moisture Meter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Moisture Meter (Green)	0	0	20	0	0	4	0	4	6	10	2	0	0	46	-
Calendar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Hose Mender	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Coloring Book	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Tri-Max 3 Flow Rate Aerators	700	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Kitchen Mat	0	0	14	2	0	0	0	3	4	3	5	4	4	39	-
Ruler	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Jar Opener	0	0	0	4	0	0	1	6	14	9	4	8	8	54	-
Rebates															
*High Performance, Low-Flush Toilet	13000	2	1	2	0	0	0	0	0	0	0	1	0	6	78,000
*High Performance Clothes Washer	2400	0	0	0	0	0	0	0	1	0	0	0	0	1	2,400
*Automatic Irrigation Controller	8800	0	0	0	0	0	0	0	0	0	0	0	1	1	8,800
Direct Install															
Direct Install: Showerhead, Standard	5110	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Direct Install: Showerhead, Handheld	4380	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Direct Install: Thermostatic Shower Valve	2529	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Direct Install: Faucet Aerator, Kitchen	700	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Direct Install: Faucet Aerator, Bathroom	700	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Direct Install: Toilet Tank Bank Installation	1752	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Total														193	113,950

Appendix K
WATER WASTE PREVENTION ORDINANCE

15.10.160 - Water waste prevention.

- A. It shall be unlawful for any property owner and/or individual having control of the property, to willfully permit runoff to leave the target landscape area due to low-head drainage, overspray, or other similar conditions where water flows onto adjacent property, nonirrigated areas, walks, roadways, parking lots or structures.
- B. Restrictions regarding overspray and runoff may be modified with approval from the city manager or his/her designee if:
 - 1. The landscape area is adjacent to permeable surfacing and no runoff occurs; or
 - 2. The adjacent nonpermeable surfaces are designed and constructed to drain entirely to landscaping.

(Ord. No. 10-206, § 2, 1-5-2010)

Appendix L

WATER AND WASTEWATER RATE SCHEDULES

ORDINANCE NO. CC-16-251

AN ORDINANCE OF THE CITY OF SHASTA LAKE AMENDING CITY MUNICIPAL CODE SECTIONS FOR WATER RATES AND CHARGES.

The City of Shasta Lake City Council does hereby ordain that City of Shasta Lake Municipal Code Sections 13.12.200 and 13.12.280 are hereby amended to read as follows:

Section 1. 13.12.200 Rates for Service: The following rates and compensation are fixed and established as the rates to be charged and collected by the city's water department for water furnished by the department:

Monthly Service Charges:

Meter Size	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
5/8"	\$24.56	\$28.25	\$31.08	\$31.08	\$31.08
1"	\$55.68	\$64.04	\$70.45	\$70.45	\$70.45
1.5"	\$107.55	\$123.69	\$136.06	\$136.06	\$136.06
2"	\$169.79	\$195.26	\$214.79	\$214.79	\$214.79
3"	\$315.03	\$362.29	\$398.52	\$398.52	\$398.52
4"	\$522.50	\$600.88	\$660.97	\$660.97	\$660.97
6"	\$1,041.20	\$1,197.38	\$1,317.12	\$1,317.12	\$1,317.12
8"	\$1,663.64	\$1,913.19	\$2,104.51	\$2,104.51	\$2,104.51
10"	\$3,012.24	\$3,464.08	\$3,810.49	\$3,810.49	\$3,810.49
12"	\$4,464.59	\$5,134.28	\$5,647.71	\$5,647.71	\$5,647.71

Consumption Charges:

Customer Class	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
Lifeline Tier 1	\$1.53	\$1.76	\$1.94	\$1.94	\$1.94
Lifeline Tier 2	\$2.20	\$2.53	\$2.79	\$2.79	\$2.79
Lifeline Tier 3	\$2.76	\$3.18	\$3.50	\$3.50	\$3.50
Residential Tier 1	\$1.92	\$2.21	\$2.44	\$2.44	\$2.44
Residential Tier 2	\$2.20	\$2.53	\$2.79	\$2.79	\$2.79
Residential Tier 3	\$2.76	\$3.18	\$3.50	\$3.50	\$3.50
Multi Family & Mobile	\$2.03	\$2.34	\$2.58	\$2.58	\$2.58
Commercial & Industrial	\$2.07	\$2.39	\$2.63	\$2.63	\$2.63
Commercial Irr. & Government	\$2.26	\$2.60	\$2.86	\$2.86	\$2.86
Schools	\$2.42	\$2.79	\$3.07	\$3.07	\$3.07
(hcf = 100 cubic feet of water or approximately 750 gallons)					
Irr. = Irrigation					

Consumption Charge Tiers:

