GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

2020 URBAN WATER MANAGEMENT PLAN

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ac-ft	acre feet
ACT	Urban Water Management Plan Act
amsl	above mean sea level
AWWA	American Water Works Association
CDS	Community Disposal System
cfs	cubic feet per second
CIP	Capital Improvement Program
CPUC	California Public Utility Commission
DMM	Demand Management Measures
DRA	Drought Risk Assessment
DWR	Department of Water Resources
EDWA	El Dorado Water Agency
ERP	Emergency Response Plan
General Plan	County of El Dorado General Plan
GPCD	gallons per capita per day
gpm	gallons per minute
LIRAP	Low-Income Rate Assistance Program
mgd	million gallons a day
NPDES	National Pollution Discharge Elimination System
pph	Person per Household
RCAC	Rural Community Assistance Corporation
SMUD	Sacramento Municipal Utility District
the District	Georgetown Divide Public Utility District
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
WRDMP	Water Resources Development and Management Plan
WSCP	Water Shortage Contingency Plan
WSDA	Water Supply and Demand Assessment
Zone	Auburn Lake Trail – On-site Wastewater Disposal System

LAY DESCRIPTION

The Georgetown Divide Public Utility District (the District) has prepared this 2020 Urban Water Management Plan (UWMP) to be utilized as a resource/planning document for the District and to meet State of California Department of Water Resources (DWR) requirements. The District is classified as an urban water supplier that provides treated water to approximately 3,800 customers and seasonal irrigation water to approximately 400 customers from a single surface water supply, Stumpy Meadows Reservoir.

Stumpy Meadows Reservoir is located along the Pilot Creek channel which is a tributary to Rubicon River and part of the larger American River Watershed. Mark Edson Dam, completed in 1962, impounds Stumpy Meadows Reservoir at a total capacity of 21,206 acre-feet (ac-ft). Supply is conveyed to the customers in the form of treated water and raw irrigation water by a canal/conduit system and distribution piping network. In 2020, the District supplied approximately 1,400 ac-ft of treated drinking water and 4,000 ac-ft of raw irrigation water. Projected 2040 approximate water use is calculated at 1,800 ac-ft for treated water and 5,000 ac-ft for raw irrigation water. Without accounting for improvements, total projected water uses in 2040, including treated and raw water losses, is estimated at approximately 9,500 ac-ft annually.

Based on historical dry year data, the District has adequate source of supply to meet 20-year demand projections, including for a single dry year and multiple dry year scenarios. Water conservation thresholds have been established to ensure these demands are met during multiple drought scenarios. The heart of water conservation methods is best management practices of annual raw irrigation water deliveries. Approximately 70 percent of District water deliveries include raw irrigation water. District policies call for an annual evaluation of the District's water supply so the District's Board of Directors can modify deliveries accordingly to ensure State of California and the District health and safety priorities are met to provide a reliable and consistent supply of safe drinking water to District customers. In addition, with the projected increase in demand the District actively evaluates demand measurement methods in order to ensure adequate and reliable water supply.

1.0 INTRODUCTION

The District has prepared this report in compliance with the Urban Water Management Planning Act (Act), as amended (California Water Code, Division 6, Part 2.6; §10610, et. seq. established by Assembly Bill 797, 1983). All urban water suppliers defined in Section 10617; 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 ac-ft annually are required to prepare an UWMP. Urban water suppliers are required to prepare and/or update their UWMP and submit a complete plan to the DWR every five years.

In January 2009, the Act was amended by Assembly Bill AB-1420, which required the implementation of demand management measures to be eligible for water grants or loans. The Act was then amended in November 2009 with the adoption of Senate Bill SBx7-7. The most significant revision in this amendment is the requirement for establishing per capita water use targets for 2015 and 2020. Since the 2015 UWMP, there are also six new additions to the California Water Code that water suppliers are required to address in the 2020 UWMP. These six new requirements discussed in the 2020 UWMP are summarized below:

- Five Consecutive Dry-Year Water Reliability Assessment;
- Drought Risk Assessment (DRA);
- Seismic Risk;
- Water Shortage Contingency Plan (WSCP);
- Groundwater Supplies Coordination; and
- Lay Description.

1.1 Report Organization

The remainder of this report is organized into the following sections:

Section 2.0: Plan Preparation

This section provides information on the processes used for developing the District's UWMP.

Section 3.0: System Description

This section provides a detailed description of the District's public water system.

Section 4.0: Water Use Characterization

This section provides description and quantifications of the District's past, current and future water use projections through 2040.

Section 5.0: Water Conservation Baseline and Targets

This section provides water conservation baseline and targets to meet Water Conservation Act of 2009 to achieve a 20-percent reduction by 2020.

Section 6.0: Water Supply Characterization

This section provides an analysis of the District's water supply reliability assessment under various hydrological and regulatory conditions.

Section 7.0: Water Service Reliability and Drought Risk Assessment

This section provides a rational basis for future decision-making related to supply management, demand management and project development.

Section 8.0: Water Shortage Contingency Plan

This section provides a detailed plan detailing how the District intends to act in the event of an actual water shortage condition.

Section 9.0: Demand Measurement Measures

This section provides actions the District can take to lower demand, improve water service reliability and help meet state and regional water conservation goals.

Section 10.0: Plan Adoption, Submittal and Implementation

This section details requirements for public hearings, adoption process and submittal.

2.0 PLAN PREPARATION

2.1 Basis for Preparing a Plan

This report has been prepared in compliance with the Act, and as amended (California Water Code, Division 6, Part 2.6; §10610, et. seq. established by Assembly Bill 797, 1983). All urban water suppliers as defined in Section 10617, 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 annually are required to prepare an UWMP. The District's water usage information is, shown on Table 2-1. Urban water suppliers are required to prepare and/or update their UWMP and submit a complete plan to the DWR every five years.

Table 2-1: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
CA0910013	Georgetown Divide Public Utility District	3,689	1,813
	TOTAL	3,689	1,813

NOTES:
Units - Acre Feet

2.2 Individual Planning and Compliance

The District is a member of El Dorado Water Agency (EDWA). The EDWA is long-term water planning organization established by the El Dorado County Water Agency Act (California Water Code Appendix Section 96-1, et seq.). EDWA's Board of Directors is composed of representatives from both the El Dorado County Board of Supervisors and public water purveyors, including the District, within the County. EDWA has the power to take actions necessary to ensure sufficient water may be available for present and future beneficial uses within the agency boundaries, including the power to carry on technical and other necessary investigations pertaining to water supply, water rights and use of water within the agency. All land use planning and development approvals within the District's boundaries are the responsibility of El Dorado County. The District's service area does not include any incorporated cities. As detailed in Table 2-2, the District has prepared an individual UWMP.

Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* *drop down list*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

2.3 Calendar Year and Units of Measure

The District is geographically isolated and; therefore, is only a retail supplier. All data presented in the 2020 UWMP represents a calendar year. All values presented in the 2020 UWMP are in ac-ft unless noted. Table 2-3 details the District's supplier identification information.

Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	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

2.4 Wholesale Information

The District does not supply wholesale water.

3.0 SYSTEM DESCRIPTION

3.1 General Description

3.1.1 District Historical Background

The discovery of gold near the present site of Coloma by James W. Marshall in 1848 resulted in an influx of settlers to the Georgetown area. The general region now occupied by El Dorado County rapidly became one of the most populous areas of the State. The town of Georgetown was founded on August 7, 1849 by George Phillips. Gold valued in millions of dollars was taken from the area during the early years of the Gold Rush, and it was during this period that the original water system for the Georgetown Divide area was developed.

The initial diversions and ditches were constructed by three companies beginning in 1852. One of the companies, the Pilot Creek Ditch Company, later absorbed the other two, and expanded the system to supply water to nearly the entire area presently supplied by the District. In 1872, a group of San Francisco investors formed the California Water Company and purchased the Pilot Creek Ditch Company. The California Water Company subsequently constructed Loon Lake Dam making considerable improvements to the distribution system and established the first policy for furnishing water for irrigation purposes.

The name of this company was changed to the Loon Lake Water and Power Company in 1890, and shortly thereafter it was purchased by the Truckee General Electric Company. This company, in turn, changed its name to the Sierra Pacific Power Company in 1915. In 1931, the Georgetown Water Company, Ltd., was formed and purchased the water system serving the Georgetown area from Sierra Pacific.

In accordance with Ordinance Number 137 of the El Dorado County Board of Supervisors, formation of the Georgetown Divide Public Utility District was submitted to and approved by the electorate of the proposed District on June 4, 1946. The statutory authority enabling the District to construct, finance, maintain, and operate a water system is found in Section 16461 of the Public Utilities Code of California. By 1952, the District had purchased all of the facilities of the Georgetown Water Company. In 1961, these facilities were officially conveyed by deed to the District. The District sold all of its facilities and water rights in the Upper Rubicon Basin to the Sacramento Municipal Utility District (SMUD) in 1957. The proceeds of the sale were to be used by the District to develop an improved and enlarged source of supply on Pilot Creek. This development became known as the Stumpy Meadows Project and was financed by a loan under Public Law 984, with most of the loan to be repaid using the SMUD payments.

The Georgetown Water Company, the immediate predecessor to the District, as well as its antecedents, held certain rights to the South Fork Rubicon River and Pilot Creek. Pilot Creek is a tributary of the Rubicon River which is in turn a tributary to the Middle Fork American River. Water use from these sources had been established as early as 1852, and the owners of the Georgetown Water Company claimed pre-1914 rights by acquisition and use to waters of those streams and several other minor watersheds. In addition, the Company claimed and held title to facilities and properties related to providing water to the Georgetown Divide, including a storage reservoir at Loon Lake (completed about 1883), and a conveyance system to bring water from Loon Lake, re-diverting it from the South Fork Rubicon River into the Pilot Creek drainage, and re-diverting it at Stumpy Meadows (a meadow at that time, not a reservoir) to the Georgetown Divide Ditch. The water was primarily used for mining and agriculture along the Georgetown Divide although some was also used for domestic purposes.

After formation of the District in 1946, Application 12421 was filed in 1948. The District requested diversion and storage rights pertinent to the Loon Lake project, which was originally the Company's and then the District's major source of water. In addition, a diversion right of 50 cubic feet per second (cfs) and storage rights for 20,000 ac-ft per year were requested in the Pilot Creek watershed, as well as a number of storage sites in the service area. The District was then in the process of acquiring the Georgetown Water Company rights, facilities, and properties including Loon Lake Reservoir and ditches, to supply the Georgetown Divide service area. The facilities were finally acquired by the District in 1959. Application 12421 had been filed to formalize the rights that the District would eventually acquire from the Georgetown Water Company, and to provide for and protect a future potential water supply for the Georgetown Divide.

In the early 1950's, SMUD expressed a desire to acquire rights and facilities of the District in the Upper Rubicon Basin, including Loon Lake and the potential future water supply from the Rubicon River, for construction of the Upper American River Hydroelectric Project. In turn, SMUD offered to provide financial assistance for planning and construction and to assist in acquiring the necessary water rights for an alternate District water supply in the Pilot Creek Basin, including the 20,000 ac-ft reservoir proposed by the District, as well as a diversion of 50 cfs from Pilot Creek. In return, the District was to withdraw its applications for rights in the Upper Rubicon watersheds under A12421 in favor of SMUD, but the District was to keep that portion of the application related to the reservoir and diversions on Pilot Creek.

During the period of negotiation, the District filed Application 16212 (1955 and 1956) requesting additional necessary diversion rights for the alternative replacement water supply. The concepts regarding the various features of the replacement water supply had already been established, but only preliminary design studies and plans had been completed at that time. The project as originally proposed, envisioned the storage reservoir at Stumpy Meadows and direct diversion from Pilot Creek at the dam as described in A12421. In a later project revision, water was to be released from Stumpy Meadows Reservoir for re-diversion from Pilot Creek. The old Georgetown Divide ditch between

Stumpy Meadows and Tunnel Hill was to be abandoned, and a new conveyance system, the El Dorado Conduit, constructed.

Application 16212 requested an additional 50 cfs diversion from Pilot Creek and diversion rights totaling 25 cfs from the tributaries to Pilot Creek and Otter Creek that would be intercepted by the proposed conveyance system. The application also requested 3,000 ac-ft of storage at Mutton Canyon and 4,000 ac-ft of storage on an unnamed canyon along the conduit route, but these storage amounts were eventually denied. The District also filed A16688 to divert water from Onion Creek in a similar fashion to that being used by predecessors. Onion Creek water would be diverted into Pilot Creek for off-stream storage at Stumpy Meadows Reservoir and re-diverted from Pilot Creek into the El Dorado Conduit at a point near Mutton Canyon.

Decision 893, issued on March 18, 1958, allocated the various waters of the American River watershed including the waters of interest to the District and to SMUD. The District and SMUD had apparently reached agreement at this time as to the exchange of water facilities in the Rubicon River and Pilot Creek. Decision 893 resulted in permits 11304, 11305, and 11306 which approved the District's diversion and storage rights.

On June 25, 1958, the District filed for partial assignment of State Filing A5644, specifically to obtain an earlier filing date for at least certain portions of the Stumpy Meadows Project. The application requested:

1) 100 cfs direct diversion from Pilot Creek
2) 20,000 ac-ft storage on Pilot Creek as had been described in the Stumpy Meadows

A *Project Feasibility Report* was prepared by consultant Clair A. Hill. Permit No. 12827 dated June 30, 1961, approved the 100 cfs diversion and 20,000 ac-ft of storage. This permit was issued in compliance with the terms of Decision 1013.

3.1.2 Governance and Service Area

The District is a Public Utility District and operates under a governing five-member Board of Directors elected at-large for four-year overlapping terms. The District's management is under the direction of the General Manger, Clerk and ex-officio Secretary of the Board, who is appointed by, and serves at the pleasure of the Board.

The Georgetown Divide is situated on the west slope of the Sierra Nevada foothills, approximately 45 miles northeast of Sacramento, California in El Dorado County. It straddles a ridge which separates the drainage basin of the Middle Fork American River and the Rubicon River (a tributary to the Middle Fork of American River) on the north from the South Fork American River to the south. The District's sphere of influence is bounded on the north, south, and west by these rivers (see Figure 1). The sphere of influence covers about 173,000 acres (270 square miles). The existing service

area encompasses approximately 75,000 acres (112 square miles) with approximately 30,000 acres currently having some form of water service available.

The District currently provides treated water service to the communities of Georgetown, Buckeye, Garden Valley, Kelsey, Spanish Dry Diggins, Greenwood, Cool, and Pilot Hill. The entire service area is located within an unincorporated area of El Dorado County. Through combined and separate infrastructure, portions of these same communities also receive untreated water for irrigation purposes.

Elevations in the District's service area vary from 500 feet above mean sea level (amsl) at the southwestern boundary to 6,100 feet amsl at Silver Hill on the eastern boundary. The relief varies from rolling foothills in the west to steep slopes and deep canyons in the upper elevations. The community of Georgetown is located at the top of the Divide at an elevation of 2,654 feet amsl.

3.1.3 Source of Supply – Stumpy Meadows Surface Water Diversion

The primary source of water to the District is the Stumpy Meadows Project, which includes storage facilities, diversion structures, and a conveyance system to the service area. The project was completed in 1962 using funds from a Public Law 984 Loan administered by the Mid-Pacific Region of the U.S. Bureau of Reclamation.

Stumpy Meadows Reservoir is formed by a 162-foot-high rock and earth fill dam (Mark Edson Dam) located on Pilot Creek. The full pool operating level is the spillway crest of the dam at an elevation of 4,262 feet amsl, with a storage capacity of 20,000 ac-ft and a surface area of approximately 330 acres. The minimum pool elevation is 4,170 feet amsl with a dead pool storage of 1,200 ac-ft, and a usable storage of approximately 18,800 ac-ft. The outlet structure is a screened, 25 square-foot precast reinforced concrete intake tower with a sill elevation of 4,132 feet amsl (130 feet below the crest of the spillway). Water released from the reservoir is funneled through a 30-inch-diameter welded steel pipeline which discharges to Pilot Creek. Flows are controlled by a Howell-Bunger valve at the discharge end of that line, with the water being redirected into Pilot Creek. The catchment area of the watershed supplying the Stumpy Meadows project is approximately 11.7 square miles, ranging in elevation from 4,170 to 6,190 feet amsl (Figure 2). The spillway is an unregulated over pour section constructed in a horseshoe configuration. The spillway discharges into a concrete chute which rejoins Pilot Creek approximately 500 feet below the toe of the dam.

On July 1, 2022, a *Stumpy Meadows Volume Survey* was completed. The revised storage capacity or full pool of Stumpy Meadows Reservoir was calculated at 21,206 ac-ft at 4,262 feet amsl. The minimum pool elevation is 4,170 feet amsl with a dead pool storage of 1,870 ac-ft, and a usable storage of approximately 19,335 ac-ft.

Water is released into Pilot Creek and is re-diverted into the District's water supply system by the Pilot Creek Diversion Dam located approximately two miles downstream of Edson Dam, near the mouth of Mutton Canyon Creek. The Pilot Creek Diversion Dam is a 110 by 20-foot reinforced concrete structure which diverts water into the El Dorado Conduit. A 36-inch-wide sluice gate controls the flow into an open concrete channel that conveys the flow into a 48-inch RCP conduit. The inlet structure is screened by a trash rack constructed of No. 8 rebar on 9-inch centers. The flow is then deviated into the El Dorado Conduit. The portion of the watershed above the diversion structure is not included in the Stumpy Meadows Reservoir watershed is about 4.1 square miles.

Diversion structures along the El Dorado Conduit divert water from cross drainages between Mutton Canyon and Tunnel Hill. Some of the en-route drainage is also intercepted by the conveyance ditch. These en-route cross diversions provide a minimal supplementary supply to the District's system, and drain, in total, approximately three-square miles of watershed above Tunnel Hill. The small watersheds tapped by the Stumpy Meadows Project below the reservoir are in a lower elevation region where snow accumulation and melt have a lesser impact on time-distribution of runoff, rendering the available water supply from these diversions less dependable and entirely secondary to the primary supply of the reservoir.

3.1.4 Description of Domestic Water System

Raw water from the Stumpy Meadows Reservoir is released down Pilot Creek, where it is diverted and conveyed through approximately 70 miles of supply ditch/conduits throughout the District. The first diversion is to Walton Lake, a raw water surface impoundment. Walton Lake supplies raw water to the Walton Lake Water Treatment Plant. The plant is located four miles east of Georgetown and has a production capacity of approximately three million gallons per day (mgd). The Walton Lake Treatment Plant distribution system serves the communities of Georgetown and portions of Greenwood, Kelsey and Garden Valley.

Following Walton Lake, raw water is delivered through a system of pipes and open ditches to another 10 ac-ft surface water impoundment that serves the Sweetwater Treatment Plant (formerly known as the Auburn Lake Trails Treatment Plant). In December 2019, the construction of a new three mgd water treatment plant was completed to comply with State Water Resources Control Board filtration requirements. The Sweetwater Treatment Plant serves the western portion of the District's service area including the communities of Cool, Pilot Hill and portions of Greenwood.

The District's treated water distribution system consists of eight generalized pressure zones, 11 treated water storage tanks, 200 miles of distribution mains and six water pumping stations. The District water system is linear in nature, generally relying on topographic relief for conveyance from the Stumpy Meadows Reservoir to the east and a system of pipes and ditches to convey water down slope to the west to various places of use. The District operates several small regulating reservoirs; however, with a break or outage in the primary transmission system, the potential exists for water

supply disruptions if the outage lasts for multiple days. Future water supply options should consider the ability to improve redundancy, the level of water service reliability and storage, in addition to meeting projected water demands.

3.1.5 Water System Reliability

In 2002, KASL Engineering completed a *Water System Reliability Study* for the District that identified and prioritized repairs, upgrades and measures to ensure raw water and treated water distribution and storage networks reliably meet customer demands. Projects are regularly incorporated into the Districts Capital Improvement Program (CIP) and are completed as funds become available.

3.2 Service Area Boundary Maps

A series of maps are provided as detail below:

- Figure 1 shows the treated water service area boundary and sphere of influence;
- Figure 2 shows the Pilot Creek watershed;
- Figure 3 shows the treated water distribution system; and
- Figure 4 shows the raw water conveyance system.

3.3 Service Area Climate

The District is located within 38 degrees latitude north and is classified as a Mediterranean climate which is characterized by hot, dry summers and cool, wet winters. Service area elevations extend from approximately 1,200 feet amsl in Pilot Hill to approximately 3,000 feet amsl in Buckeye in the Sierra Nevada Foothills. Precipitation varies greatly through the District due to orographic lifting.

3.3.1 Historical Precipitation Data

Precipitation in the Pilot Creek drainage tributary to Stumpy Meadows Reservoir averages about 66-inches per year. Much of the precipitation occurs as rain, particularly in the lower elevations. Snowpack accumulates in western portion of the watershed. Often the time distribution of the runoff hydrograph is controlled by snow accumulation and snow melt. Rainfall within the District's service area ranges from an annual average of 38.79 inches in Pilot Hill to 53.13 inches in Georgetown. Average annual snowfall in the eastern portion is approximately 16.6 inches. Most of the precipitation falls between late October and mid-April.

3.3.2 Climate Change Supply Reliability Summary

Similar to many water purveyors located along the western slope of the Sierra Nevada Mountains, the District recognizes the climate change impacts and how it will impact supplies. As discussed in

the following sections, the District expects future years to have downwards trends of total precipitation along with a trend towards more rainfall and less snowfall resulting in a shift in spring runoff occurring earlier in the season. The District has safeguards to protect treated water reliability during both single and multiple year dry periods. These safeguards are discussed in detail in the following Sections.

3.4 Service Area Population and Demographics

The District provides treated water to a total of 3,689 active customers. Customers are tracked under five water use categories: residential; multi-family; commercial; governmental/institutional and large landscape service. The District also provides irrigation water service.

3.4.1 Customers

In 2020, treated water customers consisted primarily of residential customers, with 96% of the District's accounts serving single family (3,595 accounts) dwellings. The District also had 10 multi-family units accounts serving 94 households. The District is fully metered with the exception of three the unmetered governmental connections. The District had 138 commercial/governmental accounts in 2020, which represent 4% of the total treated water accounts in the District. There were also seven large landscape accounts account for 0.2% of the total treated water accounts. The seven large landscape accounts included a nine-hole golf course owned by the Auburn Lake Trails Property Owner's Association, two other landscape accounts, two cemeteries and one Georgetown Divide Recreation District Park.

In 2020, there were 382 irrigation accounts where the District provided untreated raw water representing 74% of total water usage by the District. Irrigation water is used in a variety of ways on the Divide, including: Christmas tree farms, vineyards, pasture, orchards and hay production. This untreated raw water usage is not included in the analysis of the treated water system demands; however, it is discussed in the DRA.

3.4.2 Population

To estimate the 2020 population in the District's service area the persons per household (pph) census data for El Dorado County was used. The calculated pph for El Dorado County was 2.53. Census data is presented in Appendix A. Using a residential and multi-family residential households total of 3,689, the District's estimated service area population in 2020 is calculated to be 9,333.

3.4.3 Population Projections

The County of El Dorado's 2014 *General Plan* last amended in December 2019 (General Plan) cited an annual growth rate of 1.03 percent. We applied this factor to the District's population growth

projections. This annual growth rate generally mirrors the District's observed growth rate. Between 1995 and 2020 the average annual growth rate in the District boundaries was estimated at 1.05 percent. Due to topography, zoning, water supply, and sewage disposal constraints, the District's growth rate is not expected to significantly increase in the coming years. Table 3-1 presents the estimated population growth between 2020 and 2045 based on an occupancy rate of 2.53 pph and a 1.05 percent growth rate.

Table 3-1: Population - Current and Projected

	2020	2025	2030	2035	2040	2045*(opt)*
Population Served	9,333	9,833	10,360	10,916	11,501	12,118

3.4.4 Other Demographic Factors

The communities of Georgetown, Garden Valley, Kelsey, Greenwood, Cool and Pilot Hill make up the majority of the District's customers. With the exception of Georgetown and Cool, the majority of parcels within the District are greater than two acres reflective of a large geographical distribution of customers. The Auburn Lake Trails subdivision, located in the community of Cool, has approximately 1,200 customers, and makes up nearly one-third of the District's customer base.

The California Public Utilities Commission classified portions of Georgetown, Garden Valley and Kelsey in 2018 as disadvantaged community.

3.5 Land Uses Within Service Area

The General Plan identifies land use areas within the District's boundaries as: agricultural lands; commercial; low, medium and high density residential; rural residential; and multi-family residential and are described as follows.

Commercial: Commercial zoned areas are limited to the communities of Georgetown, Kelsey, Garden Valley, Greenwood, Cool and Pilot Hill. With the exception of Georgetown and Cool, less than ten commercial parcels are designated in each community. Georgetown and Cool have approximately 20 parcels each.

Agricultural Lands: Agricultural lands are largely located between Georgetown and Garden Valley and a majority of the parcels have been developed.

Residential / Rural Residential / Multi-Family Residential: The majority of land within the District's service boundary consists of low-density residential developments with limited areas of medium, high and rural residential. A few parcels of multi-family residential are developments located in Georgetown and Cool.

The goal of the General Plan is as follows: "*Protection and conservation of existing communities and rural centers; creation of new sustainable communities; curtailment of urban/suburban sprawl;*

location and intensity of future development consistent with the availability of adequate infrastructure; and mixed and balanced uses that promote use of alternate transportation systems." Future land use within the District's service area is expected to consistent with the General Plan.

4.0 WATER USE CHARACTERIZATION

4.1 Non-Potable Versus Potable Water Use

The District supplies both treated and irrigation/agricultural water to our customers.

4.2 Past, Current, and Projected Water Use by Sector

This section details the District's overall historical, current and projected water use between sectors.

4.2.1 Water Use Sectors Listed in Water Code

The District supplies treated water to approximately 3,900 customers who include:

- Single-Family Residential;
- Multi-Family Residential;
- Commercial;
- Institutional/Governmental; and
- Landscape

The District also provides seasonal irrigation water to approximately 400 customers.

4.2.2 Water Use Sectors in Addition to Those Listed in Water Code

During 2020, with the exception of one temporary water transfer, the District did not supply water to other water use sectors. During the months of August and September 2020, the District transferred approximately 2,000 ac-ft of raw water to Westland Water District. The water transfer was a one-time transfer. Potential future water transfers will be determined on a year-by-year basis depending on source supply availability and downstream demand.

4.2.3 Past Water Use

Between 2016 and 2019, water use at the district was generally stable and ranged from 11,606 to 12,220 ac-ft. The gross treated water usage was 164 gallons per capita per day (GPCD) in 2016 and 155 GPCD in 2019. Water usage amounts for this period are detailed on Table 4-1.

Table 4-1: Historical Water Use					
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*	Level of Treatment When Delivered *Drop down list*	2016	2017	2018	2019
Single Family	Drinking Water	1,062	1,161	1,094	1,027
Multi-Family	Drinking Water	13	16	13	14
Commercial	Drinking Water	40	45	37	48
Institutional/Governmental	Drinking Water	86	92	97	83
Landscape	Drinking Water	71	62	55	54
Agricultural irrigation	Raw Water	4,654	4,654	4,256	4,055
Losses	Drinking Water	329	272	297	391
Losses	Raw Water	1,800	2,084	2,897	2,459
	TOTAL	10,072	10,404	10,765	10,150
NOTES: Units - Acre Feet					

4.2.4 Distribution System Water Loss

The District operates and maintains approximately 200 miles of a pressurized water distribution system. The most recent water audit completed for the calendar year 2019 calculated real and apparent losses at approximately 390 ac-ft. At the time of preparation of this UWMP, a water loss standard has not yet been adopted. Average annual water losses for our pressurized treated water distribution system between 2016 and 2020 are estimated to be approximately 322 ac-ft. Estimated water losses for 2020 are detailed on Table 4-2.

Table 4-2: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
01/2016	329.4
01/2017	272.4
01/2018	296.8
01/2019	390.7
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: Units - Acre Feet	

In addition to treated water losses, the District tracks losses associated with raw/irrigation water conveyance system. In 2020 estimated raw/irrigation water conveyance losses was approximated at 3,900 ac-ft.

4.2.5 Current Water Use

Current water uses for 2020 totaled 11,367 ac-ft and including residential, commercial, industrial, institutional, landscape, irrigation, the temporary water transfer and water losses associated with the distribution of both treated and raw water. Treated and irrigation water demand is detailed on Table 4-3.

Table 4-3: Demands for Potable and Non-Potable Water - Actual

Use Type *(Add additional rows as needed)*	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
Single Family		Drinking Water	1,188
Multi-Family		Drinking Water	15
Commercial		Drinking Water	37
Institutional/Governmental		Drinking Water	89
Landscape		Drinking Water	61
Agricultural irrigation		Raw Water	3,941
Sales/Transfers/Exchanges to other agencies		Raw Water	2,000
Losses	Treated Water Distribution System	Drinking Water	416
Losses	Raw Water Conveyance System	Raw Water	3,619
		TOTAL	11,366

NOTES: Drinking water losses are associated with pressurized distribution system. Raw water losses are associated with raw water conveyance system that includes concrete lined/unlined open ditch and pipe.
Units - Acre Feet

4.2.6 Projected Water Use

Projected water use was calculated based on the District's estimated 2020 population, the referenced water use categories and actual water usage. The District does not project the addition of more customer use classes. The treated and irrigation water use projections include the following customer classes: single family, multi-family, commercial, institutional/governmental, landscape and irrigation. Projections also include treated water distribution losses and raw/irrigation water conveyance losses. Water loss projections were calculated using the average losses observed between 2016 and 2020. Treated and irrigation water projections are detailed on Table 4-4.

Table 4-4: Use for Potable and Non-Potable Water - Projected						
Use Type *(Add additional rows as needed)*	Additional Description	Projected Water Use *Report To the Extent that Records are Available*				
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*		2025	2030	2035	2040	2045 (opt)
Single Family		1,249	1,317	1,388	1,461	1,539
Multi-Family		17.6	18.6	19.6	20.6	21.7
Commercial		39.7	41.9	44.1	46.4	48.9
Institutional/Governmental		95.5	100.8	106.1	111.7	117.7
Landscape		66.1	69.8	73.5	77.3	81.5
Agricultural irrigation	Raw Water	4,794	4,794	4,794	4,794	4,794
Losses	Treated Water	341	341	341	341	341
Losses	Raw Water	2,572	2,572	2,572	2,572	2,572
	TOTAL	9,175	9,256	9,338	9,424	9,516
NOTES: Raw water conveynace and treated water loss based on 5-year average. Units - Acre Feet						

The District completed a temporary water transfer in 2020 which resulted in an above average total gross water use in 2020. The 20-year projection does not include future temporary water transfers. Future temporary water transfers will be determined by supply availability and demand, on a year-by-year annual basis. Total gross water use is detailed on Table 4-5.

Table 4-5: Total Gross Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R*	11,366	9,175	9,256	9,338	9,424	9,516
Recycled Water Demand* *From Table 6-4*	0	0	0	0	0	0
TOTAL WATER USE	11,366	9,175	9,256	9,338	9,424	9,516
**Recycled water demand fields will be blank until Table 6-4 is complete.*						
NOTES: Units - Acre Feet						

4.2.7 Characteristic Five-Year Water Use

The District developed a five-year water trend for treated and irrigation water based on current population and demand utilizing the DWR's planning tool. During 2020, water use was calculated to be 11,366 ac-ft. Based on this methodology, District water use is estimated to be 9,175 ac-ft in 2025.

4.3 Worksheets and Reporting Tables

The District utilized the DWR developed planning tool methodology and spreadsheet. The completed spreadsheet is included in Appendix B.

4.4 Water Use for Lower Income Households

The District offers a Low-Income Rate Assistance Program (LIRAP) to residential customers. The LIRAP provides a discount on the base rate charge for treated water. A total of 255 customers are enrolled in the program and account for approximately 0.06% of water usage during the 2020 report period. Low-income usage is included demand projections and is detailed in Table 4-6.

Table 4-6: Inclusion in Water Use Projections

Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc… utilized in demand projections are found.	8.5
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes

4.5 Climate Change Considerations

On October 21, 2019, EDWA a completed *Water Resources Development and Management Plan* (WRDMP) to serve as a comprehensive resource and planning document for water purveyors in El Dorado County. The WRDMP is included in Appendix C. Key components of the WRDMP address water reliability in relation to climate change. The District has limited resources to develop a similar plan and therefore, is utilizing EDWA's WRDMP to understand and plan for the anticipated climate change impacts along El Dorado County's west slope and impacts specifically related to the District. Key climate change indicators identified in the plan along the west slope include:

Water Supply – Demand Imbalance: The WRDMP found climate change will likely result in increased runoffs during winter months, and a reduced snowmelt in spring months. This would likely result in earlier filling of Stumpy Meadows Reservoir and earlier use of storage.

Vulnerability During Droughts: The west-slope generally relies on surface water as a primary source of supply. Similarly, the District relies on a single surface water supply and is geographically isolated from neighboring purveyors. The District employs documents such as the UWMP and drought contingency plans to manage water supplies during periods of drought.

Impacts of Wildfires: In 2014, the King Fire burned a significant portion of the Pilot Creek watershed that supplies Stumpy Meadows Reservoir. The King Fire represented damaging impacts of severe wildfire due to drought periods, an overly dense forest and prolonged drought periods.

Limited Groundwater Resources: The District has no plans to use groundwater as a source of supply to augment current surface water supply. Rationale for this strategy is further detailed in Section 6.2.2.

5.0 WATER CONSERVATION BASELINE AND TARGETS

This section provides the District's methodology as to how we met the requirements of the *Water Conservation Act of 2009,* as known as the SB X7-7. This act required the District to reduce urban GPCD use by 20 percent by the year 2020. In order to determine if the District met the SB X7-7 baseline, GPCD was calculated as presented in Section 5.2.

5.1 2020 UWMP Updated Calculations

The District did not experience any of the following changes that would have resulted in an updated calculation:

- Distribution area expansion caused by mergers;
- Distribution area contraction; or
- Distribution area expansion by annexation of already developed areas.

5.2 Baseline and Target Summary

The District's treated water production is estimated by the volume of treated water measured at the outlets of the District's two water treatment plants. The District's total estimated treated water production includes water used for fire hydrant flushing, firefighting, un-metered connections and water losses. Water production does not include the untreated irrigation water distributed by the District through its canal system.

The average baseline GPCD was calculated at 203 GPCD for the 10-15 (1999-2008) year baseline period and 207 GPCD for the five-year baseline period resulting in 2020 target usage of 178 GPCD. Table 5-1 summaries baselines and targets. The 2015 UWMP included a target of 167 GPCD for 2020 using Method 3. The District has met the 167 GPCD target every year since 2013 with the exception of 2017 and 2020 with usages at 170 and 178 GPCD, respectively.

Table 5-1: Baselines and Targets Summary
Retail Supplier or Regional Alliance Only

Baseline Period	Start Year	End Year	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	*1999*	*2008*	*203*	*167*
5 Year	*2004*	*2008*	*207*	*167*
*All values are in Gallons per Capita per Day (GPCD)				

During the target 2020 year the District recorded a GPCD of 173, six points higher than the Method 3 target of 167 GPCD for Sacramento River Hydrological Region. The District views the calculated 2020 GPCD as an outlier. GPCD has been trending down since 1995 and is anticipated to continue to trend down. Table 5-2 details the Districts 2020 compliance target. SBX7-7 verification forms are included in Appendix D.

Table 5-2: 2020 Compliance
Retail Supplier or Regional Alliance Only

Actual 2020 GPCD*	Optional Adjustments to 2020 GPCD				Adjusted 2020 GPCD*	2020 GPCD* *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction
	Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*			
173	0	0	0	0	173		**NO**

**All values are in Gallons per Capita per Day (GPCD)*

The District will submit a supplemental attachment detailing a plan to meet GPCD requirements.

5.3 Service Area Population

As discussed in Section 3.4, the District utilized the person-per-household method to calculate the service area population. An occupancy rate of 2.53 was used to calculate GPCD.

6.0 WATER SUPPLY CHARACTERIZATION

6.1 Water Supply Analysis Overview

The primary source of water to the District is the Stumpy Meadows Project which includes storage facilities, diversion structures and a conveyance system to the service area as shown on Figure 4. Stumpy Meadows impounds 22,206 ac-ft of surface water runoff by utilizing a 162-foot high rock and earth fill dam with a spillway crest elevation of 4,262 feet amsl.

The District utilized the optional planning tool developed by the DWR to plan for normal year, single dry year and droughts lasting up to five consecutive years. The District supplies treated water year round and irrigation water 5 of 12 months (May-September). Based on District supply and demand conditions a water shortage condition would not occur during a normal, single and 5-year drought scenario. A description of DWR's optional planning tool is included in Appendix B.

6.2 Water Supply Characterization

Water supply used for consumption purposes can be generated from many sources. The following sections detail the District's water supply.

6.2.1 Purchased or Imported Water

The District is unable to purchase or import water because the District is geographically isolated from other sources and the cost to import water is prohibitive.

6.2.2 Groundwater

District is not planning to use groundwater as a source of water to supplement its sole surface water source because the local ground water resources are not of sufficient quality or quantity to be a viable augmenting resource.

On the western slope of El Dorado County, groundwater occurs primarily in hard rock. Throughout the County, as in other parts of the Sierra Nevada foothills, alluvium consisting of unconsolidated deposits of clay, silt, sand, and gravel are laid down by surface flows and only occurs in small areas and are usually too thin to provide a significant amount of groundwater storage. Thus, the amount of usable groundwater is limited. A cooperative study entitled Georgetown Divide Water Management Study prepared by the DWR describes water supply alternatives available to the Georgetown Divide area and includes a discussion of the groundwater situation on the western slope. The following is an excerpt from that study:

"Many wells are drilled in hard crystalline rock that lies at or near the ground surface or under the thin layers of alluvium. In rock formations water moves through, and is stored in, fractures in the rock mass. The width of each fracture usually decreases with depth, causing diminished water flow and storage capacity. The amount of water that can be stored and transmitted in such fractures is generally small compared to the amount that can be held and conveyed in a porous alluvial aquifer. The survey showed that while many residential wells produced 4 to 10 gallons per minute (gpm), many had flow rates less than one gpm, and some had gone dry. Other reports substantiate the limitation of groundwater as a dependable source of water for supplementing public water supply or augmenting surface water storage during droughts. In fact, the contrary may be true where users of groundwater may look to the Districts for service when their wells go dry during droughts. Surveys also indicate that groundwater quality, though satisfactory in most 24 areas of the western slope, is often marginal. As future development occurs in areas beyond pipeline service, both quantity and quality of groundwater sources could be threatened."

The Department of Water Resources' 2003 Bulletin 118 also characterizes groundwater in the foothills as follows:

"Groundwater development in the fractured rocks of the foothills of the southern Cascades and Sierra Nevada is fraught with uncertainty. Groundwater supplies from fractured rock sources are highly variable in terms of water quantity and water quality and are an uncertain source for large-scale residential development."

6.2.3 Surface Water

Similar to many purveyors located along the west slope of the Sierra Nevada the District's primary water supply is a surface water impoundment; in the District's case, the Mark Edson Dam to the Stumpy Meadows Reservoir.

6.2.3.1 Yield Analysis

In order to determine the adequacy of the District's water supply system, yield analyses were determined. Sierra Hydrotech an engineering firm specializing in water system evaluations, analyzed yield of the water supply system. The results of this analysis are described in a report entitled *Stumpy Meadows Project Safe Yield Analysis*, dated June 1985, Revised 1986. This report describes project yield delivered to the service area with deficiencies taken in a critically dry year. The analysis was conducted by a computer model using a monthly reservoir operation simulation that, included diversions and losses in the conveyance system. The DWR re-analyzed the project yield data with virtually the same results.

6.2.3.1.1. Definition of Yield

When used in conjunction with water supply projects, the term "yield" generally refers to an annual quantity of water that can be made available to the potential project service area on a specified delivery schedule. Since this is only a general definition, more specific descriptions are required to distinguish the different types of yield. In this report, two types of yield will be discussed[1].

- **Safe Yield** is defined as "*the maximum quantity of water that can be made available without deficiency each and every year without any adverse effects and under hydrologic conditions similar to those in the historic record*." From the "*2009 Options to Increase Water Supply*" report the existing safe yield of Stumpy Meadows is 11,319 ac-ft and represents the maximum quantity of water that can be made available without deficiency each and every year of the historic record.
- **Firm Yield** is defined as "*the maximum annual quantity of water that can normally be made available each year under historic hydrologic conditions. Exceptions are allowed in critical and some dry years when a deficiency may be imposed.*" Based on available hydrologic data and operation studies performed by the District, Sierra Hydrotech and the DWR, it was determined that the period from 1975 through 1978 continues to be the most critical dry hydrologic period for the Stumpy Meadows Project as configured and has been used as the critical period for determining the firm yield of the source.

6.2.3.1.2. Stumpy Meadows Project Firm Yield

The objective of the firm yield analysis was to guide the District in operating of the Stumpy Meadows system for the period 1927 through 1983 for various levels of deficiencies in treated and untreated deliveries. The system was operated similarly to the safe yield analysis with the exception that during dry periods such as 1976 and 1977, deficiencies were applied to the water requirements.

The firm yield of the 21,206 ac-ft Stumpy Meadows Reservoir is calculated to be 13,190 ac-ft, which allows for critical dry year deficiencies in both raw water and treated water deliveries. The District Board of Directors adopted this criterion on May 13, 1997, and reaffirmed it on January 10, 2006. Actual water supply is detailed in Table 6-1.

[1] Yield and capacity values have been adjusted to match current Stumpy Meadows Volume

Table 6-1: 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				
Surface water (not desalinated)	Stumpy Meadows Reservoir	21,206	Drinking Water	13,190
	Total	21,206		13,190
NOTES: Units in acre-feet				

The firm yield analysis indicates that the District's water supply system meets both the treated water and irrigation water demands in a normal water year through 2045. This analysis includes anticipating an increase in irrigation demand during that time period. (total anticipated demand of 9,516 ac-ft). When the irrigation demands are calculated based on District ordinance 2005-01, the total demand in 2045 is estimated to be 4,794 ac-ft. The projected water supply to 2045 is detailed in Table 6-2.

Table 6-2: Water Supplies — Projected												
Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*										
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*		**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												
Surface water (not desalinated)	Stumpy Meadows Reservoir	21,206	13,190	21,206	13,190	21,206	13,190	21,206	13,190	21,206	13,190
	Total	21,206	13,190	21,206	13,190	21,206	13,190	21,206	13,190	21,206	13,190
NOTES: Units in acre-feet												

6.2.4 Stormwater

There are no stormwater capture systems located within the District boundaries and there are no plans to develop such systems. Based on previous studies, stormwater capture is not viable option to augment the District's water supply.

6.2.5 Wastewater and Recycled Water

There is currently no recycled water being used in the District's service area. The District is the managing entity for the on-site wastewater disposal system in the Auburn Lake Trails Subdivision. Treatment from these systems is limited to septic tank treatment and disposal is mainly via leach fields. The District has studied the feasibility of recycling wastewater and it was determined the development of a recycled water supply from the Auburn Lake Trails Subdivision disposal system is not practical nor economically feasible.

6.2.5.1 Auburn Lake Trails Wastewater Disposal Systems

In 1984, as part of class action legal settlement, the District became the regulatory agency responsible for wastewater disposal within the 1,100 lot Auburn Lake Trails Subdivision in Cool, and the owner of the Community Disposal System (CDS) serving 139 smaller lots in the subdivision. The Auburn Lake Trails On-Site Wastewater Disposal Zone (Zone) was formed on March 19, 1985. The purpose of the Zone is to preserve and protect the environment and public health through an approved management program for individual and small community waste disposal systems in lieu of an area-wide sewage collection, treatment and disposal system. As set forth in the Resolution 84-6, the District "*shall investigate, test, design, operate, monitor, inspect and if necessary, maintain and repair the On-Site Wastewater Disposal Systems within the Zone at the individual homeowner's expense*". The Auburn Lake Trails Zone was one of the first of its type in the State and served as a model for other Zones in the State and in the nation.

There are currently 1,031 developed lots within the Zone. The type of individual on-site wastewater disposal system utilized on a particular lot is dependent on site-specific soil conditions. Disposal systems currently utilized in the Subdivision are the conventional leach field, mound, pressure dosed, intermittent sand filter, and alternative wastewater disposal systems. The CDS was used for the remaining 139 lots that could not support any of the previously mentioned systems. The CDS collects only septic tank effluent from each residential unit's septic tank. This partially treated wastewater flows by gravity or is pumped up to the effluent lift station. From the pump station, the effluent is pumped to a large tank for distribution to the leach fields. The wastewater effluent is not chemically treated prior to disposal. The system also includes a total of 38 manholes that are 13,360 feet of collection line, a pump station and wet well, and approximately 1,800 feet of force main all connected to the community leach fields. The pump station is equipped with an emergency generator and a failsafe electrical backup system. The community leach fields consist of approximately 11,600 lineal feet of leach line. Presently, there are 137 homes connected to the CDS. An ultrasonic flow meter continuously monitors the wastewater flow to the CDS fields. Average dry weather wastewater flows from this CDS system have been about 30,961 gallons per day for the past five years. At build-out, it is anticipated that the wastewater flows will be approximately 32,000 gallons per day. This wastewater is not disinfected and is classified as primary wastewater.

6.2.5.2 Recycled Water Evaluation

In 2005, the Auburn Lake Trails Property Owner's Association and the District evaluated the potential for utilizing recycled water from the CDS system to irrigate the property owner's association golf course. The existing nine-hole golf course presently uses treated District water for irrigation purposes and for the past five years, the peak daily demand during the summer is about 94,000 gallons per day. It was determined that it was cost prohibitive at this time to develop a recycled water system for the following reasons:

- The wastewater system did not produce sufficient water during the summer months to meet the irrigation water demands of the golf course; and
- A small ultra-filtration/disinfection plant would need to be installed to meet the State's recycled water standards.

The District will continue to explore funding mechanisms to recycle the CDS wastewater for beneficial uses.

6.2.6 Desalinated Water

The District does not have any opportunities to develop desalinated water due to its remote location from any ocean water, brackish water, or high salinity groundwater.

6.2.7 Water Exchanges and Transfers

The District is geographically isolated from its neighboring water purveyors by the two forks of the American River. There are also no existing intertie facilities or source of supply watershed connections that would allow for the District to argument supply.

In 2020, the District executed a temporary water transfer for beneficial use downstream of the Pilot Creek watershed. A total of 2,050 ac-ft was delivered to Folsom Lake utilizing the Rubicon and American Rivers. The District will continue to evaluate future temporary water transfers and their associated agreements based on supply and demand of downstream water users demand on a year-to-year basis.

6.3 Future Water Projects

Inevitably, if the District continues to grow and the demand for treated and irrigation water increases, a supplemental supply to the Stumpy Meadows Project will be necessary to meet District-wide demands. A supplemental water supply would also reduce the magnitude and the frequency of projected water supply deficiencies during a critical drought period.

6.3.1 Potential Water Supply Projects

In April 2009, a report entitled, *Options to Increase Water Supply* was developed by California Water Consulting, Inc. of Roseville, California. This report is included in Appendix E. The report investigated projects to augment water supplies for the District. A total of nine options were evaluated initial cost, annual cost, total cost, total additional yield and cost of water yield criteria. Options included:

1. Conveyance Canal Loss Reduction;
2. Enlarging Stumpy Meadows Reservoir;
3. Upper Stumpy Meadows Reservoir;
4. Rubicon River Diversion;
5. North Fork American River Pumping Plant;
6. Canyon Creek Reservoir;
7. Mutton Canyon;
8. Onion Creek; and
9. Modification to Allowable Demand Deficiency.

The District has determined that many of the additional water supply options identified above are cost prohibitive, institutionally challenging and/or subject to third party permission and agreement by governmental entities whose favorable participation cannot be relied upon. The North Fork American River Pumping Plant (aka American River Pump Station) water supply project likely represents the most feasible new supply source in the long run, even with its limitations and high cost. A more detailed evaluation is included in the District's CIP and is scheduled to be completed.

In the interim, the District continues to focus on reducing conveyance system losses through lining portions of the unlined open canal sections, repairing lined portions of the canal, repairing leaking pipes, and implementing/developing a plan to replace aging water meters. In the past five years, the District has lined approximately 16,100 feet of canal.

6.4 Special Conditions

Special conditions that will likely impact the District's supply and demand include climate change and regulatory conditions.

6.4.1 Climate Change Effects.

District partners including the EDWA identified the four primary criteria likely to impact the west slope water reliability due to climate change effects.

Water Supply – Demand Imbalance: The WRDMP found climate change will likely result in increased runoffs during winter months, and a reduced snowmelt in spring months. This would likely result in earlier filling of Stumpy Meadows Reservoir and earlier use of storage.

Vulnerability During Droughts: West slope purveyors generally rely on surface water as the primary source of supply. Similarly, the District relies on a single surface water supply and is geographically isolated from neighboring purveyors. The District follows documents such as the UWMP and drought contingency plans to manage water supplies during periods of drought.

Impacts of Wildfires: In 2014, the King Fire burned a significant portion of the Pilot Creek watershed that supplies Stumpy Meadows Reservoir. The King Fire represented damaging impacts of severe wildfire due to drought periods, overly dense forest and prolonged drought periods.

Limited Groundwater Resources: The District has no plans to use groundwater as a source of supply to augment current surface water supply. Rationale is further detailed in Section 6.2.2.

The WRMP is included in Appendix C.

6.4.2 Regulatory Conditions

Primary regulatory conditions include the development of Water Loss Standards and Model Water Efficient Landscape Ordinance in response to Senate Bill 606 and Assembly Bill 1668. The goals of the legislation are as follows:

- Develop indoor water use standard that is regulated by purveyor;
- Develop water loss standard; and
- Develop outdoor water use standard.

Each goal will impact the District. Refer to Section 9.0 that in part addresses District activities to meet regulatory conditions.

Making Water Conservation a California Way of Life, prepared by DWR is included in Appendix F.

6.5 Energy Intensity

The District's hydrological model, with few exceptions, largely relies on gravity for water deliveries for both raw water conveyance and treated water distribution. Six pump stations are located throughout the District that supply a small percentage of customers. Thus, energy intensity from source to point of use is relatively minimal. The District's primary sources of energy consumption are the District's two water treatment plants.

Two non-consequential hydropower facilities are located in the District's raw water conveyance system. The District also operates a wastewater pump station as described in Section 6.22. Energy intensity tables are included in Appendix F.

7.0 WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

The District has historically taken and continues to take steps to improve water service reliability. The District has an ongoing CIP to address system reliability, increase water conservation and maximize the available water supply in the future.

In addition to forecasting domestic water demands, the District is also accounting for irrigation water demand for the next 20 years. The District adopted Ordinance 2005-01 in 2005 which allows District staff to respond to reliability issues predicted by the General Plan estimations of growth in irrigation water service. A copy of this ordinance can be found in Appendix H.

Requests for irrigation water service and associated demand are evaluated each April based on the estimated available supply. Irrigation water commitments will not be permitted unless there is sufficient capacity to meet the service requested. Regardless of the estimated available water supply, the maximum number of miner's inches allocated to irrigation customers is limited to the equivalent of approximately 5,000 ac-ft.

During a normal water year, the operation of the irrigation water system begins in about the middle of April when additional supply water from Stumpy Meadows is introduced into the conveyance system. All regulating reservoirs along the system are filled and the ditches are saturated and usually are ready for delivery of irrigation water to irrigation customers by May 1. Irrigation water is delivered to customers through standard orifices and is measured in miner's inches. The contracted amount is delivered at a continual rate, with each customer managing the usage of water.

The irrigation season is generally from May 1 through September 30 of each year but can be shortened in the event of a drought declaration or insufficient water to meet the full season demand. For example, in 2015, the irrigation season was shortened by approximately 41% to 63 days (June 1 through August 2, 2015) resulting the reduction in delivery (or conservation) of nearly 2,800 ac-ft of water to irrigation customers. The irrigation season may also be shifted to best meet customer demand and climatic conditions.

The District has ongoing management practices and conservation programs to reduce losses in the water conveyance system by lining ditches with concrete and gunite, replacing ditches with pipelines, and improving operations that affect losses. This program helps the District conserve water and in increase the life of the District's water supply. In 2020, the District estimated operational losses in the ditch conveyance system of approximately 3,619 ac-ft of water. Improved water conservation practices will continue to decrease the amount of water losses in our system. However, conservation alone may not be sufficient to meet the longer-term (>20 years) projected demands within the District's service area, and eventually, identification of an additional water supply to supplement the Stumpy Meadows Project may be necessary to meet the District's future demands.

7.1 Water Service Reliability Assessment

This section describes the reliability of the District's water supply and its vulnerability to seasonal or climatic shortages.

With the exception of small creeks located along the District's upper canal, the District's primary supply of water is the Pilot Creek watershed which drains into Stumpy Meadows Reservoir. Because this is a surface water supply, it is subject to significant reductions during dry years. However, there are no other legal, environmental or water quality limits on this source of supply.

The average annual runoff into the Stumpy Meadows reservoir is 17,885 ac-ft. The total reservoir capacity is 21,206 ac-ft. The District determines water year allocation by measuring Stumpy Meadows the reservoir level during the second week of April each year. During a normal water year, the reservoir would be full at the time of this measurement. The lowest reservoir level measured at this time was in 1977 when the reservoir's volume was only 11,890 ac-ft. The District has elected to use the 1977 level as the worst-case single year condition and for forecasting the minimum water supply five-year condition. The estimated minimum available five-year water supply is detailed in Table 7-1.

Table 7-1: 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	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☐ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	**% of Average Supply**
Average Year	21206	13190	100%
Single-Dry Year	11890	11027	52%
Consecutive Dry Years 1st Year	11890	11027	52%
Consecutive Dry Years 2nd Year	11890	11027	52%
Consecutive Dry Years 3rd Year	11890	11027	52%
Consecutive Dry Years 4th Year	11890	11027	52%
Consecutive Dry Years 5th Year	11890	11027	52%

NOTES:
Units - Acre Feet

As discussed in Section 4.0, the District has projected water supply availability to meet treated water demands. Approximately seventy percent of the District water use, included loss is dedicated to irrigation water. The irrigation customer allocation is limited to a maximum of 5,000 ac-ft; therefore, the projected demand of raw water remains the same from year to year. Table 7-2 details the normal water year where a total of 20,006 ac-ft is available to treated and irrigation use between 2020 and 2045.

Table 7-2: Normal Year Supply and Demand Comparison

	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	21,206	21,206	21,206	21,206	21,206
Demand totals *(autofill from Table 4-3)*	9,175	9,256	9,338	9,424	9,516
Difference	12,031	11,950	11,868	11,782	11,690

NOTES:
Units - Acre Feet

Based on the 1977 historical dry year, 20-year supply and demand totals were calculated. At the end of the 20-year period a surplus of 4,440 ac-ft would be available. The single dry year supply and demand comparison is detailed in Table 7-3. In addition, the five-year multiple dry year was applied to the 20-year projection. At the end of the five-year multiple dry year scenario, our 20-year projection shows a surplus of 4,440 ac-ft. Our multiple dry years supply and demand comparison is detailed in Table 7-4.

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

	2025	2030	2035	2040	2045 (Opt)
Supply totals	11,890	11,890	11,890	11,890	11,890
Demand totals	9,175	9256	9,338	9,424	9,516
Difference	2,715	2,634	2,552	2,466	2,374

NOTES:
Units - Acre Feet

Table 7-4: Multiple Dry Years Supply and Demand Comparison						
		2025	2030	2035	2040	2045 (Opt)
First year	Supply totals	11,890	11,890	11,890	11,890	11,890
	Demand totals	9,175	9,256	9,338	9,424	9,516
	Difference	2,715	2,634	2,552	2,466	2,374
Second year	Supply totals	11,890	11,890	11,890	11,890	11,890
	Demand totals	9,180	9,261	9,343	9,429	9,521
	Difference	2,710	2,629	2,547	2,461	2,369
Third year	Supply totals	11,890	11,890	11,890	11,890	11,890
	Demand totals	9,185	9,266	9,348	9,434	9,526
	Difference	2,705	2,624	2,542	2,456	2,364
Fourth year	Supply totals	11,890	11,890	11,890	11,890	11,890
	Demand totals	9,189	9,270	9,352	9,438	9,530
	Difference	2,701	2,620	2,538	2,452	2,360
Fifth year	Supply totals	11,890	11,890	11,890	11,890	11,890
	Demand totals	9,194	9,275	9,357	9,443	9,535
	Difference	2,696	2,615	2,533	2,447	2,355
NOTES: Units - Acre Feet						

7.2 Drought Risk Assessment

DRA allows for the District to plan for future water reliability and provides for short- and long-term water management decisions.

7.2.1 Data, Methods, and Basis for Water Shortage Condition

The DRA provides an evaluation based on the five driest consecutive years on record. As discussed throughout the 2020 UWMP, the District experienced a historically dry year in 1977 when the Stumpy

Meadows reservoir level was recorded at 11,890 ac-ft. In the event of water shortage conditions, water allocations and water conservation methods are enacted. Water conservation methods are discussed in Section 8.0.

7.2.2 Water Source Reliability

Stumpy Meadows is the District's only source of water supply. Being a surface water storage facility, year to year water availability relies solely on annual precipitation (e.g., rainfall and snowpack). Stumpy Meadows has proven to be a relatively reliable surface water source. The District does not have water wholesale obligations or does not rely on a purchased supply.

7.2.3 Total Water Supply and Use Comparison

In order to calculate a water supply and use comparison the District utilized the optional planning tool developed by DWR. This planning tool spreadsheet is included in Appendix B. Supply use inputs included both treated and irrigation use. The District classifies treated use as; single family residential, multi-family residential, commercial, institutional and governmental and landscape irrigation. In addition, distribution (treated) and conveyance (irrigation) losses were calculated. Dry year total gross water use was calculated at 9,200 ac-ft in year one and 9,278 ac-ft in year five. In each of the five-year consecutive dry year scenarios treated and irrigation use was calculated below historically dry supply year of 11,890 ac-ft.

For each dry year scenario, a Stage 4 water shortage contingency plan would be triggered. WSCP, demand reduction actions would be applied to total gross water use. Demand reductions include approximately 2,500 ac-ft of irrigation water and 957 ac-ft of treated water. For each dry year scenario demand reduction measure result in 37 to 38 percent surplus of stored water. The five-year drought risk assessment is detailed in Appendix B and Table 7-5.

Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	**Total**
Gross Water Use	9,200
Total Supplies	11,890
Surplus/Shortfall w/o WSCP Action	2,690
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	3,457
Revised Surplus/(shortfall)	6,147
Resulting % Use Reduction from WSCP action	38%
2022	**Total**
Gross Water Use [Use Worksheet]	9,219
Total Supplies [Supply Worksheet]	11,890
Surplus/Shortfall w/o WSCP Action	2,671
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	3,457
Revised Surplus/(shortfall)	6,128
Resulting % Use Reduction from WSCP action	37%
2023	**Total**
Gross Water Use [Use Worksheet]	9,239
Total Supplies [Supply Worksheet]	11,890
Surplus/Shortfall w/o WSCP Action	2,651
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	3,457
Revised Surplus/(shortfall)	6,108
Resulting % Use Reduction from WSCP action	37%
2024	**Total**
Gross Water Use [Use Worksheet]	9,258
Total Supplies [Supply Worksheet]	11,890
Surplus/Shortfall w/o WSCP Action	2,632
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	3,457
Revised Surplus/(shortfall)	6,089
Resulting % Use Reduction from WSCP action	37%
2025	**Total**
Gross Water Use [Use Worksheet]	9,278
Total Supplies [Supply Worksheet]	11,890
Surplus/Shortfall w/o WSCP Action	2,612
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	3,457
Revised Surplus/(shortfall)	6,069
Resulting % Use Reduction from WSCP action	37%
Notes: Units - Acre Feet	

8.0 WATER SHORTAGE CONTINGENCY PLAN

Water shortage contingency planning is a strategic planning process to prepare for and respond to water shortages. Good planning and preparation can help the District maintain reliable supplies and reduce the impacts of supply interruptions. These shortages could be caused by dry years, natural or man-made disasters, system interruptions or failures, water quality emergencies or regulatory action. The District's WSCP documents the process used by the District to anticipate water supply disruptions and shortages and is the operating manual used to prevent catastrophic service disruptions through proactive, rather than reactive, management.

The WSCP is a stand-alone document that can be amended as needed without amending the corresponding UWMP and is included in the 2020 UWMP as is required by law. The plan describes the District's staged response to address potential short and long-term water shortage conditions due to drought. The plan also describes the District's planned emergency response to sudden water shortages or water quality emergencies due to climate change or natural or man-made disasters. This response plan is also included in the District's Water Supply Emergency Response Plan.

8.1 New Water Shortage Contingency Plan Requirements

In response to the severe drought of 2012 to 2016, new legislation in 2018 created a WSCP mandate replacing the water shortage contingency analysis required under former law. The three major regulatory changes include the following:

- Six standard water shortage levels corresponding to progressive ranges of up to 10-, 20-, 30-, 40-, and 50-percent shortages and a greater than 50-percent shortage [Water Code Section 10632 (a)(3)(A)]. The District's 2015 WSCP included four water shortage levels;
- Beginning in 2022, an annual water supply and demand assessment report must be submitted to the California DWR by July 1. [Water Code Section 10632 (a)(2)]; and
- Beginning January 1, 2020, the UWMP shall include a seismic risk assessment and mitigation plan. [Water Code Section 10632.5 (a)].

8.2 Water Supply Reliability Analysis

With the exception of small creeks located along the District's upper canal, the District's primary supply of water is surface water from the 21,206 ac-ft Stumpy Meadows Reservoir. Because this is a surface water supply, it is subject to significant reductions during dry years. However, there are no other legal, environmental or water quality limits on this source of supply.

Historically, the lowest reservoir level recorded during the second week of April was in 1977 when the reservoir's water storage level was recorded at 11,890 ac-ft. To be conservative, the District has elected to use the worst-case single year condition from 1977 as the basis for estimating the worst-case five-year condition. As shown in Table 7-1, there is adequate water available for treated use for the next five years based on the worst-case five-year condition described above. The 20-year analysis also shows there would be an adequate supply of treated water based on projected water demands. Seventy percent of the District water use is for irrigation water, with annual irrigation demand of approximately 5,000 ac-ft.

It is important to note that the District is geographically separated from neighboring water purveyors by the south, middle and north forks of the American River. Consequently, there is no immediate mechanism for the transfer of water into or out of the District through a mutual aid agreement should the need arise.

8.2.1 Water Quality Impacts on Reliability

The existing water quality of the District's surface water source continues to be excellent and therefore does not and should not affect the supply reliability between now and 2040. The District's 2020 Consumer Confidence Report is included in Appendix I. Stumpy Meadows Reservoir is a 21,206 ac-ft capacity reservoir located with a crest elevation of 4,262 feet amsl. The Pilot Creek basin watershed supplying the Stumpy Meadows Reservoir is approximately 11.7 square miles in size, and ranges in elevation from 4,170 feet amsl to 6,190 feet amsl (Figure 2). Land uses within the watershed area located above the Walton Lake Water Treatment Plant are predominately forested, undeveloped and low density residential. Public access is extremely limited and much of the watershed is gated and locked.

8.3 Annual Water Supply and Demand Assessment

The District determines annual water availability based on the Stumpy Meadows Reservoir water storage level measured during the second week of April. New regulations require that the District submit an annual Water Supply and Demand Assessment (WSDA) on July 1, 2022, and annually thereafter.

The District depends on one surface water supply to provide customers with up to approximately 5,000 ac-ft of irrigation water and approximately 1,500 ac-ft of treated water annually. Stumpy Meadows has a storage capacity of 21,206 ac-ft with a firm yield of 13,190 ac-ft. Key inputs into the District WSDA include:

- Supply availability (e.g., Stumpy Meadows Reservoir storage during the second week of April of each year);

- Demand (treated and irrigation);
- Population demographics (development, immigration/emigration);
- Conveyance losses; and
- Climate conditions.

The DWR has provided an example WSDA in Appendix A of the 2020 UWMP Guidebook.

The District has provided a similar report annually to its Board of Directors every February in compliance with El Dorado County Ordinance No. 4325, which was enacted in March 1994. This ordinance directed water purveyors of El Dorado County to prepare annual supply and demand assessments.

8.4 Six Standard Water Shortage Stages

The District has responded in the past and will continue in the future to water supply shortages on an annual basis and as they develop. Generally, in the event of a drought or any other long-term water supply shortage, the District implements a program of water conservation measures that will result in water use restrictions proportional to the severity of the reductions needed. In the past, such use restrictions have been associated with droughts. Although the circumstances surrounding future droughts (or any other long-term supply shortages) may not be identical to the droughts that the District has faced in the past fifty years, the programs of voluntary and mandatory demand and use restrictions developed in response to the increasingly severe actual shortages experienced in 1977-79 and more recently in 2013-16 provide the District with a model for planning future responses to severe water shortages.

The reservoir storage level measured on the second week of April will be used to determine if it is necessary to trigger the declaration of a water shortage stage. These stages range from voluntary to mandatory water use reduction goals for both treated water and irrigation accounts. Regardless of water supply availability or service conditions, the Board of Directors reserves the right to set water conservation goals and modify stage declarations as necessary, based on reservoir levels and/or the impact to the environment or statewide water shortage conditions to align with regional or state water conservation policies, agreements, declarations or legal requirements anytime of the year.

Based on new State regulations, the District has revised its previous four shortage stages to the six standard shortage stages as defined below in Section 8.5. Shortage thresholds are detailed in Table 8-1.

Table 8-1: Water Shortage Contingency Plan Levels		
Shortage Level	Complete Both	
	Percent Shortage Range[1] *Numerical value as a percent*	Water Shortage Condition (*Narrative description*)
Add additional rows as needed		
1	Up to 10%	19,086 AF (93% of Normal)
2	Up to 20%	16,965 AF (83% of Normal)
3	Up to 30%	14,844 AF (72%of Normal)
4	Up to 40%	12,724 AF (60% of Normal)
5	Up to 50%	10,603 AF (52% of Normal)
6	>50%	<10,603 AF (<52% of Normal)
[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*		
NOTES: The amount of storage in Stumpy Meadows reservior on the second week in April triggers the declaration of drought stages. Units - Acre Feet		

8.4.1 Applicable Water Codes

During times of water shortage, there are actions the District may take that are not solely based upon internal policies and regulations. Several California Water Code Sections and California Codes of Regulation grant authority to or mandate the water purveyor to declare drought conditions and implement drought stages. Included below are summaries of specific actions required during water shortage conditions; however, the official California Water Code or California Code of Regulations should be referenced for the complete language of the section.

Title 23, California Code of Regulation, Section 865: Mandatory Actions by Water Suppliers – To promote water conservation, each urban water supplier shall implement all requirements and actions of the stage of its water shortage contingency plan that imposes mandatory restrictions on outdoor irrigation of ornamental landscapes or turf with treated water.

Section 350: The governing body of the water purveyor may declare a water shortage emergency condition whenever it determines that ordinary demands cannot be satisfied without depleting supplies to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

Section 351: The declaration shall be made only after a public hearing is held, at which consumers have an opportunity to protest and to present their respective needs to the governing body. There is an exception for a breakage or failure that causes an immediate emergency.

Section 352: At least seven days prior to the date of the public hearing, a notice of the time and place of the hearing shall be published in a newspaper that is distributed within the water purveyor's service area. Section 353 – When the governing body has declared a water shortage emergency condition within its service area, it shall adopt regulations and restrictions on the delivery and consumption of water supplied for public use in order to conserve water supply for the greatest public benefit, with particular regard to domestic use, sanitation, and fire protection.

Section 354: After allocating the amount of water, which in the opinion of the governing body will be necessary to supply domestic use, sanitation, and fire protection, the regulations may establish priorities in the use of water for other purposes – without discrimination between consumers using water for the same purpose.

Section 355: These regulations and restrictions shall remain in effect during the water shortage emergency condition, and until the water supply has been replenished or augmented.

Section 356: These regulations and restrictions may prohibit new or additional service connections and authorize discontinuing service to consumers willfully in violation of a regulation or restriction.

Section 357: These regulations and restrictions prevail over any conflicting laws governing water allocations while the water shortage emergency condition is in effect.

Section 22257: An irrigation district may impose equitable rules and regulations, including controls on the distribution and use of water, as conditions of ongoing service to its customers.

8.4.2 Drought and Water Management Tools

There are resources available to aid water purveyors and individuals before, during, and after a drought. Below is a brief description of a few of these tools.

California Urban Drought Guidebook: A publication providing help to water managers facing water shortages by showing them how to use tried-and-true methods of the past, such as demand management, conservation analysis, and fiscal considerations; as well as new methods and technology such as ET controllers and cooling system efficiencies.

DWR Office of Water Use Efficiency: Makes available technical expertise, manages the CIMIS weather station network, carries out demonstration projects and data analysis to

increase efficiency where possible, and provides loans and grants to achieve efficiency in water and energy. This information can be found at www.owue.water.ca.gov.

DWR Drought Conditions: A webpage providing State and regional updates with regards to water conditions. More information can be found at http://www.water.ca.gov/waterconditions/

U.S. Bureau of Reclamation Drought Program: Aids federal water contractors and other interested parties in a wider view of drought conditions, encompassing the western United States. Staff from this program will also provide technical assistance, grant and loan funding, and expertise in drought planning. Information on this Bureau program can be found at www.usbr.gov/drought.

California Urban Water Conservation Council: An organization serving water purveyors and environmental stakeholders through a collaborative process. Provides best management practices (BMPs) for municipal water conservation, as well as technical expertise for the implementation of these BMPs. More information can be found at www.cuwcc.org.

8.5 Shortage Response Actions

The reservoir water storage level is reviewed annually by the District's Board of Directors during the regular April Board meeting held on the second Tuesday in April. Based on this water storage level, the Board of Directors declares the type of water year the District will be facing prior to the release of irrigation water in May. Historically, the reservoir storage observed during the second week of April has triggered the declaration of drought stages by the District Board of Directors. These stages range from voluntary to mandatory reduction goals for both treated water and irrigation accounts of up to 50%. It should be noted that the District Board of Directors can declare, modify or end a water shortage declaration based on remaining supply, forecasted weather scenarios and wildland urban interface fire conditions anytime of the year.

The six stages of the WSCP correspond to progressively increasing estimated shortage conditions and align with response actions the District would implement to meet the severity of the impending shortages. There are a number of voluntary and mandatory demand reduction measures the District can implement as response actions to address shortage levels, these measures and are identified in Table 8-2. Based on experience gained during the last drought, the specific response actions identified are aligned with a shortage level and should address the anticipated gaps between normal supply and demand conditions. For example, Level 1 response actions are expected to reduce overall water use by 10%.

Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply to you.*	How much is this going to reduce the shortage gap? *Include volume units used.*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? *Drop Down List*
Add additional rows as needed				
1	Other - Shorten the irrigation season for all non-potable irrigation customers in alignment with shortage level	10%-500 AF; 20%-1000 AF; 30%-1500 AF; 40%-2000 AF; 50%-2500 AF	10% shorter season for Level 1 up to no irrigation for Levels 4-6	Yes
1	Other - Restrict or prohibit runoff from landscape irrigation	Unknown	Enforce Water Waste Ordinance; Wasteful practices will be prohibited	Yes
1	Other - Require automatic shut off hoses	Unknown	Enforce Water Waste Ordinance	Yes
1	Other - Customers would be required to repair leaks, breaks and malfunctions in a timely manner.	Unknown	Enforce Water Waste Ordinance	Yes
1	Landscape - Limit landscape irrigation to specific times.	Unknown	Enforce Water Waste Ordinance	Yes
1	Decrease Line Flushing	0.3 AF	Routine line flushing wil cease; Main flushing only on complaint basis	No
1	Expand Public Information Campaign	Residential Savings: 10%-150 AF; 20%-300 AF; 30%-450 AF; 40%-600 AF; 50%-750 AF	Inform the public using various media to conserve water; All sectors will be asked to reduce their usage by 10% to 50% depending on shortage level	No
1	Improve Customer Billing	Unknown	Provide bill inserts on water conservation; include GPCD	No
2	Offer Water Use Surveys	Unknown	The largest water users will be identified and provided with BMPs	No
2	Limit landscape irrigation to specific days	50 AF from Large landscape users; 1 AF from residential	2-3 days/week; Large landscape users will be restricted	Yes
2	CII - Lodging establishments must offer opt out of linen service	Unknown		Yes
2	CII-Restaurants may only serve water upon request.	Unknown		Yes
2	Pools and Spas-Require covers for pools and spas	Unknown		Yes
2	Water features - Restrict water use for decorative water features	Unknown	Water for non-recycling decorative water features, fountain and ponds are prohibited	
3	Pools and Spas - Allow filling of swimming pools only when an appropriate cover is in place	Unknown	No filling of new pools	
3	Increase Frequency of Meter Reading	Unknown	The largest water users will be identified for more frequent meter reading and given BMPs	Yes
3	Moratorium or Net Zero Demand Increase on New Connections	0.33 AF/year/new connection	Prohibit new domestic connections	Yes
3	Increase Water Waste Patrols	Unknown	Distribution staff will increase patrols of largest water users	Yes
3	Other - Prohibit use of potable water for washing hard surfaces	Unknown		Yes
3	Other - Prohibit vehicle washing except at facilities using recycled water	Unknown		Yes
3	Other - Prohibit use of potable water for construction and dust control	3 AF		Yes
4	Other - Prohibit all landscape irrigation except trees	4 AF		Yes
5	Other - Residental users allotted water for health and safety uses only	Residential users limited to 55 gallons/day/person; Estimated savings 900 AF	Residential customers wil be limited to indoor water use for health and safety only	Yes
6			No additional action will be taken at this level	Yes

NOTES: Implementation of the stages are cumulative meaning that the declaration of a higher stage shall also include implementation of all the conservation methods described in the previous stages.

There are other operational changes and supply augmentation measures the District can implement and they are included in Table 8-3. As stated in previous sections, water used by irrigation customers represents 70% of the overall water demands during a normal water season. The District can augment the water supply by shortening the irrigation water season or terminate the season in a Stage 5 or 6 Water Emergency. Irrigation season generally runs between May 1 and September 30, but it can be shortened depending on the water shortage condition.

Table 8-3: Supply Augmentation and Other Actions

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include volume units used.*	Additional Explanation or Reference *(optional)*
1	Other - Shorten the irrigation season for all non-potable irrigation customers in alignment with shortage level	10%-500 AF; 20%-1000 AF; 30%-1500 AF; 40%-2000 AF; 50%-2500 AF	10% shorter season for Level 1 up to no irrigation for Levels 4-6
1	Expand Public Information Campaign	Residential Savings: 10%-150 AF; 20%-300 AF; 30%-450 AF; 40%-600 AF; 50%-750 AF	Inform the public using various media to conserve water; All sectors will be asked to reduce their usage by 10% to 50% depending on shortage level
1	Improve Customer Billing	Unknown	Provide bill inserts on water conservation; include GPCD
1	Reduce System Water Loss	50 AF	
1	Decrease line flushing	0.3 AF	Routine line flushing wil cease; Main flushing only on complaint basis
2	Offer Water Use Surveys	Unknown	The largest water users will be identified and provided with BMPs
3	Increase Frequency of Meter Reading	Unknown	The largest water users will be identified for more frequent meter reading & given BMPs
3	Increase Water Waste Patrols	Unknown	Distribution staff will increase patrols of largest water users
3	Moratorium or Net Zero Demand Increase on New Connections	0.33 AF/year/new connection	Prohibit new domestic connections
4	Other - Prohibit all landscape irrigation except trees	4 AF	
5	Other - Residental users allotted water for health and safety uses only	Residential users limited to 55 gallons/day/person. Estimated savings 900 AF	Residential customers wil be limited to indoor water use for health and safety only
6			No additional action will be taken at this level

The following summarizes drought stage responses:

Stage 1 (Water Alert)	Up to 10% 19,086 ac-ft	Water supply is slightly restricted. Customers are informed of possible shortages and asked to voluntarily conserve up to 10 percent
Stage 2 (Water Warning)	Up to 20% 16,965 ac-ft	Water supply is moderately restricted. Additional voluntary and mandatory measures are implemented to achieve a demand reduction goal of up to 20 percent;

Stage 3 (Severe Crisis)	Up to 30% 14,844 ac-ft	Water supply is severely restricted. The enforcement of mandatory measures to achieve a demand reduction goal of up to 30 percent
Stage 4 (Critical Shortage)	Up to 40% 12,724 ac-ft	Shortage would require measures to reduce water use by 40%;
Stage 5 and 6 (Water Emergency)	Up to 50% 10,603 ac-ft >50% <10,603 ac-ft	Water supply is extremely restricted. This would require water rationing for health and safety purposes in order to achieve a 50 percent reduction of demands.

State law dictates that public health and safety be prioritized over irrigation and agriculture in profoundly serious water shortage conditions. Public health and safety needs rely on the treated water system and include fire protection, sanitation, medical/health clinics and other critical needs.

The priority of domestic water over irrigation water is a long-standing policy in the District and has been successfully used during periods of reduced water supply. No new irrigation accounts will be accepted during Drought Stages 2 to 6. However, the Board has the discretion to limit new irrigation customers at any time when it is deemed necessary. Stage response action reductions will be applied to untreated irrigation customers by implementing a shortened season either by starting the season later than May 1 or end the season before September 30 or both to meet conservation targets or if there is a water emergency, the irrigation season could be terminated completely.

No new domestic accounts will be accepted during Stage 3 unless the parcel has been assessed for improvements through a legal process; but during Stage 4 to 6, no new domestic accounts will be accepted. Treated water for street washing never occurs in the District's service area because there is no public entity to provide such a service. Implementation of the stages are cumulative meaning that the declaration of a higher stage shall also include implementation of all the conservation methods described in previous stages. These actions shall be used as a starting point to meet targets and shall be monitored, as described later in this plan, for performance.

The District has not had to implement punitive enforcement measures, such as fines, during past droughts. An extensive public outreach program coupled with voluntary compliance by District customers was successful in achieving the required conservation goal in the past. However, the District can initiate enforcement actions at any time if voluntary compliance does not achieve the required target conservation level.

8.5.1 Drought Guidelines and Definitions

There are a number of circumstances during a drought in which the District would be required to make and implement decisions that are not solely based upon water supply availability, such as how long to stay in a drought stage, and how demand reductions should be quantified. It is also important

to clearly define in advance the base periods that will be employed for each user class during the drought event.

8.5.1.1 Overall Guidelines

Below is a list of drought guidelines developed to assist staff in managing the water shortage event:

1) The District will strive to stay within each stage of drought for a complete billing cycle; (2 months) for effective public outreach and the equitable implementation of drought rates (if applicable).
2) Drought stage demand reductions will be quantified by output at the water treatment plants during all stages; however, in Stages 4 to 6, meter reads may also be necessary to determine compliance with individual allocations and reduction targets.
3) This Water Shortage Contingency Plan shall be reviewed and updated every year (or as needed) due to changes in water supplies, operations, expected water demands or other relevant factors.

8.5.1.2 Base Period Definitions

Below is a list of base period definitions developed to assist staff with the implementation of water use restrictions and demand reduction measures during a drought or other District or State mandated requirements.

1) The base period for single-family residential customers is defined as the District-wide average consumption per household – calculated using a three-year average of the consumption data for all single-family residential customers, divided by the total number of residential customers.
2) The base period for multi-family residential customers is defined as the District-wide average consumption per dwelling unit – calculated using a three-year average of the consumption data for all multi-family residential customers, divided by the total number of dwelling units.
3) The base period for commercial, governmental, and institutional customers, with meters serving both building and landscape, is defined as the three-year average of the individual customer's consumption data.

The base period for landscape irrigation only customers is defined as the three-year average of the individual customer's consumption data.

On November 21, 2022, California Department of Forestry & Fire Protection (Cal Fire), Fire and Resource Assessment Program (FRAP) released Fire Hazard Severity Zone Map for El Dorado

County. Approximately 80% of the District's service area is located within an areas classified as "*Very High."* Seasonal irrigation supply distributes a water source throughout the District that is often utilized to support fire suppression efforts. This resource was critical during the Mosquito Fire incident of 2022. Therefore, as mentioned above, the Board of Directors reserve the right to modify irrigation season to mitigate fire risk to District customers and community as a whole. Fire hazard map is included in Appendix J.

8.5.2 Water Supply Emergency Response Plan

The District's Emergency Response Plan (ERP) was prepared to guide the District's response to a sudden water shortage or water quality emergency such as might occur in the event of significant system damage from a major earthquake, or during a prolonged power outage, a fire, or in the event of a water quality emergency from bacteriological or chemical contamination of the water supply. Key provisions of the plan are summarized below.

The District's primary emergency operations center would be created at the District office, at 6425 Main St. Georgetown CA. The District office is equipped with radios, telephones, telemetry equipment, emergency equipment, and supplementary documents and supplies. The emergency operations center would be the central point of coordination for government services, communications, and emergency public information. Communication protocols have been established and damage evaluation procedures have been defined. In the immediate period following a major disaster, such as a fire, the District's initial task would be to evaluate the water supply system and to isolate breaks in order to minimize storage losses as quickly as possible.

The emergency operating center staffing would include the General Manager or his/her designee plus additional staff to help coordinate disaster control activities and communicate with the public. Other key District personnel would be assigned specific roles depending on the magnitude of the emergency as well as the time of occurrence. On non-business days and after hours, the District maintains 24-hour response capability with the assignment of trained on-call workers, which can be summoned by calls from the District emergency phone service or the local Police and Fire Departments.

The District has assembled an inventory of equipment and spare parts and maintains key vehicles in a "ready to respond" condition. The District also has arrangements with vendors to obtain a backhoe to perform emergency and underground work, if needed. Crews would assemble at the District Office and be taken to the emergency work site by District personnel who would also be responsible for operating any valves necessary to isolate a water main break and oversee the emergency repair work.

The goal of the District's post disaster response actions is to ensure the water transmission and storage system remains intact and operational to the greatest extent possible. Emergency response protocols specify the leadership role of the on-call worker if the emergency occurs off-hours. The response plan is very specific with regard to operating protocols for the supply pumps and the monitoring of tank levels to ascertain the presence of significant leaks or pipeline breaks.

Any repair or shut down work would be coordinated from the District Office and field crews would report progress to the emergency operations team. Regular progress reports would then be filed with the appropriate Police and/or Fire Department personnel.

8.5.3 Seismic Risk Assessment and Mitigation Plan

In accordance with Water Code Section 10632.5 (a), the 2020 UWMP must now include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. El Dorado County Office of Emergency Services developed a *Local Hazard Mitigation Plan* pursuant to the requirements of the Disaster Mitigation Act of 2000. This Plan was adopted by the El Dorado County Board of Supervisors on April 23, 2019, and Federal Emergency Management Agency in March 2019 and assessed the County's vulnerability to the impacts of natural hazards which included a seismic risk assessment. The *Local Hazard Mitigation Plan* is included in Appendix K.

According to this Plan, there has been "no major earthquake recorded within the County, although the county has felt ground shaking from earthquakes with epicenters located elsewhere. Data from the U.S. Geological Survey (USGS) Seismic Hazard Maps indicates that the expected severity of earthquakes in the region is somewhat limited." The California Division of Mines and Geology has developed maps that show the expected relative intensity of ground shaking and damage in California from anticipated future earthquakes. The District falls in the lowest probability for earthquake damage. Because the seismic risk is very low, the District has not developed a specific mitigation plan, however the District's ERP is adequate for addressing natural disasters.

8.6 Communication Protocols

Public outreach and information are integral to the implementation a successful WSCP and management of a drought event. Public education is the most important activity when a drought does occur because water demand management will not be successful if customers are not adequately informed regarding the water situation and the requirements of the District. The most important time for public outreach and education is at the beginning of a Stage 1 drought condition. The District will use bill inserts, social media, the District's website, newsletters, phone notification and any other means to inform the public during a water shortage. Ongoing actions include but are not limited to the following activities:

- Educate customers regarding water saving devices and practices;
- Educate customers regarding the overall challenges of providing a reliable water supply in a semi-arid climate;
- Educate customers regarding drought stages through bill inserts or a printed message on the bill, an article in newsletters, e-mail messages, social media, drought website, direct mail post cards, and newspaper advertisements;
- Inform customers about potential drought rates, if applicable;
- Develop and/or maintain a webpage for "Drought Stage" and "Water Conservation" information, including an easy-to-understand explanation of when a drought is called and when a drought has ended; and
- Educate customers on how to read their water meters in order to determine their own monthly usage during times of demand restrictions.

8.7 Compliance and Enforcement

The District adopted a water waste ordinance in 1982 (Appendix H) which authorizes abatement procedures to curtail blatant water waste. According to the ordinance, the District may require the installation of flow devices as a step prior to termination of service if wasteful conditions are not corrected within five days after giving the customer written notice. If conditions warrant, the Board can enact more stringent measures to supplement the ordinance and can do what is required to ensure reasonable apportionment of water supplies during times of limited supply. The existing block rate schedule also provides the basis for penalizing excessive use. Under normal water conditions and during all drought stages, the District's water waste ordinance will be enforced. All wasteful practices or unreasonable uses of water, whether willful or negligent are always prohibited. The following practices are considered wasteful practices or unreasonable uses of treated water during normal water conditions as well as during all water drought stages:

- Customers must repair leaks, breaks, faulty sprinklers and malfunctions within 72 hours of occurrence;
- Landscaping shall only be watered between the hours of 8:00 p.m. and 8:00 a.m. to reduce evaporation and prevent landscape runoff. Care shall be taken not to water past the point of saturation;
- No landscape watering shall occur during rain/snow or within 48 hours after a 1/4" or more of precipitation;
- The washing of hard surfaced areas by direct hosing without an automatic shut-off nozzle, except as necessary for public health and safety reasons is prohibited;
- Hoses used to wash cars, boats, trailers or other vehicles and machinery must have automatic shut off nozzles;

- Unauthorized use of hydrants shall be prohibited. Authorization for use must be obtained from the District; and
- All new landscaping shall, at a minimum, adhere to the specifications outlined in the State's Model Water Efficient Landscape Ordinance adopted by the California Department of Water Resources in 2010. This ordinance requires that all new construction with significant landscape area have efficient irrigation systems and include the use of low water use plants.

8.8 Legal Authorities

In accordance with the California Water Code, Chapter 3 (commencing with Section 350), the District Board of Directors shall declare a water shortage emergency, if necessary, at the District's regular board meeting, held on the second Tuesday in April. This determination will depend on the Stumpy Meadows reservoir water level measured earlier that day. The District staff will enforce its local ordinance to ensure compliance with the specific water shortage stage. The District's existing Ordinance 82-1, Section 7.5, does allow the District to discontinue service in the event the wasteful condition is not corrected within 5 days. Typically, the District charges $25 for any violation of the ordinance. The District can establish penalties and charges above and beyond those that already exist as the water shortage stage increases. With the growing impact of climate change, District water reliability and State regulations the District intents to evaluate water waste prevention and update accordingly.

8.9 Financial Consequences of Water Shortage Contingency Plan

The 2013-2016 drought in California did impact District revenues. In fiscal year 2014/15, operating revenue decreased by 7 percent due to reduced water sales. There was a slight increase in expenditures for public outreach and updating the District's website. The District has general reserves available to respond to water shortage situations. The District Board of Directors can also defer capital improvement projects and reduce operational expenses where necessary to cover increased costs of implementing the WSCP. Implementation of any stage of water rationing does not affect the minimum base meter charge even though water usage will be reduced. The rate increase resulting from the block rate increase schedule is usually sufficient to compensate for the reduction in water sold. The sole exception was the 2013 to 2016 drought when there was a Stage 3 water declaration by the District Board, resulting in a 50% demand reduction in irrigation water and a State mandated 32% treated water demand reduction. The District may consider embedding a drought charge in future rate increases to fund a drought shortage fund. There will be no change in water cost to the District since the sole source of supply at this time is the District owned Stumpy Meadows Reservoir. Based on 2020 total water revenue the following details impact on revenue for each stage action response:

Stage 1 (Water Alert)	Ten percent water conservation would result in a five percent impact on revenue.
Stage 2 (Water Waring)	Twenty percent water conservation would result in a 10 percent impact on revenue.
Stage 3 (Severe Crisis)	Thirty percent water conservation would result in a 15 percent impact on revenue.
Stage 4 (Critical Shortage)	Forty percent water conservation would result in a 21 percent impact on revenue.
Stage 5 and 6 (Water Emergency)	Fifty percent water conservation would result in a 26 percent impact on revenue.

8.10 Monitoring and Reporting

All Georgetown Divide Public Utility District customers are metered, and the sources of supply are metered, the District is able to measure the effectiveness of any water shortage contingency plan that is implemented. The District collects sufficient data, in the normal course of operations, to determine actual reductions in sales, by user category, as compared to a given base year. The District's new billing software also allows comparison to prior usage and can help the customer determine if their water conservation measures are meeting the water reduction goals.

8.10.1 Normal Monitoring Procedure

In normal water supply conditions, treated water figures are recorded daily. Totals are reported monthly to the Operations Manager and incorporated into the water supply report.

8.10.1 Stage 1 and 2 Water Shortages

During a Stage 1 or 2 water shortage, daily production figures are reported to the Water Treatment Plant Supervisor. The Supervisor compares the weekly production to the target weekly production to verify that the reduction goal is being met. Weekly reports are then forwarded to the Operations Manager. Monthly reports are sent to the General Manager. If reduction goals are not met, the General Manager will notify the Board of Directors so that corrective action can be taken.

8.10.2 Stage 3 to 6 Water Shortages

During a Stage 3 to 6 water shortage, the procedure listed above will be followed, with the addition of a daily production report to the Operations Manager. Additionally, the usage patterns of the largest water users in each sector will be evaluated and targeted for additional outreach.

8.10.3 Disaster Shortage

During a disaster shortage, production figures will be reported to the Operations Manager hourly, and to the General Manager daily. Reports will also be provided to the Board of Directors and the El Dorado County Office of Emergency Services, as necessary.

8.11 Water Shortage Contingency Plan Refinement Procedures

The District recognizes that the WSCP is an adaptive management plan and should be evaluated annually to determine if revisions and/or refinements are necessary. Once a water shortage declaration has been lifted, the water uses, and demand restrictions should be evaluated for effectiveness and the WSCP implementation costs should be identified so the Plan can be updated and refined.

8.12 Special Water Feature Distinction

In accordance with California Water Code Section 10632 (b), water features that are not pools or spas are analyzed and defined separately from pools and spas in the WSCP. Pools and spas must use treated water for health and safety considerations. For purposes of definition in the WSCP, any non-pool and non-spa will be called a decorative or recreational water feature and will have specific response actions.

8.13 Plan Adoption, Submittal, and Availability

The WSCP was adopted by the District's board of directors during the regular board meeting on June 8, 2021. Adoption resolution is included in Appendix L. The WSCP was submitted to the Water Efficiency Office in the Department of Water Resources, as required by law electronically through WUEdata, (a State online submittal tool), State Department of Water Resources by July 1, 2021. The final WSCP will be assessable through the District's website.

9.0 DEMAND MANAGEMENT MEASURES

Water conservation is a fundamental component of policy and operation at the District. As our Gold Rush era water system has evolved to meet the challenging needs and demands of the people it serves, the District is committed to promoting conservation and maximizing operational efficiency.

9.1 Existing Demand Management Measures for Retail Suppliers

Demand Management Measures (DMMs) are mechanisms the District can implement to increase water conservation and water reliability on the Georgetown Divide. The following sections detail the District's DMMs.

9.1.1 Water Waste Prevention Ordinances

District Ordinance 82-1 included in Appendix H details water waste prevention. The ordinance was originally adopted in 1982 as part of the large regulations for water service by and within the District. With the growing impact of climate change, District water reliability and State regulations the District intents to evaluate water waste prevention and update accordingly.

9.1.2 Metering

One hundred percent of District customers have a meter installed to measure water consumption. Currently the majority of meters in use within the District are nearly 30 years old and have exceeded their useful life expectancy. It is estimated that the current water meters are under recording water use by much as 25%. To mitigate apparent losses and promote water conservation the District is in the final stages of obtaining State Revolving Fund low interest loan. Funding from the loan will be used to replace all existing analog meters with automated smart meters. Full implementation of the meter replacement program with the installation of automated meters is expected to begin in the first quarter 2022.

9.1.3 Conservation Pricing

In 2017, the District retained the Rural Community Assistance Corporation (RCAC) to prepare a rate study as required by the California State Water Resources Control Board. The October 2017 Rate Study, entitled *Georgetown Divide PUD Water Financial Analysis* is included in Appendix M. Following a Proposition 218 process, the District Board of Directors adopted Resolution 2017-30 that modified the District's existing rate structure (Appendix L). The rate structure established both a base rate and usage rate per cubic foot. The usage rate is intended to promote water conservation.

9.1.4 Public Education and Outreach

The District has multiple pathways to communicate with residents of the Georgetown Divide, the pathways are detailed as follows:

- **Water Bills** – Water bill clearly detail water use during current billing period and historical water use;
- **Information Booths** – District staff hosts information booths during community events. Events include Georgetown annual Founders Day celebration and Friends of the Nature Area, Nature Fest;
- **Educational Programs** – District staff participates in El Dorado County Library Georgetown Branch and Rotary Club of Georgetown Divide information events; and
- **Online Tools** – Primary District outreach utilizes website posting, email list service and social media postings.

Moving forward the District plans on continuing public education and outreach programs to keep Georgetown Divide residences informed of District activities, especially those related to water conservation.

9.1.5 Programs to Assess and Manage Distribution System Real Loss

Following the guidance of our 2015 UWMP the District has been focused on reducing water losses within the treated water system distribution and raw water conveyance system. District staff is routinely evaluating water consumption to determine water loss. The following programs detailed below are actively being managed by District staff to limit real water to the extent feasible:

- **DWR Water Audit** – The District prepares a water loss audit using an American Water Works Association (AWWA) template worksheet for submittal to DWR. The worksheet provides a detailed evaluation of real and apparent losses within treated water distribution system. As discussed in Section 9.1.2 one key deficiencies in the treated water system is the District's use of old analog meters that under report water usage by our customers. For the past three years, the District has been in the process of acquiring both a State Revolving Fund loan and grants to fund, purchase and installation of new automated meters (Smart Meters). Another clear deficiency is the length and age of treated water main distribution lines. The District tracks water main breaks throughout the system and targets problem areas for repairs to reduce real losses;
- **Canal Monitoring** – The District's raw water conveyance system covers approximately 70-miles to deliver raw water to our two water treatment plants and to our raw water irrigation customers. Large sections of the canal/ditch are unlined. In an effort to mitigate water losses along the ditch/canal conveyance system, the District has installed water flow monitoring points throughout the system. The monitoring points enable the District to target areas to repair with the greatest observed water loss;

- **Supply and Demand Report** – The District prepares an annual supply and demand report that includes and analysis of treated, irrigation, conveyance loss and operation loss. The report provides a look at District demand and adjustments are made accordingly; and
- **National Pollution Discharge Elimination System (NPDES)** – As required by the NPDES program, the District tracks releases from the treated water distribution system including water from hydrant flushing, pipe breaks and tank flushing.

Each of these programs help the District identify sectors of operations that guide our CIP development. In addition, key findings from the programs will be used to help comply with water loss standards being develop by the SWRCB.

9.2 Implementation over the Past Five Years

In the past five years, the District's primary DMM's were the implementation of a base rate water bill component and the more frequent monitoring of canal flows. In addition, the other DMM's discussed earlier in this section have been implemented over the last five years. The District plans to continue to implement these and other DMM's over the next five years.

9.3 Implementation to Achieve Water Use Targets

With exception of the global pandemic period, water use targets have historically been met. Enhanced canal monitoring and the upcoming automated meter project will ensure the District continues to meet these targets. It is important to note the District evaluates water use targets annually. In the event water use targets are not being met, additional demand measurement measures will be implemented to meet targets.

9.4 Water Use Objectives (Future Requirements)

As discussed earlier in this Section, implementation of the DMMs will be designed to meet future water use targets.

10.0 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

10.1 Inclusion of all 2020 Data

The 2020 UWMP includes all data generated during the 2020 calendar year and is incorporated within the UWMP for planning purposes.

10.2 Notice of Public Hearing

10.2.1 Notice to Cities and Counties

The EDCWA and El Dorado County Development Services Division were notified on January 9, 2023, informing them the District was updating the UWMP for 2020 and that a public would be held on March 14, 2023, during the District's regular board meeting. Notification to cities and counties are included on Table 10-1. Letters of correspondence are included in Appendix N.

Table 10-1: Notification to Cities and Counties

City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
	☐	☐
	☐	☐
	☐	☐
County Name *Drop Down List*	**60 Day Notice**	**Notice of Public Hearing**
Add additional rows as needed		
El Dorado County	☑	☑
	☐	☐

Notes: 60-day and notice of public hearing corresponce was distributed to El Dorado County Water Agency and El Dorado County Planning Division.

10.2.2 Notice to the Public

A notice of hearing was published in the Georgetown Gazette weekly newspaper for two consecutive weeks detailing the time and location of the public hearing. The newspaper notice is included in Appendix O.

10.3 Public Hearing and Adoption

10.3.1 Public Hearing

The UWMP public hearing occurred on February 14, 2023, at the District's regular board meeting. Any comments received were evaluated, and if warranted, were incorporated into the final 2020 UWMP.

10.3.2 Adoption

The final 2020 UWMP and WSCP was adopted by the District's board of directors during the regular board meeting on June 8, 2021. Adoption resolution is included in Appendix L.

10.4 Plan Submittal

The 2020 UWMP was submitted to the Water Efficiency Office in the Department of Water Resources, as required by law electronically through WUEdata, (a State online submittal tool), State Department of Water Resources by July 1, 2021. It was also filed with the California State Library, El Dorado County, California Public Utilities Commission (CPUC) no later than 30 days after adoption.

10.5 Planned Implementation 2020-2025

This UWMP will be used by the District staff to guide the District's water conservation efforts through the year 2025. As required by §10621 (a) of the Water Code, the District will update the Plan again by July 1, 2026.

The District's per capita water usage in 2020 was 164 gpcd which met the 2020 compliance target of 167 gpcd. The District is dedicated to meet or exceed this target in the future by applying the DMM's discussed in Section 9.0. Furthermore; the *Water Shortage Contingency Plan* presented in Section 8.0 acts as a living document and will be amended if necessary.

FIGURES

Figure 1 - Area Location Map

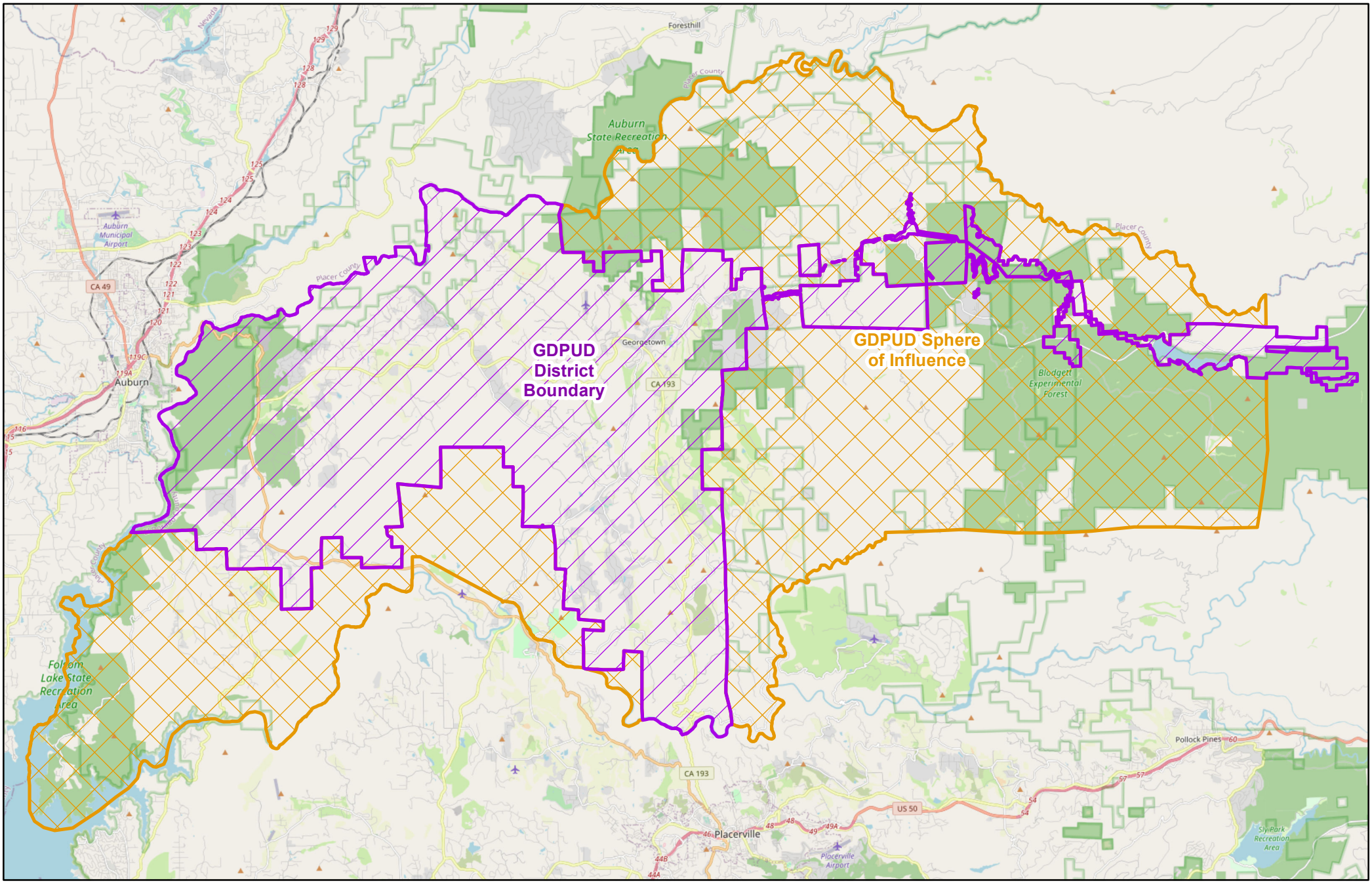
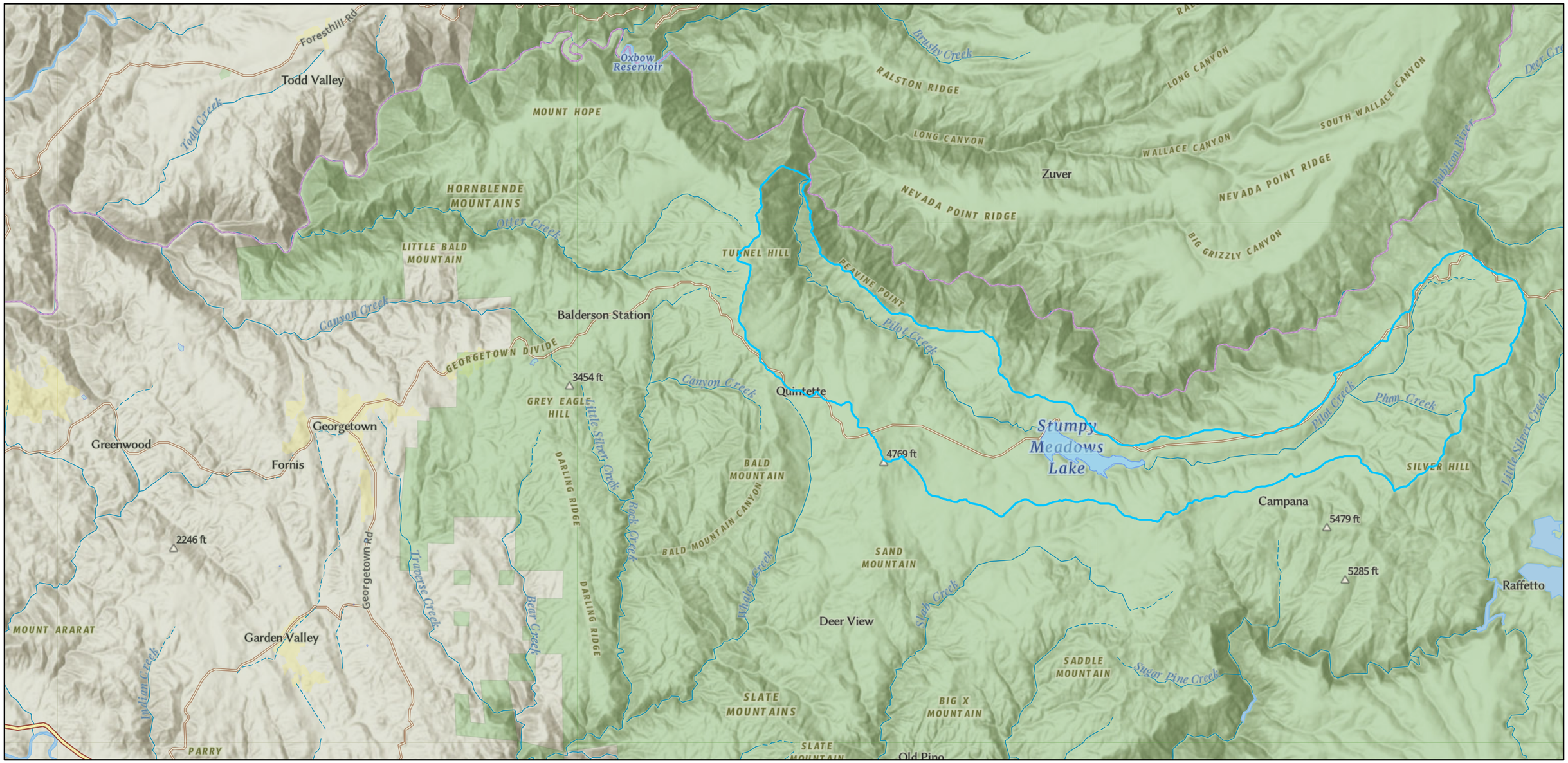


Figure 2 - Pilot Creek Watershed



Stumpy Meadows Reservoir

Pilot Creek Watershed Boundary

1:144,448

0 1.25 2.5 5 mi

0 2 4 8 km

Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, Esri, NASA, NGA, USGS

GDPUD

Sources: Esri, USGS | Esri, NASA, NGA, USGS | Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA |

Figure 3 - Treated Water Distribution System

Mainline

Private Line

Boundary - Pilot Creek Watershed

GDPUD District Boundary

GDPUD Sphere of Influence

1:144,448

0 1.25 2.5 5 mi

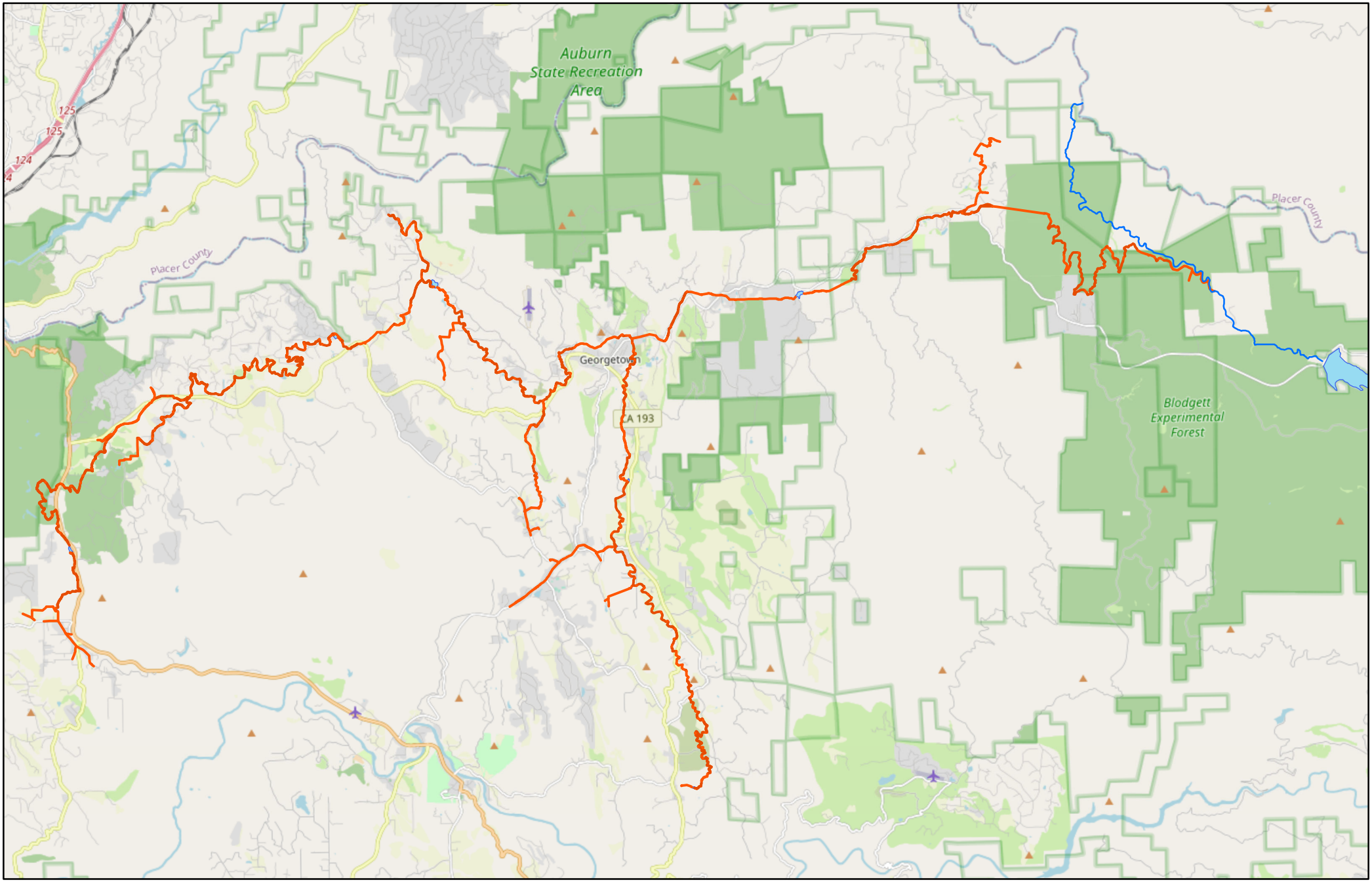
0 2 4 8 km

Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, Esri, NASA, NGA, USGS

GDPUD

Sources: Esri, USGS | Esri, NASA, NGA, USGS | Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA |

Figure 4 - Raw Water Conveyance System



TABLES

Table 2-1
Public Water Systems
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 2-1: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
CA0910013	Georgetown Divide Public Utility District	3,689	1,813
	TOTAL	3,689	1,813

NOTES:
Units - Acre Feet

Table 2-2
Plan Identification
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* *drop down list*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

Table 2-3
Supplier Identification
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	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

Table 3-1
Population - Current and Projected
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 3-1: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	9,112	9,600	10,115	10,657	11,228	11,830

Table 4-1
Hisotrical Water Use
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 4-1: Historical Water Use					
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*	Level of Treatment When Delivered *Drop down list*	2016	2017	2018	2019
Single Family	Drinking Water	1,062	1,161	1,094	1,027
Multi-Family	Drinking Water	13	16	13	14
Commercial	Drinking Water	40	45	37	48
Institutional/Governmental	Drinking Water	86	92	97	83
Landscape	Drinking Water	71	62	55	54
Agricultural irrigation	Raw Water	4,654	4,654	4,256	4,055
Losses	Drinking Water	329	272	297	391
Losses	Raw Water	1,800	2,084	2,897	2,459
	TOTAL	10,072	10,404	10,765	10,150
NOTES: Units - Acre Feet					

Table 4-2
Water Loss Audit Reporting
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 4-2: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
01/2016	329.4
01/2017	272.4
01/2018	296.8
01/2019	390.7
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: Units - Acre Feet	

Table 4-3
Demands for Potable and Non-Potable Water
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 4-3: Demands for Potable and Non-Potable Water - Actual			
Use Type *(Add additional rows as needed)*	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
Single Family		Drinking Water	1,188
Multi-Family		Drinking Water	15
Commercial		Drinking Water	37
Institutional/Governmental		Drinking Water	89
Landscape		Drinking Water	61
Agricultural irrigation		Raw Water	3,941
Sales/Transfers/Exchanges to other agencies		Raw Water	2,000
Losses	Treated Water Distribution System	Drinking Water	416
Losses	Raw Water Conveyance System	Raw Water	3,619
		TOTAL	11,366

NOTES: Drinking water losses are associated with pressurized distribution system. Raw water losses are associated with raw water conveyance system that includes concrete lined/unlined open ditch and pipe.
Units - Acre Feet

Table 4-4
Potable and Non-Potable - Projected
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 4-4: Use for Potable and Non-Potable Water - Projected						
Use Type *(Add additional rows as needed)*	Additional Description	Projected Water Use *Report To the Extent that Records are Available*				
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*		2025	2030	2035	2040	2045 (opt)
Single Family		1,249	1,317	1,388	1,461	1,539
Multi-Family		17.6	18.6	19.6	20.6	21.7
Commercial		39.7	41.9	44.1	46.4	48.9
Institutional/Governmental		95.5	100.8	106.1	111.7	117.7
Landscape		66.1	69.8	73.5	77.3	81.5
Agricultural irrigation	Raw Water	4,794	4,794	4,794	4,794	4,794
Losses	Treated Water	341	341	341	341	341
Losses	Raw Water	2,572	2,572	2,572	2,572	2,572
TOTAL		9,175	9,256	9,338	9,424	9,516

NOTES: Raw water conveynace and treated water loss based on 5-year average.
Units - Acre Feet

Table 4-5
Total Gross Water Use
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 4-5: Total Gross Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R*	11,366	9,175	9,256	9,338	9,424	9,516
Recycled Water Demand* *From Table 6-4*	0	0	0	0	0	0
TOTAL WATER USE	11,366	9,175	9,256	9,338	9,424	9,516
**Recycled water demand fields will be blank until Table 6-4 is complete.*						
NOTES: Units - Acre Feet						

Table 4-6
Inclusion in Water Use Projections
2020 Urban Water Management Plan
Georgetown Divide Utility District

Table 4-6: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc… utilized in demand projections are found.	8.5
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes

Table 5-1
Baseline and Targets Summary
2020 Urban Water Managment Plan
Georgetown Divide Public Utility District

Table 5-1: Baselines and Targets Summary *Retail Supplier or Regional Alliance Only*				
Baseline Period	Start Year	End Year	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	*1999*	*2008*	*203*	*167*
5 Year	*2004*	*2008*	*207*	*167*
*All values are in Gallons per Capita per Day (GPCD)				

Table 5-2
2020 Compliance
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 5-2: 2020 Compliance *Retail Supplier or Regional Alliance Only*							
Actual 2020 GPCD*	**Optional Adjustments to 2020 GPCD**					2020 GPCD* *(Adjusted if applicable)*	Did Supplier Achieve Targeted
	Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*	Adjusted 2020 GPCD*		
173	0	0	0	0	173		**NO**
**All values are in Gallons per Capita per Day (GPCD)*							

Table 6-1
Water Supplies - Actual
2020 Urban Water Management Plan
Georgetown Divde Public Utility District

Table 6-1: 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				
Surface water (not desalinated)	Stumpy Meadows Reservoir	21,206	Drinking Water	13,190
	Total	21,206		13,190
NOTES: Units in acre-feet				

Table 6-2
Water Supplies Projected
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 6-2: Water Supplies — Projected											
Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*									
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*		**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											
Surface water (not desalinated)	Stumpy Meadows Reservoir	21,206	13,190	21,206	13,190	21,206	13,190	21,206	13,190	21,206	13,190
	Total	21,206	13,190	21,206	13,190	21,206	13,190	21,206	13,190	21,206	13,190
NOTES: Units in acre-feet											

Table 7-1
Basis of Water Year Data (Reliability Assessment)
2020 Urban Water Management Plan
Georgetown Divide Public Utility Distrcit

Table 7-1: 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**	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☐ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	**% of Average Supply**
Average Year	21206	13190	100%
Single-Dry Year	11890	11027	52%
Consecutive Dry Years 1st Year	11890	11027	52%
Consecutive Dry Years 2nd Year	11890	11027	52%
Consecutive Dry Years 3rd Year	11890	11027	52%
Consecutive Dry Years 4th Year	11890	11027	52%
Consecutive Dry Years 5th Year	11890	11027	52%
NOTES: Units - Acre Feet			

Table 7-2
Normal Year Supply and Demand Comparison
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 7-2: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	21,206	21,206	21,206	21,206	21,206
Demand totals *(autofill from Table 4-3)*	9,175	9,256	9,338	9,424	9,516
Difference	12,031	11,950	11,868	11,782	11,690
NOTES: Units - Acre Feet					

Table 7-3
Single Dry Year Supply and Demand Comparison
2020 Urban Water Managemnet Plan
Georgetown Divide Public Utility District

Table 7-3: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Opt)
Supply totals	11,890	11,890	11,890	11,890	11,890
Demand totals	9,175	9256	9,338	9,424	9,516
Difference	2,715	2,634	2,552	2,466	2,374
NOTES: Units - Acre Feet					

Table 7-4
Multiple Dry Years Supply and Demand Comparison
2020 Urban Water Mangement Plan
Georgetown Divide Public Utility District

Table 7-4: Multiple Dry Years Supply and Demand Comparison						
		2025	2030	2035	2040	2045 (Opt)
First year	Supply totals	11,890	11,890	11,890	11,890	11,890
	Demand totals	9,175	9,256	9,338	9,424	9,516
	Difference	2,715	2,634	2,552	2,466	2,374
Second year	Supply totals	11,890	11,890	11,890	11,890	11,890
	Demand totals	9,180	9,261	9,343	9,429	9,521
	Difference	2,710	2,629	2,547	2,461	2,369
Third year	Supply totals	11,890	11,890	11,890	11,890	11,890
	Demand totals	9,185	9,266	9,348	9,434	9,526
	Difference	2,705	2,624	2,542	2,456	2,364
Fourth year	Supply totals	11,890	11,890	11,890	11,890	11,890
	Demand totals	9,189	9,270	9,352	9,438	9,530
	Difference	2,701	2,620	2,538	2,452	2,360
Fifth year	Supply totals	11,890	11,890	11,890	11,890	11,890
	Demand totals	9,194	9,275	9,357	9,443	9,535
	Difference	2,696	2,615	2,533	2,447	2,355
NOTES: Units - Acre Feet						

Table 7-5
Five-Year Drought Risk Assessment (Potable and Non-Potable)
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	**Total**
Gross Water Use	9,200
Total Supplies	11,890
Surplus/Shortfall w/o WSCP Action	2,690
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	3,457
Revised Surplus/(shortfall)	6,147
Resulting % Use Reduction from WSCP action	38%
2022	**Total**
Gross Water Use [Use Worksheet]	9,219
Total Supplies [Supply Worksheet]	11,890
Surplus/Shortfall w/o WSCP Action	2,671
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	3,457
Revised Surplus/(shortfall)	6,128
Resulting % Use Reduction from WSCP action	37%
2023	**Total**
Gross Water Use [Use Worksheet]	9,239
Total Supplies [Supply Worksheet]	11,890
Surplus/Shortfall w/o WSCP Action	2,651
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	3,457
Revised Surplus/(shortfall)	6,108
Resulting % Use Reduction from WSCP action	37%
2024	**Total**
Gross Water Use [Use Worksheet]	9,258
Total Supplies [Supply Worksheet]	11,890
Surplus/Shortfall w/o WSCP Action	2,632
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	3,457
Revised Surplus/(shortfall)	6,089
Resulting % Use Reduction from WSCP action	37%
2025	**Total**
Gross Water Use [Use Worksheet]	9,278
Total Supplies [Supply Worksheet]	11,890
Surplus/Shortfall w/o WSCP Action	2,612
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	3,457
Revised Surplus/(shortfall)	6,069
Resulting % Use Reduction from WSCP action	37%

Table 8-1
Water Shortage Contingency Plan Levels
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 8-1: Water Shortage Contingency Plan Levels		
Shortage Level	Complete Both	
	Percent Shortage Range[1] *Numerical value as a percent*	Water Shortage Condition (*Narrative description*)
Add additional rows as needed		
1	Up to 10%	19,086 AF (93% of Normal)
2	Up to 20%	16,965 AF (83% of Normal)
3	Up to 30%	14,844 AF (72%of Normal)
4	Up to 40%	12,724 AF (60% of Normal)
5	Up to 50%	10,603 AF (52% of Normal)
6	>50%	<10,603 AF (<52% of Normal)
[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*		
NOTES: The amount of storage in Stumpy Meadows reservior on the second week in April triggers the declaration of drought stages. Units - Acre Feet		

Table 8-2
Demand Reduction Actions
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply to you.*	How much is this going to reduce the shortage gap? *Include volume units used.*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? *Drop Down List*
Add additional rows as needed				
1	Other - Shorten the irrigation season for all non-potable irrigation customers in alignment with shortage level	10%-500 AF; 20%-1000 AF; 30%-1500 AF; 40%-2000 AF; 50%-2500 AF	10% shorter season for Level 1 up to no irrigation for Levels 4-6	Yes
1	Other - Restrict or prohibit runoff from landscape irrigation	Unknown	Enforce Water Waste Ordinance; Wasteful practices will be prohibited	Yes
1	Other - Require automatic shut off hoses	Unknown	Enforce Water Waste Ordinance	Yes
1	Other - Customers would be required to repair leaks, breaks and malfunctions in a timely manner.	Unknown	Enforce Water Waste Ordinance	Yes
1	Landscape - Limit landscape irrigation to specific times.	Unknown	Enforce Water Waste Ordinance	Yes
1	Decrease Line Flushing	0.3 AF	Routine line flushing wil cease; Main flushing only on complaint basis	No
1	Expand Public Information Campaign	Residential Savings: 10%-150 AF; 20%-300 AF; 30%-450 AF; 40%-600 AF; 50%-750 AF	Inform the public using various media to conserve water; All sectors will be asked to reduce their usage by 10% to 50% depending on shortage level	No
1	Improve Customer Billing	Unknown	Provide bill inserts on water conservation; include GPCD	No
2	Offer Water Use Surveys	Unknown	The largest water users will be identified and provided with BMPs	No
2	Limit landscape irrigation to specific days	50 AF from Large landscape users; 1 AF from residential	2-3 days/week; Large landscape users will be restricted	Yes
2	CII - Lodging establishments must offer opt out of linen service	Unknown		Yes
2	CII-Restaurants may only serve water upon request.	Unknown		Yes
2	Pools and Spas-Require covers for pools and spas	Unknown		Yes
2	Water features - Restrict water use for decorative water features	Unknown	Water for non-recycling decorative water features, fountain and ponds are prohibited	
3	Pools and Spas - Allow filling of swimming pools only when an appropriate cover is in place	Unknown	No filling of new pools	
3	Increase Frequency of Meter Reading	Unknown	The largest water users will be identified for more frequent meter reading and given BMPs	Yes
3	Moratorium or Net Zero Demand Increase on New Connections	0.33 AF/year/new connection	Prohibit new domestic connections	Yes
3	Increase Water Waste Patrols	Unknown	Distribution staff will increase patrols of largest water users	Yes
3	Other - Prohibit use of potable water for washing hard surfaces	Unknown		Yes
3	Other - Prohibit vehicle washing except at facilities using recycled water	Unknown		Yes
3	Other - Prohibit use of potable water for construction and dust control	3 AF		Yes
4	Other - Prohibit all landscape irrigation except trees	4 AF		Yes
5	Other - Residental users allotted water for health and safety uses only	Residential users limited to 55 gallons/day/person; Estimated savings 900 AF	Residential customers wil be limited to indoor water use for health and safety only	Yes
6			No additional action will be taken at this level	Yes

NOTES: Implementation of the stages are cumulative meaning that the declaration of a higher stage shall also include implementation of all the conservation methods described in the provious stages.

Table 8-3
Supply Augmentation and Other Actions
2020 Urban Water Management Plan
Georgetown Divide Public Utility District

Table 8-3: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include volume units used.*	Additional Explanation or Reference *(optional)*
1	Other - Shorten the irrigation season for all non-potable irrigation customers in alignment with shortage level	10%-500 AF; 20%-1000 AF; 30%-1500 AF; 40%-2000 AF; 50%-2500 AF	10% shorter season for Level 1 up to no irrigation for Levels 4-6
1	Expand Public Information Campaign	Residential Savings: 10%-150 AF; 20%-300 AF; 30%-450 AF; 40%-600 AF; 50%-750 AF	Inform the public using various media to conserve water; All sectors will be asked to reduce their usage by 10% to 50% depending on shortage level
1	Improve Customer Billing	Unknown	Provide bill inserts on water conservation; include GPCD
1	Reduce System Water Loss	50 AF	
1	Decrease line flushing	0.3 AF	Routine line flushing wil cease; Main flushing only on complaint basis
2	Offer Water Use Surveys	Unknown	The largest water users will be identified and provided with BMPs
3	Increase Frequency of Meter Reading	Unknown	The largest water users will be identified for more frequent meter reading & given BMPs
3	Increase Water Waste Patrols	Unknown	Distribution staff will increase patrols of largest water users
3	Moratorium or Net Zero Demand Increase on New Connections	0.33 AF/year/new connection	Prohibit new domestic connections
4	Other - Prohibit all landscape irrigation except trees	4 AF	
5	Other - Residental users allotted water for health and safety uses only	Residential users limited to 55 gallons/day/person. Estimated savings 900 AF	Residential customers wil be limited to indoor water use for health and safety only
6			No additional action will be taken at this level

Table 10-1
Notification to Cities and Counties
2020 Urban Water Management Plane
Georgetown Divide Public Utility District

Table 10-1: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
	☐	☐
	☐	☐
	☐	☐
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
El Dorado County	☑	☑
	☐	☐
Notes: 60-day and notice of public hearing corresponce was distributed to El Dorado County Water Agency and El Dorado County Planning Division.		

APPENDIX A

EL DORADO COUNTY CENSUS DATA

All Topics

	El Dorado County, California
Population Estimates, July 1 2022, (V2022)	⚠
Population Estimates, July 1 2021, (V2021)	⚠ 193

QuickFacts

El Dorado County, California

QuickFacts provides statistics for all states and counties, and for cities and towns with a ***population of 5,000 or more***.

Table

PEOPLE	
Population	
Population Estimates, July 1 2022, (V2022)	⚠ **NA**
Population Estimates, July 1 2021, (V2021)	⚠ **193,221**
Population estimates base, April 1, 2020, (V2022)	⚠ NA
Population estimates base, April 1, 2020, (V2021)	⚠ 191,185
Population, percent change - April 1, 2020 (estimates base) to July 1, 2022, (V2022)	⚠ NA
Population, percent change - April 1, 2020 (estimates base) to July 1, 2021, (V2021)	⚠ 1.1%
Population, Census, April 1, 2020	191,185
Population, Census, April 1, 2010	181,058
Age and Sex	
Persons under 5 years, percent	⚠ 4.5%
Persons under 18 years, percent	⚠ 19.6%
Persons 65 years and over, percent	⚠ 22.6%
Female persons, percent	⚠ 49.9%
Race and Hispanic Origin	
White alone, percent	⚠ 87.8%
Black or African American alone, percent (a)	⚠ 1.1%
American Indian and Alaska Native alone, percent (a)	⚠ 1.4%
Asian alone, percent (a)	⚠ 5.3%
Native Hawaiian and Other Pacific Islander alone, percent (a)	⚠ 0.3%
Two or More Races, percent	⚠ 4.3%
Hispanic or Latino, percent (b)	⚠ 13.8%
White alone, not Hispanic or Latino, percent	⚠ 75.9%
Population Characteristics	
Veterans, 2017-2021	12,718
Foreign born persons, percent, 2017-2021	9.3%
Housing	
Housing units, July 1, 2021, (V2021)	94,179
Owner-occupied housing unit rate, 2017-2021	76.2%
Median value of owner-occupied housing units, 2017-2021	$510,200
Median selected monthly owner costs -with a mortgage, 2017-2021	$2,478
Median selected monthly owner costs -without a mortgage, 2017-2021	$726
Median gross rent, 2017-2021	$1,409
Building permits, 2021	669
Families & Living Arrangements	
Households, 2017-2021	74,535
Persons per household, 2017-2021	2.53
Living in same house 1 year ago, percent of persons age 1 year+, 2017-2021	86.9%
Language other than English spoken at home, percent of persons age 5 years+, 2017-2021	11.7%
Computer and Internet Use	
Households with a computer, percent, 2017-2021	95.0%
Households with a broadband Internet subscription, percent, 2017-2021	90.2%

Education		El Dorado County, California
High school graduate or h		
Bachelor's degree or high	Population Estimates, July 1 2022, (V2022)	⚠
Health	Population Estimates, July 1 2021, (V2021)	⚠ 193
With a disability, under age 65 years, percent, 2017-2021		7.3%
Persons without health insurance, under age 65 years, percent		⚠ 5.4%
Economy		
In civilian labor force, total, percent of population age 16 years+, 2017-2021		58.1%
In civilian labor force, female, percent of population age 16 years+, 2017-2021		53.2%
Total accommodation and food services sales, 2017 ($1,000) (c)		548,134
Total health care and social assistance receipts/revenue, 2017 ($1,000) (c)		878,586
Total transportation and warehousing receipts/revenue, 2017 ($1,000) (c)		62,051
Total retail sales, 2017 ($1,000) (c)		1,920,952
Total retail sales per capita, 2017 (c)		$10,175
Transportation		
Mean travel time to work (minutes), workers age 16 years+, 2017-2021		28.5
Income & Poverty		
Median household income (in 2021 dollars), 2017-2021		$88,770
Per capita income in past 12 months (in 2021 dollars), 2017-2021		$48,953
Persons in poverty, percent		⚠ 8.8%
BUSINESSES		
Businesses		
Total employer establishments, 2020		4,694
Total employment, 2020		49,830
Total annual payroll, 2020 ($1,000)		2,574,260
Total employment, percent change, 2019-2020		-0.3%
Total nonemployer establishments, 2019		17,425
All employer firms, Reference year 2017		4,132
Men-owned employer firms, Reference year 2017		2,212
Women-owned employer firms, Reference year 2017		780
Minority-owned employer firms, Reference year 2017		530
Nonminority-owned employer firms, Reference year 2017		3,212
Veteran-owned employer firms, Reference year 2017		S
Nonveteran-owned employer firms, Reference year 2017		3,397
GEOGRAPHY		
Geography		
Population per square mile, 2020		111.9
Population per square mile, 2010		106.0
Land area in square miles, 2020		1,707.85
Land area in square miles, 2010		1,707.88
FIPS Code		06017

About datasets used in this table

	El Dorado County, California
Population Estimates, July 1 2022, (V2022)	⚠
Population Estimates, July 1 2021, (V2021)	⚠ 193

Value Notes

⚠ Estimates are not comparable to other geographic levels c

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info ⓘ icon to th row in TABLE view to learn about sampling error.

The vintage year (e.g., V2022) refers to the final year of the series (2020 thru 2022). Different vintage years of estimates are not comparable.

Users should exercise caution when comparing 2017-2021 ACS 5-year estimates to other ACS estimates. For more information, please visit the 2021 5-year ACS Comparison Guidance page.

Fact Notes

(a) Includes persons reporting only one race
(c) Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data
(b) Hispanics may be of any race, so also are included in applicable race categories

Value Flags

- Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest or upper in open ended distribution.
F Fewer than 25 firms
D Suppressed to avoid disclosure of confidential information
N Data for this geographic area cannot be displayed because the number of sample cases is too small.
FN Footnote on this item in place of data
X Not applicable
S Suppressed; does not meet publication standards
NA Not available
Z Value greater than zero but less than half unit of measure shown

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and P Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

APPENDIX B

DEPARTMENT OF WATER RESOURCES – PLANNING TOOL TABLE

Water Supply Worksheet (Potable) - Optional Tool

= auto-filled cell

Select Unit of Measure: Acre Feet (AF)

Part 1: SUMMARY: Existing Potable Supply Tables

[use of monthly data is recommended]

Total Supply		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
eAR (for comparison)														
2020 Actual Use		99	99	94	94	162	162	229	229	211	211	111	111	1,811
Normal Year		1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	13,190
Single Dry Year		991	991	991	991	991	991	991	991	991	991	991	991	11,890
Multi-Year Drought	2021 (1st year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2022 (2nd year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2023 (3rd year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2024 (4th year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2025 (5th year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890

Part 2: SUMMARY: Existing and Planned Potable Supplies

Total Supply		2025	2030	2035	2040	2045 (opt)
Normal		13,190	13,190	13,190	13,190	13,190
Single Dry Year		11,890	11,890	11,890	11,890	11,890
Multi-Year Drought	Year 1	11,890	11,890	11,890	11,890	11,890
	Year 2	11,890	11,890	11,890	11,890	11,890
	Year 3	11,890	11,890	11,890	11,890	11,890
	Year 4	11,890	11,890	11,890	11,890	11,890
	Year 5	11,890	11,890	11,890	11,890	11,890

Part 1: Individual: Existing Potable Supply (current monthly conditions)

[use of monthly data is reco

Potable Supply Source		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
Source 1:		Stumpy Meadows Reservoir												
2020 Actual use of supply		99	99	94	94	162	162	229	229	211	211	111	111	1,811
Normal Year		1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	13,190
Single Dry Year		991	991	991	991	991	991	991	991	991	991	991	991	11,890
Multi-Year Drought	2021 (1st year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2022 (2nd year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2023 (3rd year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2024 (4th year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2025 (5th year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890

Part 2: Individual: Existing and Planned Potable Supplies

Potable Supply Source		2025	2030	2035	2040	2045 (opt)
Normal		13,190	13,190	13,190	13,190	13,190
Single Dry Year		11,890	11,890	11,890	11,890	11,890
Multi-Year Drought	Year 1	11,890	11,890	11,890	11,890	11,890
	Year 2	11,890	11,890	11,890	11,890	11,890
	Year 3	11,890	11,890	11,890	11,890	11,890
	Year 4	11,890	11,890	11,890	11,890	11,890
	Year 5	11,890	11,890	11,890	11,890	11,890

Water Supply Worksheet (Non-potable) - Optional Tool

= auto-filled cell

Select Unit of Measure: Acre Feet (AF)

Part 1: SUMMARY: Existing Non-potable Supply Tables *[use of monthly data is recommended]*

Total Supply		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
eAR (for comparison)														
2020 Actual Use		0	0	0	0	789	789	789	789	789	0	0	0	3,945
Normal Year		1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	13,190
Single Dry Year		991	991	991	991	991	991	991	991	991	991	991	991	11,890
Multi-Year Drought	2021 (1st year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2022 (2nd year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2023 (3rd year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2024 (4th year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2025 (5th year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890

Part 2: SUMMARY: Existing and Planned Non-potable Supplies

Total Supply		2025	2030	2035	2040	2045 (opt)
Normal		12,200	12,200	12,200	12,200	12,200
Single Dry Year		11,060	11,060	11,060	11,060	11,060
Multi-Year Drought	Year 1	11,060	11,060	11,060	11,060	11,060
	Year 2	11,060	11,060	11,060	11,060	11,060
	Year 3	11,060	11,060	11,060	11,060	11,060
	Year 4	11,060	11,060	11,060	11,060	11,060
	Year 5	11,060	11,060	11,060	11,060	11,060

Part 1: Individual: Existing Non-potable Supply (current monthly conditions) *[use of monthly data is recommended]*

Potable Supply Source		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
Source 1:		Stumpy Meadows Reservoir												
2020 Actual use of supply						789	789	789	789	789				3,945
Normal Year		1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	1,099	13,190
Single Dry Year		991	991	991	991	991	991	991	991	991	991	991	991	11,890
Multi-Year Drought	2021 (1st year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2022 (2nd year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2023 (3rd year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2024 (4th year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890
	2025 (5th year)	991	991	991	991	991	991	991	991	991	991	991	991	11,890

Part 2: Individual: Existing and Planned Non-potable Supplies

Potable Supply Source		2025	2030	2035	2040	2045 (opt)
Normal		12,200	12,200	12,200	12,200	12,200
Single Dry Year		11,060	11,060	11,060	11,060	11,060
Multi-Year Drought	Year 1	11,060	11,060	11,060	11,060	11,060
	Year 2	11,060	11,060	11,060	11,060	11,060
	Year 3	11,060	11,060	11,060	11,060	11,060
	Year 4	11,060	11,060	11,060	11,060	11,060
	Year 5	11,060	11,060	11,060	11,060	11,060

Customer Water Use Worksheet (Potable) - Optional Tool

= auto-filled cell

Select Unit of Measure: *Acre Feet (AF)*

Part 1: Current (2020) Total Water Use (potable)

[use of monthly data is recommended]

	Use Category	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	2020 Tot.
2020	Single-family Residential	56	56	52	52	110	110	162	162	149	149	66	66	1,189
	Multi-family Residential	1	1	1	1	1	1	2	2	2	2	1	1	16
	Commercial	2	2	2	2	3	3	5	5	6	6	2	2	38
	Industrial													0
	Institutional and Governmental	4	4	4	4	8	8	13	13	12	12	5	5	90
	Landscape Irrigation	1	1	1	1	6	6	13	13	9	9	2	2	62
	Sales to Other Agencies													0
	Agricultural													0
	Other 1													0
	Other 2													0
	Other 3													0
	Customer Water Use Subtotal	64	64	60	60	127	127	194	194	177	177	76	76	1,395
	Distribution System Water Loss	35	35	35	35	35	35	35	35	35	35	35	35	416
	2020 Total Water Use	99	99	94	94	162	162	229	229	211	211	111	111	1,811
Past Use	2016	60	60	64	64	114	114	199	199	138	138	60	60	1,272
	2017	61	61	55	55	142	142	200	200	166	166	64	64	1,376
	2018	64	64	58	58	118	118	182	182	139	139	88	88	1,299
	2019	61	61	58	58	102	102	179	179	139	139	81	81	1,240

Part 2: Projected Total Water Use (potable)

2025	2030	2035	2040	2045 (opt)
1,249	1,317	1,388	1,461	1,539
18	19	20	21	22
40	42	44	46	49
96	101	106	112	118
66	70	73	77	81
1,468	1,548	1,631	1,717	1,809
341	341	341	341	341
1,809	1,889	1,972	2,058	2,150

Part 3: Estimating Total Water Use (potable) for next 5 years *[use of monthly data is recommended]*

For Drought Risk Assessment	Change from 2020	1	1	1	1	2	2	2	2	2	2	1	1	19	
	2021 Total Water Use	100	100	95	95	163	163	231	231	213	213	112	112	1,830	Used for Year 1 of DRA
	Change from 2021	1	1	1	1	2	2	2	2	2	2	1	1	19	
	2022 Total Water Use	101	101	96	96	165	165	234	234	216	216	113	113	1,849	Used for Year 2 of DRA
	Change from 2022	1	1	1	1	2	2	2	2	2	2	1	1	19	
	2023 Total Water Use	102	102	97	97	167	167	236	236	218	218	114	114	1,869	Used for Year 3 of DRA
	Change from 2023	1	1	1	1	2	2	2	2	2	2	1	1	20	
	2024 Total Water Use	103	103	98	98	168	168	239	239	220	220	116	116	1,888	Used for Year 4 of DRA
	Change from 2024	1	1	1	1	2	2	3	3	2	2	1	1	20	
	2025 Total Water Use	104	104	99	99	170	170	241	241	223	223	117	117	1,908	Used for Year 5 of DRA

Customer Water Use Worksheet (Non-potable) - Optional Tool

= auto-filled cell

Select Unit of Measure: *Acre Feet (AF)*

Part 1: Current (2020) Total Water Use (Non-potable)

[use of monthly data is recommended]

	Use Category	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	2020 Tot.
2020	Single-family Residential													0
	Multi-family Residential													0
	Commercial													0
	Industrial													0
	Institutional and Governmental													0
	Landscape Irrigation													0
	Sales to Other Agencies													0
	Agricultural	0	0	0	0	789	789	789	789	789	0	0	0	3,944
	Other 1													0
	Other 2													0
	Other 3													0
	Customer Water Use Subtotal	0	0	0	0	789	789	789	789	789	0	0	0	3,944
	Distribution System Water Loss	92	92	92	92	386	386	386	386	386	92	92	92	2,572
	2020 Total Water Use	92	92	92	92	1,175	1,175	1,175	1,175	1,175	92	92	92	6,516
Past Use	2016	0	0	0	0	930	930	930	930	930	0	0	0	4,649
	2017	0	0	0	0	930	930	930	930	930	0	0	0	4,649
	2018	0	0	0	0	850	850	850	850	850	0	0	0	4,250
	2019	0	0	0	0	810	810	810	810	810	0	0	0	4,051

Part 2: Projected Total Water Use (Non-potable)

2025	2030	2035	2040	2045 (opt)
4,794	4,794	4,794	4,794	4,794
4,794	4,794	4,794	4,794	4,794
2,572	2,572	2,572	2,572	2,572
7,366	7,366	7,366	7,366	7,366

Part 3: Estimating Total Water Use (Non-potable) for next 5 years *[use of monthly data is recommended]*

For Drought Risk Assessment	Change from 2020	0	0	0	0	171	171	171	171	171	0	0	0	855	
	2021 Total Water Use	92	92	92	92	1,345	1,345	1,345	1,345	1,345	92	92	92	7,370	Used for Year 1 of DRA
	Change from 2021	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2022 Total Water Use	92	92	92	92	1,345	1,345	1,345	1,345	1,345	92	92	92	7,370	Used for Year 2 of DRA
	Change from 2022	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2023 Total Water Use	92	92	92	92	1,345	1,345	1,345	1,345	1,345	92	92	92	7,370	Used for Year 3 of DRA
	Change from 2023	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2024 Total Water Use	92	92	92	92	1,345	1,345	1,345	1,345	1,345	92	92	92	7,370	Used for Year 4 of DRA
	Change from 2024	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2025 Total Water Use	92	92	92	92	1,345	1,345	1,345	1,345	1,345	92	92	92	7,370	Used for Year 5 of DRA

5-year Drought Risk Assessment Tool (potable)

= auto calculated

= From prior tables

5-year Drought Risk Assessment Tables to address §10635(b)

2021	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
Total Potable Water Use [Use Worksheet]	100	100	95	95	163	163	231	231	213	213	112	112	1,830
Total Potable Supplies [Supply Worksheet]	991	991	991	991	991	991	991	991	991	991	991	991	11,890
Surplus/Shortfall w/o WSCP Action	891	891	895	895	828	828	759	759	777	777	879	879	10,060
Planned WSCP Actions (use reduction and supply augmentation)													
WSCP - supply augmentation benefit	0	0	0	0	0	0	0	0	0	0	0	0	0
WSCP - use reduction savings benefit	75	75	75	75	86	86	86	86	86	75	75	75	955
Revised Surplus/(shortfall)	966	966	970	970	914	914	845	845	863	852	954	954	11,015
Resulting % Use Reduction from WSCP action	75%	75%	79%	79%	53%	53%	37%	37%	40%	35%	67%	67%	52%

2022	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
Total Potable Water Use [Use Worksheet]	101	101	96	96	165	165	234	234	216	216	113	113	1,849
Total Potable Supplies [Supply Worksheet]	991	991	991	991	991	991	991	991	991	991	991	991	11,890
Surplus/Shortfall w/o WSCP Action	890	890	894	894	826	826	757	757	775	775	878	878	10,040
Planned WSCP Actions (use reduction and supply augmentation)													
WSCP - supply augmentation benefit	0	0	0	0	0	0	0	0	0	0	0	0	0
WSCP - use reduction savings benefit	75	75	75	75	86	86	86	86	86	75	75	75	955
Revised Surplus/(shortfall)	965	965	969	969	912	912	843	843	861	850	953	953	10,995
Resulting % Use Reduction from WSCP action	75%	75%	78%	78%	52%	52%	37%	37%	40%	35%	66%	66%	52%

2023	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
Total Potable Water Use [Use Worksheet]	102	102	97	97	167	167	236	236	218	218	114	114	1,869
Total Potable Supplies [Supply Worksheet]	991	991	991	991	991	991	991	991	991	991	991	991	11,890
Surplus/Shortfall w/o WSCP Action	889	889	893	893	824	824	755	755	773	773	876	876	10,021
Planned WSCP Actions (use reduction and supply augmentation)													
WSCP - supply augmentation benefit	0	0	0	0	0	0	0	0	0	0	0	0	0
WSCP - use reduction savings benefit	75	75	75	75	86	86	86	86	86	75	75	75	955
Revised Surplus/(shortfall)	964	964	968	968	910	910	841	841	859	848	951	951	10,976
Resulting % Use Reduction from WSCP action	74%	74%	77%	77%	52%	52%	36%	36%	39%	34%	66%	66%	51%

2024	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
Total Potable Water Use [Use Worksheet]	103	103	98	98	168	168	239	239	220	220	116	116	1,888
Total Potable Supplies [Supply Worksheet]	991	991	991	991	991	991	991	991	991	991	991	991	11,890
Surplus/Shortfall w/o WSCP Action	888	888	892	892	822	822	752	752	771	771	875	875	10,001
Planned WSCP Actions (use reduction and supply augmentation)													
WSCP - supply augmentation benefit	0	0	0	0	0	0	0	0	0	0	0	0	0
WSCP - use reduction savings benefit	75	75	75	75	86	86	86	86	86	75	75	75	955
Revised Surplus/(shortfall)	963	963	967	967	908	908	838	838	857	846	950	950	10,956
Resulting % Use Reduction from WSCP action	73%	73%	76%	76%	51%	51%	36%	36%	39%	34%	65%	65%	51%

2025	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
Total Potable Water Use [Use Worksheet]	104	104	99	99	170	170	241	241	223	223	117	117	1,908
Total Potable Supplies [Supply Worksheet]	991	991	991	991	991	991	991	991	991	991	991	991	11,890
Surplus/Shortfall w/o WSCP Action	887	887	891	891	821	821	750	750	768	768	874	874	9,982
Planned WSCP Actions (use reduction and supply augmentation)													
WSCP - supply augmentation benefit	0	0	0	0	0	0	0	0	0	0	0	0	0
WSCP - use reduction savings benefit	75	75	75	75	86	86	86	86	86	75	75	75	955
Revised Surplus/(shortfall)	962	962	966	966	907	907	836	836	854	843	949	949	10,937
Resulting % Use Reduction from WSCP action	72%	72%	75%	75%	51%	51%	36%	36%	39%	34%	64%	64%	50%

5-year Drought Risk Assessment Tool (Non-potable)

	= auto calculated
	= From prior tables

5-year Drought Risk Assessment Tables to address §10635(b)

2021	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
Total Non-potable Water Use [Use Worksheet]	92	92	92	92	1,345	1,345	1,345	1,345	1,345	92	92	92	7,370
Total Non-potable Supplies [Supply Worksheet]	991	991	991	991	991	991	991	991	991	991	991	991	11,890
Surplus/Shortfall w/o WSCP Action	899	899	899	899	-355	-355	-355	-355	-355	899	899	899	4,519
Planned WSCP Actions (use reduction and supply augmentation)													
WSCP - supply augmentation benefit	0	0	0	0	0	0	0	0	0	0	0	0	0
WSCP - use reduction savings benefit	0	0	0	0	500	500	500	500	500	0	0	0	2,500
Revised Surplus/(shortfall)	899	899	899	899	145	145	145	145	145	899	899	899	7,019
Resulting % Use Reduction from WSCP action	0%	0%	0%	0%	37%	37%	37%	37%	37%	0%	0%	0%	34%

2022	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
Total Non-potable Water Use [Use Worksheet]	92	92	92	92	1,345	1,345	1,345	1,345	1,345	92	92	92	7,370
Total Non-potable Supplies [Supply Worksheet]	991	991	991	991	991	991	991	991	991	991	991	991	11,890
Surplus/Shortfall w/o WSCP Action	899	899	899	899	-355	-355	-355	-355	-355	899	899	899	4,519
Planned WSCP Actions (use reduction and supply augmentation)													
WSCP - supply augmentation benefit	0	0	0	0	0	0	0	0	0	0	0	0	0
WSCP - use reduction savings benefit	0	0	0	0	500	500	500	500	500	0	0	0	2,500
Revised Surplus/(shortfall)	899	899	899	899	145	145	145	145	145	899	899	899	7,019
Resulting % Use Reduction from WSCP action	0%	0%	0%	0%	37%	37%	37%	37%	37%	0%	0%	0%	34%

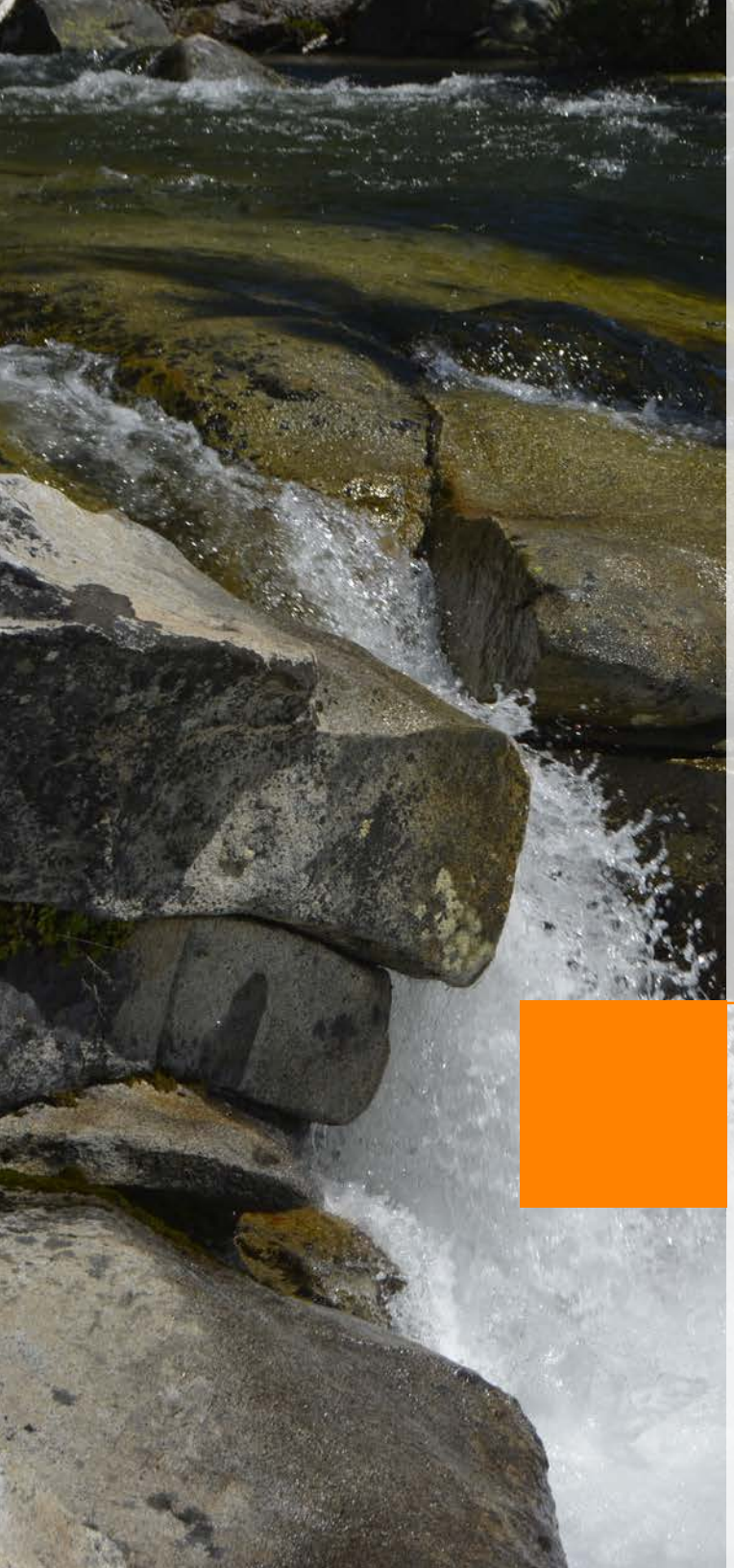
2023	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
Total Non-potable Water Use [Use Worksheet]	92	92	92	92	1,345	1,345	1,345	1,345	1,345	92	92	92	7,370
Total Non-potable Supplies [Supply Worksheet]	991	991	991	991	991	991	991	991	991	991	991	991	11,890
Surplus/Shortfall w/o WSCP Action	899	899	899	899	-355	-355	-355	-355	-355	899	899	899	4,519
Planned WSCP Actions (use reduction and supply augmentation)													
WSCP - supply augmentation benefit	0	0	0	0	0	0	0	0	0	0	0	0	0
WSCP - use reduction savings benefit	0	0	0	0	500	500	500	500	500	0	0	0	2,500
Revised Surplus/(shortfall)	899	899	899	899	145	145	145	145	145	899	899	899	7,019
Resulting % Use Reduction from WSCP action	0%	0%	0%	0%	37%	37%	37%	37%	37%	0%	0%	0%	34%

2024	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
Total Non-potable Water Use [Use Worksheet]	92	92	92	92	1,345	1,345	1,345	1,345	1,345	92	92	92	7,370
Total Non-potable Supplies [Supply Worksheet]	991	991	991	991	991	991	991	991	991	991	991	991	11,890
Surplus/Shortfall w/o WSCP Action	899	899	899	899	-355	-355	-355	-355	-355	899	899	899	4,519
Planned WSCP Actions (use reduction and supply augmentation)													
WSCP - supply augmentation benefit	0	0	0	0	0	0	0	0	0	0	0	0	0
WSCP - use reduction savings benefit	0	0	0	0	500	500	500	500	500	0	0	0	2,500
Revised Surplus/(shortfall)	899	899	899	899	145	145	145	145	145	899	899	899	7,019
Resulting % Use Reduction from WSCP action	0%	0%	0%	0%	37%	37%	37%	37%	37%	0%	0%	0%	34%

2025	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total
Total Non-potable Water Use [Use Worksheet]	92	92	92	92	1,345	1,345	1,345	1,345	1,345	92	92	92	7,370
Total Non-potable Supplies [Supply Worksheet]	991	991	991	991	991	991	991	991	991	991	991	991	11,890
Surplus/Shortfall w/o WSCP Action	899	899	899	899	-355	-355	-355	-355	-355	899	899	899	4,519
Planned WSCP Actions (use reduction and supply augmentation)													
WSCP - supply augmentation benefit	0	0	0	0	0	0	0	0	0	0	0	0	0
WSCP - use reduction savings benefit	0	0	0	0	500	500	500	500	500	0	0	0	2,500
Revised Surplus/(shortfall)	899	899	899	899	145	145	145	145	145	899	899	899	7,019
Resulting % Use Reduction from WSCP action	0%	0%	0%	0%	37%	37%	37%	37%	37%	0%	0%	0%	34%

APPENDIX C

EL DORADO COUNTY WATER AGENCY – WATER RESOURCES DEVELOPMENT AND MANAGEMENT PLAN



El Dorado County Water Agency

Water Resources Development and Management Plan

October 21, 2019

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El Dorado County Water Agency

Water Resources Development and Management Plan

October 21, 2019

Mission Statement

Ensure that El Dorado County has adequate water for today and in the future.

Board of Directors

Brian Veerkamp, El Dorado County Board of Supervisors, District III

Shiva Frentzen, El Dorado County Board of Supervisors, District II

Lori Parlin, El Dorado County Board of Supervisors, District IV

George Osborne, El Dorado Irrigation District Board of Directors, Division I

Kelly Sheehan, South Lake Tahoe Public Utility Board of Directors, Seat 4

General Manager

Kenneth V. Payne, P.E.

A New Era

Water is at the heart of everything our communities do and need. The El Dorado County Water Agency is proud of its history of long-term water resources planning for the benefit of the communities in our county. Our primary focus has been to ensure that El Dorado County has adequate water supplies for now and in the future, and historically, we have worked with water purveyors in the county in planning and developing reliable water supplies for continued economic development.

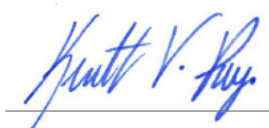
Today, at the cusp of our 60th anniversary, we examine the broad charges entrusted by the State Legislature in the 1959 El Dorado County Water Agency Act (Act), and we recognize the gravity of our mission and responsibilities. Water resources are critical to achieve the objectives of the adopted General Plan in maintaining economic prosperity, environmental protection, and our desired rural-agricultural way of life. Facing diverse, yet interrelated water resources challenges, prudent and comprehensive water resources planning is not just a niche service for our county today, but a necessity to achieve sustainability for future generations. As a steward of water resource in El Dorado County, the Agency needs to embrace the full spectrum of our responsibilities to residents and communities in the county, consistent with the 1959 Act. Our outcome-oriented actions need to propel us to secure water supplies, improve drought preparedness, manage stormwater as a resource, provide adequate flood protection, and enhance watershed health—all integral elements for proactive water management planning for the county's future.

We completed the 2019 Water Resources Development and Management Plan (Plan) as a blueprint for a new chapter in the Agency's history. The 2019 Plan lays the groundwork to identify resource management strategies to counter the threats to our county, including droughts, wildfires, deteriorated headwaters, limited groundwater resources, and fragmented water management. Through integrated and collaborative implementation, these resource management strategies will proactively address changing water resources needs, regulatory requirements, and climate variability. The focused and defined role and responsibility in implementing actions for advancing these strategies would ensure effectiveness and efficiency in achieving anticipated outcomes, while promoting the Agency's long-term organizational and financial sustainability.

On behalf of our Board, we recognize that the 2019 Plan is the result of nearly a year of collaboration with advisory groups consisting of water purveyors, key county staff, and stakeholders representing the rural and agricultural interests of El Dorado County. Great care was taken to acknowledge and preserve "our county roots" and the rural-agricultural way of life that El Dorado County was built on. This Plan is the culmination of hard work and dedication of our partners and stakeholders. We are grateful for their knowledge sharing and more importantly, their passion for the success of El Dorado County. This spirit of collaboration and shared experience will certainly pay dividends in plan implementation, which requires the same, if not more collaboration and cooperation to secure our collective water future.

Best Regards,

Brian Veerkamp
Board Chair
El Dorado County Water Agency
and El Dorado County Supervisor, District III



Kenneth V. Payne, P.E.
General Manager
El Dorado County Water Agency

Executive Summary

Through the 1959 El Dorado County Water Agency Act, the El Dorado County Water Agency's (EDCWA or Agency) mission is to ensure that El Dorado County has adequate water for today and in the future. The Agency's responsible area covers the entire El Dorado County, on both sides of the Sierra Nevada in the Tahoe Basin as well as the West Slope foothill area (West Slope). This diverse landscape has headwaters and national forests with some urbanization and general rural-agricultural surroundings.

This 2019 update of the Water Resources Development and Management Plan (WRDMP) marks a new beginning of the Agency's service to El Dorado County. It reflects the Agency's progression toward countywide long-term water security and a renewed focus on advancing integrated water management to realize the vision of the General Plan adopted by the County of El Dorado (County) for economic development, environmental protection, and quality of life for all residents.

A Need for a New Perspective

The recent drought from 2012 through 2016 served as a wake-up call for water managers statewide, with the recognition of the severe vulnerabilities we face with our current water management practices. In addition, recent devastating wildfires exposed the weaknesses of current passive forest management and overall headwater management that are critical to climate resiliency in El Dorado County.

California continues to experience rapid growth of its population and economy, and the influence of socioeconomic changes that cross geographic boundaries is becoming more prevalent. Increasing regulatory requirements and rapidly manifesting consequences of climate change also contribute significantly to concerns over long-term water supply reliability and climate resiliency, as well as the overall economy and way of life.

The County General Plan lays out a vision that encourages a strong economy; and also preserves the rural-agricultural way of life in El Dorado County. Imbedded in that vision is the protection of El Dorado County's rich natural resources for future generations. However, about 53 percent of the land in the West Slope that is covered by the County General Plan for economic development lacks adequate water supply for intended land use. The complexity and interrelationship of water resource-related challenges require a more integrated and collaborative approach. Future investments by many local, regional, and federal entities could be better coordinated and leveraged to create broader and long-lasting benefits for all communities countywide.

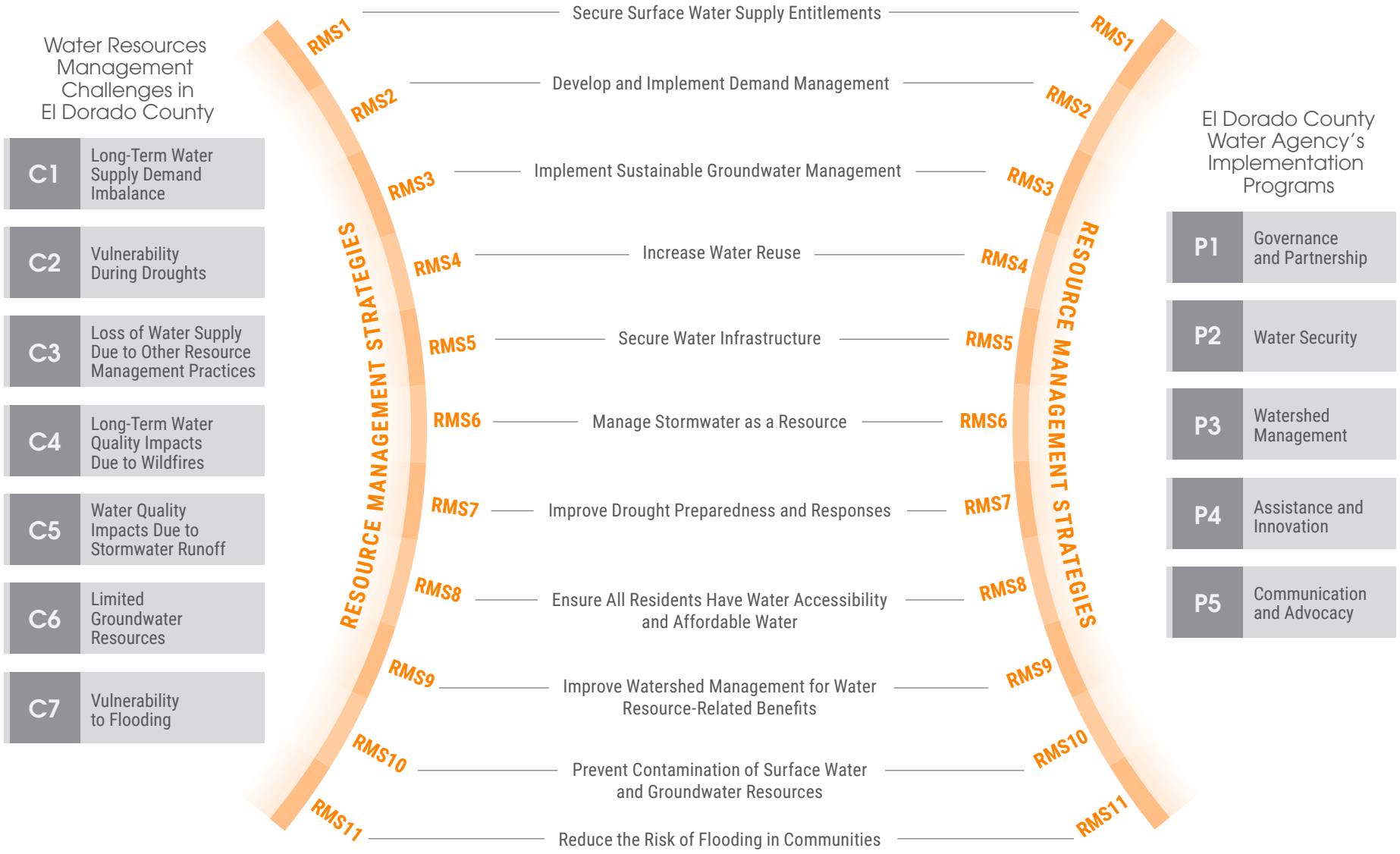
An Integrated and Collaborative Approach to a Better Future

The Agency does not currently own any water facilities nor provide water supply directly to any water users. Rather, it collaborates with water entities to develop local water supplies and is seeking to contract with the U.S. Department of the Interior, Bureau of Reclamation for Central Valley Project water service contract deliveries that support a portion of El Dorado County's domestic uses and economic development.

The Agency's 2016-2020 Strategic Plan calls for improved organization and a renewed focus on a more integrated and comprehensive water management approach to create benefits for El Dorado County, especially those not served by a water purveyor. This intent is fully reflected in this update of the WRDMP through its collaborative development process involving relevant County departments, water purveyors, stakeholders, and interested parties.