Customer Class	Rate Tiers
Lifeline and Residential	
Tier 1	1,000 cu. ft.
Tier 2	2,000 cu. ft.
Tier 3	>2,000 cu. ft.
All other Classes	
Tier 1	Uniform rate
Tier 2	Uniform rate

Drought Rates:

Drought Rate Summary	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Surcharge					
Tier 1 (Lifeline)	\$0.03	\$0.07	\$0.10	\$0.37	\$0.47
Tier 1 (SFR)	\$0.04	\$0.09	\$0.13	\$0.47	\$0.59
Tier 2	\$0.05	\$0.10	\$0.15	\$0.54	\$0.68
Tier 3	\$0.06	\$0.13	\$0.19	\$0.67	\$0.85
Multi Family & Mobile	\$0.05	\$0.09	\$0.14	\$0.50	\$0.62
Commercial & Industrial	\$0.05	\$0.09	\$0.14	\$0.51	\$0.64
Commercial Irr. & Government	\$0.05	\$0.10	\$0.15	\$0.55	\$0.70
Schools	\$0.06	\$0.11	\$0.17	\$0.59	\$0.74

Pass-Through Rates:

The City will also pass-through any wholesale water rate increases imposed on the City by its wholesalers starting in FY 2017. The pass-through for FY 2017 is currently estimated to be \$0.01 / hundred cubic feet (hcf) and the rates shown in the *Consumption Charges* table above *includes* the pass-through for FY 2017. However, the table above does not include wholesaler pass-throughs for FY 2018-2021 since wholesaler water costs are not known at this time. *Assuming* 5% wholesaler cost increases each year, the pass-through would range from \$0.03 / hcf in FY 2018 to \$0.08 / hcf in FY 2021. The exact pass-through charge for FY 2018 (and subsequent FYs) will be calculated based on actual wholesale purchased water costs imposed on the City. The pass-through calculation is the difference in wholesale water purchase costs for each FY divided by the estimated water use for that FY.

Section 2. 13.12.280 Fire Service-Monthly Rates-Use of hydrants prohibited when: A. The monthly rates to be charged and collected for service used for unmetered fire protection shall be as follows:

Monthly Private Fire Line Rates:

Size	Charge
2" fire line or less	\$5.53
3" fire line or less	\$16.06
4" fire line or less	\$34.22
6" fire line or less	\$99.42
8" fire line or less	\$211.86
10" fire line or less	\$381.00
12" fire line or less	\$615.41

Section 3. Severability: If any provision of this ordinance or the applications thereof to any person or circumstances is held invalid, the remainder of the ordinance and the applications of such provision will remain in effect to the extent permitted by law.

Section 4. Effective Date: This ordinance shall take effect 30 days after the date of its second reading and posting pursuant to City Code with an operative date of October 1, 2016.

I HEREBY CERTIFY that the foregoing Ordinance was introduced and read at a regular meeting of the City Council of the City of Shasta Lake held on the 2nd day of August 2016, and was finally passed at a regular meeting of the City Council of the City of Shasta Lake held on the 16th day of August 2016.

PASSED, APPROVED AND ADOPTED this 16th day of August, 2016, by the following vote:

AYES: FARR, KERN, MORGAN, WATKINS, CHAPMAN-SIFERS
NOES: NONE
ABSENT: NONE

LORI CHAPMAN-SIFERS, Mayor

ATTEST:

TONI M. COATES, CMC, City Clerk

ORDINANCE NO. CC-20-281

AN ORDINANCE OF THE CITY OF SHASTA LAKE AMENDING CITY MUNICIPAL CODE SECTION 13.16.590, SCHEDULE OF MINIMUM MONTHLY CHARGES, AND ESTABLISHING NEW WASTEWATER RATES

City of Shasta Lake Municipal Code Section 13.16.590 is hereby amended to read as follows:

Section 1. Rates for Service: The following rates are established as the rates to be charged and collected by the city's wastewater department:

Table with 6 columns: User Class, Effective July 1, 2020, Effective July 1, 2021, Effective July 1, 2022, Effective July 1, 2023, Effective July 1, 2024. Rows include Residential Flat Rate per Unit, Residential Flat Rate per Unit-Lifeline, Efficiency Dwelling Flat Rate per Unit, Multi-Family Flat Rate per Unit, Non-Residential Rate per SFEC, and Industrial Rate per SFEC.

*Single Family Equivalency Connection Charge

Notes:

- 1. Residential accounts include single-family residences, mobile homes and accessory dwelling units (ADU's)
2. One SFEC equals 170 gallons (per day (5,168 gallons/mo.) of wastewater flow, which is the estimated flow from a typical single-family household
3. Efficiency Dwelling Unit rate is based on the ratio between the expected average number of occupants in an Efficiency Dwelling Unit (1.5 persons) and the typical occupants in a single-family residence in the City of Shasta Lake according to the American Community Survey (ACS). It is estimated this ratio may be about 57%.
4. Multi-Family accounts are based on 85% of one SFEC
5. Non-Residential SFEC's based on 90% of average monthly water consumption for January, February and March, with a minimum charge of one SFEC.
6. Industrial accounts have the choice to 1)pay a wastewater bill based on 90% of average water use with a minimum charge of one SFEC or 2)install a flowmeter in the lateral and pay for 100% of the wastewater discharged with a minimum charge of one SFEC.