The WRDMP connects the identified water resource-related challenges to achieving the County General Plan vision with the Agency's implementation programs through an array of resource management strategies. Resource management strategies represent strategic directives that may mitigate the identified challenges through coordinated and collective efforts of all responsible parties. Key actions are established, along with the primary responsible agency(ies), and Agency's corresponding roles in leading, facilitating, or supporting a given activity are also clarified and consistent with its authority and best ways for the Agency to create direct value and benefits for all communities in El Dorado County.

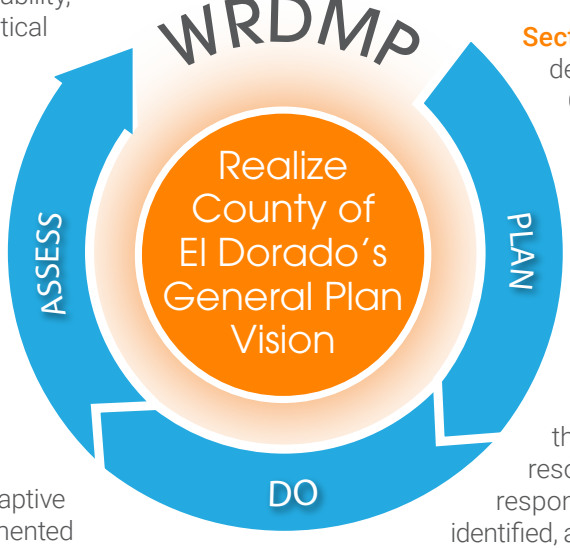
The resource management strategies with focused actions identified in the Water Resources Development and Management Plan align with the water resource-related challenges in El Dorado County and the El Dorado County Water Agency's existing and future implementation programs.



A Policy-Oriented Planning Practice for Adaptive Management

Consistent with the Agency's renewed focus, this WRDMP includes governing policies and guidance that will be required for successful implementation. The plan provides the necessary flexibility and adaptability to allow the collaborating agencies to formulate efficient and effective means to weather the uncertainties of climate variability, regulatory changes, geopolitical influences, and social preferences throughout implementation.

For efficiency of investment and accountability, the Agency prepared this WRDMP as a living document to allow periodic reviews for changed conditions and necessary adjustments in actions and priorities. The Plan-Do-Assess cycle of adaptive management will be implemented through a 5-year update cycle to maintain the WRDMP's relevancy and ensure responsible governance.



Simplified Document Structure for Efficient Updates and Adoption

This WRDMP separates policy directives for Board adoption from the constantly evolving technical detail. Supporting technical information (e.g., data, tools, evaluation methods) are instead incorporated by reference, where needed. This approach results in a concise document with a structure that facilitates future updates. It also highlights the importance of establishing stable policies and guidance for the Agency's operations and implementation.

Section 1: Introduction – This section describes the charge of the Agency and the need for a WRDMP with a new focus. It clarifies the Agency's goals and collaborative principles used in developing the WRDMP.

Section 2: Current Water Management – This section provides a description of land use and environmental protection outlined in the County General Plan, current water management practices and responsibilities, and existing major infrastructure that support implementation of the County General Plan.

Section 3: Challenges Ahead – This section summarizes the identified water resources-related challenges ahead for El Dorado County, recognizing the differences between the West Slope and Tahoe Basin, as well as the integrated nature of water resource management.

Section 4: Resource Management Strategies – This section describes the resource management strategies to mitigate for identified water resource-related challenges in El Dorado County. Major actions, primary responsible agency(ies), and the Agency's specific implementation roles are identified, all aiming at an efficient and collaborative approach for collective success.

Section 5: Implementation – This section summarizes the Agency's implementation policies and guidance, and the programs necessary to organize and coordinate the Agency's implementation efforts. For accountability, both recent accomplishments and prioritized actions by program for the next five years are described. Performance matrices and indicators are fully developed in this WRDMP but will be an area of focus for the next update, supporting efforts for accountability and investment efficiency.

Table of Contents

The Water Resources Development and Management Plan was prepared collaboratively through the contribution of the following groups and individuals.

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Jodi Lauther – Grizzly Flats Community Services District
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Abbreviations and Acronyms

Act	El Dorado County Water Agency Act
ACWA	Association of California Water Agencies
Agency	El Dorado County Water Agency
BLM	U.S. Department of the Interior, Bureau of Land Management
Board	El Dorado County Water Agency Board of Directors
CABY	Cosumnes, American, Bear, Yuba
County	County of El Dorado
CVP	Central Valley Project
DWR	California Department of Water Resources
EDCWA	El Dorado County Water Agency
EID	El Dorado Irrigation District
EMD	Environmental Management Department
FEMA	Federal Emergency Management Agency
GDPUD	Georgetown Divide Public Utility District
GFCSD	Grizzly Flats Community Services District
GSA	Groundwater Sustainability Agency
IRWM	Integrated Regional Water Management
IRWMP	Integrated Regional Water Management Plan
LAFCO	Local Agency Formation Commission
M&I	Municipal and Industrial
OCA	Other County Area
Plenary	El Dorado County Plenary for Water
PG&E	Pacific Gas and Electric Company
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
RMS	Resource Management Strategies
RWA	Regional Water Authority
SGMA	Sustainable Groundwater Management Act
SMUD	Sacramento Municipal Utility District
SWRCB	State Water Resources Control Board
STPUD	South Tahoe Public Utility District
TAF	Thousand Acre-Feet
TCPUD	Tahoe City Public Utility District
TRPA	Tahoe Regional Planning Agency
USFS	U.S. Forest Service
West Slope	El Dorado County area west of the Sierra Nevada Crest
WRDMP	Water Resources Development and Management Plan

Photo Credits

Brendan Ferry, County of El Dorado – Page iii

Yung-Hsin Sun, Stantec – Cover, Table of Contents, Pages ES-0, v, 4, 12, 30, 44

Glossary

The following key terms are listed below for easy reference. Where applicable, existing definitions from the statute and regulations are provided.

Adjoining Use — The type of water use (agricultural water use or municipal and industrial water use) that can be allowed by the adopted County General Plan when the primary use for a parcel in the rural-agricultural water use planning zone has been established. Also see the definition of primary use.

Capacity — The buildout capacity for an undetermined point in time when all land use capacity is utilized, as defined in the County General Plan.

Community Services District — A form of independent local government used to provide services in unincorporated areas of a county under the Community Services District Law (Government Code §61000-61850) to provide a wide variety of services including water, wastewater, solid waste, fire protection, and other essential services.

Community Water System — A public water system that serves at least 15 service connections used by yearlong residents or regularly serves at least 25 yearlong residents of the area served by the system, as described in Health and Safety Code §116275(i).

Disadvantaged Community — A community with a median household income less than 80 percent of the statewide average, as described in Public Resources Code §75005(g).

Federal Poverty Level — It is a measure of income used by the U.S. government to determine who is eligible for subsidies, programs, and benefits.

Noncommunity Water System — A public water system that is not a community water system, as described in Health and Safety Code §116275(j).

Non-Potable Reuse — All recycled or reclaimed water applications except those related to water supply augmentation and drinking water.

Nontransient Noncommunity Water System — A public water system that is not a community water system and that regularly serves at least 25 of the same persons over six months per year, as described in Health and Safety Code §116275(k).

Other County Area — Comprised of areas in El Dorado County that fall outside federally-managed land and a water purveyors' service area.

Potable Reuse — Recycled water used to augment drinking water supplies and including both indirect and direct uses.

Primary Use — The type of water use (agricultural water use or municipal and industrial water use) associated with the land use designation of a parcel within the rural-agricultural water use planning zone, allowed by the adopted County General Plan.

Public Utility District — A public utility district is a community-owned, locally-regulated utility authorized to provide electricity, water and sewer services, and wholesale telecommunications. A public utility district may provide one or more of these services, depending on the needs of the community under the Public Utility District Act (Public Utilities Code §15501-18055).

Public Water System — 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, as described in Health and Safety Code §116275(h). A public water system includes the following:

(1) Any collection, treatment, storage, and distribution facilities under control of the operator of the system that are used primarily in connection with the system.

(2) Any collection or pretreatment storage facilities not under the control of the operator that are used primarily in connection with the system.

(3) Any water system that treats water on behalf of one or more public water systems for the purpose of rendering it safe for human consumption.

Resource Conservation District — Resource conservation districts are special districts of the state of California, set up to be locally governed agencies with their own locally appointed or elected, independent board of directors to conserve soil and water, control runoff, prevent and control soil erosion, manage watersheds, protect water quality, and develop water storage and distribution (Public Resources Code §9001-9972). California resource conservation districts implement projects on public and private lands, and educate landowners and the public about resource conservation.

Rural-Agricultural Water Use Planning Zone — A geographic delineation of land that may have both agricultural water use and municipal and industrial water use (including rural domestic water use), allowed by the adopted County General Plan.

Severely Disadvantaged Community — A community with a median household income less than 60 percent of the statewide average, as described in Public Resources Code § 75005(g).

Small Water Supplier — Serves 15 to 2,999 service connections or delivers less than 3,000 acre-feet of water in a year.

State Small Water System — System for the provision of piped water to the public for human consumption that serves at least five, but not more than 14, service connections and does not regularly serve drinking water to more than an average of 25 individuals daily for more than 60 days out of the year, as described in Health and Safety Code §116275(n).

Transient Noncommunity Water System — Noncommunity water system that does not regularly serve at least 25 of the same persons over six months per year, as described in Health and Safety Code §116275(o).

Water Use Planning Zone — A geographic delineation of land that may have a certain type of water use, allowed by the adopted County General Plan. Also see the definitions of the urban water use planning zone and rural-agricultural water use planning zone.

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, as described in Water Code §10617.

Urban Water Use Planning Zone — A geographic delineation of land that may have only municipal and industrial water use allowed by the adopted County General Plan.

SECTION

1

Introduction

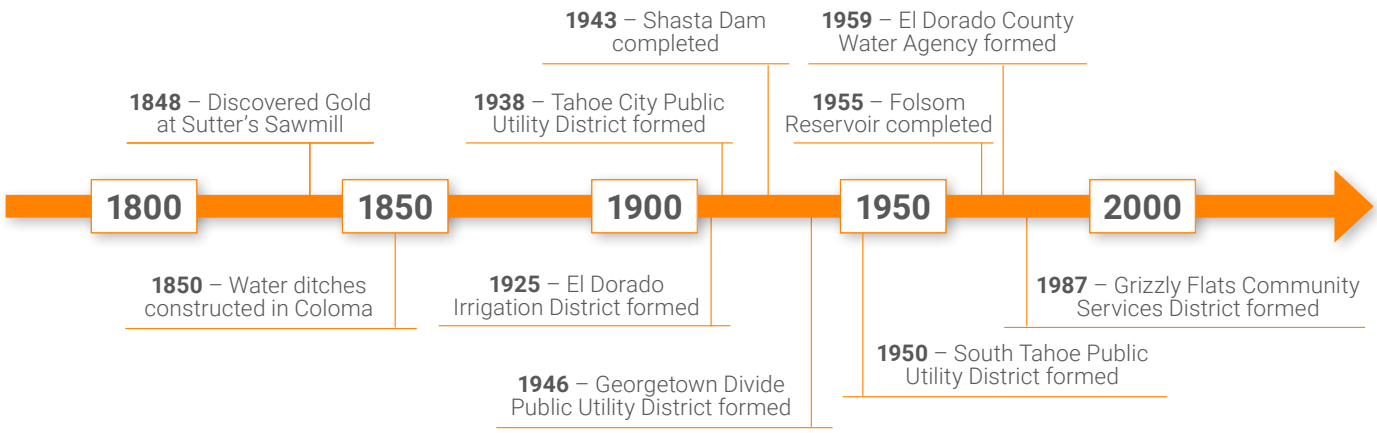
The El Dorado County Water Agency (Agency or EDCWA) was created in 1959 through the El Dorado County Water Agency Act (Act) to ensure that El Dorado County had adequate water to serve its many needs now and into the future. The Agency covers the entire El Dorado County, on both sides of the Sierra Nevada with headwaters and national forests. El Dorado County's diverse landscapes include a portion of the Tahoe Basin located on the east of the Sierra Nevada Crest, that has unique governance and ecological sensitivities. The vast West Slope foothill area (West Slope) located to the west of the Sierra Nevada Crest in El Dorado County, has urbanized areas in the west near Sacramento County. The majority of the West Slope has a rural-agricultural setting, which is a preferred way of life.

The Agency does not currently own any water facilities. It currently collaborates with water purveyors to develop local water supplies and is finalizing a contract with the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) for a Central Valley Project (CVP) water service contract for deliveries that support El Dorado County's continued economic development.

1.1 Needs

The Agency developed its first Water Resources Development and Management Plan (WRDMP) in 1993 to outline its strategy and actions for water resources development and management in El Dorado County. The 2007 update of the WRDMP brought forth some emerging issues such as climate change. In 2014, the Agency completed a update that was limited to the West Slope water use demands only.

The recent drought from 2012 through 2016 left water managers throughout California, like the Agency, with changed perspectives regarding their water supply vulnerabilities and the importance of being climate resilient. In 2016, the Agency completed its 2016-2020 Strategic Plan that called for improved organization and a renewed focus on a more integrated and comprehensive water management approach to create benefits for the entire El Dorado County, especially those residents not served by a water purveyor. As these directives required the Agency to reevaluate and adjust, if needed, its focus in future investments and its associated role and responsibilities, the Agency conducted a full update of the WRDMP.



1.2 Goals

The primary goal of the WRDMP is to assist the County of El Dorado (County) in realizing its adopted General Plan through prudent and integrated water management. The County General Plan is unique in several ways in that it:

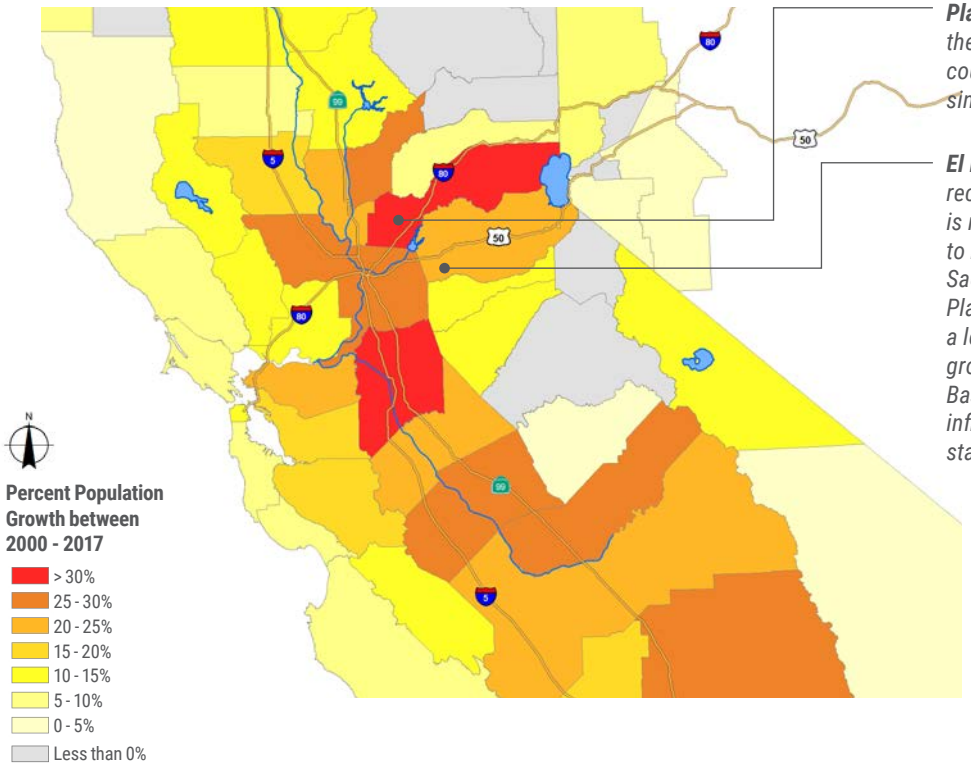
- Contains a land use plan for economic development and integrated natural resource protection and management.
- Plans for land capacity for all purposes by considering future economic development beyond the typical near-term urbanization focus.
- Incorporates policies and considerations that allow for urbanization but also preserve the rural-agricultural way of life that residents value significantly.

Additional goals of the WRDMP include:

- Develop a concise, adaptable, and policy-focused plan with actions that are commensurate with the Agency's role and responsibilities.
- Incorporate an integrated water management approach into sustainable investment strategies and implementation.
- Address changes in countywide water supply conditions, regulations, as well as the evolving understanding of climate change and its effects.
- Promote transparency and common understanding of the Agency's investment priorities in water resources development and management.

Through the WRDMP, the Agency developed corresponding resource management strategies based on an integrated water management concept and corresponding investment priorities to fulfill the vision presented in the County General Plan.

In Northern California, economic development and housing challenges in the Bay Area resulted in population growth along major transportation corridors including El Dorado County. In anticipation of future growth, the County of El Dorado General Plan vision allows for economic development while preserving the way of life in rural-agricultural communities. In 2014, the El Dorado County Board of Supervisors approved a 1.03 percent annual growth rate for the next 20 years.



Source: United States Census, 2000 and 2017 Quickfacts

1.3 Development of the Water Resources Development and Management Plan

The Agency outlined several principles for its WRDMP including:

- ***Respect the roles and responsibilities of water purveyors and other local agencies.*** The Agency has broad authority and charge from the Act; however, it considers its greatest value to be promoting countywide broad benefits and focusing on improving water supply and other related water resource management issues that are not fully covered by other local agencies.
- ***Promote dialogues among local agencies, economic interests, and stakeholders for mutual understanding.*** The Agency believes the County's long-term vision can only be realized through collaboration, so it formed various advisory groups for the WRDMP development and established a foundation for long-term collaborative forums for countywide water management issues.

For plan development, the Agency organized a Plan Advisory Group to provide input. This group met monthly and included representatives from County departments and commissions as well as local water purveyors. In addition, an Agricultural Advisory Group and a Municipal and Industrial (M&I) Advisory Group also assisted with demand projections and consistency. It is the Agency's intention to continue collaborating with these entities and stakeholders into the future.

1.4 Organization

The WRDMP is organized into 5 sections:

- **Section 1: Introduction** describes the charge of the Agency and the need for a WRDMP update with a fresh perspective, including clarification of the Agency's goals and collaborative principles.
- **Section 2: Current Water Management** provides a description of land use and environmental protection outlined in the County General Plan, current water management practices and responsibilities, and existing major infrastructure that supports the implementation of the County General Plan.
- **Section 3: Challenges Ahead** identifies water resource-related challenges that El Dorado County is facing, recognizing the differences between the West Slope and the Tahoe Basin, as well as the integrated nature of water resource management.
- **Section 4: Resource Management Strategies** describes resource management strategies to mitigate for identified water resource-related challenges in El Dorado County including corresponding roles and responsibilities for implementation. Specific roles and responsibilities for the Agency are highlighted as appropriate and consistent with its authority.
- **Section 5: Implementation** describes the Agency's implementation policies and guidance, and the programs necessary to organize and coordinate the Agency's implementation efforts. For accountability, both recent accomplishments and prioritized actions for the next five years are described.

Why We Do It

Who Are Responsible

What Is Ahead

How We Do It

What We Do

SECTION

2

Current Water Management

Understanding current water management practices, responsibilities, infrastructure, and commitments is critical to developing water management strategies and investment priorities that will provide opportunities for sustained economic development and help the Agency fulfill the vision in the County General Plan.

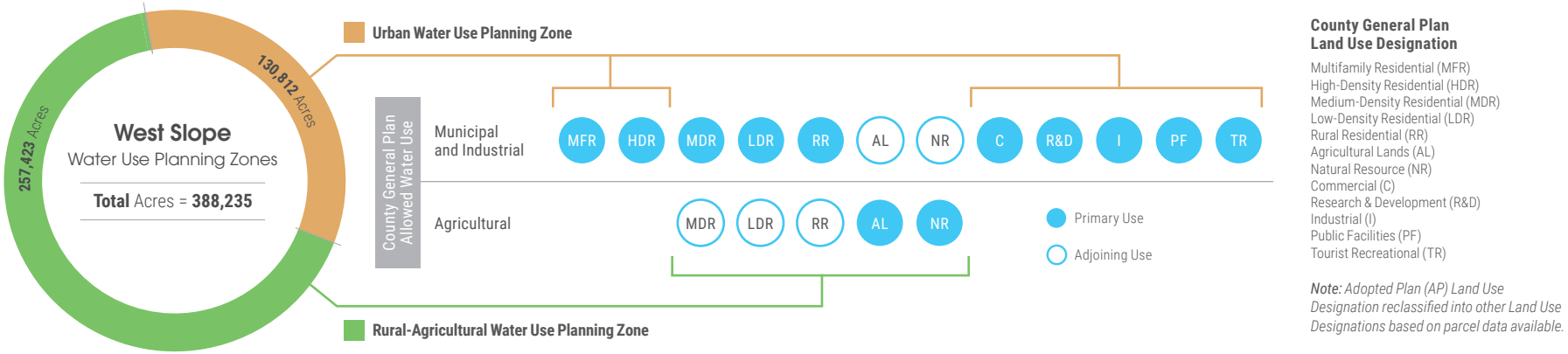
2.1 Economic Development

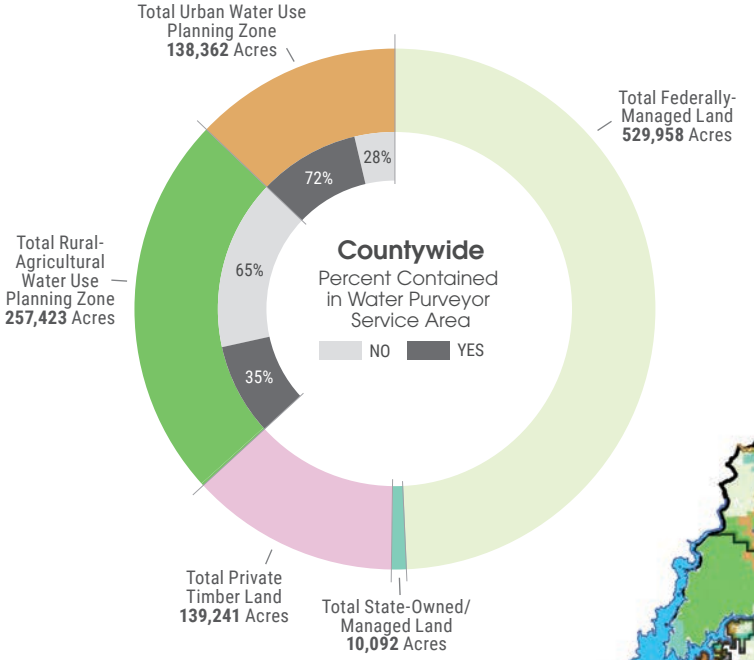
The County General Plan designates lands for economic development and identifies areas where community and agricultural development may occur. These lands are outside of national forest lands, private timber lands, and other state and federally-managed lands. The County shares responsibility for land use regulation in the Tahoe Basin with the Tahoe Regional Planning Agency (TRPA), established through the Congressionally-ratified Bi-State Compact between the states of California and Nevada. The resulting Tahoe Regional Plan is intended to provide orderly growth and development in the Tahoe Basin that is consistent with that area's environmental carrying capacity. The County General Plan reflects the intended coordination and alignment of land use. All projects in the Tahoe Basin area must be consistent with the Tahoe Regional Plan including TRPA and County codes and regulations. Decades of planning and development have resulted in the Tahoe Basin's economic development being more "mature" compared to the West Slope that is experiencing new growth.

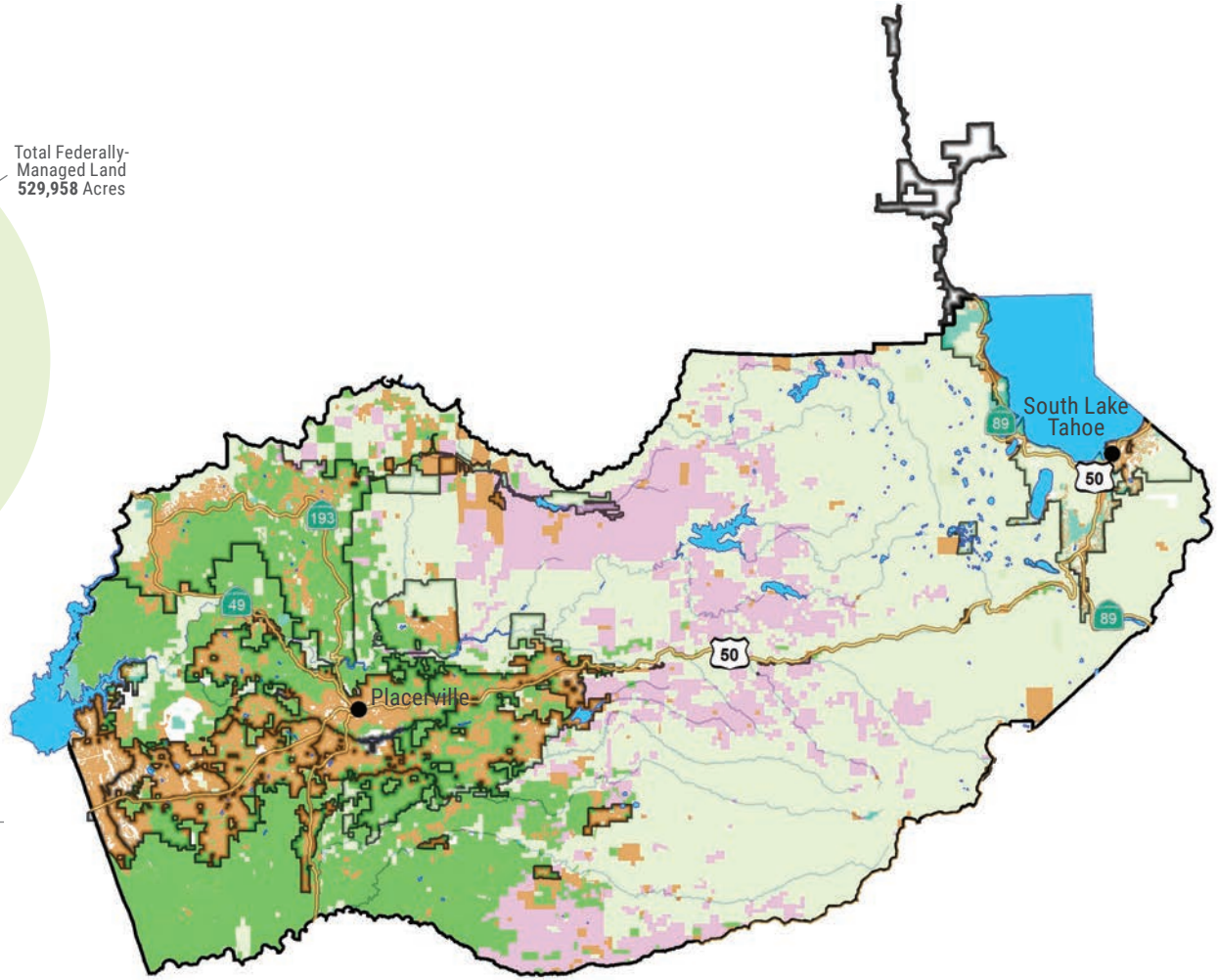
For the West Slope, the County General Plan lays out a rural-agricultural dominated landscape with high density urban development concentrated in areas adjacent to Sacramento County and along Highway 50 using a combination of land use designation, zoning ordinance designation, and policies. Constrained by the terrain, commercial farming operations in El Dorado County are small in comparison to the Central Valley, on average less than 3 acres; large corporate farming operations do not exist in El Dorado County. For planning purposes, two water use planning zones are established, consistent with the County General Plan:

- **Urban water use planning zone**: Lands for economic development where the County General Plan allows only M&I water use. The delineation of this zone is relatively straightforward.
- **Rural-agricultural water use planning zone**: Lands for economic development where the County General Plan allows both M&I use (including rural domestic use) and agricultural use. The delineation of this zone is more complex because the presence of M&I use and agricultural use may vary based on the County General Plan land use designation. For example, parcels within the Low-Density Residential land use designation are for residential use, resulting in M&I water use (i.e., primary use). However, the County General Plan also permits agricultural practices on larger residential parcels, resulting in agricultural water use (i.e., adjoining use). Similarly, a parcel designated as Agricultural Lands is dedicated to agriculture, resulting in agricultural water use (i.e., primary use). A farmhouse with domestic water use could also be permitted for complementing the intended farming operation, resulting in M&I water use (i.e., adjoining use). The preferred rural-agricultural way of life means that permitted agricultural practices in El Dorado County include both commercial and non-commercial purposes where non-commercial practices are to limited household consumption.

These zones reflect the foundational policies in the County General Plan in terms of where and what water use may occur, and why. These policies do not guarantee water demands will be realized, as that requires consideration of other conditions such as physical constraints (e.g., slope and soil types), preferences (e.g., community centers and agricultural districts), and management strategies (e.g., water use efficiency and applied technology).







Reliable water supplies are foundational to ensure economic development and prosperity into the future. In the West Slope, a substantial portion of the land designated for economic development in the County of El Dorado General Plan is not served by any major water purveyor. Approximately 71 percent of the urban water use planning zone and 35 percent of the rural-agricultural water use planning zone are served by a public water purveyor. In the Tahoe Basin, areas of economic development are completely within the service areas of existing water purveyors.

Water Use Planning Zone
- Rural-Agricultural
- Urban

Areas Not in General Plan Land Use Designation
- Private Timber
- Federally-Managed Land
- State-Owned/Managed Land
- City
- Existing Water Purveyor Service Area

Source of parcel information; County of El Dorado, March 2019

N

0 2.5 5 10 15 20 Miles

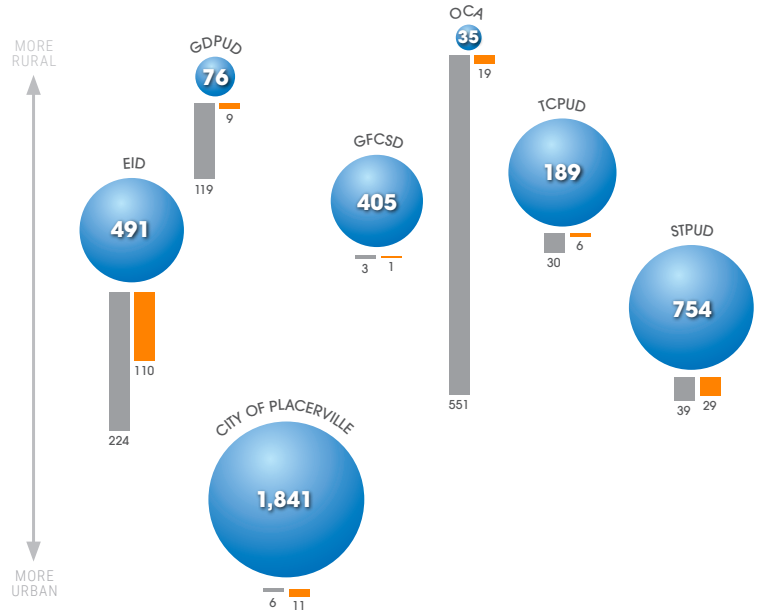
2.2 Roles and Responsibilities in Water Management

Many entities have active water management roles at the local or regional level including the Agency, County, public water purveyors, private water companies, and those that are considered self-supplied. The Agency is charged with developing a countywide water plan and participating in statewide water planning. It can negotiate, under the Act, contracts with the California Department of Water Resources (DWR), Reclamation, and other local, state, and federal agencies for water management and facility construction. The Agency supports actions to protect existing uses of water rights on which water purveyors and their customers depend, and it applies for the use of additional water rights as needed for the beneficial use of future customers or to extend service boundaries to include existing landowners.

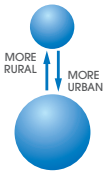
There are six public water purveyors in El Dorado County. El Dorado Irrigation District (EID), Georgetown Divide Public Utility District (GDPUD), City of Placerville, and Grizzly Flats Community Services District (GFCSD) serve surface water in the West Slope. The City of Placerville receives wholesale water from EID. South Lake Tahoe Public Utility District (STPUD) serves groundwater, and Tahoe City Public Utility District (TCPUD) serves water from both groundwater and spring wells in the Tahoe Basin. These purveyors' service areas do not cover the entire El Dorado County. Residents, farms, ranches, and businesses outside these purveyors' boundaries primarily rely on groundwater. In the West Slope, shallow groundwater wells are used, and in the Tahoe Basin, groundwater is extracted from either the Tahoe South or Tahoe West Subbasin.

The Agency collaborates with EID, GDPUD, GFCSD, STPUD, TCPUD, and the City of Placerville in water management. Currently, the Agency represents the Other County Area, comprised of areas in El Dorado County that fall outside private timber land, state and federally-managed land, and a water purveyors' service area.

Water purveyors in El Dorado County have different population densities, suggesting their relative urban/rural characteristics. In comparison, the Other County Area is the most rural.



LEGEND AND SOURCES



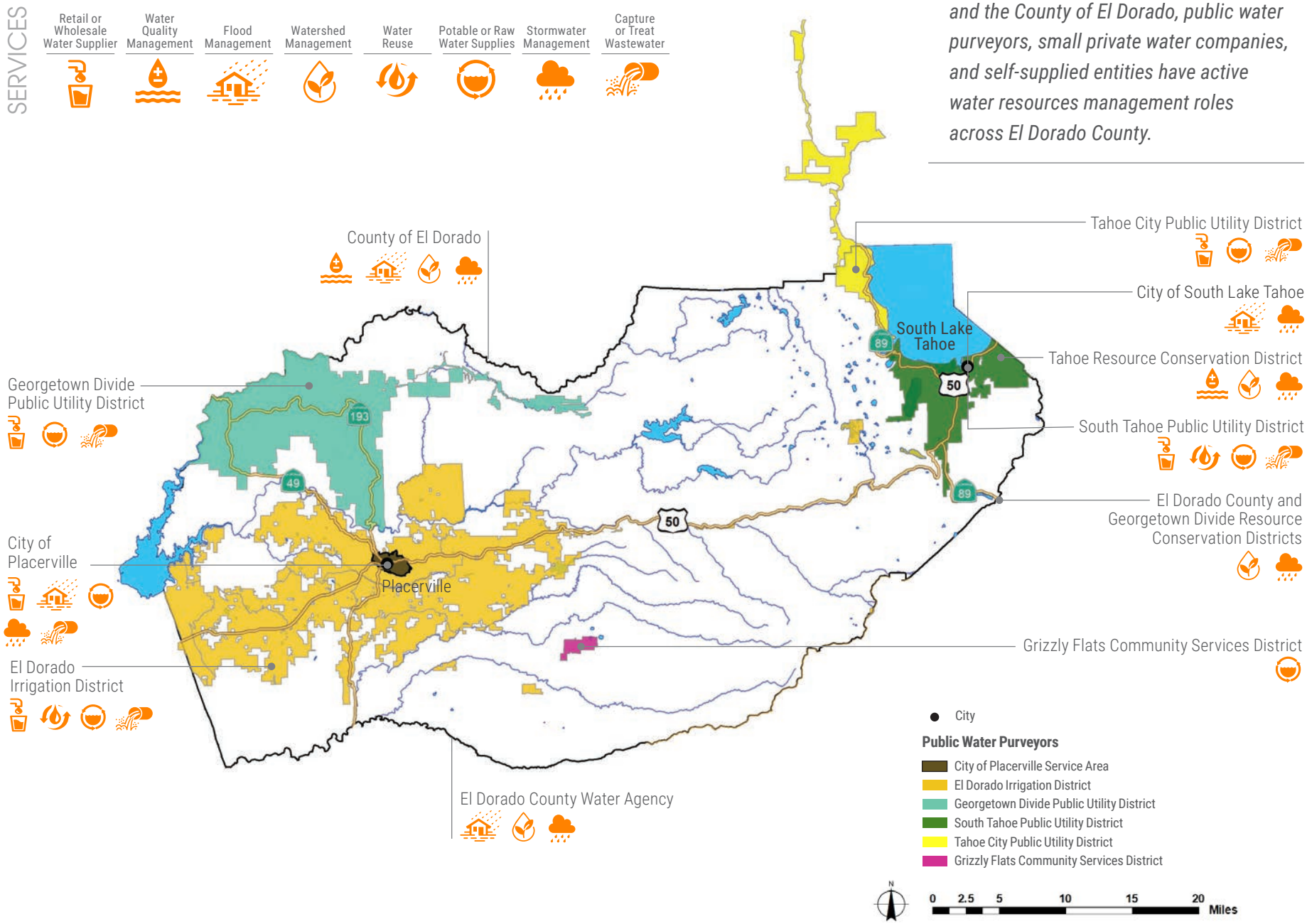
Population Density (number of persons/square miles)

Total Service Area Including Area Outside El Dorado County (square miles)
(Source: County of El Dorado)

Total Population Including Area Outside El Dorado County (square miles)
(Source: 2015 El Dorado Irrigation District Urban Water Management Plan, 2015 Georgetown Divide Urban Water Management Plan, 2014 Grizzly Flats Community Services District Municipal Service Review, 2015 South Tahoe Public Utility District Urban Water Management Plan, 2015 Tahoe City Public Utility District Urban Water Management Plan, United States Census QuickFacts, City of Placerville Economic Development website)

Key
EID = El Dorado Irrigation District
GDPUD = Georgetown Divide Public Utility District
GFCSD = Grizzly Flats Community Services District
OCA = Other County Area
STPUD = South Tahoe Public Utility District
TCPUD = Tahoe City Public Utility District

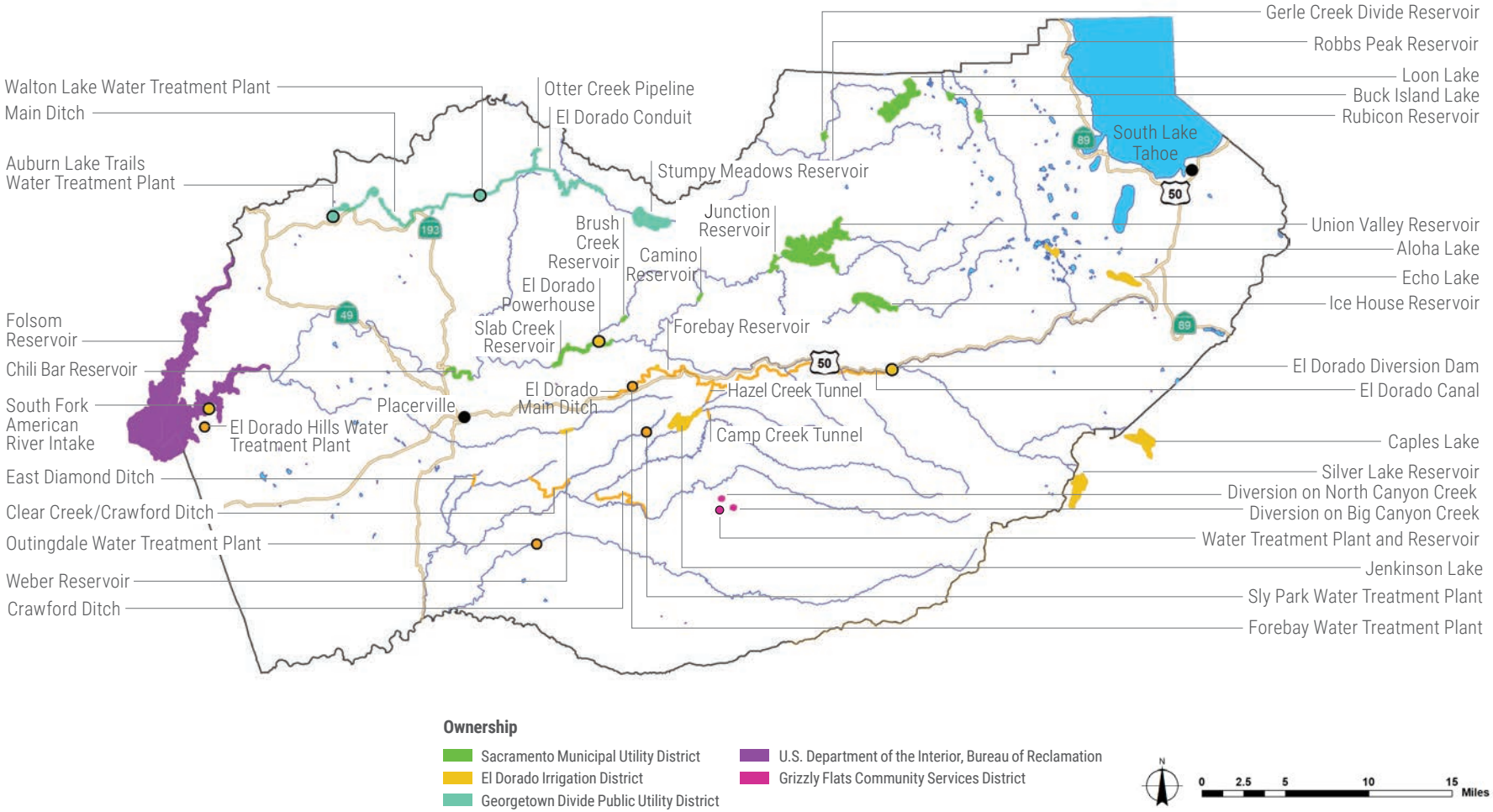
El Dorado County Water Agency, cities and the County of El Dorado, public water purveyors, small private water companies, and self-supplied entities have active water resources management roles across El Dorado County.



2.3 Major Raw Water Infrastructure

The Agency does not own any water facilities at this time. In the past, the Agency collaborated with water purveyors within El Dorado County to develop water infrastructure and other related assets. After acquisition of new assets, a water purveyor often assumed ownership and management responsibilities. This practice could be modified in the future, when appropriate, as the Agency assumes a more active role in its mission to ensure countywide water management.

Water supplies in El Dorado County originate as runoff from the Sierra Nevada snow pack that replenish the rivers and lakes on both sides of the mountain ridge. In the West Slope, water is stored and distributed throughout El Dorado County for supply and hydropower generation purposes. Most of the water infrastructure in the Sacramento Municipal Utility District (SMUD) Upper American River Project is located in El Dorado County including 11 dams, 8 powerhouses to meet electricity demands, and Loon Lake (a major water storage reservoir).



Folsom Reservoir is owned and operated by Reclamation as part of the CVP to provide flood control, hydropower, and water supplies. EID owns and operates Jenkinson Lake Reservoir in Pollock Pines and Project 184 including Echo, Aloha, Caples, and Silver Lakes. According to EID's 2013 Integrated Water Resources Master Plan, EID also diverts its CVP contract water from Folsom Reservoir. GDPUD owns and operates Stumpy Meadows Reservoir east of Georgetown in addition to several ditches used for conveyance. GFCSD owns and operates its own reservoir and diverts water from North Canyon Creek and Big Canyon Creek. Some of the infrastructure owned by EID and GDPUD are from the Gold Rush era and consist of several wooden flumes used for conveyance.

In the Tahoe Basin, snowmelt runoff recharges groundwater basins and drains into Lake Tahoe and then to the Truckee River. Water purveyors rely on the groundwater for water supply and lack other major water infrastructure. In the Tahoe Basin, STPUD serves its customers from wells. TCPUD serves its customers from 10 groundwater and 2 spring wells.

Most rural areas in both the West Slope and the Tahoe Basin are served from groundwater wells by either small private water companies or are self-supplied. In addition to the major water purveyors, there are many small water systems owned and operated by various entities and communities that provide water supply with mostly groundwater from generally low-yield fractured rock aquifers.

2.4 Environmental Protection

The County General Plan includes land use designations for integrated natural resource protection and management. Areas in El Dorado County that the Agency will help protect include several types of conservation areas:

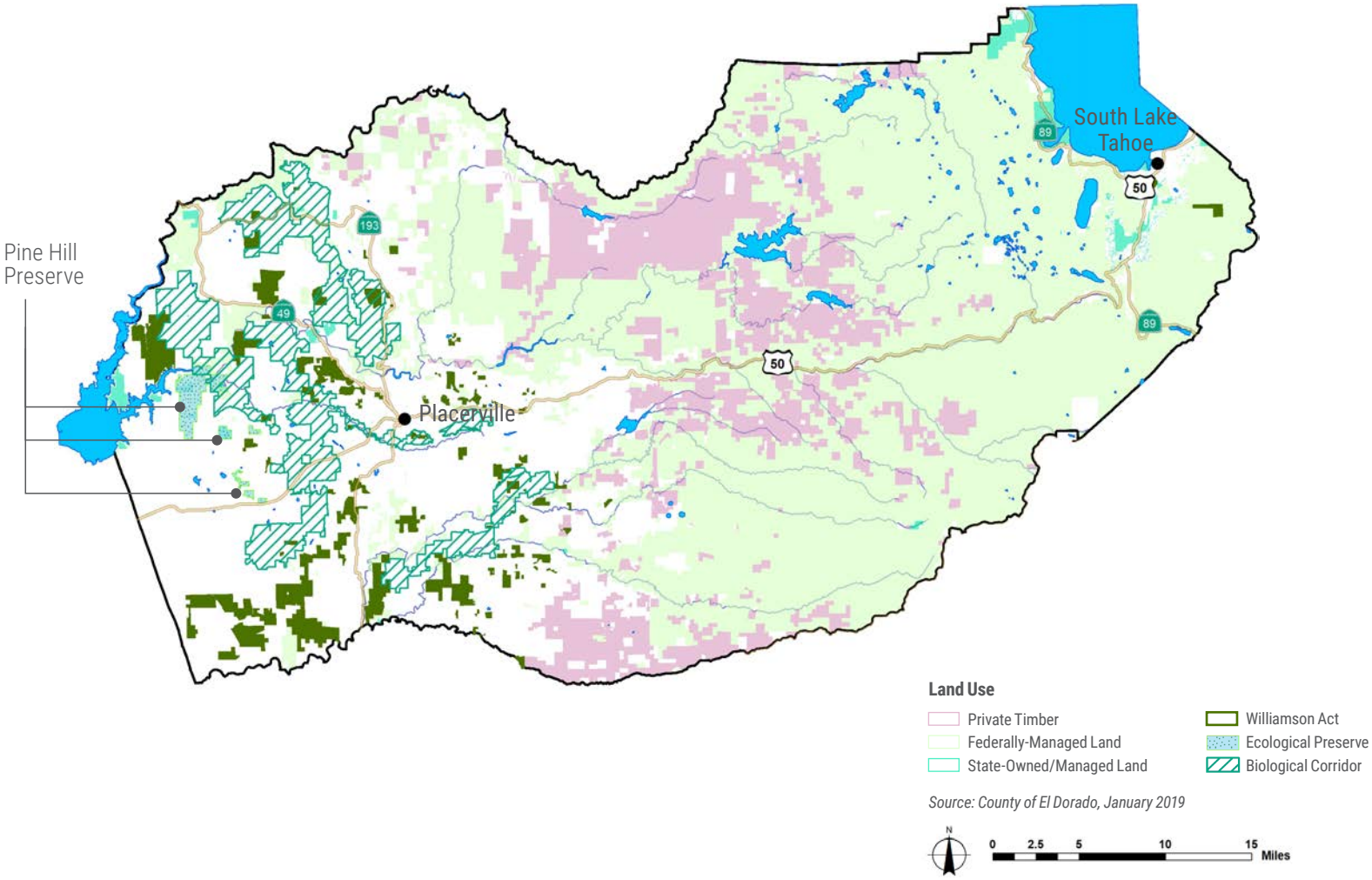
The Williamson Act – Enacted in 1965, this state law enables local governments to enter into contracts with private landowners to restrict specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments that are much lower than normal.

Biological Corridors – Biological Corridors in El Dorado County apply to lands having high wildlife habitat values because of extent, habitat function, connectivity, and other factors. Biological Corridors are home to large mammals such as mountain lions, bobcats, mule deer, the American black bear, and coyotes.

Ecological Preserves – These lands have been or will be established as habitat preserves for rare or endangered plant and animal species, critical wildlife habitat, and natural communities of high quality or of statewide importance. These lands are in addition to the resources managed by state and federal agencies, such as national forests. Pine Hill Preserve, the only Ecological Preserve in El Dorado County, has rare plant species and habitats. The County General Plan identifies necessary mitigation for the planned economic development. Parcels in El Dorado County are characterized for the needed level of mitigation should they be used for economic development purposes. Ecological Preserves are areas classified as Mitigation Area 0, which do not allow any level of development as described in the County of El Dorado Zoning Ordinance 130.71.030.

Through the WRDMP development and implementation, the Agency will also include conservation objectives outlined above in its integrated approach to sustainable water management for economic development.

The County of El Dorado General Plan recognizes the importance of protecting natural resources contained in the Williamson Act, biological corridors, and ecological preserves for long-term environmental protection and ecological needs, adding to those managed by state and federal agencies. The Pine Hill Preserve is an example of such policy implementation and is currently managed by the U.S. Department of the Interior, Bureau of Land Management.



SECTION

3

Challenges Ahead

Many have invested considerable time, effort, and funds to ensure continued water reliability and economic prosperity in El Dorado County over the years. But ever-changing conditions—both within and outside the direct control of local government and residents—mean that we must remain attentive and forward-thinking to prepare for the challenges that may lie ahead. Through the "lens" of the Agency's authority, these water resources-related challenges are summarized by category: water supply, water quality, and public safety. These three inter-related issues in the West Slope and the Tahoe Basin are shown separately to highlight the differences in water resource management priorities between the two regions. The rest of the section provides more detail.

Water-Resource Related Challenges in the West Slope

Water Supply			Water Quality			Public Safety
C1 Long-Term Water Supply-Demand Imbalance (3.1)	**C2 Vulnerability During Droughts (3.2)**	**C3 Loss of Water Supply Due to Other Resource Management Practices (3.3, 3.4, 3.5)**	**C4 Long-Term Water Quality Impacts Due to Wildfires (3.3)**	**C5 Water Quality Impacts Due to Stormwater Runoff (3.5)**	**C6 Limited Groundwater Resources (3.6)**	**C7 Vulnerability to Flooding (3.7)**
• Expected increase in demands and less reliable supplies due to limited availability of groundwater from local fractured rock aquifers and changes in surface water availability. Climate change and other factors result in long-term reduction in water supply reliability. • The Other County Area is not serviced by a water purveyor and therefore may lack reliable water supply for planned economic growth.	• There is no meaningful groundwater supply in the region and water supply can be vulnerable due to reliance on a single source of water (surface water). • The Other County Area is not covered by an existing active drought mitigation planning. • More than 100 small public water systems are susceptible to the effects of drought.	• Dense forests prevent snow from reaching the ground, resulting in a reduction in water supply availability. • Stormwater is managed as a hazard and for water quality compliance purposes but not as a potential resource for broader benefits. • Water infrastructure includes historic unlined ditches and wooden flumes that are susceptible to destruction by fires or landslides. Loss of these major conveyance structures would hinder water deliveries.	• Increasing frequency and intensity of wildfires result in both temporary and long-term water quality degradation on a landscape scale.	• Stormwater runoff may impact water quality, especially along the highway corridor. Wastewater discharges or spills from damaged facilities located near surface water could create water quality concerns.	• Septic tank systems and pollution from runoff pose potential threats to local groundwater quality, although no significant issues have been identified to-date. • Natural occurrence of arsenic in the West Slope could affect water quality in certain areas.	• Riverine flooding is not a substantial threat in the West Slope; however, localized flooding is common in some communities with chronic drainage problems.

Level of Concern

High | Moderate High | Moderate Low | Low

Water-Resource Related Challenges in the Tahoe Basin

Water Supply			Water Quality			Public Safety
C1 Long-Term Water Supply-Demand Imbalance (3.1)	**C2 Vulnerability During Droughts (3.2)**	**C3 Loss of Water Supply Due to Other Resource Management Practices (3.3, 3.4, 3.5)**	**C4 Long-Term Water Quality Impacts Due to Wildfires (3.3)**	**C5 Water Quality Impacts Due to Stormwater Runoff (3.5)**	**C6 Limited Groundwater Resources (3.6)**	**C7 Vulnerability to Flooding (3.7)**
• The planned economic development areas are covered by the existing service areas of major water purveyors, although many small water systems exist. • The growth restrictions and land use in the Tahoe Regional Plan significantly reduce the risk of water supply-demand imbalance. • Ongoing water right proceeding and process to resolve the 23,000 AF allocation for California parties per Public Law 101-618 (Settlement Act) poses uncertainty in long-term water supply.	• The Tahoe Basin is less susceptible to extended droughts, relying on both surface water and groundwater. • Existing drought ordinances do not provide coverage to the entire Tahoe Basin, although most areas have human consumption. • Small public water systems are susceptible to the effects of drought such as the temporary loss of water supply.	• Dense forests prevent snow from reaching the ground, resulting in reduced water supply available to the Tahoe Basin as groundwater via recharge. • Stormwater is presently being managed as a hazard and for water quality compliance purposes but not as a potential resource for broader benefits.	• Increasing frequency and intensity of wildfires result in both temporary and long-term water quality degradation.	• Stormwater runoff may impact water quality in Lake Tahoe and along the highway corridor.	• Septic tanks are not prevalent in the Tahoe Basin, but leakage could affect groundwater quality. • Long-term groundwater availability is less of a concern because runoff and snowmelt, even under climate change conditions, are adequate for recharge. • Perchloroethylene contamination has been observed in the South Tahoe Basin.	• Riverine flooding is not a substantial threat in the Tahoe Basin; however, rain on snow often causes extensive street flooding in certain areas.

Level of Concern

High | Moderate High | Moderate Low | Low

3.1 Water Supply-Demand Imbalance

The economic prosperity that balances urbanization and the rural-agricultural way of life envisioned in the County General Plan requires clean, affordable, and reliable water supplies. To assist the County in realizing the vision of its General Plan, a water supply-demand imbalance assessment was completed at the capacity level, as defined in the County General Plan, and not under an interim condition for a mandated time period in the near future (e.g., the next 20 years as required for an Urban Water Management Plan).

Changes and Adaptation

As discussed in Section 2.1 (see page 6), much of the West Slope planned development areas are not within water purveyors' existing service areas which could result in lengthy lead times to acquire the sources of water and needed facilities to provide reliable water supplies to these areas. Moving into the future, continued economic growth, climate change effects, technological advancements, and regulatory changes may affect both the demand and supply outlooks, resulting in a "water supply-demand imbalance" (an aggregated outcome of these changing factors).

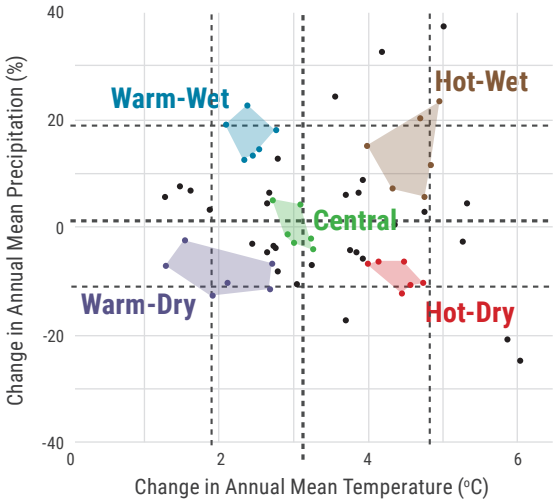
Many state, federal, and regional entities including the Agency are engaged in activities to improve understanding of the potential imbalance, and update policies and develop short-term and long-term actions to lessen the impacts. The concepts of safe yield and firm yield and any perceived assurance of water availability from senior water rights or major infrastructure are gradually fading into the past. Investment decisions in structural and non-structural measures should consider integration of resource management with institutional arrangements in order to reduce both individual and collective vulnerabilities over a broad range of future scenarios. This approach has proven to be both a more effective and financially sustainable way to weather the vast uncertainties associated with influential factors.

The Agency, in partnership with Reclamation and other regional agencies, is conducting the American River Basin Study to evaluate potential effects of climate change and develop adaptation strategies for the American River Basin, of which the upper watershed is mostly within the West Slope of El Dorado County. Projected climate change through 2100 is expected to reduce snowpack (the primary source of water in El Dorado County) as a result of more precipitation falling as rain instead of snow. Increases in temperature will increase agricultural and urban outdoor water needs. More importantly, the seasonal distribution of precipitation will shift – the runoff midpoint (when 50 percent of the total annual runoff has occurred) may shift from March to between 30 and 35 days earlier in the mid-century and end-of-century projections. This shift will result in "flashier" hydrology that could overwhelm the existing facilities that were designed and are operated according to the historical hydrology.

The increasing frequency and severity of extreme climatic events (droughts and flooding) will likely have devastating effects on communities. Historical annual precipitation totals in the American River Basin have fluctuated between 50 to 200 percent of average, but those amounts are not an indicator of future conditions, and water managers should recognize that any "state-of-the-art" water supply analysis based on monthly projections may not show the full extent of these extremes for use in adaptation strategy development and that complementary emergency response and preparedness effects must continue.

Estimated Changes in Precipitation and Changes in Temperature from Latest Climate Change Studies Published by the United Nations Intergovernmental Panel on Climate Change

Historical: 1980-2009, Future: 2070-2099



Source: American River Basin Study; preliminary information

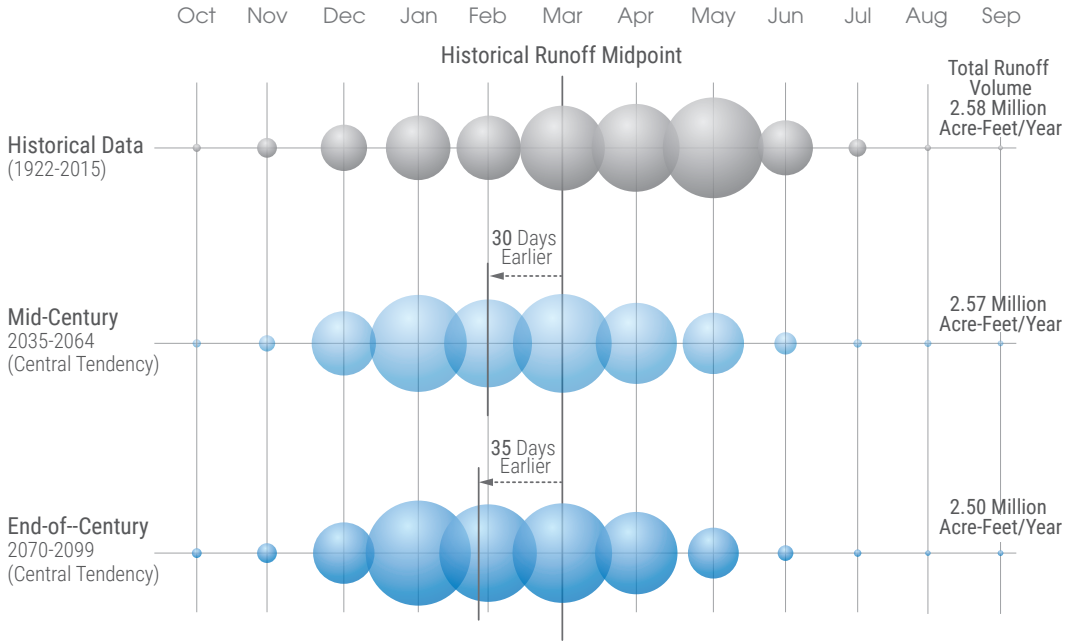
An ensemble approach to climate change impact assessments is standard and accounts for the effects of simulated changes influenced by assumed adaptation and differences in various, Global Circulation Models. Five representative trends that cover the range of possibilities but are not overly aggressive are often considered for assessing potential effects of climate change. Typically, the hot-dry and warm-wet tendencies would bracket potential water supply impacts.

Regulatory changes could also influence future demands and supply availability. California will soon transition from a volume-based conservation goal as required in Senate Bill X7-7 of 2009 to budget-based conservation requirements per Senate Bill 606 and Assembly Bill 1668 of 2018 after the State Water Resources Control Board (SWRCB) adopts various water use efficiency standards in 2023. Pending implementation of the new regulation imposes additional uncertainties on water demands and supply reliability. Continued conservation is necessary and beneficial; however, it also hardens demands, requiring more robust drought preparedness and response actions. It also requires attention to water supply reliability for vulnerable populations and disadvantaged communities.

As climate change effects continue to be felt, regulatory changes related to environmental protection and other public benefits will push water managers to improve efficiency and effectiveness in managing limited water supplies for all beneficial uses.

Water management in California adjusts its trajectory after each major drought. In the short but intense 1977-78 drought, statewide demands for water supply and environmental protection were still relatively low. Changes in water management were mostly reflected in operations and continued implementation of major water infrastructure projects. The persistent 1987-92 drought, and subsequent endangered species protection needs, drastically changed water system operational priorities and increased conflicts in providing for all beneficial uses, resulting in substantial reductions in yields from both the federal CVP and California's State Water Project. Positive outcomes from this period, however, included (1) emergence of market-based water management tools such as water banking and water transfers, which water purveyors in El Dorado County have historically limited participation, and (2) interest in integrated regional water management incentivized by state policies and financial assistance.

Technological advancements resulted in increased water use efficiency, operational efficiency, and opportunities to diversify sources of water (such as water reuse). However, the Sacramento-San Joaquin Rivers system continues to experience ecosystem collapse,



Source: American River Basin Study; Preliminary Information

Climate change will likely result in increased runoffs during winter months, and reduced snowmelt in spring months for water supply. The existing facilities designed and operated based on historical hydrology will be overwhelmed and unable to provide adequate flood protection or water supply for all beneficial uses.

prompting the call for additional environmental protection even as statewide economic development continues to drive up water supply needs.

In the 21st Century, during the historic 2012-16 drought the Sacramento and San Joaquin Rivers system was highly stressed and overwhelmed due to its recent record-breaking persistence and intensity. Under an emergency drought declaration, the SWRCB expanded its response to implement unprecedented curtailments of senior water rights and mandatory water conservation statewide. Other concurrent state policies – such as the Sustainable Groundwater Management Act (SGMA) implementation, and; voluntary and mandatory water system consolidation – also actively promote enhanced regional self-reliance and more rigorous drought protection efforts, especially as they relate to vulnerable populations and rural communities. Such significant changes in practice will be critical to planning for future water supply needs.

Imbalance Assessment

Supporting the vision of the County General Plan requires that the land use, at the capacity level, be consistent with the policies, requirements, and conditions in the adopted County General Plan. Section 2.1 (see page 5) sets forth the eligibility criteria for certain water use based on land use designations and zoning ordinances. This basic eligibility does not imply that demands will be realized at a given parcel because additional factors would affect the owner's decision to incur certain demands including:

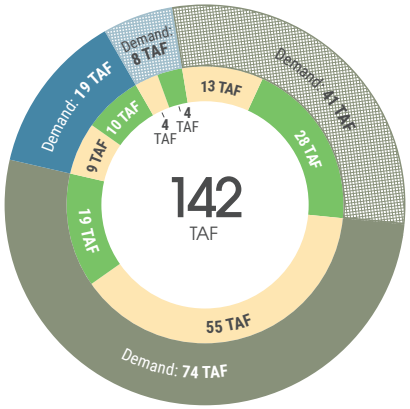
- Physical conditions (e.g., soil types, slopes)
- Settings (e.g., access roads, limits in dwelling density, preferences in agricultural districts or community center designations)
- Other policies and limitations in the County General Plan and associated regulations and permitting requirements (e.g., the total population cap)

The resulting screened parcels will be used in a demand estimate where applicable economic activities, demand management practices, use of technology, and other water management strategies are considered.

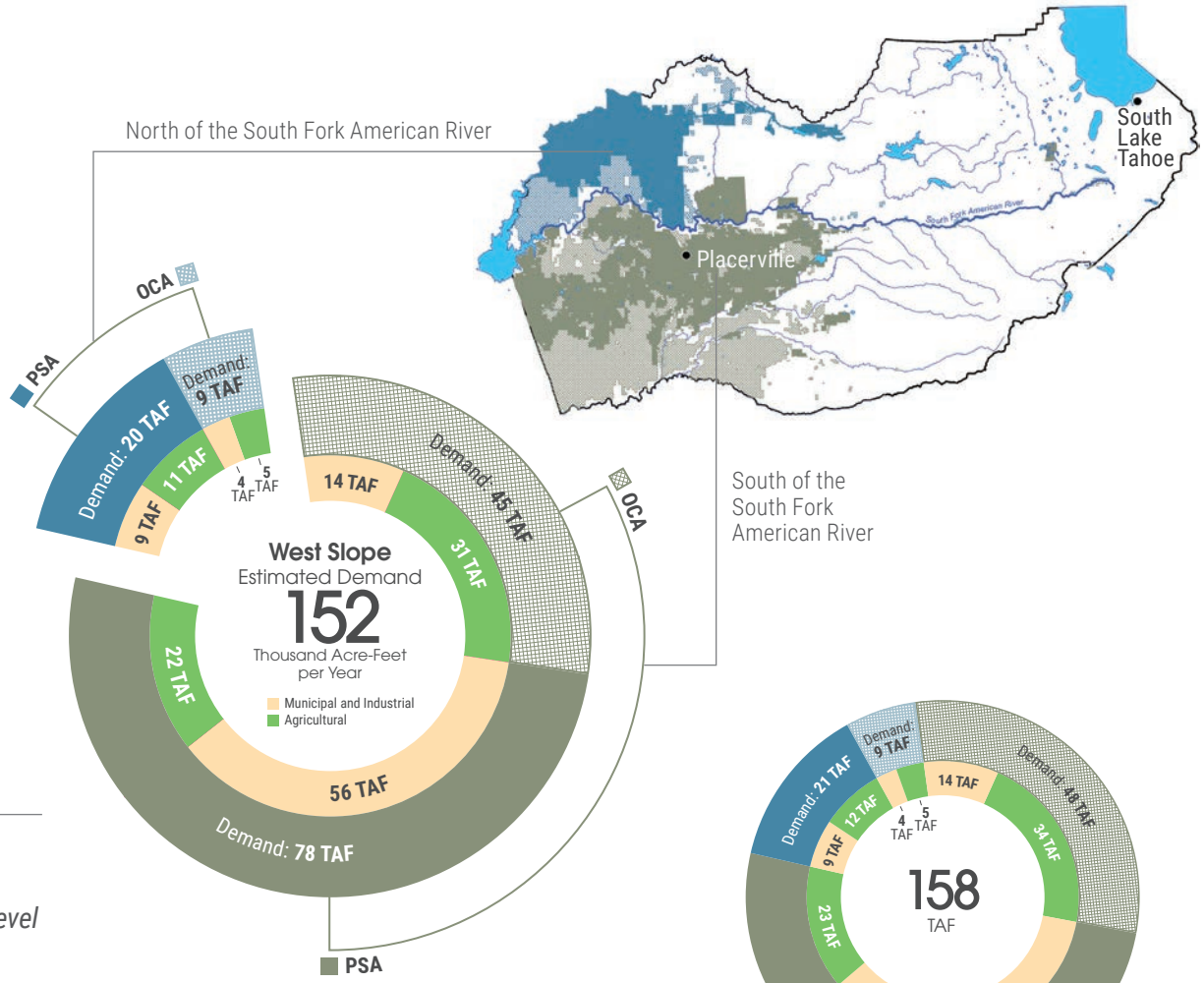
Such an assessment must be updated regularly to reflect changing conditions and new information, re-evaluate risks and uncertainties, and account for the sometimes lengthy lead time to go from planning to implementation of an action or infrastructure. Preliminary findings from the ongoing effort to assess the water supply-demand imbalance in both the West Slope and in the Tahoe Basin are summarized below.

West Slope. The ongoing assessment integrates an in-progress demand revision that includes scenarios for future implementation of urban water conservation requirements, and market-informed economic development potential for commercial agricultural practices and agritourism. Hydrology, precipitation, and evaporation potential under climate change conditions were obtained from the ongoing American River Basin Study. Preliminary findings suggest that (1) existing facilities and operations are likely to be less effective in providing flood protection or capturing needed water supply, and (2) a substantial water supply-demand imbalance is likely to occur at the capacity level defined in the County General Plan. The imbalance is expected to be intensified during drought conditions. These findings are consistent with those of previous studies, and the need for additional long-term water supply to sustain countywide socioeconomics, and to provide adequate drought protection are not anticipated to change as assessment refinement continues.

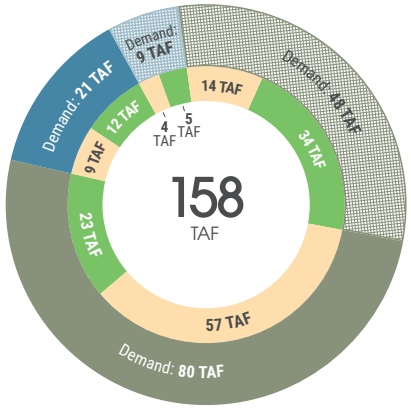
Tahoe Basin. The ongoing assessment integrates interim findings from both the in-progress water right entitlement discussion and demand evaluation. Tahoe Basin demands are based on population growth, economic development, and water-based tourism. A unique consideration in this area is the considerable fluctuation in water use – both seasonally, and during the weekends and holidays – with the influx of tourists. Transient water demands present a challenge to implement water management strategies effectively. Fortunately, the water supply-demand imbalance is likely to be minimal in the Tahoe Basin because projected demands are relatively low in comparison to the available snowpack, even under climate change conditions. Groundwater recharge is expected to continue, irrespective of the form of precipitation. Any imbalance is likely to be tempered by both groundwater accessibility and the limitations on growth and other uses imposed by the TRPA. Tahoe Basin water purveyors in the Tahoe Basin will need to secure the water rights under the Truckee River Operating Agreement. This agreement was negotiated to satisfy provisions of Public Law 101-618 (Settlement Act) which limits California's total gross diversions in the Lake Tahoe Basin to 23,000 acre-feet per year from all natural sources, including both direct diversion from Lake Tahoe and groundwater. As the SWRCB administers surface water rights and groundwater rights differently, reconciliation of the different institutional requirements and limitations must be a high priority for affected Tahoe Basin water purveyors (TCPUD, STPUD, and North Tahoe Public Utility District) to ensure long-term water supply reliability.



WARM-WET TENDENCY



CENTRAL TENDENCY



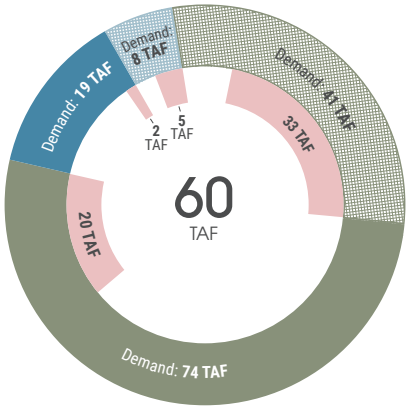
HOT-DRY TENDENCY

The projected water demand associated with the economic activities and way of life at the capacity level envisioned in the County of El Dorado General Plan is assumed to be realized by 2070. The preliminary results from ongoing economic-based agricultural development opportunity and municipal and industrial demand review incorporates considerations of foreseeable demand management practices, technology advancement, and regulatory changes. The climate change also affects agricultural demands and municipal and industrial outdoor demands.

Key

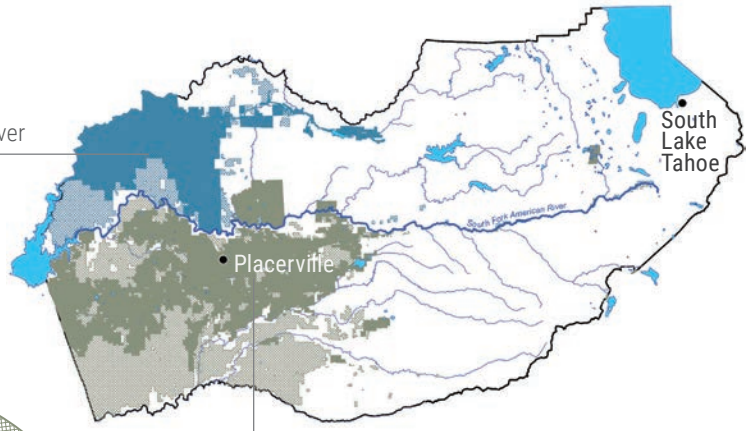
OCA = Other County Area
PSA = Purveyor Service Area
TAF = Thousand Acre-Feet

Source: West Slope Demand Review; preliminary information



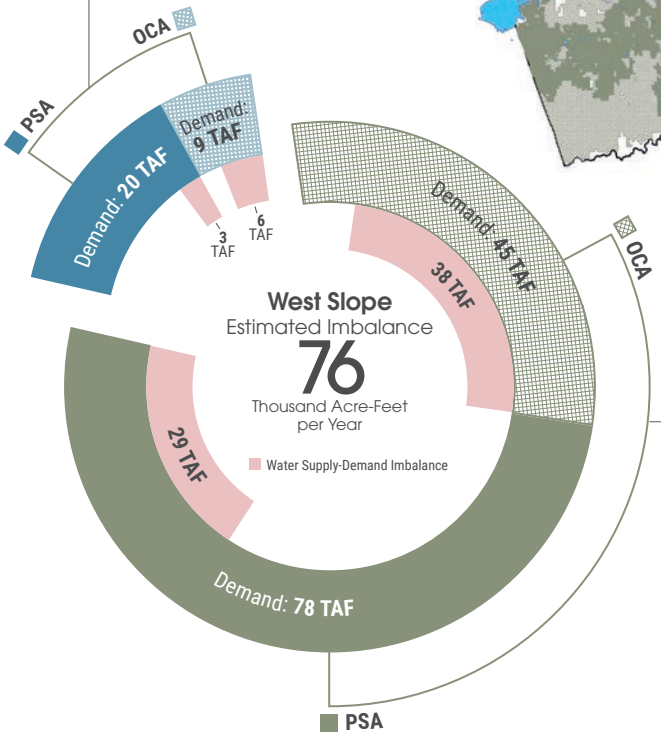
WARM-WET TENDENCY

The preliminary results from applying the demand projection and climate hydrology in 2070 suggest a significant water supply-demand imbalance, especially during drought conditions, based on existing facilities and operations. Additional adaptation strategies are required for sustaining the socioeconomic conditions and way of life in the West Slope.



North of the South Fork American River

South of the South Fork American River



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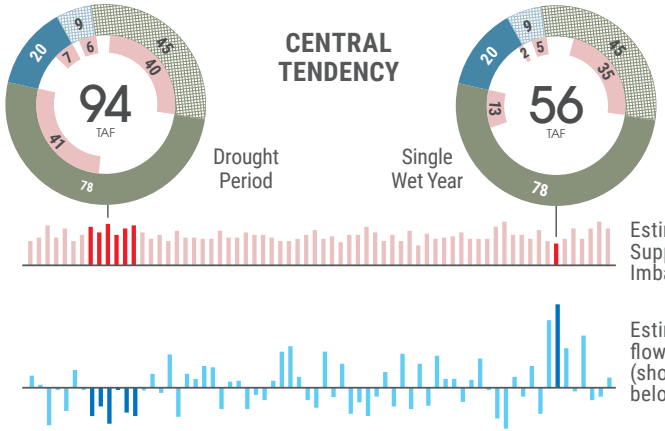
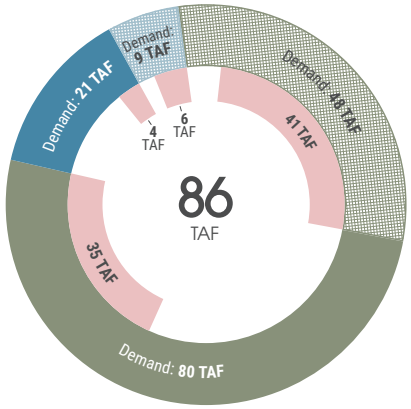




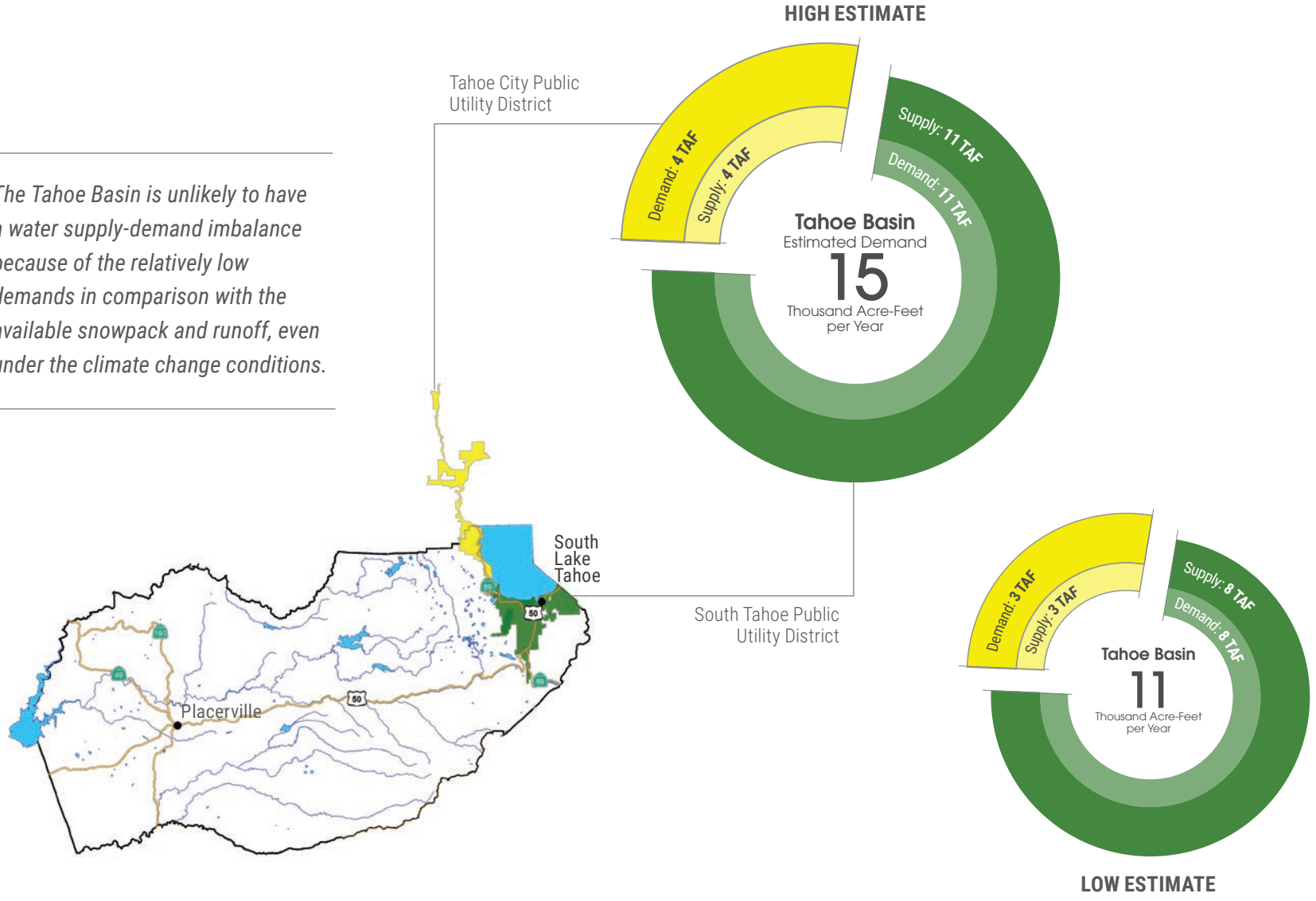
HOT-DRY TENDENCY

Key

OCA = Other County Area
PSA = Purveyor Service Area
TAF = Thousand Acre-Feet

Source: American River Basin Study; preliminary information

The Tahoe Basin is unlikely to have a water supply-demand imbalance because of the relatively low demands in comparison with the available snowpack and runoff, even under the climate change conditions.



Source: Tahoe Basin Ongoing Assessment

3.2 Vulnerability During Droughts

Water purveyors and agencies continue to actively plan for emergencies and extended droughts. Overall, there is broad coverage throughout El Dorado County which has resulted from the Agency being proactive and previously sponsoring drought plans. All agencies are required to have drought plans (or be in compliance with drought ordinances) and have established ways to respond when needed. Historical drought response in El Dorado County has been positive such that after the 1976-1977 drought, water meters were installed to improve water management.

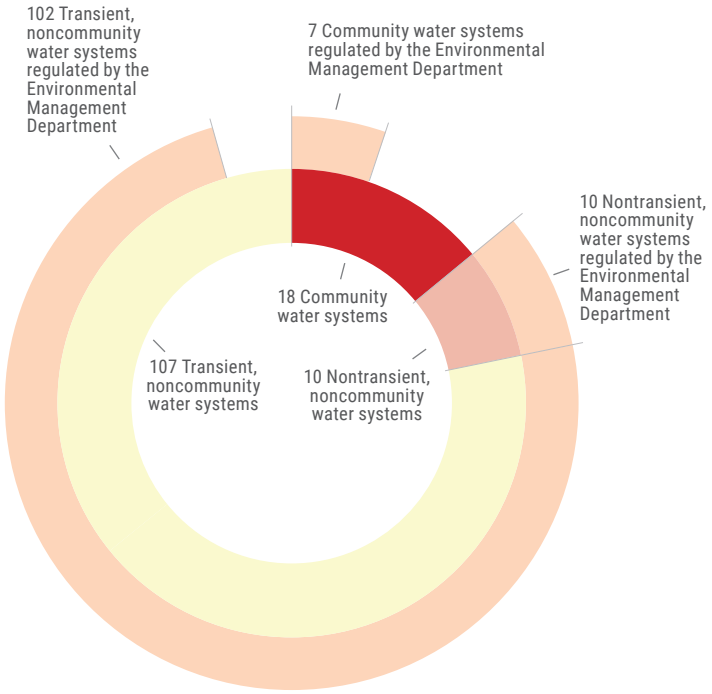
The West Slope is vulnerable to drought because it relies primarily on surface water and does not have access to much groundwater or other alternative water supplies in dry periods. GFCSD, EID, and GDPUD oversee drought plans, but in the rest of the West Slope, the Other County Area is likely to experience hardships as a result of not having secure water supplies. In the recent drought from 2012 through 2016, residents obtained supplemental water supplies from EID's bulk water stations. Understanding how droughts affect areas in El Dorado County is a first step to be taken in mitigating future drought impacts.

The Tahoe Basin is managed under the Truckee River Operating Agreement and is less susceptible to drought conditions. The majority of this area is covered by drought ordinances overseen by STPUD and TCPUD, and the Other County Area in the Tahoe Basin is primarily open space.

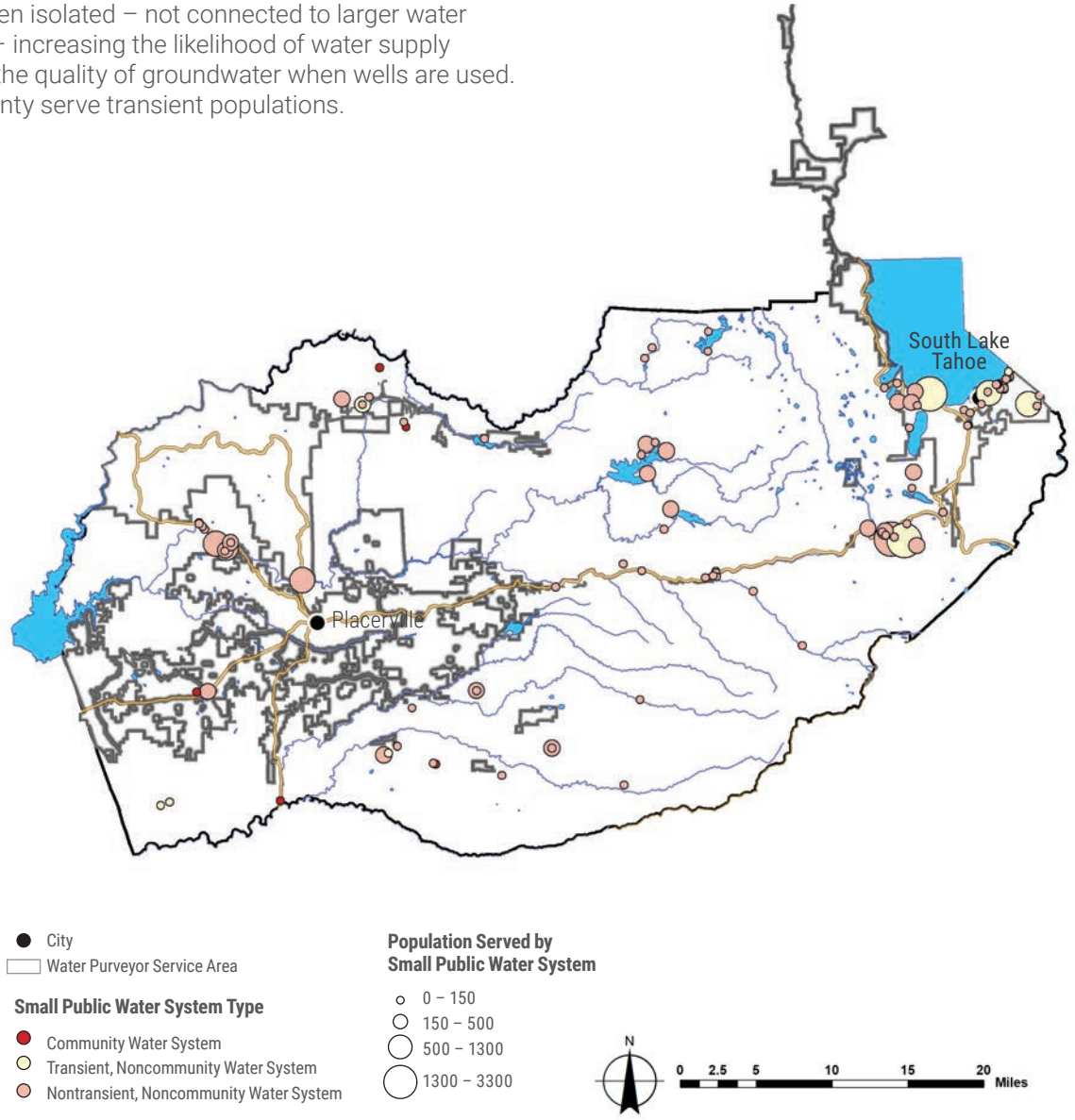
There are several small public water systems that provide drinking water supplies to various populations in the diverse, terrain-challenged El Dorado County. Small public water systems are often less resilient to natural disasters, such as drought and fire, have more difficulty adjusting to regulatory changes, and may struggle to fund infrastructure maintenance and replacement due to poor economies of scale and lack of staff. As small public water systems tend to have less resources and be more vulnerable, the SWRCB encourages water system partnerships and voluntary consolidation, and Senate Bill 88 (2015) further authorizes the SWRCB to require certain water systems that consistently fail to provide safe drinking water to consolidate with, or receive an extension of service from, another public water system. In the past few years, the County Environmental Management Department (EMD) has worked with water purveyors and small public water system owners on potential consolidations to achieve better water supply reliability and public health under the SWRCB's water system partnerships and voluntary consolidation program. Between 2017 and 2018, 9 small public water systems completed the consolidation process. As a result of these efforts, the County EMD received a consolidation award from the Division of Drinking Water in 2017. It is anticipated that small public water system consolidation will continue in El Dorado County.

Currently, the major water purveyors in El Dorado County have either a drought plan or drought ordinance to manage water supply shortages during droughts. However, the Other County Area is not actively managed by any agency. Many small public water systems permitted by the County of El Dorado in the West Slope are also vulnerable due to potential shortfalls in limited local groundwater supplies or local springs during droughts.

Through a Local Primary Agency agreement with the SWRCB, the County EMD oversees 119 small public water systems and 18 registered state small water systems as of June of 2019. Larger public water systems (e.g., water systems of major water purveyors) are overseen by the SWRCB directly. These small public water systems and state small water systems are often isolated – not connected to larger water purveyors and agencies, even if they are in close proximity – increasing the likelihood of water supply impacts during drought conditions as well as reductions in the quality of groundwater when wells are used. Majority of the small public water systems in El Dorado County serve transient populations.



Source: June 2019 State Water Resources Control Board and County of El Dorado Environmental Management Department



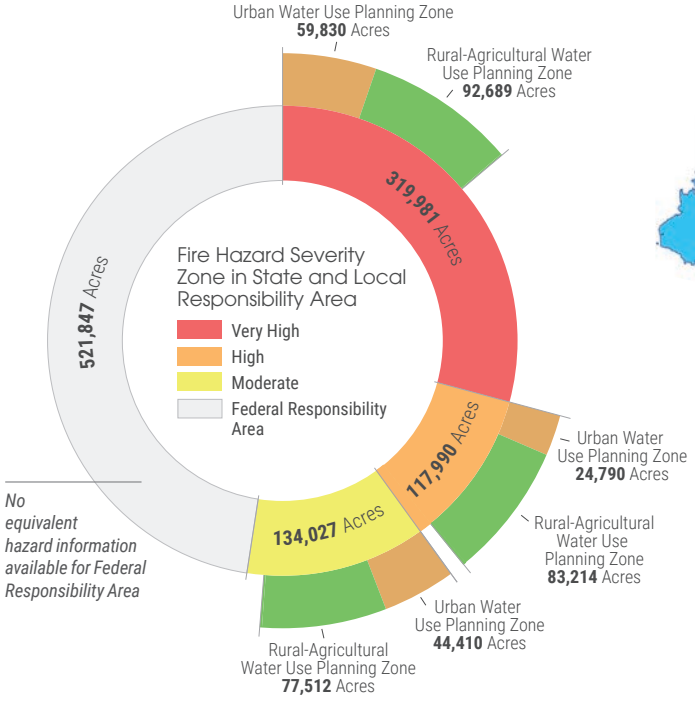
3.3 Impacts of Wildfires

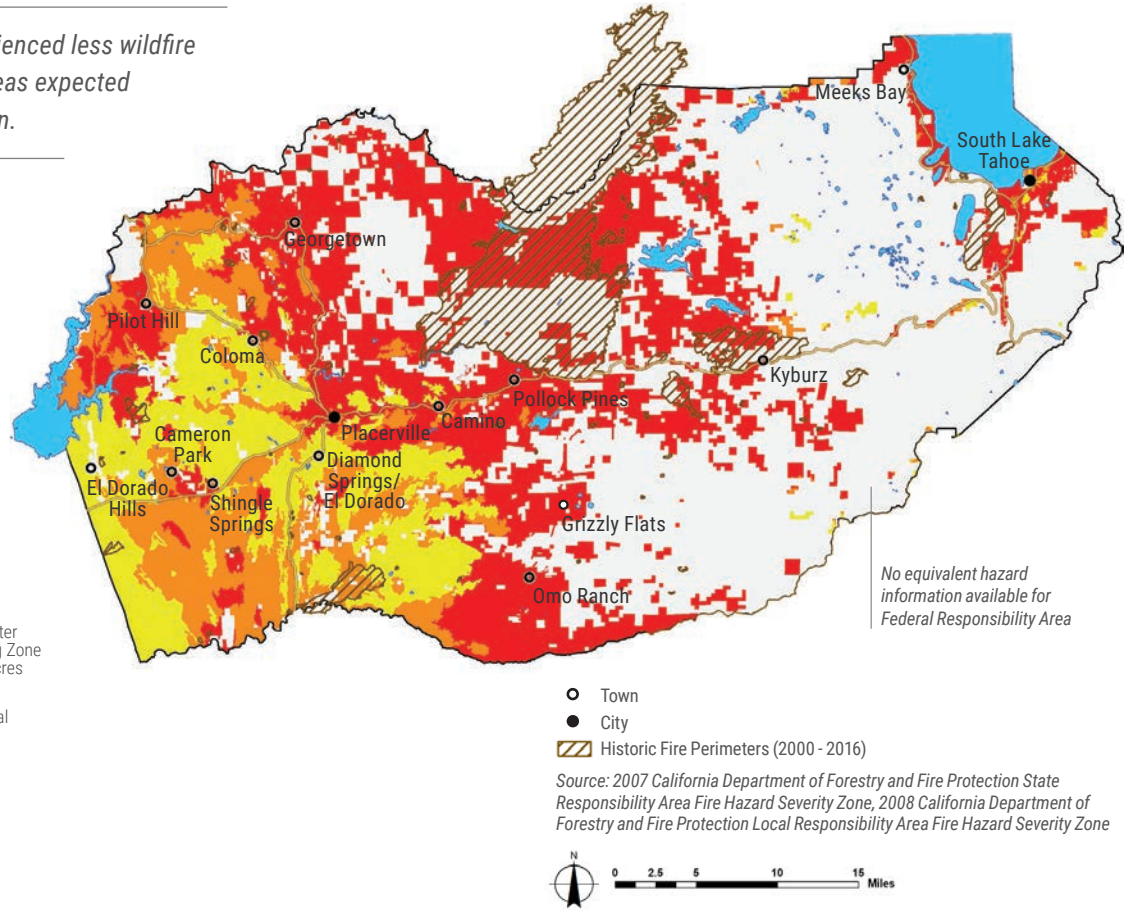
Wildfire damages and suppression costs have risen continuously over time. And the frequency, size, and intensity of these fires are expected to grow – another effect of climate change, overly dense forests, and prolonged droughts. Loss of life and structures as a direct or proximate result of wildfires is at an all-time high. However, compared to statewide trends, El Dorado County has had fewer occurrences, accumulated acreage burned, and overall damages.

Fire protection is divided between Federal, State and Local responsibility. Within the State and Local Responsibility Area, the California Department of Forestry and Fire Protection identified zones likely to experience fire hazards. Although equivalent information is not available for the Federal Responsibility Area the fire hazard is considered high because of the accumulation of biomass in the national forest areas.

The fire hazard severity zones are based on relevant factors such as fuels, terrain, and weather and are described according to their potential for ignition to buildings. The fire hazard severity zones also relate to building codes designed to reduce the ignition to buildings. New buildings associated with the anticipated economic growth in El Dorado County in the State and Local Responsibility Area must comply with the Wildland Urban Interface Codes designed to ensure that structures are built with fire resistant material that minimize damage to those structures during a wildfire. A large fraction of the areas in the "very high" fire hazard severity zone are timber lands that are managed by private entities and federal lands in national forests.

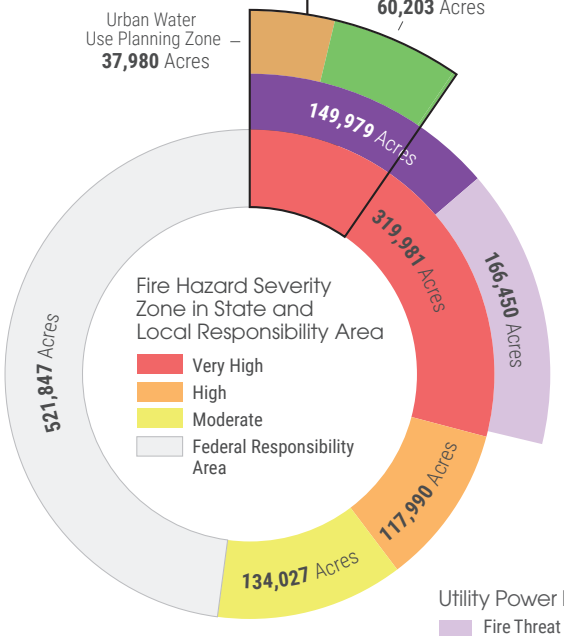
Compared to statewide trends, El Dorado County has experienced less wildfire damages. However, potentially devastating risks exist in areas expected to have economic growth in the West Slope and Tahoe Basin.

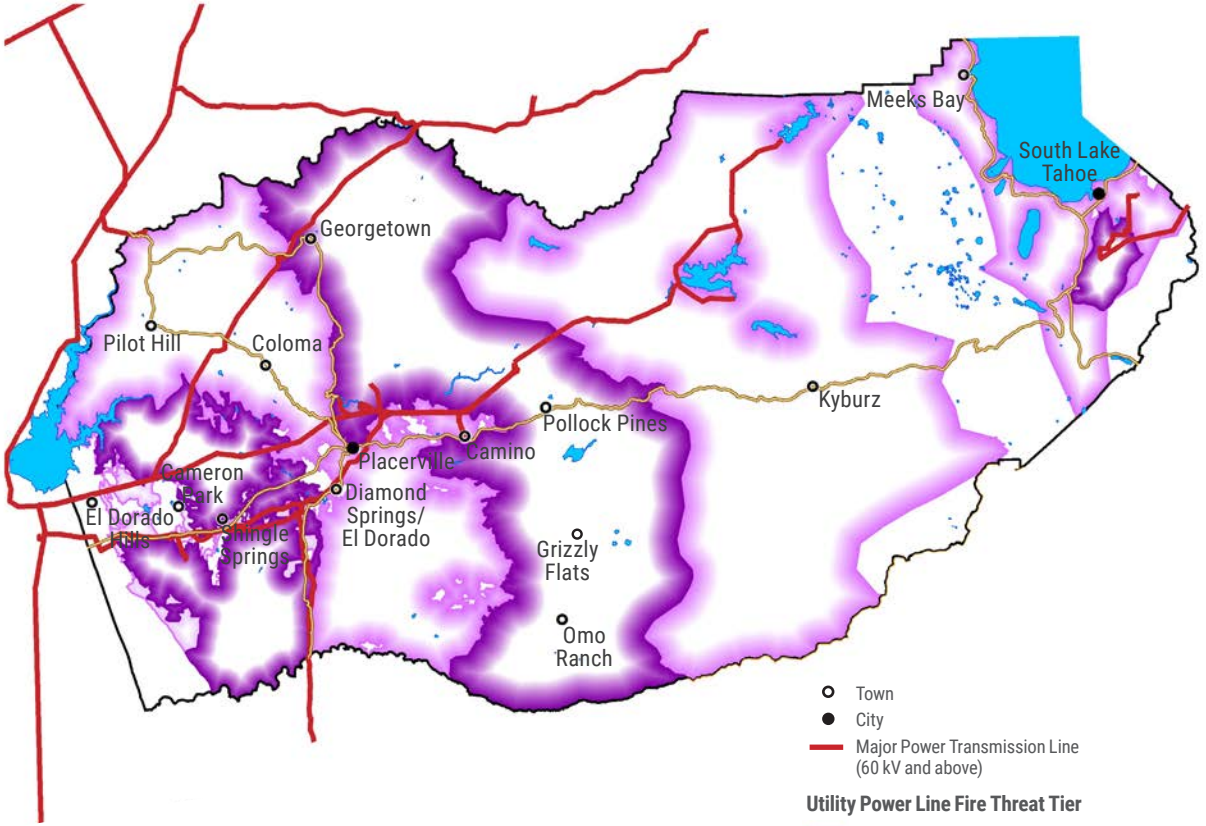




Areas with the highest threat of utility power line fires in El Dorado County (Utility Power Line Fire Threat Tier 3, map, below right) are those where both utility power lines and vegetation are present (black and white overlap map, left). Most of these areas are located in the West Slope.

Fire Hazard Severity Zone very high and Utility Power Line Fire Threat Tier 3 overlap





Utility Power Line Fire Threat Tier
Fire Threat Tier 2
Fire Threat Tier 3

Source: 2018 California Natural Resources Agency California Electric Transmission Lines, 2018 California Public Utilities Commission, Utility Fire Threat

N
0 2.5 5 10 15 Miles

The U.S. Geological Survey's 2018 study on *Historical Patterns of Wildfire Ignition Sources in California Ecosystems,* indicates that wildfires can be effectively decreased in California, except for those caused by utility power or transmission lines. Areas with both abundant vegetation (forests, grasses, agricultural activities, etc.) and utility power transmission lines are where the most devastating fires could occur. In recent years, the majority of wildfires of concern in the state (fires in Mendocino, Santa Barbara/Ventura, Sonoma, and Butte Counties in 2017 and 2018) are reported to be related to falling utility power transmission lines, although official data on some of these fires are yet to be confirmed. In the past two decades in El Dorado County, only the Latrobe Fire in 2000 and the Emerald Fire in 2016 were caused by a utility power line. The Latrobe Fire was in the Fire Threat Tier 3, and the Emerald Fire was in the Fire Threat Tier 2 for utility power line fires, recently published by the California Public Utilities Commission.

El Dorado County agencies and residents, however, cannot overlook other potential causes of wildfire. As an example, the largest fire in El Dorado County—the 2014 King Fire—was caused by arson. Water resources-related impacts from wildfires can be direct or indirect, with both affecting the ability to reliably deliver water of acceptable quality. In El Dorado County, direct impacts on water supply from the damage to water supply-related infrastructure (treatment facilities, powerhouses, conveyance, etc.), and indirect impacts (such as increased risks for landslides, erosion, water pollution and flooding that can cause damage) are often realized long after the disaster. Vegetation management can be critical for minimizing the direct and indirect impacts from wildfires.

A unique aspect in El Dorado County, wooden flumes from the Gold Rush era and other delivery structures are particularly vulnerable to both direct impacts (destruction during a fire) and indirect impacts (damage from later mudslides and trees falling, originating at the burned site). These wooden flumes and unlined ditches are major water conveyances in the West Slope, and interruption of water supply due to fire damage would be significant.

One critical lesson learned is that the ever-increasing wildfires are also a symptom of improper forest management, and high concentrations of dead trees are often the result of prolonged droughts (discussed in the next section, *Headwaters Management*).

3.4 Headwaters Management

Headwaters significantly contribute to California's water quality and water supply reliability. But variables such as climate change, increasing wildfires, groundwater overdraft, and reduced snowpack are looming and will threaten headwaters' ability to continue serving that purpose. El Dorado County is in the American River headwaters, and the health of the headwaters and its management could directly affect El Dorado County water supplies, especially in communities relying on local minor streams or springs. Properly managed American River headwaters could also have broader effects on statewide water supply because the American River flows regulated at Folsom Reservoir are a major source of statewide water supply.

Two areas of headwaters management are critical:

(1) Meadow health that can affect water retention and water quality

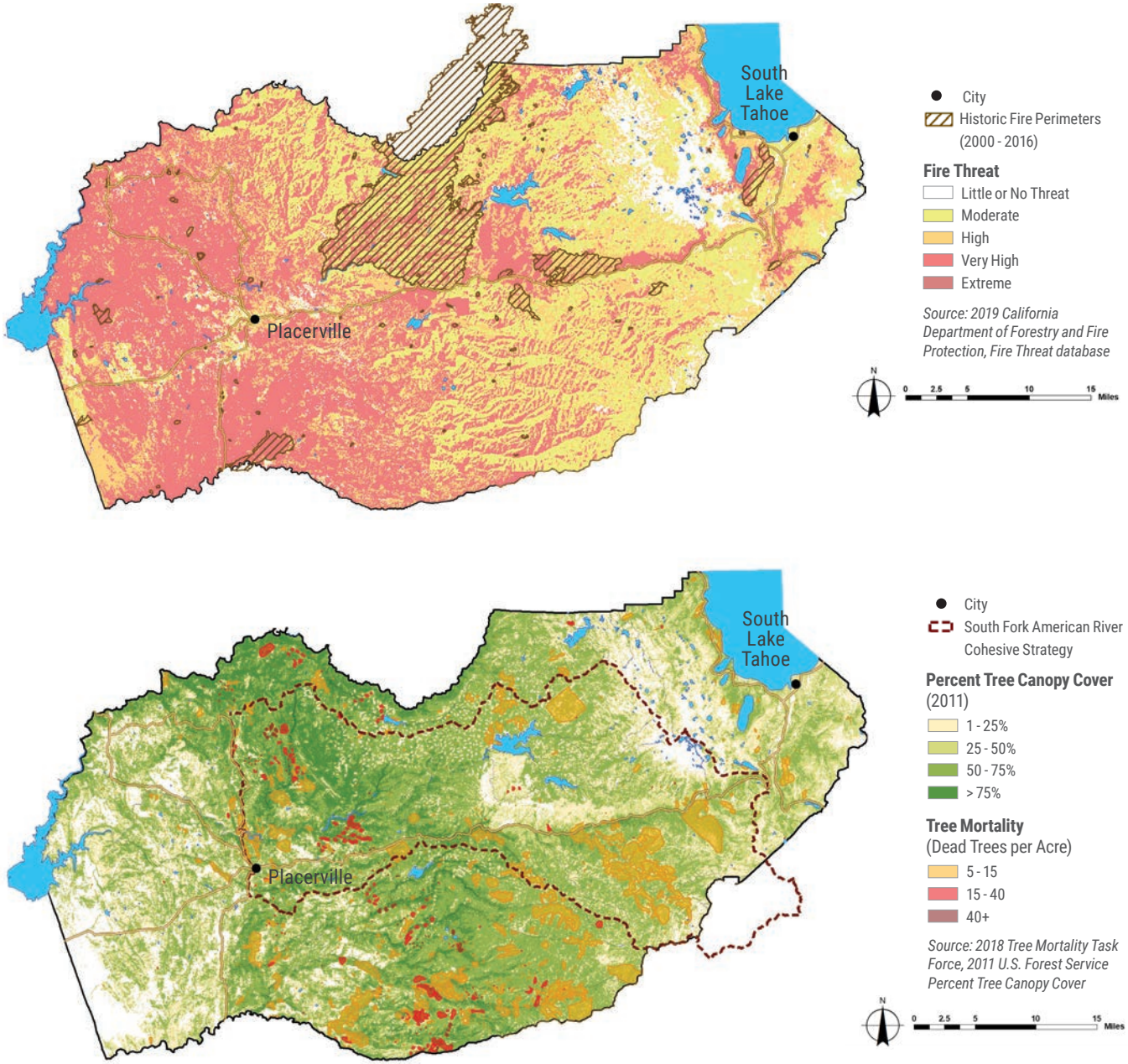
(2) Forest management to avoid high tree density with significant canopy cover that intercepts snowpack and reduces water retention.

El Dorado County is part of the Cosumnes, American, Bear, Yuba (CABY) Integrated Regional Water Management region, and these headwaters management issues are included in that effort. However, forest thinning is not often considered or implemented. Decades of improper forest management have resulted in dense forests that not only affect water supply but also increase the threat of wildfires. According to the 2011 *Forests and Water in the Sierra Nevada: Sierra Nevada Watershed Ecosystem Enhancement Project*, first-order estimates based on average climate information suggest that reducing forest cover by 40 percent of the maximum levels across a watershed can potentially increase water yields by 9 percent.

Exacerbating fire risk is the increased urban/wildland interface and prolonged drought conditions that have caused pervasive tree mortality across the Central and Southern Sierra Nevada. It is estimated that over 129 million trees have died across the state since 2010, and this number continues to grow. El Dorado County is not immune to this epidemic and declared an emergency for unprecedented tree mortality in March of 2016 due to drought conditions and related bark beetle infestations. The emergency declaration is still in effect today.

As part of the U.S. Forest Service-led National Cohesive Strategy for forest fire management, the South Fork American River Cohesive Strategy is being developed and implemented in collaboration with both federal and state management agencies. However, there are still sizeable areas in El Dorado County that need the same level of attention. In separate efforts, Yuba Water Agency and Placer County Water Agency recently launched their corresponding partnership in forest restoration with the U.S. Forest Service, Sierra Nevada Conservancy, California Tahoe Conservancy, non-profit organizations, an academic research institute, water supply and hydropower owners, and private landowners to restore forest health and resilience and reduce wildfire risks. This activity could generate significant insights to entities in El Dorado County about adequate measures that are suitable in the Sierra Nevada for a sustainable forest management approach on a landscape scale.

In areas not already managed by an entity, organized efforts to manage forest density and meadow health in El Dorado County are likely to improve both water quality conditions and water retention in the headwaters. Adequate snowpack levels with reasonable tree canopy cover can be achieved.



3.5 Stormwater as a Resource

For many years, stormwater was considered a nuisance to be managed to reduce pollution of rivers, lakes, and the ocean. Stormwater runoff has limited water quality impacts in most of El Dorado County, and runoff tends to occur along transportation corridors. Urban stormwater runoff is the largest source of pollution in Lake Tahoe. Stormwater discharges are regulated through National Pollutant Discharge Elimination System permits.

In El Dorado County, there are some impaired bodies of water on the Clean Water Act 303(d) list because they have a high presence of mercury, aluminum, manganese, Escherichia coli, invasive toxic species, sediment, or iron. This means that stormwater management is an important issue to protecting water quality and supply.

During intense rain events, wastewater treatment plants could present a risk to water quality if collection lines overflow or leak into nearby water bodies. The City of Placerville is an area where this risk exists.

Recent changes in state water management policy present an opportunity to treat stormwater as a source of water that can be leveraged for reliability purposes, in particular, for groundwater recharge. In the Tahoe Basin, groundwater recharge from stormwater occurs naturally, but the West Slope is more of a foothill setting with no significant groundwater capacity to realize such a potential benefit. Stormwater resource planning requires customization for these local conditions, as reflected in recently-completed stormwater resource plans for the West Slope (2018) and Tahoe-Sierra Region (2018) that recognize stormwater as an additional water resource that will require continued efforts for implementation.