Section 2. Severability: If any provision of this ordinance or the applications thereof to any person or circumstances is held invalid, the remainder of the ordinance and the applications of such provision will remain in effect to the extent permitted by law.

Section 3. Effective Date: This ordinance shall take effect 30 days after the date of its second reading and posting pursuant to City Code.

I HEREBY CERTIFY that the foregoing Ordinance was introduced and read at a regular meeting of the City Council of the City of Shasta Lake held on the 7th day of April 2020, and was finally passed at a regular meeting of the City Council of the City of Shasta Lake held on the 21st day of April 2020.

PASSED, APPROVED, AND ADOPTED this 21st day of April 2020, by the following vote:

AYES: FARR, KERN, MORGAN, WATKINS, POWELL
NOES: NONE
ABSENT: NONE

Handwritten signature of Janice Powell
JANICE POWELL, Mayor

ATTEST: Handwritten signature of Toni M. Coates
TONI M. COATES, CMC, City Clerk

Appendix M
UWMP CHECKLIST

UWMP Checklist

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	Section 1.1
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	Section 1.1
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	Section 2.1

2020 Urban Water Management Plan Guidebook

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	Section 2.4
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	Section 2.4
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	N/A

2020 Urban Water Management Plan Guidebook

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	N/A
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Section 3.1
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.2
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.3.1
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.3.2
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Section 3.3.1
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.4

2020 Urban Water Management Plan Guidebook

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	Section 4.2
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	Section 4.3
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	Section 4.4
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	Section 4.2
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	Section 4.3
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	Section 4.5
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	Section 4.6

2020 Urban Water Management Plan Guidebook

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	Chapter 5 (see SB X7-7 forms in Appendix C)
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.6
	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	N/A
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	Section 5.6

2020 Urban Water Management Plan Guidebook

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	Section 5.5
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	Section 5.6 (See SB X7-7 forms in Appendix C)
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	Section 7.4
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, <i>including changes in supply due to climate change.</i>	System Supplies	Section 7.4

2020 Urban Water Management Plan Guidebook

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	Chapter 6
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Chapter 6
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	Section 6.10
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.3
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	Section 6.3
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.3

2020 Urban Water Management Plan Guidebook

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	Section 6.3
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	Section 6.3
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	Section 6.3
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	Section 6.3
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	Section 6.8

2020 Urban Water Management Plan Guidebook

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)	Section 6.6.3
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)	Section 6.6.5
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)	Section 6.6.5
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)	Section 6.6.5
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)	Section 6.6.6

2020 Urban Water Management Plan Guidebook

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)	Section 6.6.5.1
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.7
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)	Section 6.6.2
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	Section 6.9
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	Section 6.12

2020 Urban Water Management Plan Guidebook

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	Section 7.2.1
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	Section 7.2.3
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	Section 7.4
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	Section 7.5

2020 Urban Water Management Plan Guidebook

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	Section 7.3
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	Section 7.4
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	Section 7.4
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	Sections 6.11 and 7.22
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	See Appendix I

2020 Urban Water Management Plan Guidebook

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	See Appendix I, Chapter 2
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	See Appendix I, Chapter 10
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	See Appendix I, Chapter 3
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	See Appendix I, Chapter 3

2020 Urban Water Management Plan Guidebook

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	See Appendix I, Chapter 5
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	N/A
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	See Appendix I, Section 5.9
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	See Appendix I, Section 5.9

2020 Urban Water Management Plan Guidebook

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	See Appendix I, Section 5.10
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	Section 8.3
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	Section 8.3
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	See Appendix I, Section 5.12
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	See Appendix I, Section 6.5
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	See Appendix I, Sections 6.3 and 6.4

2020 Urban Water Management Plan Guidebook

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	See Appendix I, Chapter 7
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	See Appendix I, Chapter 8
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	See Appendix I, Section 1.3
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	See Appendix I, Chapter 8
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	See Appendix I, Chapter 9
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	See Appendix I, Chapter 9

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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	See Appendix I, Chapter 9
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	See Appendix I, Chapter 10
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	See Appendix I, Chapter 12
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	Section 10.4.4 (See Commitment to Distribute in Appendix A)

2020 Urban Water Management Plan Guidebook

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	See Appendix I, Chapter 13
	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	N/A
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	Chapter 9
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	Section 10.3