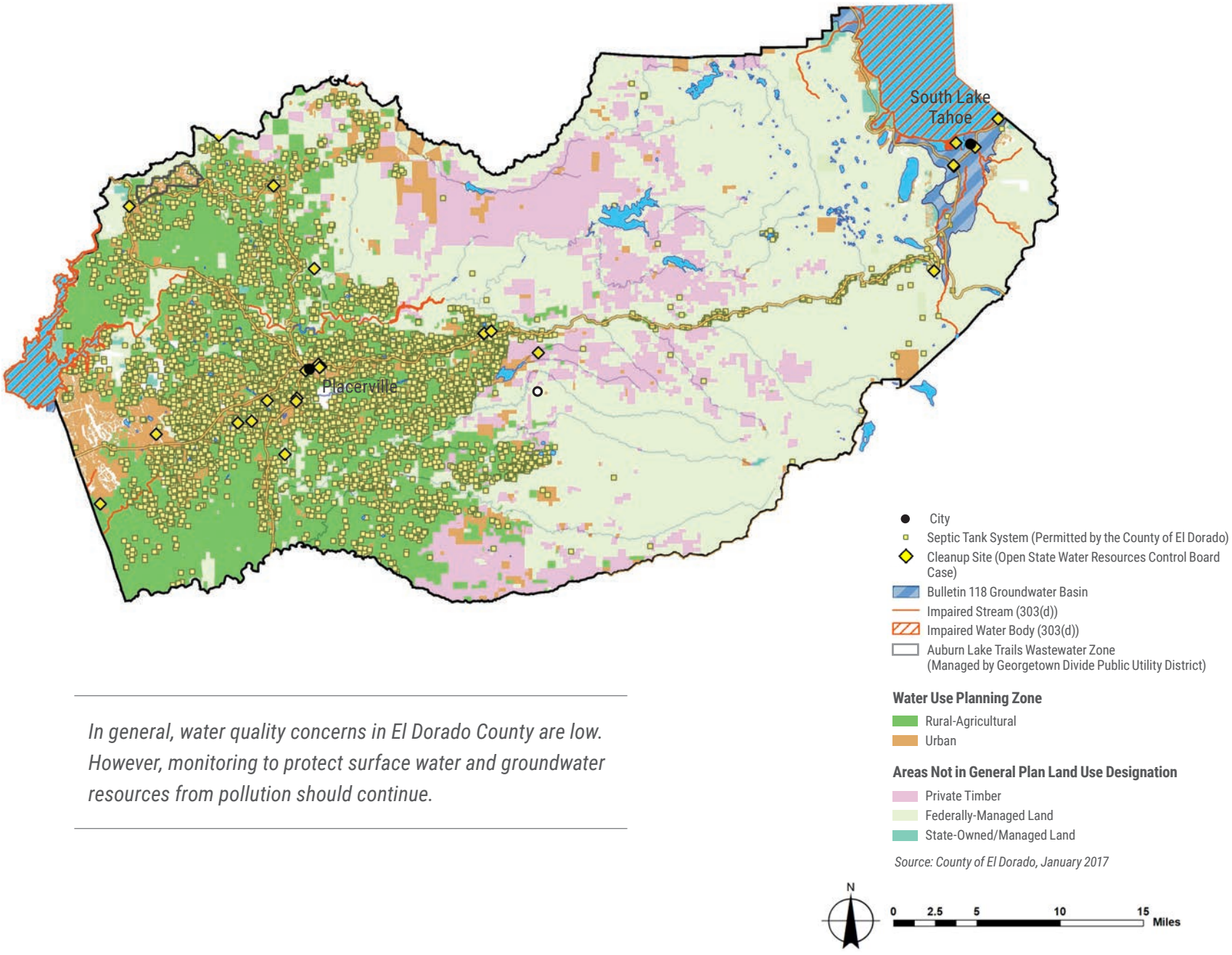
3.6 Limited Groundwater Resources

The only recognized groundwater basin in El Dorado County is in the South Tahoe Basin area, where it is the primary source of water supply for STPUD and other local water suppliers (small public water systems). This is the only groundwater basin in El Dorado County that is subject to the requirements and regulatory framework under SGMA. Currently, STPUD and the Agency are serving as the Groundwater Sustainability Agencies (GSA) under SGMA for areas in and outside of the STPUD service area. Groundwater is replenished by local snowmelt and stream flows, meaning that recharge is sensitive to snowpack conditions and potential climate change effects.

In the South Tahoe Basin, groundwater quality issues include perchloroethylene contamination. The perchloroethylene plume that has been slowly migrating from the "Y" area of the South Tahoe Basin towards Lake Tahoe has been studied since the 1980s.

In the rest of the Tahoe Basin and the West Slope, groundwater resources are shallow and localized. In these areas, groundwater provides limited water supply to existing agricultural practices and domestic uses from the permitted small public water systems.

Groundwater becomes potentially vulnerable in prolonged drought conditions and is also susceptible to pollution from runoff or contamination from septic tank systems found throughout the West Slope along the highway corridor. There have been reported incidents of septic tank systems contaminating local water supplies. Although there is no current prevailing problem of polluted runoff or septic tank systems impacting groundwater resources, it is worthwhile to monitor the water quality of shallow and localized groundwater resources. Mobile home parks and other areas close to water bodies may pose greater contamination threats. The County EMD is responsible for permit issuance and administration of septic tank systems in El Dorado County. In the Auburn Lake Trails Wastewater Zone, GDPUD is charged by the state to manage and inspect septic tanks systems. In the West Slope, naturally occurring arsenic can sometimes create water quality concerns, resulting in water supply challenges. The extensive agricultural practices in the West Slope are of low toxicity and pose a limited risk of groundwater contamination.



In general, water quality concerns in El Dorado County are low. However, monitoring to protect surface water and groundwater resources from pollution should continue.

3.7 Vulnerability to Flooding

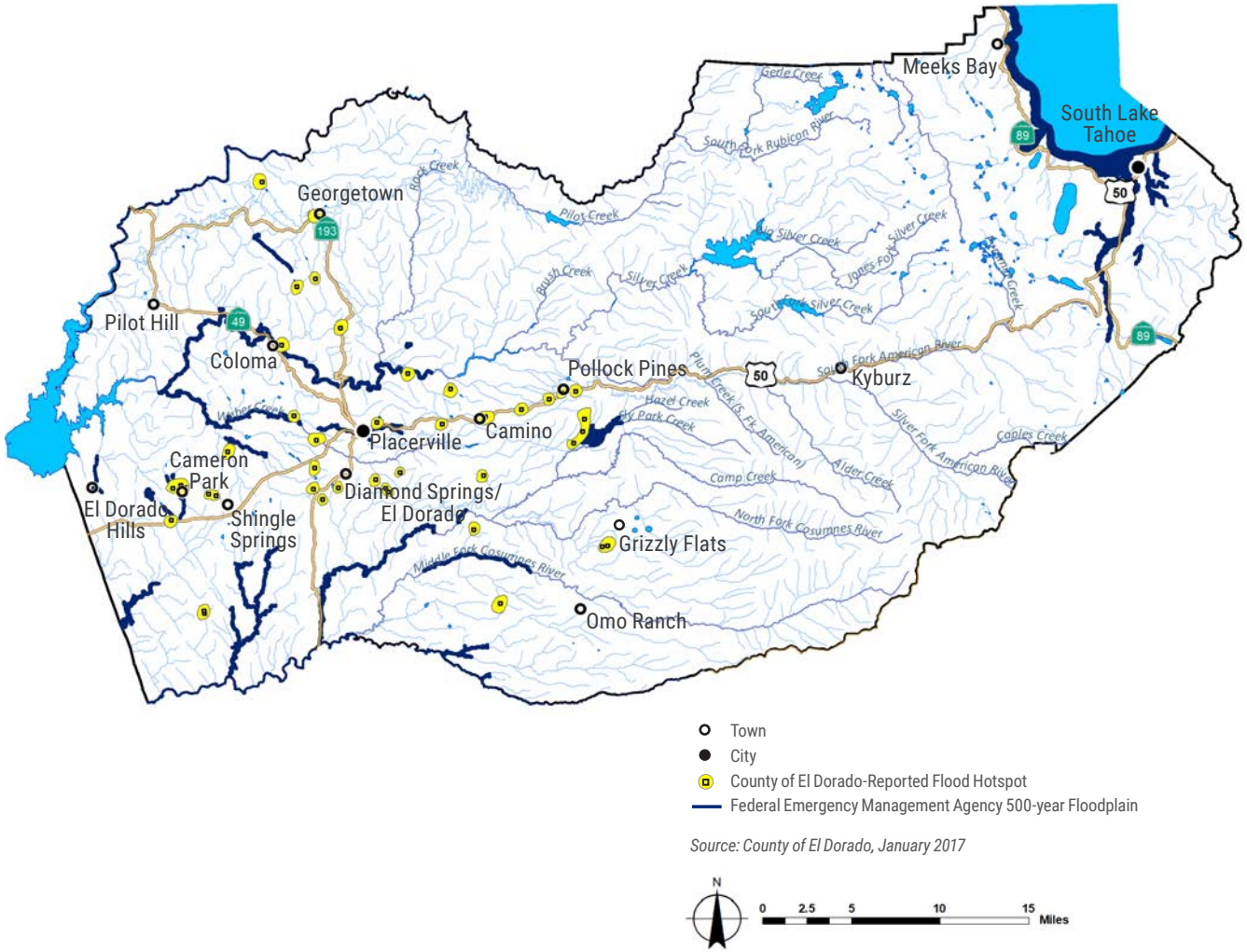
El Dorado County is vulnerable to flood risk. The combination of West Slope hydrology, soils, and land-surface slopes means that this area experiences frequent and localized flooding. The Tahoe Basin experiencs flooding as a result of rainfall on snow.

Drainage problems and occasional flooding have occurred in low-lying areas such as Cameron Park and similarly located communities. Any runoff is discharged into local creeks and tributaries, and that flow contributes to occasional flooding. Culverts that are undersized or blocked with debris and sediment intensify that flooding, such as near Slate Creek in the Town of El Dorado and the Sly Park Portal Subdivision in Pollock Pines.

Flooding is reported in the Tahoe Basin from rainfall on snow. Residential areas and roads plowed for snow removal are likely to experience flooding during rain events when runoff pools because it cannot infiltrate through the snow layer or the impermeable plowed surfaces.

There is a fragmented presence of the Federal Emergency Management Agency 500-year floodplain in El Dorado County. This floodplain is designated as a Moderate Flood Hazard Area, meaning that the areas are not in immediate danger from flooding caused by overflowing rivers or hard rains but are still at risk of floods. The floodplain closely follows some of the West Slope local rivers and streams, Tahoe Basin tributaries, and Lake Tahoe itself.

Most flooding is localized, and hotspots are often related to capacity conveyance issues in the West Slope. In the Tahoe Basin flooding results from rainfall on snow.



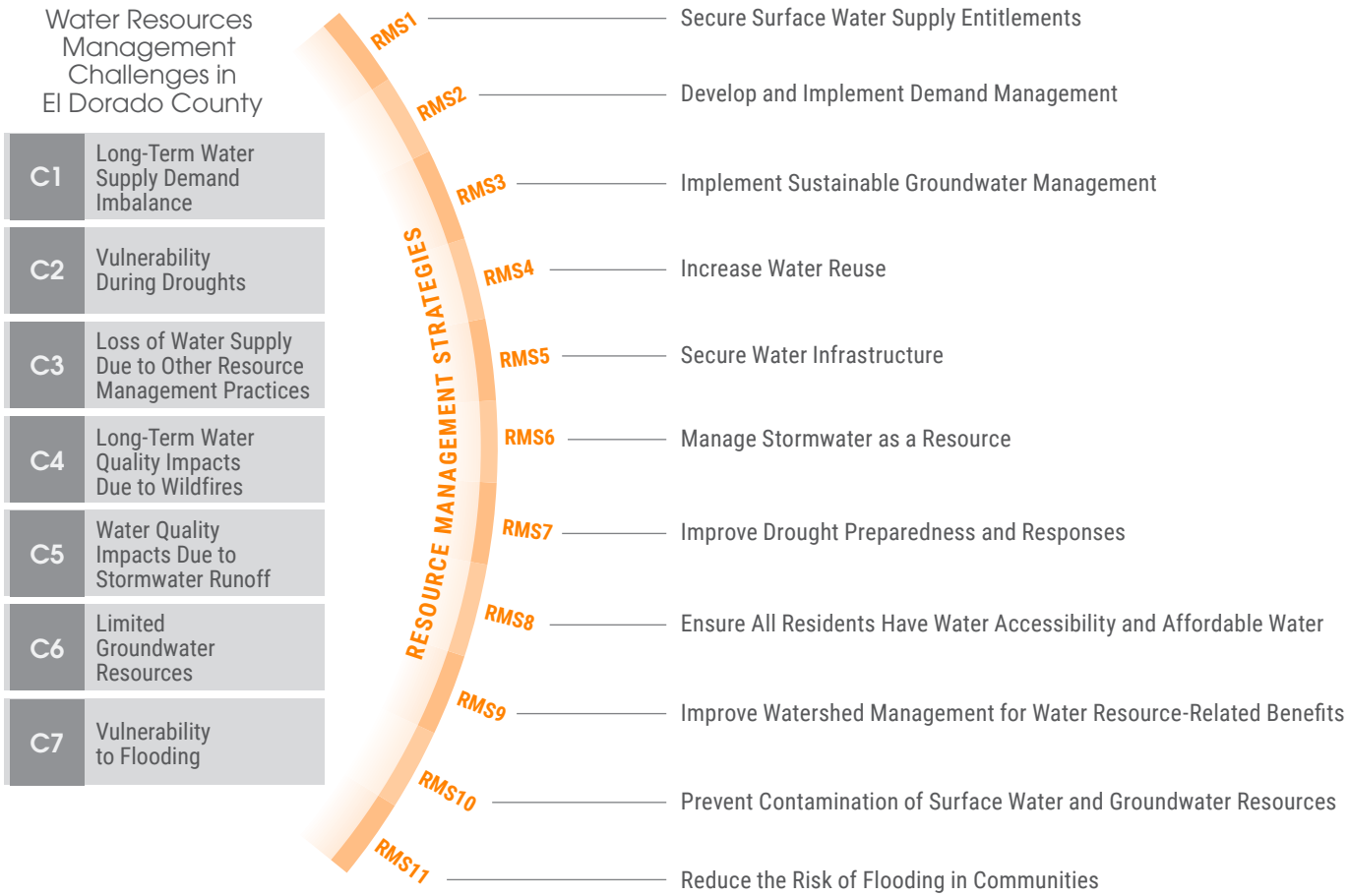
SECTION

4

Resource Management Strategies

Achieving the vision in the County General Plan requires an integrated approach and comprehensive strategies that accommodate continual changes in climate variability, regulatory environment, and progress made in various mitigation and adaptation actions. For an issue as vexing as water management, there is not a 1-to-1 relationship between a challenge and a management strategy or action. Although partnerships with other regional/state/federal agencies cannot be overemphasized for successful implementation, we, as resource managers in El Dorado County must take the initiative.

Broad Resource Management Strategies (RMS) have been developed to help address identified water resource-related challenges described in Section 3. Each RMS represents ***what*** needs to be done on a broad, strategic level as well as ***who*** is (or are) primarily responsible for making it a reality. Correspondingly, the Agency has different roles and responsibilities. The Agency's role may be to **lead**, **facilitate**, or **support** an RMS, or some combination of those roles with specific emphases and focused outcomes, consistent with its authority and the principles of engagement (described in Section 1).



4.1 RMS1 – Secure Surface Water Supply Entitlements

At its core, water supply planning is about looking at all aspects of available water sources (yield, reliability, quality, infrastructure, cost, etc.). The basis for a surface water supply includes water rights and contract entitlements, and such a supply is subject to increasing hydrologic variability and regulatory constraints. Protecting existing water rights and contract entitlements from further reductions in reliability is as important as securing pending and planned water rights and contract entitlements – planning for robust economic development cannot leverage what does not yet exist. One example of such a pending contract entitlement is the Public Law 101- 514 (Fazio) CVP Water Supply Contract that has been in-process since 1990.

Primary Challenges Addressed

C1 ***C2*** *C3* *C4* *C5* *C6* *C7*

RMS Actions	West Slope	Tahoe Basin	Principal Implementing Agencies	Agency's Role(s)
1a. Secure CVP long-term water service contracts with Reclamation	X		EDCWA, EID, GDPUD	**L** – Complete contract negotiation and execution for 15-TAF CVP (Fazio) Water Service Contract, and in coordination with water purveyors and regional partners, lead the development of additional plan and actions for full utilization **S** – Support water purveyors and regional partners in engagement with Reclamation and federal advocacy
1b. Secure water rights for projected needs	X	X	EDCWA, EID, GDPUD, GFCSD, STPUD, TCPUD	**L** – Acquire 40-TAF water right and integrate with use of Sacramento Municipal Utility District storage agreement, and other opportunities that could contribute to long-term water supply reliability **S** – Support water purveyors in water right proceedings (e.g. surface water and groundwater rights) and advocacy
1c. Develop water infrastructure to meet projected needs	X	X	City of Placerville, EDCWA, EID, GDPUD, GFCSD, STPUD, TCPUD	**L** – Represent OCA in water supply and infrastructure planning **F** – Coordinate with water purveyors on water supply needs, to improve overall countywide infrastructure planning and Agency's actions
1d. Manage and leverage Sacramento Municipal Utility District storage agreement	X		EDCWA	**L** – Administrate and manage the El Dorado Sacramento Municipal Utility District Agreement for countywide benefits, and in coordination with water purveyors, lead the development of the plan and actions for full utilization **L** – Develop management strategies for strategic use in coordination with water purveyors and other potential water users
1e. Develop operational agreements as needed for flexible use of water supply entitlements	X	X	City of Placerville, EDCWA, EID, GDPUD, GFCSD, STPUD, TCPUD	**L** – Develop additional agreements with water purveyors and regional partners for use of Fazio contract and EDCWA's water rights, when acquired **F** – Coordinate with water purveyors on compatible strategy for water use
1f. Determine water purveyors for OCA	X	X	County, EDCWA, El Dorado County LAFCO	**L** – Develop work plan and actions for the determination in collaboration with County, and coordinate with El Dorado County LAFCO for approval process

Key

L = **Lead** – Assuming the responsibility in advancing an RMS
F = **Facilitate** – Organizing and assisting in advancing an RMS, but not directly responsible
S = **Support** – Providing as-needed coordination, advocacy, and occasional assistance

County = County of El Dorado
CVP = Central Valley Project
EDCWA = El Dorado County Water Agency
EID = El Dorado Irrigation District
GDPUD = Georgetown Divide Public Utility District
GFCSD = Grizzly Flats Community Services District
LAFCO = Local Agency Formation Commission
OCA = Other County Area
STPUD = South Tahoe Public Utility District
TCPUD = Tahoe City Public Utility District

4.2 RMS2 – Develop and Implement Demand Management

Water is a precious resource, and it supports multiple beneficial uses directly and indirectly, both in El Dorado County and beyond. Responsible use of this limited resource is a shared duty of all Californians. A comprehensive approach to water use efficiency in M&I and agricultural uses is important to align with the statewide implementation of long-term water conservation policies. At the same time, local implementation of conservation policies should account for El Dorado County's unique conditions, availability of supplemental water, and complementary needs and planning for emergencies (e.g., severe droughts and wildfires).

Primary Challenges Addressed

C1 ***C2*** *C3* *C4* *C5* *C6* *C7*

RMS Actions	West Slope	Tahoe Basin	Principal Implementing Agencies	Agency's Role(s)
2a. Review and update demands by incorporating regulatory changes and best management practices	**X**	**X**	City of Placerville, County, EDCWA, EID, GDPUD, GFCSD, STPUD, TCPUD	**L** – Update West Slope agricultural and M&I demands consistent with the County General Plan **F** – Coordinate the development of agricultural and M&I demands (including seasonal demands due to transient visitors) consistent with TRPA's Tahoe Regional Plan for the Tahoe Basin **S** – Support communications, information sharing and advocacy efforts
2b. Engage in the development of statewide long-term conservation policies, regulations, and legislation to ensure applicability in foothill and forested/ mountain communities and related to preservation of countywide interests	**X**	**X**	City of Placerville, County, EDCWA, EID, GDPUD, GFCSD, STPUD, TCPUD	**L** – Participate in and contribute to the development of state policy, regulation, and legislation **F** – Coordinate consistent messages and approach amongst water purveyors **S** – Support communications, information sharing and advocacy efforts

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EID = El Dorado Irrigation District
GDPUD = Georgetown Divide Public Utility District
GFCSD = Grizzly Flats Community Services District

M&I = Municipal and Industrial
STPUD = South Tahoe Public Utility District
TCPUD = Tahoe City Public Utility District
TRPA = Tahoe Regional Planning Agency

4.3 RMS3 – Implement Sustainable Groundwater Management

SGMA defines sustainable groundwater management as the management of groundwater supplies in a manner that can be maintained during the planning and implementation horizon without causing undesirable results. Although groundwater is primarily used in the South Tahoe Basin and is limited in other parts of El Dorado County, the principles of sustainable groundwater management apply everywhere it is used, and that is the focus of this strategy. For this strategy, the Agency has an oversight role in the West Slope (outside the STPUD service area) but has a less prominent role in the Tahoe Basin.

Primary Challenges Addressed

C1 ***C2*** *C3* *C4* *C5* ***C6*** *C7*

RMS Actions	West Slope	Tahoe Basin	Principal Implementing Agencies	Agency's Role(s)
3a. Implement sustainable groundwater management consistent with the SGMA for major groundwater basins		**X**	EDCWA, STPUD	**F** – Coordinate development and implementation of the Tahoe Valley South Basin Groundwater Sustainability Plan, working with STPUD as the Groundwater Sustainability Agency in that basin **S** – Support communications, information sharing and advocacy efforts
3b. Engage in the development of statewide sustainable groundwater management policies, regulations, and legislation related to the preservation of El Dorado County interests	**X**	**X**	County, EDCWA, STPUD	**F** – Coordinate consistent messages and engagement approach with STPUD and other groundwater users in El Dorado County **S** – Support communications, information sharing and advocacy efforts
3c. Improve understanding of conditions and use of localized and shallow groundwater resources outside of the major groundwater basins	**X**	**X**	County, EDCWA	**L** – Explore data sufficiency and adequacy in coordination with the County for groundwater monitoring and condition assessment and coordinate efforts for improving understanding as appropriate **F** – Integrate data and information for countywide coverage and assessment needs **S** – Support communications, information sharing and advocacy efforts
3d. Improve understanding of level of public health concerns associated with private wells that are not subject to regulations	**X**	**X**	County, EDCWA	**F** – Explore data collection in terms of use, water level and water quality in coordination with the County to improve understanding and identify potential needs for assistance **S** – Support communications, information sharing, and advocacy efforts

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EDCWA = El Dorado County Water Agency
SGMA = Sustainable Groundwater Management Act
STPUD = South Tahoe Public Utility District

4.4 RMS4 – Increase Water Reuse

Where possible, water reuse should be considered. In the long run, use of recycled water (water reuse) can be separated into two categories – ***potable reuse*** (recycled water used to augment drinking water supplies and includes both indirect and direct uses) and ***non-potable reuse*** (all recycled or reclaimed water applications except those related to water supply augmentation and drinking water). Currently, non-potable reuse in El Dorado County is mostly limited to landscape applications. In the Tahoe Basin, both the terrain and cost effectiveness may limit opportunities to implement water reuse, especially for TCPUD, as wastewater from the portion of its service area in El Dorado County is collected and treated by another agency down slope from TCPUD.

Primary Challenges Addressed

C1 ***C2*** *C3 C4 C5 C6 C7*

RMS Actions	West Slope	Tahoe Basin	Principal Implementing Agencies	Agency's Role(s)
4a. Explore potential for and implement potable reuse of treated wastewater	**X**	**X**	City of Placerville, County, EID, STPUD	**S** – Support communications, information sharing and advocacy efforts **S** – Support state and federal grant applications (where appropriate)
4b. Increase non-potable reuse of treated wastewater onsite	**X**		City of Placerville, County, EID	**S** – Support communications, information sharing and advocacy efforts **S** – Support state and federal grant applications (where appropriate)
4c. Increase non-potable reuse of treated wastewater for instream flow augmentation		**X**	STPUD	**S** – Support communications, information sharing and advocacy efforts **S** – Support state and federal grant applications (where appropriate)
4d. Encourage greywater reuse and rainfall harvest practices on household and individual facility level	**X**	**X**	City of Placerville, County, EID, GDPUD, GFCSD, STPUD, TCPUD	**S** – Support communications, public information sharing and advocacy efforts **S** – Support state and federal grant applications (where appropriate)

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EID = El Dorado Irrigation District
GDPUD = Georgetown Divide Public Utility District

GFCSD= Grizzly Flats Community Services District
STPUD = South Tahoe Public Utility District
TCPUD = Tahoe City Public Utility District

4.5 RMS5 – Secure Water Infrastructure

The lifespan of any infrastructure is finite, and the consequences of neglected infrastructure can be expensive, wasteful, and harmful. Owners of existing water infrastructure in El Dorado County must responsibly continue their ongoing operations, maintenance, repair, and rehabilitation to ensure that facilities are working properly, are safe, are free from contaminants, and are cleared of nearby hazards. New infrastructure that augments water supply reliability and flexibility and reduces risks to water supply and quality should also be investigated and developed (where appropriate).

Primary Challenges Addressed

C1 ***C2*** ***C3*** ***C4*** *C5* ***C6*** *C7*

RMS Actions	West Slope	Tahoe Basin	Principal Implementing Agencies	Agency's Role(s)
5a. Ensure water infrastructure integrity, operations, and maintenance through agency-specific Capital Improvement Programs	**X**	**X**	City of Placerville, EID, GDPUD, GFCSD, STPUD, TCPUD	**S** – Support communication, information sharing and advocacy efforts **S** – Support state and federal grant applications (where appropriate)
5b. Develop new high mountain storage to increase water supply reliability	**X**		County, City of Placerville, EDCWA, EID, GFCSD	**L** – Develop Congressionally-authorized Alder Creek Water Storage and Conservation Project with Reclamation for countywide and regional benefits
5c. Reduce vulnerability of water infrastructure to large-scale wildfires	**X**	**X**	City of Placerville, EID, GDPUD, GFCSD, STPUD, TCPUD	**F** – Compile and synthesize wildfire risk information and develop a list of at-risk water infrastructure in coordination with facility owners **S** – Support communications, public information sharing and advocacy efforts **S** – Support state and federal grant applications (where appropriate)
5d. Update emergency response and communication plan regularly to maintain current, including consideration of wildfire and potentially extended power shutoff under threat	**X**	**X**	City of Placerville, EID, GDPUD, GFCSD, STPUD, TCPUD	**S** – Support communications, information sharing and advocacy efforts

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EID = El Dorado Irrigation District
GDPUD = Georgetown Divide Public Utility District

GFCSD = Grizzly Flats Community Services District
STPUD = South Tahoe Public Utility District
TCPUD = Tahoe City Public Utility District

4.6 RMS6 – Manage Stormwater as a Resource

No longer perceived as a hazard, stormwater is a recognized alternative source of water in the context of integrated water management. Stormwater Resource Plans for the West Slope and Tahoe-Sierra Region were developed as the beginning of this new approach in El Dorado County, thereby providing eligibility for future state financial assistance. Implementation of this new approach requires additional organizational and budgetary support.

Primary Challenges Addressed

C1 ***C2*** *C3* *C4* ***C5*** ***C6*** ***C7***

RMS Actions	West Slope	Tahoe Basin	Principal Implementing Agencies	Agency's Role(s)
6a. Update Stormwater Resource Plans	**X**	**X**	City of Placerville, City of South Lake Tahoe, County, Tahoe Resource Conservation District	**L** – Update West Slope Stormwater Resource Plan and provide program management support with implementing agencies **F** – Coordinate with implementing agencies on the update of the Tahoe-Sierra Region Stormwater Resource Plan **S** – Support communications, information sharing and advocacy efforts **S** – Support state and federal grant applications (where appropriate)
6b. Implement water quality control measures to address runoff from highways, streets, and other priority impervious areas	**X**	**X**	City of Placerville, City of South Lake Tahoe, County	**S** – Support communications, information sharing and advocacy efforts
6c. Implement Stormwater Management Plan (now also as part of the stormwater resource plan), and implement California Municipal Separate Storm Sewer Systems Permits – Phase I (Tahoe Basin) and Phase II (West Slope)	**X**	**X**	City of Placerville, City of South Lake Tahoe, County	**S** – Support communications, information sharing and advocacy efforts

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4.7 RMS7 – Improve Drought Preparedness and Responses

California is drought-prone, and climate change may further increase the frequency, duration, and intensity of future droughts. Small public water systems and rural communities in El Dorado County are particularly vulnerable during extended droughts. Recurring situation assessments and improvements are critical to ensure all residents in El Dorado County have adequate water supplies and to preserve options for leveraging available state and federal assistance when necessary.

Primary Challenges Addressed

C1 ***C2*** *C3* *C4* *C5* ***C6*** *C7*

RMS Actions	West Slope	Tahoe Basin	Principal Implementing Agencies	Agency's Role(s)
7a. Expand current agency-specific drought plans to address drought planning requirements specified in Assembly Bill 1668/Senate Bill 606	**X**	**X**	County, EDCWA, EID, GDPUD, GFCSD, STPUD, TCPUD	**L** – Develop and update plan for the Other County Area (as necessary) **F** – Coordinate consistency of drought planning efforts in El Dorado County **S** – Support communications, information sharing and advocacy efforts
7b. Include droughts as a hazard in El Dorado County's Multi-Jurisdictional Hazard Mitigation Plan for emergency response coordination and potential future FEMA assistance	**X**	**X**	County	**F** – Coordinate plan development with the County's Long Range Planning department **S** – Support communications, information sharing and advocacy efforts
7c. Conduct vulnerability assessments for small water systems and rural communities	**X**	**X**	County, EDCWA	**L** – Develop vulnerability assessments **S** – Support communication, information sharing and advocacy efforts
7d. Develop countywide plan for addressing drought vulnerability for small public water systems and rural communities	**X**	**X**	County, EDCWA	**L** – Develop countywide plan **S** – Support communications, information sharing and advocacy efforts
7e. Develop West Slope Regional Drought Contingency Plan to coordinate and align all drought plans in the West Slope	**X**		County, EDCWA, EID	**L** – Develop West Slope Regional Drought Contingency Plan per Reclamation's WaterSMART Program guidance and requirements

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EID = El Dorado Irrigation District
FEMA = Federal Emergency Management Agency

GDPUD = Georgetown Divide Public Utility District
GFCSD = Grizzly Flats Community Services District
STPUD = South Tahoe Public Utility District
TCPUD = Tahoe City Public Utility District

4.8 RMS8 – Ensure All Residents Have Water Accessibility and Affordable Water

California leads the nation in recognizing the human right to water. As stated in California Water Code Section 106.3, it is "…the established policy of the state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes." The legislative intent is consistent with the water management policy in El Dorado County, as reflected in the Agency's mission statement. To protect residents and foster economic development in El Dorado County, it is essential that sufficient, safe, acceptable, physically accessible, and affordable water be available for personal and household uses, requiring collaboration of many departments and agencies.

It is also recognized that the provisions in Proposition 218 of 1996 prohibit public water agencies from providing a subsidized rate for low-income households, creating a significant obstacle to water accessibility and affordability. However, it is possible for water purveyors (e.g., STPUD) to provide assistance using an alternative revenue source. At the state level, implementation details are currently under development, so it is critical to understand needs throughout El Dorado County and continue working with state agencies and other communities to formulate adequate implementation strategies and protocols.

Primary Challenges Addressed

C1 ***C2*** *C3* *C4* *C5* *C6* *C7*

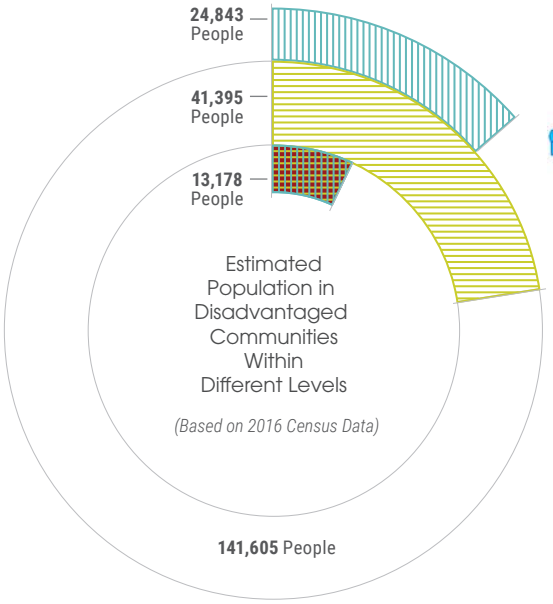
RMS Actions	West Slope	Tahoe Basin	Principal Implementing Agencies	Agency's Role(s)
8a. Assess challenges in water accessibility and affordability in El Dorado County (Human Right to Water, California Water Code Section 106.3)	**X**	**X**	City of Placerville, County, EID, GDPUD, GFCSD, STPUD, TCPUD	**F** – Coordinate with County to conduct situation assessment **S** – Support communications, information sharing and advocacy efforts
8b. Participate in statewide efforts to develop policy, regulations, and legislation related to water affordability that is workable for specific communities	**X**	**X**	City of Placerville, County, EDCWA, EID, GDPUD, GFCSD, STPUD, TCPUD	**L** – Represent OCA **F** – Coordinate with purveyors as cooperating party to improve affordability and accessibility **S** – Support communications, information sharing and advocacy efforts

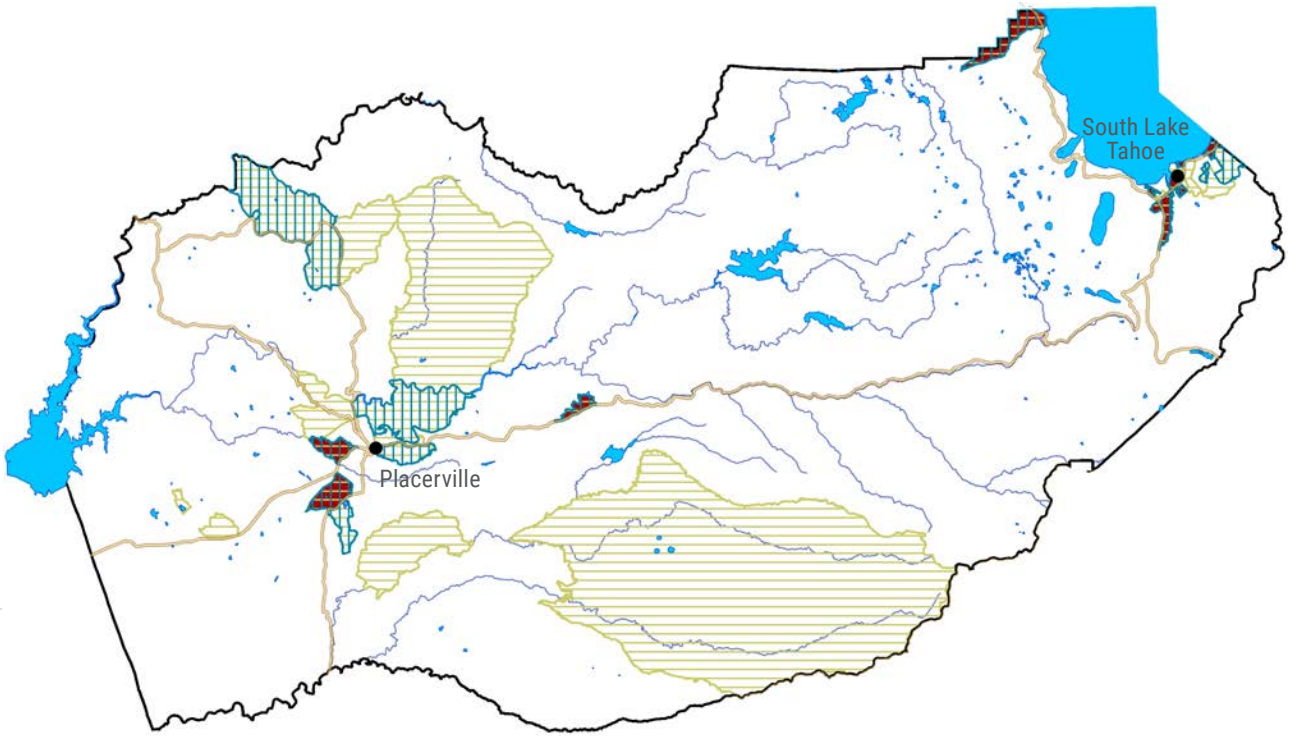
Key

L = **Lead** – Assuming the responsibility in advancing an RMS
F = **Facilitate** – Organizing and assisting in advancing an RMS, but not directly responsible
S = **Support** – Providing as-needed coordination, advocacy, and occasional assistance

County = County of El Dorado
EDCWA = El Dorado County Water Agency
EID = El Dorado Irrigation District
GDPUD = Georgetown Divide Public Utility District
GFCSD = Grizzly Flats Community Services District
OCA = Other County Area
STPUD = South Tahoe Public Utility District
TCPUD = Tahoe City Public Utility District

Implementation of the 2012 human right to water legislation is under development. In the State Water Resources Control Board's January 2019 draft recommendation to the legislature, it proposes that households with income below 2 times the federal poverty level to be eligible for the Low-Income Water Rate Assistance Program. The corresponding communities are mapped together with the Disadvantaged Communities and the Severely Disadvantaged Communities in El Dorado County.





Sources:
** Census GIS Data was downloaded from: https://data.cnra.ca.gov/database/census-block-group-disadvantaged-communities-2016*
*** https://aspe.hhs.gov/2017-poverty-guidelines#threshholds*

Notes:
1. *Refer to the Glossary in the Table of Contents for definitions of disadvantaged community, severely disadvantaged community and federal poverty level.*
2. *The federal poverty level is based on the size of household, similar to the criteria set forth for the Air Resource Board to implement the loan and grant eligibility under the California Greenhouse Gas Reduction Fund Project as directed by Assemble Bill (AB) 1550 (2016). The AB 1550 mapping method is used for mapping the community with income below 2 times federal poverty line.*

4.9 RMS9 – Improve Watershed Management for Water Resource-Related Benefits

Successful watershed management integrates and coordinates activities that affect a watershed's natural resources and water quality in a comprehensive manner. It requires the expertise, authorities, engagement, and actions of multiple agencies and organizations involved in land use, water management, and related efforts, meaning that no one entity can accomplish it alone. Watershed management is broad in both scope and geographic coverage. Many watershed management actions have direct (or indirect) effects on water availability and quality; however, while both the County and the Agency will advise and assist with broad watershed management, many state and federal agencies are ultimately responsible for forest and headwater health. As such, collaboration and observation roles and responsibilities are important in implementation of watershed management.

Primary Challenges Addressed

C1 ***C2*** ***C3*** ***C4*** *C5* ***C6*** *C7*

RMS Actions	West Slope	Tahoe Basin	Principal Implementing Agencies	Agency's Role(s)
9a. Implement headwater meadow restoration for water retention and water quality management	X	X	USFS, CABY and Tahoe Sierra IRWMs implementing agencies	**S** – Participate in CABY and Tahoe Sierra Integrated Regional Water Management (IRWM efforts) **S** – Support communications, information sharing and advocacy efforts
9b. Implement invasive species management	X	X	El Dorado County Noxious Weed Group, Tahoe Basin Weed Coordinating Group	**S** – Support communications and information sharing efforts
9c. Collaborate with resource management agencies, power utilities, water purveyors, and stakeholders to promote sustainable forest management for long-term benefits of water supply infrastructure protection, biodiversity and ecosystem functions	X	X	BLM, California Department of Forestry and Fire Protection, private entities (e.g., Sierra Pacific Industries), Sierra Nevada Conservancy, Tahoe Conservancy, USFS and Liberty Utilities, PG&E, SMUD and EID, GDPUD, GFCSD, STPUD, TCPUD	**F** – Participate in the South Fork American River Cohesive Strategy Group and explore feasibility of establishing similar efforts or collaborative forums for the remainder of El Dorado County **F** – Coordinate effort to develop, collect, synthesize and distribute information on forest health and associated benefits, including water retention and fuel management, to strengthen science-based decisions and promote support for changes in forest management policies, implementation and funding authority **S** – Support communications, information sharing and advocacy efforts; Support state and federal grant applications (where appropriate)
9d. Expand options for utilizing and disposing of woody biomass	X	X	County, EID, GDPUD, GFCSD, STPUD, TCPUD	**S** – Collaborate with implementation agencies and stakeholders to explore options including incentives for biomass energy productions, coordination with logging companies, and other creative solutions

Key

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BLM = U.S. Department of the Interior, Bureau of Land Management
CABY = Cosumnes, American, Bear, Yuba
County = County of El Dorado
EID = El Dorado Irrigation District
GDPUD = Georgetown Divide Public Utility District
GFCSD = Grizzly Flats Community Services District

IRWM = Integrated Regional Water Management
PG&E = Pacific Gas and Electric Company
SMUD = Sacramento Municipal Utility District
STPUD = South Tahoe Public Utility District
TCPUD = Tahoe City Public Utility District
USFS = U.S. Forest Service

4.10 RMS10 – Prevent Contamination of Surface Water and Groundwater Resources

Overall, El Dorado County's surface water and groundwater are of good quality. But it is critically important to maintain the water quality we currently enjoy. Contamination of water supplies – either surface water or groundwater – can have dire consequences. Contamination can restrict potable uses, exacerbate the existing supply-demand imbalance, be expensive to remediate, have negative effects on the environment, and impact agriculture and recreation thereby endangering economic prosperity in the long run.

Primary Challenges Addressed

C1 ***C2*** *C3* *C4* ***C5*** ***C6*** ***C7***

RMS Actions	West Slope	Tahoe Basin	Principal Implementing Agencies	Agency's Role(s)
10a. Apply advanced technologies for water quality monitoring (surface water and groundwater), including remote sensing, for areas susceptible to water quality problems	**X**	**X**	County, EID, El Dorado County Agricultural Water Quality Management Corporation	**F** – Facilitate innovation and pilot for advanced technology
10b. Implement Sewage System Management Plans in coordination with system owners including emergency response protocols and vulnerability assessment	**X**	**X**	City of Placerville, County, EID, GDPUD, STPUD, TCPUD	**F** – Coordinate with the County and water purveyors to identify vulnerable sewage lines with high risk of contaminating surface water or groundwater resources **S** – Support communications, information sharing and advocacy efforts
10c. Implement the Nutrient Management Plan for agricultural practice to reduce the risk of long-term effects on the quality of surface water and groundwater resources	**X**	**X**	County	**F** – Coordinate with the County to evaluate the monitoring of data available and synthesize the data for public access and information sharing **S** – Support communications, information sharing and advocacy efforts **S** – Support grant applications for monitoring and best management practices implementation (where appropriate)
10d. Implement County Local Agency Management Plan for Onsite Wastewater Treatment Systems, including enforcement on guidelines for approval and repairs	**X**	**X**	County	**F** – Coordinate with the County to evaluate the monitoring of data available and synthesize the data for public access and information sharing **S** – Support communications, information sharing and advocacy efforts
10e. Conduct public outreach and education activities to encourage prevention of water supply contamination	**X**	**X**	City of Placerville, County, EID, GDPUD, GFCSD, STPUD, TCPUD	**S** – Support communications, information sharing and advocacy efforts
10f. Inspection of permitted septic tank systems in the Auburn Lake Trails Wastewater Zone	**X**		GDPUD	Not applicable

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STPUD = South Tahoe Public Utility District
TCPUD = Tahoe City Public Utility District

4.11 RMS11 – Reduce the Risk of Flooding in Communities

Historically, most flooding in El Dorado County has been localized due to the terrain and headwater location, or as a result of rainfall on snow. However, climate change may result in more extreme flooding conditions, with expanded areas of impact and increased severity as well as potential effects on critical infrastructure (including major water facilities). Continued flood management efforts are critical for local communities and may produce additional benefits to downstream communities outside of El Dorado County.

Primary Challenges Addressed

C1 C2 C3 C4 C5 C6 **C7**

RMS Actions	West Slope	Tahoe Basin	Principal Implementing Agencies	Agency's Role(s)
11a. Update potential risks of flooding and infrastructure vulnerability	X	X	City of Placerville, City of South Lake Tahoe, County, EID, GDPUD, GFCSD, STPUD, TCPUD	**F** – Communicate flood risks in coordination with the County and City of Placerville and City of South Lake Tahoe **F** – Develop and maintain coordination with facility owners, and an inventory of water infrastructure that is vulnerable to flooding **S** – Support communication, information sharing and advocacy efforts
11b. Develop and implement flood risk reduction projects to reduce localized and neighborhood flooding	X	X	City of Placerville, City of South Lake Tahoe, County	**F** – Collaborate with the implementing agencies in developing and implementing flood risk reduction projects **S** – Support state and federal grant applications (where appropriate) **S** – Support communications, information sharing and advocacy efforts – See RMS6a for relevant actions
11c. Improve implementation of residual flood risk mitigation actions including participation of the National Flood Insurance Program and voluntary use of flood resistant materials and other California Building Code requirements as appropriate	X	X	City of Placerville, City of South Lake Tahoe, County	**S** – Support communications, information sharing and advocacy efforts
11d. Incorporate the effects of climate change in the frequency and intensity of flood-causing storm events in facility planning (siting and design) for long-term sustainability	X	X	County, EID, GDPUD, GFCSD, STPUD, TCPUD	**S** – Support state and federal grant applications (where appropriate) **S** – Support communications, information sharing and advocacy efforts

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STPUD = South Tahoe Public Utility District
TCPUD = Tahoe City Public Utility District

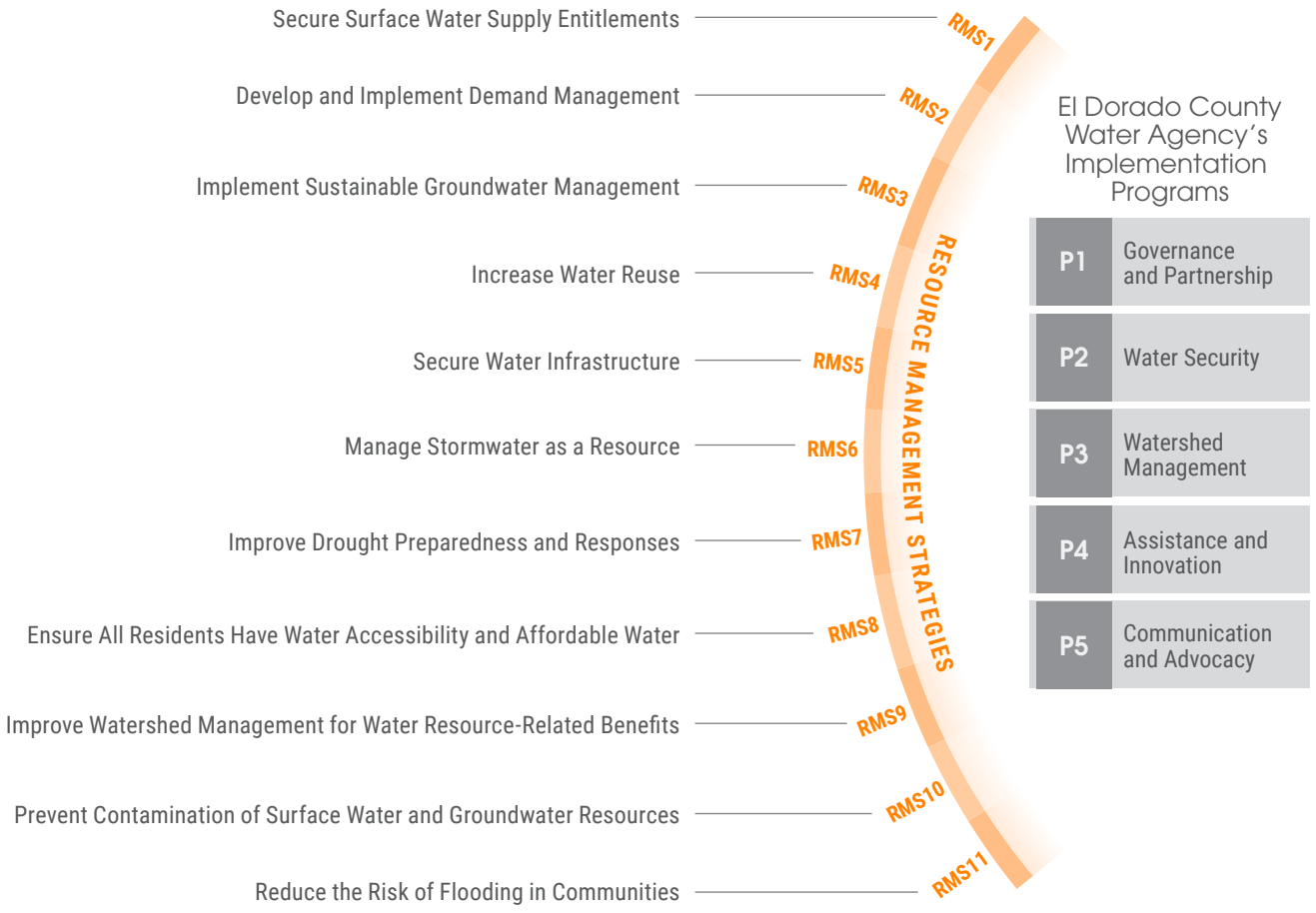
SECTION

5

Implementation

Implementation of the WRDMP will be a continual, incremental, and an adaptive process. Some progress on actions has already been made, other actions will be underway or completed before the next update of the WRDMP in 2024, and still others will require more time to develop and implement, not being finished in the next 20 years.

The RMSs and actions identified in Section 4 are wide-ranging, and their implementation will be a shared responsibility between the identified principal implementing agencies, requiring both organization and coordination. The Agency will play a vital role in advancing actions that are consistent with its authorities and priorities, and it will need to develop policies and guidance for its continued involvement, to evaluate progress, and to focus its efforts. This section describes the ***how*** and the ***when*** for the Agency's involvement in water resources development and management in El Dorado County in collaboration with other local/regional and federal entities to realize the vision in the County General Plan.



5.1 Implementation Programs

To do its part in furthering the RMSs and actions outlined in the previous section (Section 4), the Agency has created five implementation programs:

- **Governance and Partnership**
- **Water Security**
- **Watershed Management**
- **Assistance and Innovation**
- **Communication and Advocacy**

These programs align with the Agency's authorities and are reflective of its levels of engagement in the RMSs and actions. Together, the programs encompass the work required of the Agency.

Governance and Partnership Program

The Governance and Partnership Program focuses on how the Agency will function throughout WRDMP implementation in creating benefits for all El Dorado County. The extent of this program is defined by the Agency's authority in the Act, and it includes the Agency's involvement in advancing RMSs, actions, water sale agreements, coordinated operations, and other water-related efforts. Initial program activities include the strategic formation of a governing body (or authority) for WRDMP implementation and building capacity to support future Agency activities.

Water Security Program

The Water Security Program focuses on the Agency's effort to prepare El Dorado County for an uncertain water future, and it is the most important program for the Agency. It encompasses the Agency's role in the ongoing water supply and demand gap analysis, water supply development, drought protection and response, developing stormwater as a resource, flood management, and water quality. This program is at the center of the Agency's work, requiring the most effort and the greatest financial investment in comparison with other programs.

El Dorado County Water Agency's five implementation programs are mutually supportive and guided by the adopted policies and guidance, providing a focus on outcomes to benefit the communities in El Dorado County.

Watershed Management Program

The Agency has broad authority to engage in water management actions related to water supply, water quality and flood management. It is more likely to take a supporting (rather than leading) role in watershed management and primarily in areas with direct correlations to water management. As such, the Agency's Watershed Management Program involves participating in actions that meaningfully contribute to long-term water supply reliability and water quality protection for El Dorado County, in the areas of headwater management, water quality management for rural and agricultural communities, and habitat and other ecosystem function enhancement.

Assistance and Innovation Program

Innovation is the key to continued improvement of both the understanding and management of water resource-related challenges. Through the Assistance and Innovation Program, the Agency aims to encourage the development and use of innovative ideas in water planning and management, as well as provide technical and educational assistance to other entities involved in RMS and action development and implementation. At present, the Agency's ability to provide direct financial assistance is limited, but it may explore alternative mechanisms that are within its authority.

Communication and Advocacy Program

The intent of the Communication and Advocacy Program is to coordinate efforts throughout El Dorado County so they are more consistent, efficient, and effective. It consists of public information, countywide communications, and federal and state advocacy related to water resource issues and management. This program is crucial to WRDMP implementation, as it fosters coherent and effective messages regarding investments and actions. This program also facilitates consistent Agency engagement in implementation and coordination efforts with other local/regional, state and federal agencies, stakeholders and interested parties.

> *"Ensuring WATER SECURITY at the local level includes efforts to conserve and use water more efficiently, to protect or create habitat for local species, to ensure food security, to recycle water for reuse, to capture and treat stormwater for groundwater recharge and reuse, and to remove salts and contaminants from brackish or contaminated water or from seawater. But, mostly it requires integrating disparate or individual government efforts into one combined regional commitment where the sum becomes greater than any single piece."*
>
> – California Water Action Plan, 2016 Update

5.2 Implementation Policies and Guidance

Related to WRDMP implementation, the Agency's Board of Directors (Board) adopted the following policies that affirm the purposes of the WRDMP and associated adaptive management for its long-term implementation.

- **Policy WRDMP-01:** The WRDMP shall be the countywide water plan to support the realization of the vision established in the County General Plan.
- **Policy WRDMP-02:** The WRDMP shall include resource management strategies to improve water resources management in El Dorado County, with anticipated economic and public benefits accrued in all communities throughout El Dorado County.
- **Policy WRDMP-03:** The WRDMP shall identify and prioritize the Agency's implementation actions and priorities consistent with the authority and roles provided by the Act.
- **Policy WRDMP-04:** The implementation of the WRDMP shall be based on collaborative principles for developing partnership with regional, state, and federal agencies who share resource management responsibilities and cooperate in creating mutual benefits.
- **Policy WRDMP-05:** The WRDMP shall be updated every 5 years by June 30 in years ending in 4 and 9 to address changed conditions, assess progress of implementation, and realign priorities of the Agency's actions.

The Board also adopted the following guidance for the Agency's implementation of the WRDMP.

- **Guidance WRDMP-01:** The Agency shall convene a chartered Countywide Plenary for Water (Plenary) to foster collaboration on the water resources development and management in El Dorado County. The Agency shall convene the Plenary twice per year with representation from, at a minimum, the County's planning department, cities, water purveyors, and other water-resource related resource management entities.
- **Guidance WRDMP-02:** The Agency shall develop alternative revenue sources to support incentives and innovations to improve countywide water management.
- **Guidance WRDMP-03:** The Agency shall maximize available state and federal technical and financial assistances in implementation actions, where feasible.
- **Guidance WRDMP-04:** The Agency shall allocate cost of project development and implementation fairly among beneficiaries.
- **Guidance WRDMP-05:** The Agency shall leverage significant opportunities for hydropower generation in El Dorado County in its project development, where feasible, as a cost-offset mechanism.
- **Guidance WRDMP-06:** The Agency shall consider regional and statewide water market transfers in its project development, where appropriate, as a cost-offset mechanism. No water market transfers can result in water supply impacts within El Dorado County.

5.3 Recent Accomplishments (2017–2019 Fiscal Years)

The Agency's completion of its 2016-2020 Strategic Plan marked a pivotal point for water resource management in El Dorado County. This transition is reflected in the 2016-2020 Strategic Plan's vision statement:

> *"Within the next five years, El Dorado County Water Agency will be known as the trusted, countywide leader on water-resource issues, representing the long-term interest of our community, purveyors and residents through a dedicated team of professionals, responsive and accountable to the public we serve."*

Since that time, the Agency has focused on implementing that vision in concert with the County's efforts in promoting and realizing the vision of the County General Plan. Described below is the summary of accomplishments between fiscal years 2017 through 2019; a fiscal year is from July through June of the following year. In the two years since completion of the Agency's 2016-2020 Strategic Plan, the Agency has been in continual transition, while making significant strides in the planning and management of water resources in El Dorado County.

Governance and Partnership Program

- Renewed the Joint Exercise of Powers Agreement with EID, Placer County Water Agency, and the Nevada Irrigation District in 2016 related to the CABY Integrated Regional Water Management Plan (IRWMP) for regional planning studies and implementation activities with a focus on the interests of El Dorado County in the Sierra Nevada.
- Participated with the Regional Water Authority (RWA) as an associate member agency on a continued basis for regional planning studies and implementation activities with a focus on the interests of El Dorado County in the American River Basin and statewide (including the CVP-State Water Project system).
- Formed a GSA with STPUD in 2018 to sustainably manage groundwater resources in the areas found in the Tahoe Valley South Subbasin (outside of STPUD's service area). The Agency and STPUD are responsible for the compliance with the law and regulations pertinent to the SGMA.
- Continued implementation of the El Dorado-SMUD Agreement as the lead agency in 2019 for integration with the Agency's long-term planning activities in coordination with the County, water purveyors and interested parties.
- Entered into cost-share agreements with Reclamation for the American River Basin Study in 2017 under Reclamation's WaterSMART program (with other non-federal partners, namely Placer County Water Agency, City of Roseville, City of Folsom, City of Sacramento, and the RWA). In coordination with EID, the Agency also entered into a cost-share agreement for the Alder Creek Water Conservation and Storage Project Feasibility Study in 2018.
- Completed the environmental and contract negotiation process for the long-term CVP (Fazio) water service contract with Reclamation in 2019 for scheduled contract execution in the winter of 2019 to provide additional water supply of up to 15 TAF per year for long-term water needs within the service areas of EID, GDPUD and possibly a portion of the Other County Areas.

- Continued negotiation with Reclamation for developing long-range planning studies under Reclamation's WaterSMART program, including the American River Basin Water Marketing Strategy Project with Placer County Water Agency, Sacramento Suburban Water District, City of Folsom, City of Sacramento, and the RWA; and the Upper American River Basin and Upper Cosumnes River Basin Regional Drought Contingency Plan with EID.

Water Security Program

- Refocused the development of the El Dorado Water Reliability Project for acquisition of water rights of additional 40 TAF and issued a Notice of Preparation for the Environmental Impact Report in 2017.
- Facilitated the completion of a Stormwater Resource Plan for the West Slope in 2018 in collaboration with the County and City of Placerville, the first annual implementation report, and implementation program. The Agency submitted selective projects to the American River Basin IRWMP and CABY IRWMP in 2019 to preserve eligibility for potential state financial assistance. The County and City of Placerville would incorporate needs for further project refinement and implementation in their budgetary processes.
- Participated in regional planning efforts through the RWA, including the North American River Basin Regional Drought Contingency Plan, the RWA Regional Water Reliability Plan, and the Sacramento Regional Groundwater Bank development to improve long-term regional collaboration and water supply reliability.
- Received the award of federal assistance in 2016 for developing the American River Basin Study under Reclamation's WaterSMART program; completed the Plan of Study in 2017; currently actively engaging in study development in partnership with Reclamation and other non-federal partners to unify the data and tools for future planning efforts, develop the climate adaptation portfolios that are actionable and create mutual benefits for Reclamation and the American River Basin region.
- Awarded federal assistance in 2017 for development of the American River Basin Water Marketing Strategy Project to advance regional initiative to incorporate water markets and associated opportunities as part of the tactics to improve long-term regional water supply reliability and climate resiliency. The Agency is currently actively negotiating the study agreement with Reclamation and developing the workplan.
- Completed the Plan of Study for the Alder Creek Water Conservation and Storage Project Feasibility Study in collaboration with Reclamation, including an update of the project cost estimate. The feasibility study is pending in anticipation of federal cost-share funding.
- Awarded with EID, federal assistance in 2018 for development of the Upper American River Basin and Upper Cosumnes River Basin Regional Drought Contingency Plan under Reclamation's WaterSMART program. The Agency is currently actively negotiating the study agreement with Reclamation and developing a workplan.
- Completed the Environmental Impact Statement and contract negotiations in collaboration with Reclamation for the long-term CVP (Fazio) water service contract of up to 15 TAF in 2019 for the needs within water service areas of EID and GDPUD, and possibly a portion of the Other County Area. The contract finalization is scheduled in the winter of 2019.

- Initiated studies to revise the M&I and agricultural demands for the West Slope consistent with the County General Plan in collaboration with water purveyors and water users to characterize the economic development opportunities and included considerations of climate change, long-term conservation efforts and other regulatory changes. The revised demands will focus on the long-term capacity level envisioned by the County General Plan and would be used consistently in various ongoing and future project development and studies. The study is scheduled for completion in the fall of 2019.
- Developed the WRDMP in collaboration with County, water purveyors and interested parties as a policy document to cover the broad charges of the Agency authorized by the Act, define actionable resource management strategies, and focused implementation actions by the Agency that are consistent with the charges and the broad benefits of El Dorado County. The WRDMP is scheduled for completion and potential adoption by the Board in the fall of 2019.
- Engaged actively in state-led workgroups for advancing the implementation of the 2018 legislation for long-term water conservation and drought planning (Senate Bill 606 and Assembly Bill 1660) in coordination with the Association of California Water Agencies (ACWA) and other water user communities. The Agency particularly participated in the Countywide Drought Planning Advisory Group to ensure that the interests of El Dorado County and foothill communities will be properly considered and the resulting law and regulations are implementable.

Watershed Management Program

- Completed initial concept development for the watershed management program and conducted desktop information gathering for review.
- Collaborated with ACWA Headwaters Work Group in developing recommendations on policy and implementation for improving forest health, water retention and yield, biodiversity, and environmental services.

Assistance and Innovation Program

- Promoted public water education and social awareness through sponsorship to the Water Education Foundation as a contributing member for impartial dialogue and original content. Through sponsorship to the El Dorado County Ag in the Classroom Program, the Agency helped cultivate an understanding and appreciation of how important an all-encompassing agriculture is in our daily lives through an exhibit at the El Dorado County Kids Expo.
- Commenced the clarification of criteria and purposes for the potential assistance from the Agency and explored alternative revenue incomes to support the development and implement innovative solutions for identified water resource-related challenges.
- Provided financial and technical assistance to water purveyors, County and cities, and water users as appropriate and as needed.

Communications and Advocacy Program

- Engaged actively with federal agencies and elected officials with an emphasis on Reclamation and Congressional representatives, including Agency-specific actions and advocacy, and collaborated efforts with the RWA, ACWA, the Sacramento Metropolitan Chamber of Commerce, and other entities with common interests.
- Reviewed and developed action plans to improve the effectiveness of communication, advocacy, and overall presence of the Agency in water communities and the government structure.
- Participated in the development of prioritization for policy and project development with a federal nexus.
- Participated in state advocacy efforts through DWR's Countywide Drought Planning Advisory Group.

5.4 Near-Term Priority Actions (2020–2024 Fiscal Years)

Following adoption of the WRDMP and through its first update in 2024, the Agency has prioritized several distinct actions. This list of actions is neither exhaustive nor is it static. The Agency expects that it will need to be flexible, adapting to changing conditions and new developments to ensure adequate water for today and in the future.

Governance and Partnership Program

- Continue the established governance and partnership roles and responsibilities in the CABY Integrated Regional Water Management Region, RWA, Tahoe Valley South Subbasin GSA, El Dorado-SMUD Agreement, and various partnerships with Reclamation including CVP (Fazio) Water Service Contract, the American River Basin Study, and the Alder Creek Water Conservation and the Storage Project Feasibility Study.
- Continue to develop and foster new partnerships with state and federal agencies, water communities, non-profit organizations and other interest parties to advance the Agency's goals and functions.

Water Security Program

- Lead (where appropriate) and participate in water supply and drought planning efforts as part of the focus of the Agency to improve the countywide water future, including:
  - Continue developing the El Dorado Water Reliability Project to complete the environmental review process and advance the water right acquisition process.
  - Complete the American River Basin Study in collaboration with Reclamation and regional partners to achieve the anticipated outcome with integrated data and tools for future planning needs, and climate adaption portfolios that are appropriate and supportable by El Dorado County interests and regional benefits.

  - Complete the cost-share agreement negotiation and subsequent execution with Reclamation and regional partners for the American River Basin Water Marketing Strategy Project, and the Upper American River Basin Regional Drought Contingency Plan.
  - Collaborate with Reclamation in securing federal cost share funding for the Alder Creek Water Conservation and Storage Project Feasibility Study and execute the Plan of Study once the funding becomes available (as one of the recommended climate adaption portfolios in the American River Basin Study).
  - Continue engaging in the CABY IRWMP update to ensure the realized benefits and outcomes to meet El Dorado County needs and interests.
  - Continue developing the plan and protocol for use of the newly acquired CVP (Fazio) water service contract with EID and GDPUD, and developing the necessary exchange agreement with Placer County Water Agency to facilitate the use for GDPUD as originally anticipated in the Congressional authorization for constructing the American River Pump Station and restoring the Auburn Dam site.
  - Collaborate with the RWA and regional partners to implement RWA's Regional Water Reliability Plan, with a special focus on the planning and approval of the Sacramento Regional Groundwater Bank (as one of the recommended climate adaption portfolios in the American River Basin Study).
- Complete the 2019 WRDMP for adoption and develop the 2024 WRDMP update that includes tracking and reporting progress towards effective plan implementation.
- Update the West Slope Stormwater Resource Plan, prepare annual progress reports, provide project development assistance to the County (where appropriate), engage the SWRCB for approval of the Stormwater Resource Plan to ensure state grant funding eligibility, and provide grant application assistance (where appropriate).
- Conduct in collaboration with the County (e.g., Health and Human Service Agency, and EMD), one comprehensive situation assessment or multiple ones with a focused scope to improve understanding of potential levels of concerns over water accessibility, quality, and affordability in all communities of El Dorado County to formulate potential courses of action, where appropriate, to address the intent of Assembly Bill 685 of 2012 related to the human right to water.
- Explore options to facilitate the management and public dissemination of water management data that builds on the synthesized information contained in the WRDMP and improve public accessibility.
- Support conducting a special study for agricultural needs given that agriculture is the largest water demand in the West Slope.

Watershed Management Program

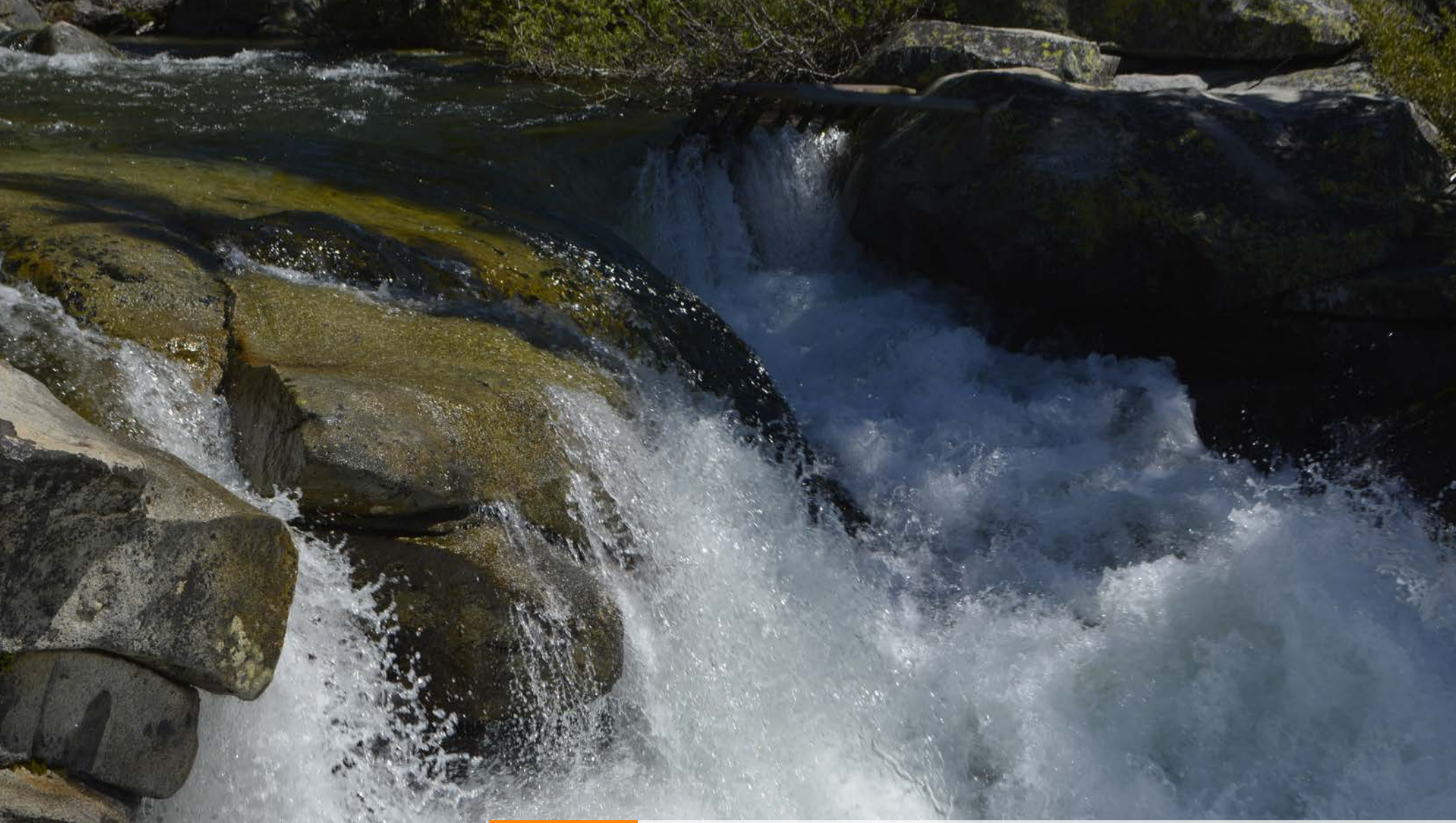
- Support local implementation of the National Cohesive Wildland Fire Management Strategy, including participating with the South Fork of the American River group and other efforts to reduce the likelihood of wildfires in areas of high risk (as appropriate).
- Participate in resource conservation efforts related to headwaters management, forest management, watershed conservation, and meadow restoration (as appropriate).

Assistance and Innovation Program

- Continue to foster public water education and social awareness about the importance of sustainable water management.
- Explore the development of a potential grant application assistance program to support state and federal grant applications. This would include the development of formal assistance criteria and priorities (where needed and appropriate).

Communications and Advocacy Program

- Conduct a Countywide Plenary for Water, a forum for water management, to encourage collaboration on the water resources development and management in El Dorado County between the County's planning department, cities, water purveyors, and other water-resource related resource management entities.
- Continue to support communications, information sharing, provide information to the public and advocacy efforts (as needed).



Stantec

Water Resources Development and Management Plan

For more information, contact
El Dorado County Water Agency
4330 Golden Center Drive, Suite C
Placerville, CA 95667
(530) 621-5392
https://www.edcgov.us/Water

APPENDIX D

DEPARTMENT OF WATER RESOURCES – SB7X-7 TABLES

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 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☐	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☑	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	9,333
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use							
Compliance Year 2020	**2020 Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**2020 Deductions**					**2020 Gross Water Use**
		Exported Water *	**Change in Dist. System Storage*** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use***	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	1,813			-		-	**1,813**

*** 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 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Stumpy Meadows Reservoir
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] *Optional (+/-)*	Corrected Volume Entering Distribution System
	1,813	-	1,813

[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

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
1,813	9,333	**173**
NOTES:		

SB X7-7 Table 9: 2020 Compliance							
Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD Enter "0" if Adjustment Not Used Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]	TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
173	-	-	-	-	173		**NO**

[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:

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 Submittal 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	2,145	Acre Feet
	2008 total volume of delivered recycled water	-	Acre Feet
	2008 recycled water as a percent of total deliveries	0%	**See Note 1**
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	1999	
	Year ending baseline period range[3]	2008	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2004	
	Year ending baseline period range[4]	2008	

[1] *If the 2008 recycled water delivery is less than 10 percent of total water deliveries, then the 10-15year baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater of total deliveries, the 10-15 year 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 for the 10-15 year baseline period must be between December 31, 2004 and December 31, 2010.*

[4] *The ending year for the 5 year baseline period 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)	
☐	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☑	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: Service Area Population		
Year		**Population**
10 to 15 Year Baseline Population		
Year 1	1999	8,114
Year 2	2000	8,317
Year 3	2001	8,573
Year 4	2002	8,815
Year 5	2003	8,874
Year 6	2004	9,008
Year 7	2005	9,025
Year 8	2006	8,987
Year 9	2007	8,923
Year 10	2008	8,818
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2004	9,008
Year 2	2005	9,025
Year 3	2006	8,987
Year 4	2007	8,923
Year 5	2008	8,818
NOTES:		

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

Baseline Year *Fm SB X7-7 Table 3*		Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Deductions					Acre Feet
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	Annual Gross Water Use
10 to 15 Year Baseline - Gross Water Use								
Year 1	1999	1,906			-		-	1,906
Year 2	2000	1,809			-		-	1,809
Year 3	2001	1,956			-		-	1,956
Year 4	2002	1,938			-		-	1,938
Year 5	2003	1,885			-		-	1,885
Year 6	2004	2,191			-		-	2,191
Year 7	2005	2,088			-		-	2,088
Year 8	2006	1,958			-		-	1,958
Year 9	2007	1,992			-		-	1,992
Year 10	2008	2,144			-		-	2,144
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**1,987**
5 Year Baseline - Gross Water Use								
Year 1	2004	2,191			-		-	2,191
Year 2	2005	2,088			-		-	2,088
Year 3	2006	1,958			-		-	1,958
Year 4	2007	1,992			-		-	1,992
Year 5	2008	2,144			-		-	2,144
5 year baseline average gross water use								**2,075**

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

NOTES:

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

Name of Source	Stumpy Meadows Reservoir
This water source is:	
✓	The supplier's own water source
	A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System[1]	Meter Error Adjustment[2] *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1999	1,906		1,906
Year 2	2000	1,809		1,809
Year 3	2001	1,956		1,956
Year 4	2002	1,938		1,938
Year 5	2003	1,885		1,885
Year 6	2004	2,191		2,191
Year 7	2005	2,088		2,088
Year 8	2006	1,958		1,958
Year 9	2007	1,992		1,992
Year 10	2008	2,144		2,144
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-
5 Year Baseline - Water into Distribution System				
Year 1	2004	2,191		2,191
Year 2	2005	2,088		2,088
Year 3	2006	1,958		1,958
Year 4	2007	1,992		1,992
Year 5	2008	2,144		2,144

[1] ***Units of measure*** *(AF, MG , or CCF) must remain consistent throughout the UWMP, as reported in Table 2-3.*

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

NOTES:

SB X7-7 Table 5: Baseline Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1999	8,114	1,906	210
Year 2	2000	8,317	1,809	194
Year 3	2001	8,573	1,956	204
Year 4	2002	8,815	1,938	196
Year 5	2003	8,874	1,885	190
Year 6	2004	9,008	2,191	217
Year 7	2005	9,025	2,088	207
Year 8	2006	8,987	1,958	195
Year 9	2007	8,923	1,992	199
Year 10	2008	8,818	2,144	217
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**203**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2004	9,008	2,191	217
Year 2	2005	9,025	2,088	207
Year 3	2006	8,987	1,958	195
Year 4	2007	8,923	1,992	199
Year 5	2008	8,818	2,144	217
5 Year Average Baseline GPCD				**207**

NOTES:

SB X7-7 Table 6: Baseline GPCD *Summary* *From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	203
5 Year Baseline GPCD	207
NOTES:	

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		**Supporting Tables**
☐	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D
☑	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator *Located in the WUE Data Portal at wuedata.water.ca.gov* Resources *button*
NOTES:		

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%)
		North Coast	137	130
		North Lahontan	173	164
✓	100%	Sacramento River	176	167
		San Francisco Bay	131	124
		San Joaquin River	174	165
		Central Coast	123	117
		Tulare Lake	188	179
		South Lahontan	170	162
		South Coast	149	142
		Colorado River	211	200
			2020 Target *(If more than one region is selected, this value is calculated.)*	**167**

NOTES:

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target					
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	**Calculated 2020 Target [2]**			**Confirmed 2020 Target[4]**
		As calculated by supplier in this SB X7-7 Verification Form	**Special Situations[3]**		
			Prorated 2020 Target	Population Weighted Average 2020 Target	
207	197	167			**167**

[1] ***Maximum 2020 Target*** *is 95% of the 5 Year Baseline GPCD except for suppliers at or below 100 GPCD.*

[2] ***Calculated 2020 Target*** *is the target calculated by the Supplier based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target. Supplier may only enter one calculated target.*

[3] ***Prorated targets and population weighted target*** *are allowed for special situations only. These situations are described in Appendix P, Section P.3*

[4] ***Confirmed Target*** *is the lesser of the Calculated 2020 Target (C5, D5, or E5) or the Maximum 2020 Target (Cell B5)*

NOTES:

APPENDIX E

GEORGETOWN DIVIDE PUBLIC UTILITY DISTRCIT – OPTIONS TO INCREASE WATER SUPPLY

GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

OPTIONS TO INCREASE WATER SUPPLY

April 2009

- DRAFT -

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GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

OPTIONS TO INCREASE WATER SUPPLY

April 2009

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Appendix

1.0 EXECUTIVE SUMMARY

A set of options selected to increase water supply has been identified and evaluated based on ability to meet future water supply demands of the Georgetown Divide Public Utility District (District). Supplemental water supply project options were identified during meetings with the District and by review of historical reports. Listing and potential water yield and cost information for each of the options to increase water supply to the District included in the evaluation is presented below in Table 1.

Georgetown Divide Public Utility District Ditch

Table 1 – Summary of Georgetown Divide Public Utility District Options to Increase Water Supply

Option Number	Option Name	Additional Water Yield (acre-feet)	Initial Cost ($mil)	Cost of Water ($/af/yr)
1	Conveyance canal loss reduction	670	11.5	1,200
2	Enlarging Stumpy Meadows Reservoir	250-1,000[1]	-[2]	-[2]
3	Upper Stumpy Meadows Reservoir	3,200	-[2]	-[2]
4	(a) Rubicon River Diversion – with tunnel	3,300-10,300[3]	59.0	470-1,100[3]
	(b) Rubicon River Diversion – without tunnel	3,300-10,300[3]	28.5	290-680[3]
5	North Fork American River Pumping Plant	10,300	14.2	230
6	Canyon Creek Reservoir	6,100	108.3	1,200
7	Mutton Canyon	100	0.140	130
8	Onion Creek	50-300[4]	2.2	500-3,000[4]
9	Modification to allowable demand deficiency	200-1,000[5]	0	0

[1]Range depends on size of dam raise (see Section 4.2).
[2]No known cost information and none developed in this analysis.
[3]Depending on diversion capacity of 15 or 50 cfs (see Section 4.4)
[4]Range depends on type of water right (see Section 4.8).
[5]Range depends on demand deficiency modification (see Section 4.9).

The *Initial Cost* shown in Table 1 represents the cost to bring the option on-line while the *Cost of Water* represents the unit cost of water per year.

2.0 INTRODUCTION AND BACKGROUND

The District is investigating options to increase its available water supply to help meet future increasing water demands. The El Dorado County Water Agency's *Water Resources Development and Management Plan,* December 2007 (Water Plan) reports that about 10,300 acre-feet (about 25% residential-commercial and 75 % agricultural) of additional water could be needed to meet District demands at year 2025 demand levels and up to 21,600 acre-feet per year to meet demands at buildout. In addition to these water needs, the Water Plan suggests that areas located near the District service area could possibly be annexed through service area expansion driving the water need even higher. This report summarizes an investigation of a set of options selected to increase the water supply availability to the District to help meet future water supply demands. The projected water need presented here does not include supplemental water that would be made available under the P.L. 101-514 (Fazio Water) project that is currently being developed by the District, El Dorado County Water Agency, and El Dorado Irrigation District. Water that would be made available under the P.L 101-514 project is included as OPTION 5 - North Fork American River Pumping Plant of this report.

The District provides water in the Georgetown Divide area of El Dorado County including the areas of Cool, Pilot Hill, Greenwood, Georgetown, Garden Valley, and Kelsey. The Stumpy Meadows Project, owned and operated by the District, is the District's primary water supply source. The main feature of the Stumpy Meadows Project is Stumpy Meadows Dam and Reservoir located on Pilot Creek. The reservoir has a total storage capacity of about 20,000 acre-feet and a usable capacity of about 18,800 acre-feet. The average annual inflow to Stumpy Meadows Reservoir is about 23,000 acre-feet (1923-1999 average). Water from Stumpy Meadows Reservoir is released to Pilot Creek and rediverted and conveyed to the District's service area through the El Dorado Conduit and Georgetown Divide Ditch. The *firm* and *safe* water yield of the Stumpy Meadows Project is calculated as 12,251 and 10,541 acre-feet, respectively. The evaluation summarized in this report uses the following definition of *firm* and *safe* yield which is consistent with traditional District definitions.

> *Firm yield* is defined as the maximum annual water supply that is expected to be available with the understanding that lower yields will occur in some dry

years in accordance with the Districts water deficiency policy.
Safe yield is defined as the maximum annual water supply that is expected to be available in all years even during the most critically dry years.

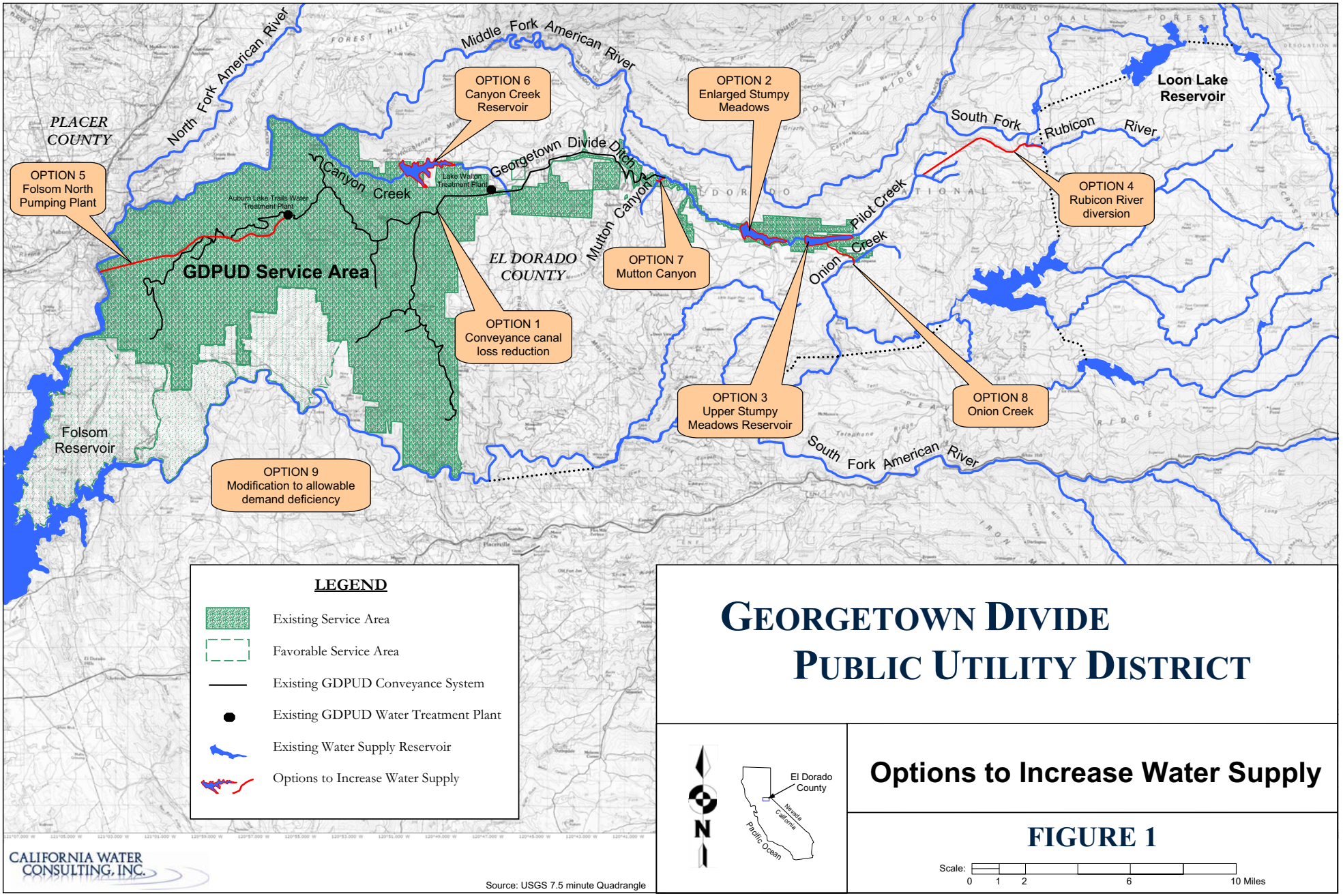
The evaluation presented here is intended to provide a general conceptual-level overview of some options available to the District to increase water supply. Based on this conceptual-level information, results of the evaluation are intended to present a description of each alternative, conceptual-level cost estimates where available, an evaluation of the ability of the option to provide supplemental water, discussion of water rights, and other contributing factors. Information presented in this report is intended to be used to evaluate selected options that best meet the needs of the District for consideration of implementation or further evaluation.

3.0 APPROACH TO EVALUATION

The District has previously investigated a number of options aimed at supplementing its water supply over the years. The investigation summarized in this report considers nine potential options many of which have been evaluated previously at varying levels of detail. These options were identified during meetings with the District and review of historical reports. The evaluation described here primarily relied on research and updating previously developed information. Some options were previously fully developed and some were modified to meet the needs of this study. *OPTION 9 – Modification to allowable demand deficiency* was fully developed as part of this evaluation as no previous studies evaluating this option are known.

4.0 OPTIONS TO INCREASE WATER SUPPLY

This section describes each of the nine options considered in this evaluation to increase water supply to the District. Figure 1 illustrates the location of each of the nine options.



GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

Options to Increase Water Supply

FIGURE 1

Scale: 0 1 2 6 10 Miles

4.1 OPTION 1 – Conveyance canal loss reduction

The District's ongoing management practices and conservation programs to reduce demands in its water conveyance system by lining ditches with gunite, replacing ditches with pipelines, and improving procedures to minimize operational water requirements has increased the reliability of its water delivery system as well as minimized water loss do to ditch seepage and leakage. The District estimates that operational water requirements and losses total about 3,600 acre-feet per year. Operational water requirements and loss reduction was evaluated in the Department of Water Resources (DWR) *Georgetown Divide Water Treatment Study*, 1992. That study was used as the basis for considering potential additional reduction of operational water requirements and losses in the Districts conveyance system in this evaluation as well as considering updated information related to system operation received from District personnel.

Even with the District's continuing program of system improvements to manage operational water requirements and reduce water losses, some losses still exists and are evaluated as to the feasibility of further reduction in this option. *OPTION 1 - Conveyance canal loss reduction* investigates the potential to reduce operational water requirements and losses thereby making additional water available to meet increasing water demands.

This option consists mainly of lining portions of unlined open ditch in the conveyance system with gunite. As the District has knowledge of the areas that are more susceptible to seepage and leakage losses, it is assumed that only those portions that experience significant loss would be lined and that continuing to line ditches will eventually reach a diminishing return by lining sections of ditch that currently experience little loss. It should be acknowledged that gunite lined open ditches do not always reduce water losses to zero and over time, losses can increase in lined ditches due to the formation of cracks in the lining requiring additional maintenance to continue to control losses.

Additionally, open ditches do gain water during some times of the year and at some locations due to direct inflow and groundwater intrusion. Additional evaluation of the existing ditch system is required to identify the locations that would most benefit from gunite lining.

Conveyance water requirement is associated with water transmission and delivery. In the treated and untreated water delivery system, this water may include seepage, leakage, and other losses associated with conveyance. The 1992 DWR study projected that conveyance

water requirements could be reduced to the order of about 13 percent by year 2000 by providing system improvements similar to those that the District performed in the past. A reduction to 13% might be a bit ambitious, but does represent a potential target and was used in this evaluation.

Carriage water requirement is the additional water that must be supplied due to the necessity to provide flows for regulation and diversion by users along the ditch system. The 1992 DWR study projected carriage water requirements for year 2000 of 2.3 cfs during the 5-month summer irrigation season and 1.4 cfs during the winter.

Distribution system water requirements result from the distribution of treated water and may include line flushing, fire fighting, casual sales (typically for construction and filling of swimming pools) and unauthorized water diversion. The 1992 DWR study projected distribution system losses could be reduced to 13 percent of the treated water production, or about 410 acre-feet per year. Process water requirement for the purpose of this study, refers to water uses including street cleaning and backwashing the water treatment plants. The District reports process water requirements in 2004 of approximately 150 acre-feet per year. The last major category of operational water requirements is water associated with watering-up of the canal system at the beginning of the irrigation season. The District reports water-up requirements in 2004 of approximately 450 acre-feet per year.

The District reports that the total system operational water requirement and losses were approximately 3,600 acre-feet in 2007. Of that amount, 600 acre-feet per year are accounted for in the process and water up losses described above. The other 3,000 acre-feet per year results from conveyance, carriage, and distribution requirements. As the split of these water requirements is unknown, year 2000 projected conveyance, carriage, and distribution losses from the 1992 DWR study were used to distribute the remaining 3,000 acre-feet of losses among the three categories by weighting the losses according to the weighted distribution from the 1992 study.

Potential measures to reduce operational water requirements and losses were considered based on the distribution of the source. No reduction in carriage, process, and distribution water requirements were considered in this option for the following reasons:

- The District monitors and operates to minimize the amount of carriage water required, and the water requirement is already below the projected 2000 levels indicated the 1992 DWR study.

- Process water requirements are considered to be necessary uses of water, for which reductions would only be minimal compared to the total operational requirements.
- Water-up requirements are necessary for operation of the conveyance system and can not be avoided.
- Although there may be opportunities for some further reductions in operational water requirements, they are minor compared to the overall requirements and, therefore, were not considered in the evaluation.

Excluding the above operational water requirements leaves conveyance and carriage requirements as opportunities for reducing water demands. Based on conversations with the District personnel, approximately 30% of the conveyance system is lined canal, tunnel, or pipeline. The remaining 70% of the District's 75 miles of conveyance is unlined ditch. It was assumed that an effort to line ditches in the areas that are more likely or known to have a higher degree of conveyance losses would result in the most efficient use of resources to achieve the highest degree of water savings. The cost for this savings was determined based on this assumption and an average cost per linear foot of canal lining.

This analysis estimates that a maximum of about 670 acre-feet could be saved through reduction in conveyance losses. To achieve this amount, costs are estimated at about $11.5 million. An advantage of this option is that ditch improvements can be incrementally staged over time as the need for supplemental water arises.

4.2 OPTION 2 – Enlarging Stumpy Meadows Reservoir

Stumpy Meadows Reservoir is located on Pilot Creek and has a capacity of 20,000 acre-feet. The existing Stumpy Meadows Dam has a crest length of 1,230 feet and width of 30 feet. The Pilot Creek drainage area tributary to the reservoir is about 15.6 square miles. *OPTION 2 - Enlarging Stumpy Meadows Reservoir* considers the increase in water supply made available by raising the Stumpy Meadows Dam and impounding additional water.

Stumpy Meadows Reservoir

There is a limit to how high the Stumpy Meadows Dam could be raised based on the physical aspects of the impoundment, dam stability, cost, as well as the reducing water

supply benefit afforded by increasing storage capacity. For this evaluation, Stumpy Meadows Dam raise of up to 9 feet was investigated. Additional information and study is needed to determine whether a simple dam raise of this magnitude would be supported by the existing dam foundation. If a simple dam raise is not feasible, costs would increase significantly.

The operation of an enlarged Stumpy Meadows Reservoir was evaluated using the District's *StumpSIM* computer model. Dam raises up to 9 feet, in one foot increments, were analyzed to determine the increase in project firm yield. Table 4 show the expected increase in water supply yield expected with additional storage capacity at Stumpy Meadows Reservoir made possible by increasing the dam height.

Table 2 – Stumpy Meadows Project Firm Yield With Increased Storage Capacity

Stumpy Meadows Dam Raise (feet)	Stumpy Meadows Reservoir Storage (acre-feet)	Stumpy Meadows Project Yield (acre-feet)	Water Supply Increase (acre-feet)
0	20,000	12,251	-existing project-
1	20,350	12,379	128
2	20,700	12,507	256
3	21,000	12,616	365
5	21,700	12,867	616
7	22,300	13,088	837
9	23,000	13,362	1,111

The evaluation indicates that raising Stumpy Meadows Dam 9 feet would increase the firm yield of the Stumpy Meadows Project by about 1,100 acre-feet. It might be possible to add a couple feet of flash boards to the Stumpy Meadows Project spillway to increase the storage capacity at a relative low cost. A two foot raise would provide an increase in firm yield of about 250 acre-feet. See Appendix 2 for additional information on this evaluation.

An advantage of this option is that the dam is already in place on Pilot Creek. Environmental impacts are relatively less compared to a new dam as fish and wildlife in the stream are already subject to regulated flow regime. Also, the incremental cost of adding

storage is typically much lower than for new dam projects. A disadvantage of this option might be that raising the existing Stumpy Meadows Dam might open the door for new requirements from regulatory agencies such as increase in minimum instream flow release requirements.

Cost information for this option has not been developed as it is unknown if a simple raise is feasible. Additional information and analysis is required to provide an estimate the cost of this option.

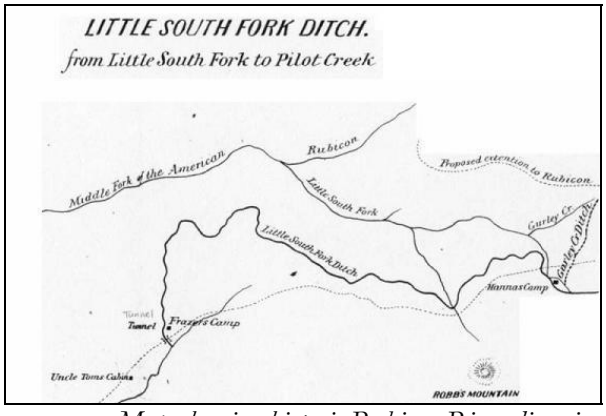
4.3 OPTION 3 – Upper Stumpy Meadows Reservoir

Upper Stumpy Meadows Reservoir is conceptualized to consist of building a new rockfill dam upstream of the existing Stumpy Meadows Dam and Reservoir on Pilot Creek. The dam would be 820 feet long and approximately 145 feet high with the crest elevation at 4,500 feet. The reservoir impounded by the dam would have a surface area of 194 acres with a storage volume of 10,820 acre-feet. The drainage area above the dam would be approximately 10 square miles. Preliminary evaluations estimated a safe yield of 3,200 acre-feet for the project. Upper Stumpy Meadows Reservoir would be operated in conjunction with Stumpy Meadows Reservoir to maximum water supply benefits.

A cost estimate was not prepared for this option. The dam will be similar in cost to *OPTION 6 - Canyon Creek Reservoir* (slightly less due to a smaller structure), but with a water yield of only one-half of that for Canyon Creek Reservoir. These two factors strongly indicate that the cost per acre-foot of water of this alternative will be significantly greater than the Canyon Creek Reservoir option. Due to the anticipated high cost and low water yield, no further evaluations were considered prudent for this option.

4.4 OPTION 4 – Rubicon River diversion

This option consists of constructing a gravity diversion conveyance system from the South Fork of the Rubicon River at or near Robbs Peak Forebay, or from Gerle Creek, to Pilot Creek upstream of the Stumpy Meadows Reservoir. There are two versions of this option being investigated, OPTION 4(a) and OPTION 4(b). OPTION 4(a) includes a pipeline and tunnel. Utilization of a tunnel



Map showing historic Rubicon River diversion

would provide for relatively minimal operation and maintenance costs and a reliable conveyance of water. However, construction of a tunnel does have a relatively high initial cost. OPTION 4(b) considers an all pipeline conveyance without use of a tunnel. Water conveyance would be achieved though a new pipeline following near the original historical flume alignment that once brought water from the Rubicon River to the Georgetown area.

OPTION 4(a) – Rubicon River diversion (with tunnel) consists of constructing a gravity diversion conveyance system from the South Fork of the Rubicon River at or near Robbs Peak Forebay, or from Gerle Creek, to Pilot Creek. Once diverted into Pilot Creek, water would flow down the natural channel for about 6 miles where it would enter Stumpy Meadows Reservoir. The diversion would include approximately 2.6 miles of pipeline along the historical diversion route followed by a new 2.6-mile tunnel to convey water to the headwaters of Pilot Creek. As considered in previous studies, a pipeline and tunnel configuration was investigated to provide a diversion capacity of 50 cfs. There is some concern whether Pilot Creek could support flows at this rate. A diversion capacity of 15 cfs was also investigated to evaluate how a more modest project could increase the District's water supply.

OPTION 4(b) – Rubicon River diversion (without tunnel) would include approximately 7.2 miles of pipeline located along the historical route to convey water to the headwaters of Pilot Creek. Diversion and conveyance capacities of 15 and 50 cfs were investigated. Once the water is diverted to Pilot Creek, it would flow down the natural channel for about 6 miles to Stumpy Meadows Reservoir augmenting its natural inflow.

Remnants of Rubicon River Diversion Flume

Proposed diversions from the South Fork Rubicon River, or Gerle Creek, would occur on an "as-needed" basis, and would increase the yield of the Stumpy Meadows Project by supplementing the natural runoff of Pilot Creek. Diversions from the Rubicon River, or Gerle Creek, would be made in dry years when Stumpy Meadows Reservoir is not expected to fill to capacity. For the 50 cfs diversion capacity scenario, on about April 1st of each year, if the storage in Stumpy

Meadows Reservoir in addition to the forecasted April through October inflow to the reservoir is less than 23,000 acre-feet, then diversions from the South Fork Rubicon would be made into Pilot Creek and Stumpy Meadows Reservoir. These diversions are expected to occur starting in April of the year when the need is identified and continuing at a rate of 50 cfs as long as needed to meet District demands for that year. The ability to make diversions from the South Fork Rubicon River, or Gerle Creek, will allow the District to rely on a greater portion of the water stored in Stumpy Meadows Reservoir than under current operating practice. This would allow for water diversions from the South Fork Rubicon River to only be required during drier water years. During wet years, there would be less need, or no need, to make diversions to meet water supply demands as the natural flow in Pilot Creek would be sufficient.

A maximum diversion rate of about 50 cfs is required to take a sufficient volume of water to meet the identified needs of 10,300 acre-feet. At this rate, about 3,000 acre-feet of water per month can be diverted into Stumpy Meadows Reservoir. Using the diversion criteria described above, the District's *StumpySIM* operational model was used to determine the required diversion volume. The results of the modeling effort are as follows:

Upper Pilot Creek

- Number of years analyzed = 77 (1923-1999)
- Number of years when diversion was required = 32 (42% of years)
- Average annual diversion volume = 2,700 acre-feet
- Maximum annual diversion volume = 18,200 acre-feet (occurred in 1977)
- Water supply yield increase = 10,300 acre-feet

A preliminary analysis was conducted to evaluate the water supply benefit of setting the diversion and conveyance capacity to a rate of 15 cfs. At this diversion rate, about 900 acre-feet of water per month can be diverted into Stumpy Meadows Reservoir which could result in an additional water supply of about 3,300 acre-feet per year. Diversions under this scenario were taken starting on March 1. This analysis is representative of the water supply benefits that could be developed with a 15 cfs diversion capacity. Additional project optimization studies should be conducted when additional information is known on the

diversion sizing criteria, more specific construction and water costs and potential SMUD power foregone costs. The District's operational model was used to estimate how this scenario could operate for representative purposes and results are as follows:

- Number of years analyzed = 77 (1923-1999)
- Number of years when diversion was required = 25 (32% of years)
- Average annual diversion volume = 1,100 acre-feet
- Maximum annual diversion volume = 7,200 acre-feet (occurred in 1977)
- Water supply yield increase = 3,300

Operational information for *OPTION 4 – Rubicon River diversion* is included in Appendix 4.

Development of this option would require additional water rights to allow new diversion and rediversion of water. This option will require the following new rights.

- Right to divert water from Rubicon River and Gerle Creek to storage in Stumpy Meadows Reservoir;
- Right to redivert water stored in Loon Lake at or near Robbs Peak Forebay if this water is desired;
- Right to redivert water from Pilot Creek released from Stumpy Meadows Reservoir storage to the place of use in the District service area.

Review of existing water rights, project facilities, operation, and hydrology of the Rubicon River indicate that unappropriated water is not available to fully meet the diversions required under *OPTION 4 – Rubicon River diversion.* Near the location of potential diversion from the Rubicon River, SMUD holds the rights to divert and store water for power generation and the City of Sacramento and US Bureau of Reclamation (USBR) hold similar consumptive rights. Water diverted under this option could impact SMUD's ability to utilize water under its rights for power production. Water diverted under this alternative could also impact the City of Sacramento and the USBR's ability to take consumptive water under their rights.

Costs associated with obtaining the right to use water for this option is assumed to be $75 per acre-foot which might be consistent with, for example, a transfer. If water were to be obtained for less that this value, then the cost of this option would decrease. For all options in this study, the cost of water is estimated only for the water actually taken. This assumes that the cost associated with water use will only have to be paid for the water actually used.

The cost of *OPTION 4 - Rubicon River diversion* alternative (a) and (b) is estimated at almost $59 million and $29 million, respectively (see Appendix 4). These costs are based on the diversion and conveyance capacity of 50 cfs. There would be some cost reduction to develop the option at a capacity of 15 cfs accounting for a reduction associated with a smaller diversion, pipeline and associated infrastructure. Cost for the 15 cfs diversion scenario is estimated at 85% of the 50 cfs diversion scenario cost.

4.5 OPTION 5 – North Fork American River Pumping Plant

North Fork American River

The North Fork American River Pumping Plant is a joint project with Placer County Water Agency (PCWA) located on the North Fork American River near the undeveloped Auburn Dam site. PCWA has completed a portion of the project and is now able to divert water at this location. The Pumping Plant shares a pump station site, including the intake structure and appurtenances. Two pumps to serve the District would be located on the north bank of the river. A casing has been constructed across the river to allow for a future pipe installation for water to be diverted and pumped to the District's service area. From this location, new conveyance infrastructure would be used to lift water about 800 to 900 feet along the first 3,000 feet of pipeline following a ridge line up to a small regulating reservoir with a total static lift of about 980 feet. Water would then be pumped from a new regulating reservoir and conveyed through a second pipeline to a proposed new treatment plant near the town of Cool or Greenwood Lake.

Based on preliminary estimates in previous studies, total pumping for the two pump stations of up to 4,600 hp would be required. As conceived, a 21 to 24-inch diameter pipeline about 16,000 to 17,000 feet (about 3 miles) in length would be required, with a capacity of about 22 cfs. The static lift from the North Fork American River to a treatment plant site near the town of Cool is approximately 1,080 feet. The project would require a regulating reservoir of approximately 100 acre-feet in size, water treatment plant and related piping to integrate with the existing water distribution system. The required 100 acre-foot regulating reservoir is included in the cost estimate of this options alternative, but not the water treatment plant and related piping.

This option is configured to allow the District to meet its projected water supply need (up to 10,300 acre-feet at year 2025 demand level) using water from the North Fork American River via the pumping plant. For this evaluation, the pumping plant operation was assumed to deliver water to meet demands ramped up starting in year 2009 to the full 10,300 acre-feet per year in 2025. With the North Fork American River Pumping Plant in service, additional water can be taken from the Stumpy Meadows Project minimizing the need to pump water at the North Fork American River Pumping Plant. This is especially the case in earlier years when the District demands have not substantially increased. A Sierra Hydrotech study showed that on average and at full demands, about 84% of the District's increased system water yield was required to be pumped from the North Fork American River Pumping plant with the remaining yield occurring through additional water being utilized from the Stumpy Meadows Project. This study assumes that 84% of the required additional safe yield based on updated water supply demand projections would be required to be pumped at the North Fork American River Pumping Plant. Pumping would occur to the regulating reservoir during off-peak hours to minimize operational energy costs. Water from the regulating reservoir will then be conveyed to the treatment plant as needed. The 100 acre-foot capacity regulating reservoir is sized to meet the storage requirements based on an anticipated delivery schedule.

Water for this option would be made available from the North Fork of the American River and be made up of water secured under a future EDCWA contract with the USBR (P.L. 101-514) and/or water made available under the Supplemental Water Rights Project, currently underway. Because water made available under both a USBR contract as well as the Supplemental Water Rights Project would be required to be taken directly from Folsom Reservoir, downstream of the North Fork American River Pumping Plant location, it is anticipated that water would be exchanged with other PCWA supplies allowing water to be taken directly at the North Fork American River Pumping Plant location. This would require agreement with PCWA and approval from the State Water Resources Control Board.

An advantage of this option is that the North Fork American River Pumping Plant would provide the District with a second major water supply project in addition to the existing Stumpy Meadows Project. Having two major sources of water available to serve the District would increase the dependability of water supply to the end customers. For example, if a catastrophic occurrence should occur on one project, such as conveyance failure, there would be a source of water available from the other project to partially meet demands. Another advantage is that this option locates water near where development is likely to take

place within the District's service area. The cost of the North Fork American River Pumping Plant is estimated at about $14 million (see Appendix 5).

4.6 OPTION 6 – Canyon Creek Reservoir

Canyon Creek Reservoir is a major storage project conceptualized on Canyon Creek below the confluence with Dark Canyon Creek located about 3 miles west of Lake Walton. The proposed dam would have a crest length of 980 feet and a height of 216 feet, providing storage capacity of 17,500 acre-feet. Water would be conveyed from Canyon Creek Reservoir to the existing District water system through 2.6 miles of pipeline and tunnel to a site north of Greenwood.

The Canyon Creek Project would provide gravity supply water to the western and southwestern portions of the District's service area below about 2,000 feet in elevation, while the Stumpy Meadows Project would continue to serve most of the eastern portions. Inflow to the Canyon Creek Reservoir could be augmented with surplus water from the Stumpy Meadows Project by conveying water in the existing District system to the Canyon Creek Reservoir. The Canyon Creek Dam would capture runoff from approximately 12.5 square miles of the Canyon Creek watershed. Operated in conjunction with the Stumpy Meadows Project, past reports have indicated that the safe yield of Canyon Creek Reservoir is about 6,100 acre-feet, with a firm yield of about 6,780 acre-feet.

A small hydroelectric power plant would probably be located at the Canyon Creek Dam to utilize head from the release of surplus water and stream maintenance flow. Releases made through the power plant would decrease over time as District demands continue to increase reducing available flow.

Previous studies of the Canyon Creek Reservoir site considered importing additional water from Otter Creek, thereby increasing the size of the watershed contributing to Canyon Creek Reservoir. The conclusion was that the relatively high cost of the diversion as related to the small increase in yield seemed to make the import from Otter Creek infeasible.

Development of the Canyon Creek Reservoir option would require rights to allow new diversion of water. *OPTION 6 – Canyon Creek Reservoir* would require the following new rights to divert water.

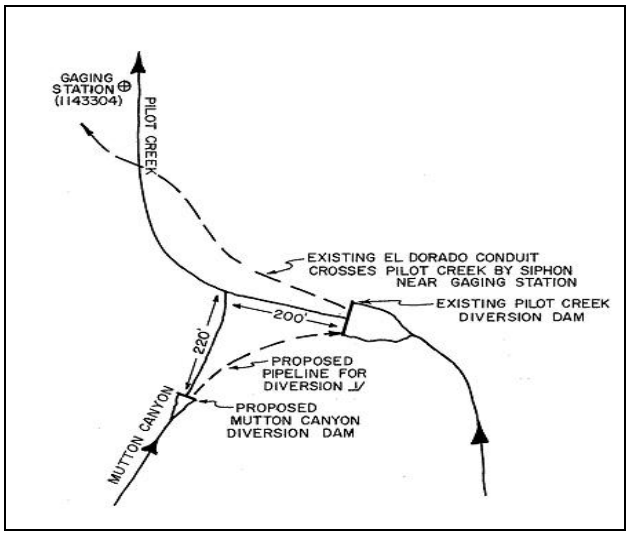
- Right to directly divert water from Canyon Creek, a tributary to the Middle Fork American River, for consumptive use;
- Right to divert water from Canyon Creek to storage in Canyon Creek Reservoir;
- Right to redivert water released from storage to the District's service area; and
- Right to store water from the Stumpy Meadows Project in Canyon Creek Reservoir (if this option were used).

An advantage of this option is that it would provide the District with a second major water supply project in addition to the existing Stumpy Meadows Project. Also, water from the Georgetown Divide Ditch at Walton Lake could be conveyed to Canyon Creek and stored in the reservoir augmenting inflow. A disadvantage is that construction of Canyon Creek Dam and Reservoir would likely have significant environmental opposition making it difficult to obtain project approvals.

The water supply provided by Canyon Creek Reservoir (firm yield of 6,780 acre-feet) is significant but would not meet the full identified 10,300 acre-feet identified as the water need by year 2025. The cost of Canyon Creek Project is estimated at about $108 million (see Appendix 6).

4.7 OPTION 7 – Mutton Canyon

The original vision of the Stumpy Meadows Project included water diverted from Mutton Canyon intended to augment water available from Stumpy Meadows Reservoir. As originally planned, the Pilot Creek Diversion Dam was to be located downstream from the Mutton Canyon confluence, which would have included the flows of Mutton Canyon. However, certain construction problems made it necessary to build the Pilot Creek Diversion Dam above the confluence. Consequently, the flow of Mutton Canyon was never diverted directly to the El Dorado Conduit and Georgetown Divide Ditch.



Mutton Canyon Option

This option would locate a new point of diversion on Mutton Canyon at a location just upstream from the confluence with Pilot Creek. From this new diversion location, water would be conveyed to either the existing Pilot Creek Diversion Dam on just upstream from its confluence with Mutton Canyon or conveyed directly into the El Dorado Conduit. Mutton Canyon diversions would be used to supplement Stumpy Meadows storage by reducing the need to make releases from storage when diversions from Mutton Canyon were available.

This option would include construction of a concrete diversion dam about six feet high and 40 feet long on Mutton Canyon, approximately 220 feet upstream from the confluence with Pilot Creek. The dam would have a crest height approximately 20 feet above the crest elevation of Pilot Creek Diversion Dam. A 15-inch pipeline approximately 400 feet long with a maximum capacity of 15 cfs would be constructed from the Mutton Canyon Diversion Dam and discharge into the pool behind Pilot Creek Diversion Dam or alternatively directly into the El Dorado Conduit.