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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	Section 10.2.1
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	Section 10.4.1
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	Section 10.2.2, Section 10.3, See Appendix A
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	Section 10.2.1
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	See Section 10.3, Appendix N

2020 Urban Water Management Plan Guidebook

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	Section 10.4.3 (See Commitment to Distribute in Appendix A)
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	Section 10.4.4 (See Commitment to Distribute in Appendix A)
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	Section 10.4.2 and 10.6
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	Section 10.5 (See Commitment to Distribute in Appendix A)
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	See Appendix I, Chapter 13

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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	N/A
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	See Appendix I, Chapter 13

Appendix N
CITY ADOPTION RESOLUTIONS

RESOLUTION CC 2021-38

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SHASTA LAKE ADOPTING THE
2020 URBAN WATER MANAGEMENT PLAN UPDATE**

WHEREAS, the California Urban Water Management Planning Act (UWMPA), California Water Code Sections 10610 – 10656, requires urban water suppliers to prepare and adopt an Urban Water Management Plan (UWMP) every five years; and

WHEREAS, the City of Shasta Lake is an urban water supplier under the definition of California Water Code Section 10617; and

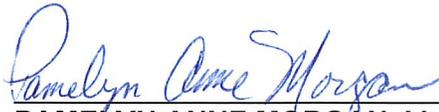
WHEREAS, the City has prepared a 2020 Urban Water Management Plan Update and completed all required coordination and legal notices, including publication in the Record Searchlight on June 1, 2021 and June 8, 2021, pursuant to Government Code Section 6066, posting on the City's website, and posting at six public locations throughout the City; and

WHEREAS, on June 15, 2021, the City Council conducted a duly noticed public hearing to obtain public testimony.

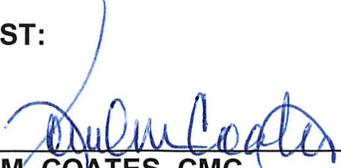
NOW THEREFORE, BE IT RESOLVED, that the City Council of the City of Shasta Lake hereby:

1. Determines that adoption of the 2020 Urban Water Management Plan Update is exempt from the California Environmental Quality Act (CEQA) pursuant to California Water Code Section 10652.
2. Adopts the 2020 Urban Water Management Plan Update;
3. Directs staff to file the 2020 Urban Water Management Plan Update with the California Department of Water Resources and the California State Library within thirty (30) days of adoption;
4. Directs staff to make the 2020 Urban Water Management Plan Update available for public review within thirty (30) days after filing a copy with the California Department of Water Resources;
5. Directs staff to submit the final 2020 Urban Water Management Plan Update in electronic format to Shasta County within thirty (30) days of adoption.

AYES: DOYLE, KERN, POWELL, WATKINS, MORGAN
NOES: NONE
ABSENT: NONE


PAMELYN ANNE MORGAN, Mayor

ATTEST:


TONI M. COATES, CMC
City Clerk

RESOLUTION CC-2021-39

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SHASTA LAKE ADOPTING THE CITY OF SHASTA LAKE'S 2020 WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, in response to the severe drought of 2012-2016, new legislation in 2018 created a WSCP (Water Shortage Contingency Plan) mandate replacing the water shortage contingency analysis under former law, and

WHEREAS, the new legislation will strengthen local drought resilience through improved planning and annual assessments; and

WHEREAS, the new planning and assessment methods will allow local officials and their customers to understand the risks of water supply shortages from longer and more severe droughts and will improve the information sent to both customers and the State during drought conditions; and

WHEREAS, better planning and information will make communities more resilient and will reduce costs and impacts on customers in the wake of more frequent and severe drought conditions under climate change, and

WHEREAS, the City has prepared a 2020 Water Shortage Contingency Plan and completed all required coordination and legal notices, including publication in the Record Searchlight on June 1, 2021 and June 8, 2021, pursuant to the California Water Code, and

WHEREAS, on June 15, 2021, the City Council conducted a duly noticed public hearing to obtain public testimony.

WHEREAS, this Plan is required to be updated every 5 years.

NOW THEREFORE, BE IT RESOLVED, that the City Council of the City of Shasta Lake hereby:

1. Adopts the 2020 Water Shortage Contingency Plan.
2. Directs staff to make the final Water Shortage Contingency Plan available on the City's website within 30 days of adoption.
3. Directs staff to submit the final 2020 Water Shortage Contingency Plan in electronic format to Shasta County within thirty (30) days of adoption.
4. This resolution will be effective when Ordinance-2021-289 repealing Chapter 13.14 is operative.

AYES: DOYLE, KERN, POWELL, MORGAN
NOES: WATKINS
ABSENT: NONE


PAMELYN ANNE MORGAN, Mayor

ATTEST:


TONI M. COATES, CMC
City Clerk