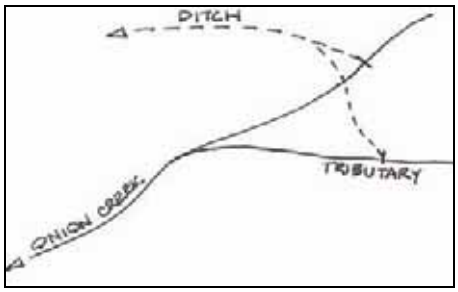
It is anticipated that a maximum diversion of 15 cfs would be made between November 1 and August 1 of each year. For this evaluation, it is assumed that the minimum streamflow release requirement below Mutton Canyon Diversion Dam would be 1 cfs or the natural flow, whichever is less. This stream release would flow down Mutton Canyon and then to Pilot Creek were it would be used to make partial compliance of the 4 cfs minimum release requirement (2 cfs in a dry year) at the compliance point located about 400 feet below the confluence.

When combined flow of Pilot Creek and Mutton Canyon exceeds the demand from the Georgetown Divide Ditch, spill will occur at Pilot Creek Diversion Dam as currently occurs and will occur at Mutton Canyon Diversion Dam when Mutton Canyon diversion capacity of 15 cfs is exceeded. Diversion would be made primarily during the spring runoff period of the drier years, permitting the District to maintain a higher project water yield without as great a degree of storage depletion at Stumpy Meadows Reservoir. It has been estimated that under the most favorable conditions during a moderately dry year, a diversion of 600 to 700 acre-feet could be made to meet District demands. The practical diversion of the flows of Mutton Canyon will likely be on the order of a couple of hundred acre-feet per season. During extremely dry years, it is unlikely that substantial diversion could be made from Mutton Canyon due to a lack of available natural flow. However, diversion that had occurred during previous seasons would assist by providing additional carryover storage at Stumpy Meadows Reservoir. For this evaluation, an increase in yield of 100 acre-feet is used.

The District claims the right to divert water from Mutton Canyon under existing water rights Application 5644A totaling up to about 690 afa at a rate of 15 cfs from Mutton Canyon as part of the Stumpy Meadows Project. Development of *OPTION 7 – Mutton Canyon* could require confirming these water rights will support this option. The Mutton Canyon pipeline would be located on U.S. Forest Service land requiring a special use permit or long-term easement.

The Cost of *OPTION 7 – Mutton Canyon* is estimated at about $190,000 (see Appendix 7).

4.8 OPTION 8 – Onion Creek



Onion Creek Option

The diversion from Onion Creek was originally constructed in the late 1800's as part of the Georgetown Divide Water Company system, diverting about 1.5 square miles of Onion Creek (a tributary to the South Fork American River) into Pilot Creek for enroute use and rediversion to the Georgetown Divide Ditch. The Water Company had pre-1914 water rights to the diversion of this water for mining and domestic purposes on the Georgetown Divide. Water was diverted from Onion Creek into a tributary of Pilot Creek and then rediverted from Pilot Creek to the Georgetown Divide Ditch for conveyance to the Georgetown area. Onion Creek Diversion was acquired by the District and utilized until the early 1970's. Diversion continued from Onion Creek until the early 1980's to serve cabins located along the ditch alignment. It is understood that logging operations in the 1980's destroyed much of the conveyance system from Onion Creek.

This option would include reconstructing the Onion Creek Diversion and conveyance System to allow water to once again be conveyed from Onion Creek to Pilot Creek. This diversion would increase the yield from the Stumpy Meadows project as the diverted water would augment project storage thereby increasing yield.

In order to provide the means of conveying water from Onion Creek to the Pilot Creek watershed, a new pipeline located along the old alignment would probably be the most practical approach. The length of the new pipeline would be about 1.7 miles.

It is not clear how much water could be made available from a restored Onion Creek Diversion as there is some question as to the type of water rights that could be utilized for this option; pre-1914 or permitted water rights. The District's *StumpySIM* computer model

was used to develop estimates of the potential additional Stumpy Meadows Project water supply firm yield that could be developed through diversions from Onion Creek. Project yield was estimated based on, 1) operation under pre-1914 water rights, and 2) operation under permitted water rights. It is assumed that the pre-1914 water rights allow diversion year around and the permitted water rights allow diversion from November 1 through August 1 with a minimum instream release requirement of 0.5 cfs. Results of the water supply yield analysis are shown below in Table 3.

Table 3 – Stumpy Meadows Project Firm Yield With Onion Creek Diversion

Onion Creek Water Right Type	Stumpy Meadows Project Yield (acre-feet)	Water Supply Increase (acre-feet)
-	12,251	-existing project-
Pre-1914 right	12,566	315
Permitted Right	12,305	54

The additional firm yield from *Option 8 – Onion Creek* operating under pre-1914 water rights is over 300 acre-feet. Under permitted rights, the additional firm yield is about 50 acre-feet. A first step in the potential reconstruction of the Onion Creek Diversion should be a water rights assessment to gain a better understanding of diversion constraints and potential water yield.

4.9 OPTION 9 – Modification to allowable demand deficiency

The annual safe yield of the Stumpy Meadows Project is 10,541 acre-feet estimated using the District's *StumpySIM* computer model. The project is operated to provide an estimated firm yield of 12,251 acre-feet per year by imposing dry year demand deficiency requirements. The District operates the Stumpy Meadows Project employing the demand deficiency criteria shown below in Table 4.

Table 4 – Georgetown Divide Public Utility District Maximum Dry Year Demand Deficiency Criteria

	Demand Deficiency	% of years Requiring Deficiency*
Treated water	10%	7%
Untreated water	50%	

*A year with required deficiency is defined as when modeling indicates a deficiency of over 5% is required for either treated or untreated water.

In most years, the District is able to supply the full firm yield of 12,251 acre-feet of water to its customers. In dry years, the District can impose up to 10% and 50% demand deficiency in treated and untreated water deliveries, respectively. Using this criterion, the District should expect to require some level of demand deficiency during about 7% of the years (less than 1 year out of ten) when water demands increase to equal the project firm yield.

OPTION 9 - Modification to allowable demand deficiency considers alternative dry year demand deficiency criteria designed to increase the firm yield of the Stumpy Meadows Project. Increasing the dry year demand deficiency criteria, allows for an increase in project firm yield by reducing the water used in dry years. Several different alternative dry year deficiency criteria have been examined to demonstrate how different criteria affect the Stumpy Meadows Project firm yield.

Table 5 lists the alternative dry year demand deficiency criteria considered in this evaluation along with the estimated Stumpy Meadows Project firm yield. Also shown is the percent of years that would require some level of demand deficiency. As shown in the table, the greater the deficiency criteria the more often demand deficiency would be required.

Table 5 – Stumpy Meadows Project Firm Yield
Alternative Water Demand Deficiency Criteria*

Demand Deficiency		% of years Requiring Deficiency	Stumpy Meadows Project Yield (acre-feet)	Water Supply Increase (acre-feet)
Treated	Untreated			
0%	0%	0%	10,541	-safe yield-
10%	50%	7%	12,251	-existing firm yield-
20%	50%	9%	12,493	242
30%	50%	9%	12,753	502
10%	60%	9%	12,616	365
20%	60%	12%	12,876	625
30%	60%	11%	13,161	910

*See Appendix 9 OPTION 9 - Modification to allowable demand deficiency for additional information on this option.

An increase in water supply firm yield is made available by increasing the demand deficiency criteria. For example, by increasing the treated water demand deficiency from 10% to 30%, a firm yield increase of about 500 acre-feet is realized (an increase of about 4%). By increasing the treated water demand deficiency from 10% to 30% and the untreated deficiency from 50% to 60% a firm yield increase of over 900 acre-feet is realized (an

increase of over 7%). Detailed results of this analysis including an evaluation of additional alternative demand deficiencies are included in Appendix 9.

The advantages of this option include its very low cost (for this analysis it is assumed cost is zero), no infrastructure requirements, and no outside approval requirements. The option could be realized through adoption of a new District dry year deficiency policy, operation of the Stumpy Meadows Project to implement the new policy, managing the associated water supply "cut backs" in dry years, and a perhaps a water rate schedule that encourages conservation, especially in dry years.

The main disadvantage of this option is that it would require more stringent dry year water supply deficiency to customers during dry years. However, the evaluation indicates that the increase in number of years that would require demand deficiencies would probably be minimal.

5.0 SUMMARY OF EVALUATION

Stumpy Meadows Reservoir

The options evaluated here are designed to increase the Districts available water supply yield to help meet future increasing demands. The potential water supply benefit and projected development cost for each evaluated option are summarized in Table 6 – Georgetown Divide Public Utility District Options to Increase Water Supply Summary of Findings. The water supply yield developed by each option ranges from under 100 acre-feet per year (Onion Creek) to 10,300 acre-feet (100% of projected future need) for several of the options. Initial costs range greatly from near zero for *OPTION 9 – Modification to Allowable Demand Deficiency* to $108 million to develop *OPTION 6 - Canyon Creek Reservoir*. Annual operating costs for the options range from near zero for *OPTION 9 – Modification to Allowable Demand Deficiency* to $1.4 million per year for the *OPTION 6 – North Fork American River Pumping Plant*. Unit cost of water per acre-foot per year ranges from near zero to over $1,000 for some options.

The information presented here is intended to provide a general conceptual-level overview of a series of options that could be available to the District to increase water supply. The intent of this study is to provide the District with information that can be used to help decide which options are most promising. The most promising options should be considered for detailed study to better understand their feasibility and ability to meet the Districts future water supply needs.

Table 6 - Georgetown Divide Public Utility District
Options to Increase Water Supply Summary of Findings

OPTION	Option Name	Initial Costs ($ mil) (Option 7, 8 and 9 in $1,000)						Annual Costs ($1,000/yr)					Total Cost ($ mil) (Option 7, 8 and 9 in $1,000)		Water Supply Safe yield (acre-feet)	Cost of Water ($/af/yr)
		Construction	Engineering[1]	Financing[2]	Land	Approvals	Total	Power Foregone[3]	Pumping Cost	Cost of Water[4]	O&M	Total	Present	Annual[5]		
1	Conveyance canal loss reduction	9.4	1.4	0.3	0	0.4	11.5	0	0	0	0	0	11.5	0.8	670	1,200
2	Enlarging Stumpy Meadows Reservoir	*Cost analysis not performed*						-	-	-	-	-	-	-	250 - 1,000	-
3	Upper Stumpy Meadows Reservoir	*Cost analysis not performed*						-	-	-	-	-	-	-	3,200	-
4	(a) Rubicon River Diversion-50 cfs (with tunnel)	48.6	7.3	1.5	0.5	1.2	59.0	540	0	203	25	768	70.3	4.8	10,300	470
	Rubicon River Diversion-15 cfs (with tunnel)	41.3	6.2	1.2	0.5	1.2	50.4	220	0	83	25	328	55.2	3.8	3,300	1,100
4	(b) Rubicon River Diversion-50 cfs (without tunnel)	22.9	3.4	0.7	0[6]	1.5	28.5	540	0	203	250	993	43.0	2.9	10,300	290
	Rubicon River Diversion-15 cfs (without tunnel)	19.5	2.9	0.6	0[6]	1.5	24.5	220	0	83	250	553	32.5	2.2	3,300	680
5	North Fork American River Pumping Plant	9.9	1.5	0.3	1.0	1.5	14.2	0	1,100	216	100	1,400	34.6	2.4	10,300	230
6	Canyon Creek Reservoir	85.0	12.8	2.6	3.0	5.0	108.3	0	0	0	200	200	111.2	7.6	6,100	1,200
7	Mutton Canyon	140	21	4	0	25	190	0	0	0	15	15	190	13	100	130
8	Onion Creek	1,800	270	54	0	50	2,200	0	0	0	20	20	2,200	150	50 - 300	500 - 3,000
9	Modification to allowable demand deficiency	0	0	0	0	0	0	0	0	0	0	0	0	0	200 - 1,000	0

[1] Engineering costs estimated at 15% of construction costs.
[2] Financing costs estimated at 3% of construction costs.
[3] Based on an estimated cost of $200/acre-foot.
[4] Cost of water assumes full water demand for all years
[5] Annual costs determined using a discount rate of 3.2% and a project life of 20 years.
[6] Assumes land is available under the original land patent

6.0 REFERENCES

The following references were reviewed in carrying out the evaluation described in this report. Information from these references is incorporated throughout the report.

State of California, Department of Water Resources, Central District, *Georgetown Divide Water Management Study*, June 1992.

Sierra Hydrotech, Memorandum to Marie Davis, Subject: Preliminary Report – Folsom North Pumping Project, September 2, 1997.

Sierra Hydrotech, *Georgetown Divide Public Utility District's Water Rights and Water Supply and Sacramento Municipal Utility District's Relicensing Issues*, December 12, 2003.

Placer County Water Agency, US Army Corps of Engineers, *East Loomis Basin Canal Efficiency Study*, June 2008.

El Dorado County Water Agency, *Water Resources Development and Management Plan*, April 2007.

Mead & Hunt, Inc., Joint Benefit Investigation Plan, *Technical Analysis of Preliminary Alternatives*, July 2004.

Mead & Hunt, Inc., *Georgetown Divide Public Utility District Supplemental Water Supply Options Study, Technical Analysis of Preliminary Alternatives*, November 2004.

Website: (http://www.gerlecreek.com/documents/georgetowndividemaps.htm)

Brown & Caldwell, Georgetown Divide Public Utility District Drought Plan, October 2007.

APPENDIX 1

Conveyance canal loss reduction

OPTION 1 - Conveyance canal loss reduction

Losses estimated from 1992 DWR Georgetown Divide Water Management Study

Source	Projected 2000 Loss AF/yr	Losses Pro-Rated to 2009[2]	Percent of Total Water 10,300 AF
Process Water (wash streets, back flush treatment plant, etc) [1]	-	150	1%
System Water-up (annual) [1]	-	450	4%
Treated Water Distribution System Process Water (Casual sales, fire department, water theft, etc)	410	406	4%
Carriage Water (additional flow necessary for regulation and diversion by users) [1]	1,280	1,270	12%
Conveyance Losses (seepage, leakage and other losses associated with conveyance)	1,340	1,330	13%
	Total Process Water and Losses =	3,600	
	Total as Percent of Water Delivered =	35%	

Carriage Losses: (Assuming 10,300 acre-feet of delivery)

Season	Duration Months[1]	Rate cfs[1]	Total Loss (AF)
Summer	5	2.3	690
Winter	7	1.4	590
			1,280

Additional Water from Stumpy Meadows from Conservation:

Assumptions:
1. Carriage water requirements are already reduced to the projected 2000 levels from the 1992 DWR study.
2. A reduction in conveyance water requirements is considered for ditch lining only. Assume that by lining a percentage of the remaining unlined ditches at areas most susceptible to leakage and seepage, a 50% reduction in conveyance water requirement can be realized.
3. Water-up and process water requirements are necessary and can not be reduced.
4. Distribution system water requirement reductions are minor and not considered for reduction.

Conveyance:

Total Conveyance Length:		75	miles
Percent lined, tunnel, or pipeline: [1]		30%	
Percent of unlined canal to be lined:		40%	
Length of canal for lining:		21	miles
Cost per foot of ling:	$	85.00	per linear foot
Total cost for lining:	$	9,420,000	
Additional water:		670	AF/year

Total Cost (year 2009)	$	9,420,000			
Additional Water 2010 - 2029:		13,400	AF	Cost/AF	$ 700

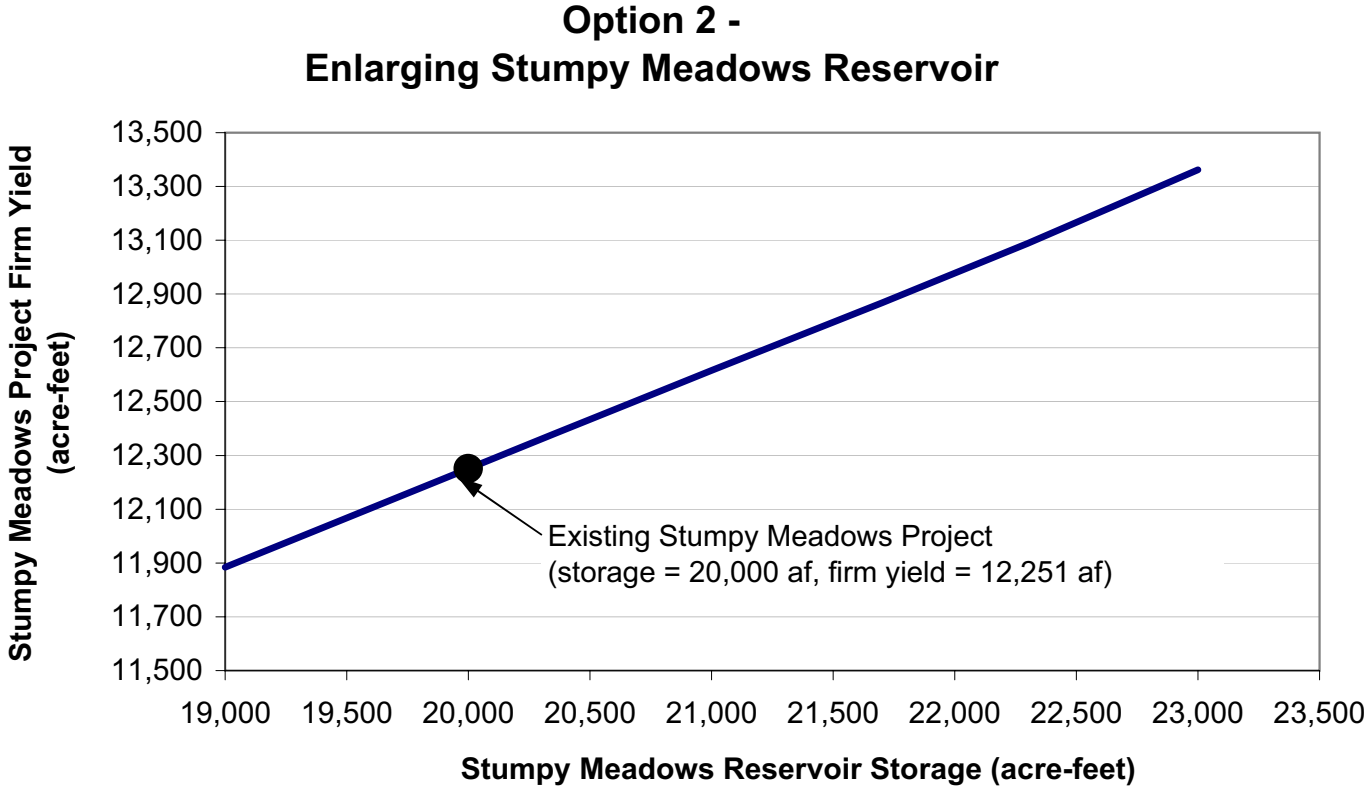
[1] *Estimates provided by GDPUD personnel.*

[2] *GDPUD reports total system losses of 3,600 acre-feet/year. Projected year 2000 losses from the 1992 study were pro-rated to match the remaining 3,000 acre-feet of losses reported by GDPUD after removing process and system water up demands.*

APPENDIX 2

Enlarging Stumpy Meadows Reservoir

Stumpy Storage (af)	Additional Storage (af)	Dam Height (feet)	Dam Raise (feet)	Project Yield	Delta from Existing Yield
19,000	-1,000	159	-3	11,884	-367
20,000	0	162	0	12,251	0
20,350	350	163	1	12,379	128
20,700	700	164	2	12,507	256
21,000	1,000	165	3	12,616	365
21,700	1,700	167	5	12,867	616
22,300	2,300	169	7	13,088	837
23,000	3,000	171	9	13,362	1,111



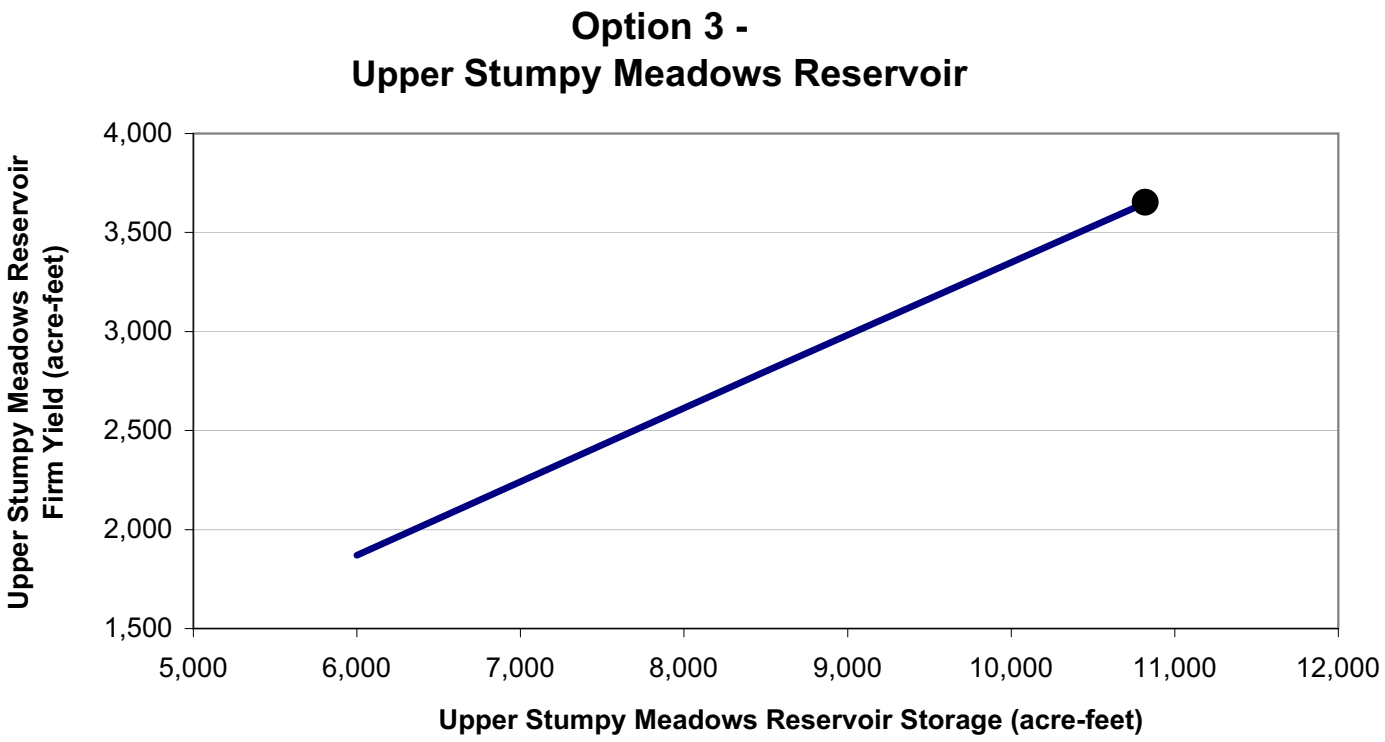
APPENDIX 3

Upper Stumpy Meadows Reservoir

Upper Stumpy Storage (af)	Usable Capacity (af)	Dam Height (feet)	Project Firm Yield w/Stumpy (af)	Upper Stumpy Project Firm Yield (af)
6,000	5,000	≈100	14,121	1,870
8,500	7,500	≈130	15,048	2,800
10,820	9,820	145	15,903	3,650

Upper Stumpy Meadows Dam and Reservoir
configuration used for cost development

Upper Stumpy Meadows Dam height = 142 feet
Dam crest elevation = 4,500 feet
Reservoir surface area = 194 acres
Storage capacity = 10,820 acre-feet
Assume dead pool = 1,000 acre-feet
Usable storage capacity = 9,820 acre-feet
Reservoir drainage area = 10 square miles



OPTION 3 - Upper Stumpy Meadows Reservoir

Project: Upper Stumpy Meadows Reservoir
Location: Pilot Creek, Upstream of existing Stumpy Meadows Reservoir

Comparison with Canyon Creek Dam:

	Upper Stumpy Meadows		Canyon Creek	
Dam:	Rockfill		Earthfill	
Top of Dam:	4500	feet	2256	feet
Base of Dam	4355	feet	2040	feet
Height:	145	feet	216	feet
Length:	850	feet	980	feet
Topwidth:	20	feet		feet
Reservoir Area:	194	acres	280	acres
Reservoir Volume	10820	acre-feet	17500	acre-feet
Safe Yield:	3200	acre-feet	6100	acre-feet
Drainage Basin:	10	square miles	12.5	square miles

Cost Estimate: Not performed due to comparison with Canyon Creek. Project will cost more and provide less benefits.

APPENDIX 4

Rubicon River diversion

Georgetown Divide Public Utility District
Options to Increase Water Supply

OPTION 4 - Rubicon River Diversion (50 cfs)

Water Year	Water Demand ac-ft	Stumpy Safe Yield ac-ft	GDPUD Defficiency ac-ft	Water Req'd to meet Deff.[1] ac-ft	Power Foregone Cost[2]	2009 Power Foregone	Option 4(a) With Tunnel O&M	Option 4(a) With Tunnel 2009 Discounted O&M	Option 4(b) Without Tunnel O&M	Option 4(b) Without Tunnel 2009 Discounted O&M	Cost of Water	2009 Discounted Cost of Water
2005	11,257	10,500	757	0	Year Not Used in Analysis							
2006	11,734	10,500	1,234	135	Year Not Used in Analysis							
2007	12,211	10,500	1,711	270	Year Not Used in Analysis							
2008	12,688	10,500	2,188	405	Year Not Used in Analysis							
2009	13,166	10,500	2,666	540	Year Not Used in Analysis							
2010	13,643	10,500	3,143	675	Year Not Used in Analysis							
2011	14,120	10,500	3,620	810	$ 162,000	$ 147,393	$25,000	$ 22,746	$250,000	$ 227,458	$ 60,750	$ 55,272
2012	14,597	10,500	4,097	945	$ 189,000	$ 166,626	$25,000	$ 22,040	$250,000	$ 220,405	$ 70,875	$ 62,485
2013	15,074	10,500	4,574	1,080	$ 216,000	$ 184,525	$25,000	$ 21,357	$250,000	$ 213,571	$ 81,000	$ 69,197
2014	15,551	10,500	5,051	1,215	$ 243,000	$ 201,154	$25,000	$ 20,695	$250,000	$ 206,948	$ 91,125	$ 75,433
2015	16,028	10,500	5,528	1,350	$ 270,000	$ 216,574	$25,000	$ 20,053	$250,000	$ 200,531	$101,250	$ 81,215
2016	16,506	10,500	6,006	1,485	$ 297,000	$ 230,844	$25,000	$ 19,431	$250,000	$ 194,313	$111,375	$ 86,567
2017	16,983	10,500	6,483	1,620	$ 324,000	$ 244,021	$25,000	$ 18,829	$250,000	$ 188,288	$121,500	$ 91,508
2018	17,460	10,500	6,960	1,755	$ 351,000	$ 256,159	$25,000	$ 18,245	$250,000	$ 182,450	$131,625	$ 96,060
2019	17,937	10,500	7,437	1,890	$ 378,000	$ 267,310	$25,000	$ 17,679	$250,000	$ 176,792	$141,750	$ 100,241
2020	18,414	10,500	7,914	2,025	$ 405,000	$ 277,523	$25,000	$ 17,131	$250,000	$ 171,310	$151,875	$ 104,071
2021	18,891	10,500	8,391	2,160	$ 432,000	$ 286,845	$25,000	$ 16,600	$250,000	$ 165,998	$162,000	$ 107,567
2022	19,369	10,500	8,869	2,295	$ 459,000	$ 295,323	$25,000	$ 16,085	$250,000	$ 160,851	$172,125	$ 110,746
2023	19,846	10,500	9,346	2,430	$ 486,000	$ 302,999	$25,000	$ 15,586	$250,000	$ 155,864	$182,250	$ 113,625
2024	20,323	10,500	9,823	2,565	$ 513,000	$ 309,915	$25,000	$ 15,103	$250,000	$ 151,031	$192,375	$ 116,218
2025	20,800	10,500	10,300	2,700	$ 540,000	$ 316,110	$25,000	$ 14,635	$250,000	$ 146,347	$202,500	$ 118,541
2026	20,800	10,500	10,300	2,700	$ 540,000	$ 306,309	$25,000	$ 14,181	$250,000	$ 141,810	$202,500	$ 114,866
2027	20,800	10,500	10,300	2,700	$ 540,000	$ 296,811	$25,000	$ 13,741	$250,000	$ 137,412	$202,500	$ 111,304
2028	20,800	10,500	10,300	2,700	$ 540,000	$ 287,607	$25,000	$ 13,315	$250,000	$ 133,151	$202,500	$ 107,853
2029	20,800	10,500	10,300	2,700	$ 540,000	$ 278,689	$25,000	$ 12,902	$250,000	$ 129,023	$202,500	$ 104,508
2030	20,800	10,500	10,300	2,700	$ 540,000	$ 270,048	$25,000	$ 12,502	$250,000	$ 125,022	$202,500	$ 101,268
2031	20,800	10,500	10,300	2,700	$ 540,000	$ 261,674	$25,000	$ 12,115	$250,000	$ 121,145	$202,500	$ 98,128
2032	20,800	10,500	10,300	2,700	$ 540,000	$ 253,560	$25,000	$ 11,739	$250,000	$ 117,389	$202,500	$ 95,085
2033	20,800	10,500	10,300	2,700	$ 540,000	$ 245,698	$25,000	$ 11,375	$250,000	$ 113,749	$202,500	$ 92,137
2034	20,800	10,500	10,300	2,700	$ 540,000	$ 238,079	$25,000	$ 11,022	$250,000	$ 110,222	$202,500	$ 89,280
2035	20,800	10,500	10,300	2,700	$ 540,000	$ 230,697	$25,000	$ 10,680	$250,000	$ 106,804	$202,500	$ 86,511
2036	20,800	10,500	10,300	2,700	$ 540,000	$ 223,544	$25,000	$ 10,349	$250,000	$ 103,492	$202,500	$ 83,829
2037	20,800	10,500	10,300	2,700	$ 540,000	$ 216,612	$25,000	$ 10,028	$250,000	$ 100,283	$202,500	$ 81,230
2038	20,800	10,500	10,300	2,700	$ 540,000	$ 209,895	$25,000	$ 9,717	$250,000	$ 97,174	$202,500	$ 78,711
Total (2011 - 2025)			100,000			$ 3,700,000		$ 300,000		$ 2,800,000		$ 1,388,745

[1] Estimated amount of water needed to supplement Stumpy Meadows Project.

[2] UARP Power Forgone estimated at $200/acre-foot

OPTION 4(a) - Rubicon River Diversion (50 cfs) with tunnel

Item	Qty	Unit	Unit Price	Total Price
1 Clearing				
Clearing for Pipeline	14	AC	$ 4,000	$ 56,000
Clearing for Intake	3	AC	$ 3,000	$ 9,000
Clearing for Tunnel Entrance Portal	4	AC	$ 3,000	$ 12,000
Clearing for Tunnel Exit Portal	3	AC	$ 3,000	$ 9,000
TOTAL CLEARING				**$ 86,000**
2 Diversion at/near Robbs Peak Forebay				
Cofferdam	1	LS	$ 300,000	$ 300,000
Bypass Piping	250	LF	$ 500	$ 125,000
Diversion Intake Structure	1	LS	$ 2,500,000	$ 2,500,000
Demolition, Temp. structure removal	1	LS	$ 50,000	$ 50,000
TOTAL DIVERSION				**$ 2,975,000**
3 Pipeline				
≈30" Pipeline with excavation and backfill	13,700	LF	$ 550	$ 7,535,000
structures/supports at above ground location (assumed 15% of length)	2,100	EA	$ 1,500	$ 3,150,000
TOTAL PIPELINE				**$ 10,685,000**
4 Tunnel with pipe lining				
Entrance Portal	1	LS	$ 750,000	$ 750,000
Tunnel 8' dia.	13,700	LF	$ 1,100	$ 15,070,000
Tunnel Lining & Grouting (8' dia.)	13,700	LF	$ 650	$ 8,905,000
Exit Portal	1	LS	$ 450,000	$ 450,000
TOTAL TUNNEL AND PIPE LINING				**$ 25,175,000**
			Subtotal (Direct Construction Costs)	$ 38,900,000
			Contingency @ 25%	$ 9,700,000
			OPTION 5(a) Total Estimated Construction Cost =	**$ 48,600,000**

OPTION 4(b) - Rubicon River Diversion (50 cfs) without tunnel

Item	Qty	Unit	Unit Price	Total Price
1 Clearing				
Clearing for Pipeline	38.4	AC	$ 4,000	$ 154,000
Clearing for Intake	3	AC	$ 3,000	$ 9,000
TOTAL CLEARING				**$ 163,000**
2 Diversion at/near Robbs Peak Forebay				
Cofferdam	1	LS	$ 300,000	$ 300,000
Bypass Piping	250	LF	$ 500	$ 125,000
Diversion Intake Structure	1	LS	$ 2,500,000	$ 2,500,000
Demolition, Temp. structure removal	1	LS	$ 50,000	$ 50,000
TOTAL DIVERSION				**$ 2,975,000**
3 Pipeline				
≈30" Above ground pipeline with structures and supports	38,000	LF	$ 400	$ 15,200,000
TOTAL PIPELINE				**$ 15,200,000**
			Subtotal (Direct Construction Costs)	$ 18,300,000
			Contingency @ 25%	$ 4,600,000
			OPTION 5(b) Total Estimated Construction Cost =	**$ 22,900,000**

Georgetown Divide Public Utility District
Options to Increase Water Supply

OPTION 4 - Rubicon River Diversion (50 cfs)

Monthly diversion from Robbs Peak Res. based on a target of 23,000 acre-feet for sum of April 1 storage and remaining April-Oct inflow. Volumes are listed as thousands of acre-feet.

Calendar Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1923	0	0	0	0	0	0	0	0	0	0	0	0	0
1924	0	0	0	2.975	2.975	2.975	2.975	0.34	0	0	0	0	12.24
1925	0	0	0	0	0	0	0	0	0	0	0	0	0
1926	0	0	0	2.975	1.895	0	0	0	0	0	0	0	4.87
1927	0	0	0	0	0	0	0	0	0	0	0	0	0
1928	0	0	0	0	0	0	0	0	0	0	0	0	0
1929	0	0	0	2.975	2.975	2.581	0	0	0	0	0	0	8.531
1930	0	0	0	2.975	2.65	0	0	0	0	0	0	0	5.625
1931	0	0	0	2.975	2.975	2.975	2.975	1.446	0	0	0	0	13.346
1932	0	0	0	0	0	0	0	0	0	0	0	0	0
1933	0	0	0	2.975	1.675	0	0	0	0	0	0	0	4.65
1934	0	0	0	2.975	2.975	2.975	1.117	0	0	0	0	0	10.042
1935	0	0	0	0	0	0	0	0	0	0	0	0	0
1936	0	0	0	0	0	0	0	0	0	0	0	0	0
1937	0	0	0	0	0	0	0	0	0	0	0	0	0
1938	0	0	0	0	0	0	0	0	0	0	0	0	0
1939	0	0	0	2.5	0	0	0	0	0	0	0	0	2.5
1940	0	0	0	0	0	0	0	0	0	0	0	0	0
1941	0	0	0	0	0	0	0	0	0	0	0	0	0
1942	0	0	0	0	0	0	0	0	0	0	0	0	0
1943	0	0	0	0	0	0	0	0	0	0	0	0	0
1944	0	0	0	2.975	0.725	0	0	0	0	0	0	0	3.7
1945	0	0	0	0	0	0	0	0	0	0	0	0	0
1946	0	0	0	0	0	0	0	0	0	0	0	0	0
1947	0	0	0	2.975	0.71	0	0	0	0	0	0	0	3.685
1948	0	0	0	0.3	0	0	0	0	0	0	0	0	0.3
1949	0	0	0	0.7	0	0	0	0	0	0	0	0	0.7
1950	0	0	0	0	0	0	0	0	0	0	0	0	0
1951	0	0	0	0	0	0	0	0	0	0	0	0	0
1952	0	0	0	0	0	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0	0	0	0	0	0
1955	0	0	0	2.975	1.195	0	0	0	0	0	0	0	4.17
1956	0	0	0	0	0	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	2.975	1.11	0	0	0	0	0	0	0	4.085
1960	0	0	0	2.975	1.175	0	0	0	0	0	0	0	4.15
1961	0	0	0	2.975	2.975	2.975	2.975	0.765	0	0	0	0	12.665
1962	0	0	0	2.975	0.4	0	0	0	0	0	0	0	3.375
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	1.9	0	0	0	0	0	0	0	0	1.9
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	2.975	0.68	0	0	0	0	0	0	0	3.655
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	1.4	0	0	0	0	0	0	0	0	1.4
1973	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	2.975	2.975	2.975	0.85	0	0	0	0	0	9.775
1977	0	0	0	2.975	2.975	2.975	2.975	2.975	2.975	0.3	0	0	18.15
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0.8	0	0	0	0	0	0	0	0	0.8
1980	0	0	0	0	0	0	0	0	0	0	0	0	0

Georgetown Divide Public Utility District
Options to Increase Water Supply

OPTION 4 - Rubicon River Diversion (50 cfs)

Monthly diversion from Robbs Peak Res. based on a target of 23,000 acre-feet for sum of April 1 storage and remaining April-Oct inflow. Volumes are listed as thousands of acre-feet.

Calendar Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1981	0	0	0	2.975	2.975	0.19	0	0	0	0	0	0	6.14
1982	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	2.8	0	0	0	0	0	0	0	0	2.8
1986	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	2.975	2.975	2.975	0.209	0	0	0	0	0	9.134
1988	0	0	0	2.975	2.975	2.975	2.975	2.775	0	0	0	0	14.675
1989	0	0	0	2.826	0	0	0	0	0	0	0	0	2.826
1990	0	0	0	2.975	2.975	2.975	0.867	0	0	0	0	0	9.792
1991	0	0	0	2.975	2.975	2.975	0.885	0	0	0	0	0	9.81
1992	0	0	0	2.975	2.975	2.975	2.188	0	0	0	0	0	11.113
1993	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	2.975	2.975	0.65	0	0	0	0	0	0	6.6
1995	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0	0

Avg=	0	0	0	1.099	0.700	0.469	0.273	0.108	0.039	0.004	0	0	2.691
Min=	0	0	0	0	0	0	0	0	0	0	0	0	0
Max=	0	0	0	2.975	2.975	2.975	2.975	2.975	2.975	0.3	0	0	18.15

APPENDIX 5

North Fork American River Pumping Plant

Georgetown Divide Public Utility District
Options to Increase Water Supply

OPTION 5 - North Fork American River Pumping Plant

Water Year	Water Demand ac-ft	Stumpy Safe Yield ac-ft	GDPUD Defficiency ac-ft	Water Req'd to meet Deff. ac-ft	Pumping Hours Per Year	Annual Pumping Cost	2008 Discounted Cost	Cost of Water[1]	2008 Discounted Cost of Water	O&M Cost	2008 Discounted O&M
2005	11,257	10,500	757	0	Year Not Used in Analysis						
2006	11,734	10,500	1,234	433	Year Not Used in Analysis						
2007	12,211	10,500	1,711	865	Year Not Used in Analysis						
2008	12,688	10,500	2,188	1,298	Year Not Used in Analysis						
2009	13,166	10,500	2,666	1,730	Year Not Used in Analysis						
2010	13,643	10,500	3,143	2,163	Year Not Used in Analysis						
2011	14,120	10,500	3,620	2,596	1,472	$ 321,973	$ 292,941	$ 64,890	$ 59,039	$ 200,000	$ 181,966
2012	14,597	10,500	4,097	3,028	1,717	$ 375,636	$ 331,168	$ 75,705	$ 66,743	$ 200,000	$ 176,324
2013	15,074	10,500	4,574	3,461	1,962	$ 429,298	$ 366,742	$ 86,520	$ 73,913	$ 200,000	$ 170,857
2014	15,551	10,500	5,051	3,893	2,208	$ 482,960	$ 399,791	$ 97,335	$ 80,573	$ 200,000	$ 165,559
2015	16,029	10,500	5,529	4,326	2,453	$ 536,622	$ 430,438	$ 108,150	$ 86,750	$ 200,000	$ 160,425
2016	16,506	10,500	6,006	4,759	2,698	$ 590,284	$ 458,800	$ 118,965	$ 92,466	$ 200,000	$ 155,451
2017	16,983	10,500	6,483	5,191	2,943	$ 643,947	$ 484,990	$ 129,780	$ 97,744	$ 200,000	$ 150,630
2018	17,460	10,500	6,960	5,624	3,189	$ 697,609	$ 509,114	$ 140,595	$ 102,606	$ 200,000	$ 145,960
2019	17,937	10,500	7,437	6,056	3,434	$ 751,271	$ 531,276	$ 151,410	$ 107,072	$ 200,000	$ 141,434
2020	18,414	10,500	7,914	6,489	3,679	$ 804,933	$ 551,574	$ 162,225	$ 111,163	$ 200,000	$ 137,048
2021	18,891	10,500	8,391	6,922	3,924	$ 858,596	$ 570,102	$ 173,040	$ 114,897	$ 200,000	$ 132,799
2022	19,369	10,500	8,869	7,354	4,170	$ 912,258	$ 586,951	$ 183,855	$ 118,293	$ 200,000	$ 128,681
2023	19,846	10,500	9,346	7,787	4,415	$ 965,920	$ 602,207	$ 194,670	$ 121,368	$ 200,000	$ 124,691
2024	20,323	10,500	9,823	8,219	4,660	$ 1,019,582	$ 615,952	$ 205,485	$ 124,138	$ 200,000	$ 120,824
2025	20,800	10,500	10,300	8,652	4,906	$ 1,073,244	$ 628,266	$ 216,300	$ 126,620	$ 200,000	$ 117,078
2026	20,800	10,500	10,300	8,652	4,906	$ 1,073,244	$ 608,785	$ 216,300	$ 122,694	$ 200,000	$ 113,448
2027	20,800	10,500	10,300	8,652	4,906	$ 1,073,244	$ 589,908	$ 216,300	$ 118,889	$ 200,000	$ 109,930
2028	20,800	10,500	10,300	8,652	4,906	$ 1,073,244	$ 571,616	$ 216,300	$ 115,203	$ 200,000	$ 106,521
2029	20,800	10,500	10,300	8,652	4,906	$ 1,073,244	$ 553,892	$ 216,300	$ 111,631	$ 200,000	$ 103,218
2030	20,800	10,500	10,300	8,652	4,906	$ 1,073,244	$ 536,717	$ 216,300	$ 108,169	$ 200,000	$ 100,018
2031	20,800	10,500	10,300	8,652	4,906	$ 1,073,244	$ 520,075	$ 216,300	$ 104,815	$ 200,000	$ 96,916
2032	20,800	10,500	10,300	8,652	4,906	$ 1,073,244	$ 503,948	$ 216,300	$ 101,565	$ 200,000	$ 93,911
2033	20,800	10,500	10,300	8,652	4,906	$ 1,073,244	$ 488,322	$ 216,300	$ 98,416	$ 200,000	$ 90,999
2034	20,800	10,500	10,300	8,652	4,906	$ 1,073,244	$ 473,180	$ 216,300	$ 95,364	$ 200,000	$ 88,178
2035	20,800	10,500	10,300	8,652	4,906	$ 1,073,244	$ 458,508	$ 216,300	$ 92,407	$ 200,000	$ 85,443
2036	20,800	10,500	10,300	8,652	4,906	$ 1,073,244	$ 444,291	$ 216,300	$ 89,542	$ 200,000	$ 82,794
	Total (2011-2025)		104,399				$ 7,400,000		$ 1,500,000		$ 2,200,000

Information based on 1997 Sierra Hydrotech Memo

Pumping					
	Static Head:	1,080	ft		
	Length Of Pipe:	17,000	ft		
	Pipe Diameter:	2	ft		
	Discharge:	21.3	cfs		
	Headloss:	132	ft		
	Velocity:	6.8	fps		
	PS Efficiency:	65%			
	Pumping Power:	3,366	kW	or	4,514 hp
	Power Cost:	$ 0.065	/kW-hr		

Pumping Cost Per Acre-foot			
	Flowrate:	21.3	cfs
	Time:	1	hour
	Volume:	1.76	Acre-Feet
Average	Power Cost:	$ 0.065	/kW-hr
	Unit Cost:	*$ 124.05*	*/acre-foot*
High:	. Power Cost:	$ 0.085	/kW-hr
	Unit Cost:	*$ 162.21*	*/acre-foot*
Low:	. Power Cost:	$ 0.045	/kW-hr
	Unit Cost:	*$ 85.88*	*/acre-foot*

[1]Assume $25 per acre-foot to secure right to water typical of what might be charged for PL 101-514 water.

OPTION 5 - North Fork American River Pumping Plant

Project cost estimation as of 1997 from Sierra Hydrotech study.

1997 S.H. Study		
Estimated Cost:	$ 8,440,000	
Remove Treatment Plant	$ (3,000,000)	(remove treatment plant cost for consistancy with other options)
1997 Project Cost for Evaluation	$ 5,440,000	
Escalation factor 1997 to 2009	1.46	3.2% annual escalation rate
Updated Construction Cost		
Updated Project Cost:	$ 7,900,000	
Contingencies @ 25%	$ 2,000,000	
Total 2009 Cost	$ 9,900,000	(Cost does not include new or expanded water treatment plant)

Initial Costs		
Construction Cost	$ 9,900,000	
Engineering	$ 1,500,000	(15% of Construction Cost)
Financing	$ 300,000	(3% of Construction Cost)
Land	$ 1,000,000	(Assumed $1.0 million)
Approvals	$ 1,500,000	(Assumed $1.5 million)
Total Initial Cost Estimate =	$ 14,200,000	

Annual Costs		
Pumping Cost:	$ 1,100,000	
Cost of Water:	$ 220,000	(Cost of water asumes full water demand for all years)
O&M	$ 100,000	(Assumed at $100,000)
Total Annual Cost Estimamte =	$ 1,400,000	

Total Costs		
Project Life =	20	years
Discount Rate =	3.2	%
Present =	$ 34,900,000	
Annual =	$ 2,400,000	

Water Supply Safe Yield =	10,300	(acre-feet)
Cost of Water =	**$ 230**	**($/acre-foot/year)**

APPENDIX 6

Canyon Creek Reservoir

Georgetown Divide Public Utility District
Options to Increase Water Supply

OPTION 6 - Canyon Creek Reservoir

Project cost estimated as of July 1986 taken from DWR study.

1986 DWR Study			
Estimated Cost:	$	34,000,000	(Cost does not include conveyance system to existing distribution system.)
Year		1986	
Set Inflation Rate		3.2%	
Updated Construction Cost			
Updated Project Cost:	$	68,000,000	
Contingency @ 25%	$	17,000,000	(Represents increases in project cost in addition to inflation)
Total 2009 Cost	$	85,000,000	
Initial Costs			
Construction Cost	$	85,000,000	
Engineering	$	12,800,000	(15% of Construction Cost)
Financing	$	2,600,000	(3% of Construction Cost)
Land	$	3,000,000	(Assumed $3.0 million)
Approvals	$	5,000,000	(Assumed $5.0 million)
Total Initial Cost Estimate =	$	108,400,000	
Annual Costs			
O&M	$	200,000	(Assumed at $200,000)
Total Costs			
Project Life =		20	years
Discount Rate =		3.2	%
Present =	$	111,300,000	
Annual =	$	7,600,000	
Water Supply Safe Yield =		6,100	(acre-feet)
Cost of Water =	**$**	**1,200**	**($/acre-foot/year)**

APPENDIX 7

Mutton Canyon

OPTION 7 - Mutton Canyon

Item	Qty	Unit	Unit Price	Total Price
1 Clearing				
Clearing for Pipeline	0.5	AC	$ 4,000	$ 2,000
Clearing for Intake	0.1	AC	$ 3,000	$ 300
TOTAL CLEARING				**$ 2,300**
2 Diversion at Mutton Canyon				
Cofferdam	1	LS	$ 6,000	$ 6,000
Bypass Piping	50	LF	$ 175	$ 8,750
Diversion Intake Structure	1	LS	$ 30,000	$ 30,000
Demolition, Temp. structure removal	1	LS	$ 5,000	$ 5,000
TOTAL DIVERSION				**$ 50,000**
3 Pipeline				
≈15" Above ground pipeline with structures and supports	400	LF	$ 150	$ 60,000
TOTAL PIPELINE				**$ 60,000**
			Subtotal (Direct Construction Costs)	$ 112,300
			Contingency @ 25%	$ 28,100
			OPTION 7 Total Estimated Construction Cost =	**$ 140,000**

APPENDIX 8

Onion Creek

Georgetown Divide Public Utility District
Options to Increase Water Supply

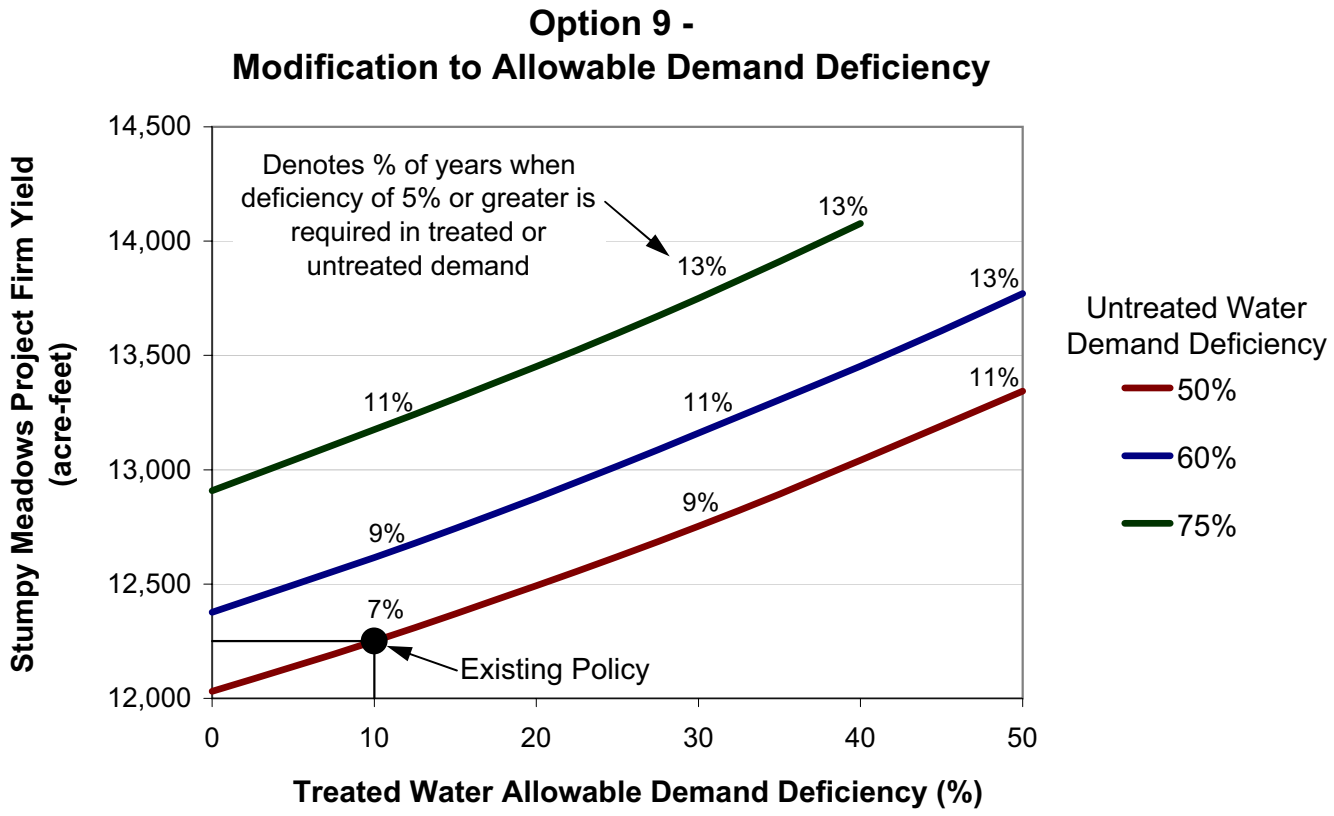
OPTION 8 - Onion Creek

Item	Qty	Unit	Unit Price	Total Price
1 Clearing				
Clearing for Pipeline	9.1	AC	$ 4,000	$ 36,000
Clearing for Intake	0.1	AC	$ 3,000	$ 300
TOTAL CLEARING				**$ 36,300**
2 Diversion at Onion Creek				
Cofferdam	2	LS	$ 6,000	$ 12,000
Bypass Piping	100	LF	$ 175	$ 17,500
Diversion Intake Structure	2	LS	$ 25,000	$ 50,000
Demolition, Temp. structure removal	2	LS	$ 5,000	$ 10,000
TOTAL DIVERSION				**$ 90,000**
3 Pipeline				
≈15" pipeline	9,000	LF	$ 150	$ 1,350,000
TOTAL PIPELINE				**$ 1,350,000**
			Subtotal (Direct Construction Costs)	$ 1,476,000
			Contingency @ 25%	$ 369,000
			OPTION 8 Total Estimated Construction Cost =	**$ 1,800,000**

APPENDIX 9

Modification to allowable demand deficiency

Deficiency Treated (%)	Deficiency Untreated (%)	Project Yield	Delta from Existing Yield	Deficiency Treated (%)	Deficiency Untreated (%)	Project Yield	Delta from Existing Yield	Deficiency Treated (%)	Deficiency Untreated (%)	Project Yield	Delta from Existing Yield
0	50	12,031	-220	0	60	12,377	-239	0	75	12,909	-267
5	50	12,138	-113	5	60	12,495	-121	5	75	13,041	-135
10	50	12,251	0	10	60	12,616	0	10	75	13,176	0
15	50	12,369	118	15	60	12,743	127	15	75	13,312	136
20	50	12,493	242	20	60	12,876	260	20	75	13,451	275
25	50	12,620	369	25	60	13,016	400	25	75	13,597	421
30	50	12,753	502	30	60	13,161	545	30	75	13,750	574
35	50	12,893	642	35	60	13,306	690	35	75	13,911	735
40	50	13,041	790	40	60	13,453	837	40	75	14,077	901
45	50	13,193	942	45	60	13,608	992				
50	50	13,344	1,093	50	60	13,771	1,155				



Demand Deficiency Criteria (%)

Treated	10	50	30	40	30	10	10	30	50	20	40	20	40	20
Untreated	50	50	50	75	75	75	60	60	60	50	50	60	60	75

Water Delivery (% of demand)

Year	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated
1923	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1924	0.82	0.99	0.77	0.89	0.80	0.96	0.63	0.90	0.65	0.93	0.68	0.98	0.77	0.99	0.74	0.95	0.71	0.88	0.81	0.98	0.78	0.93	0.75	0.97	0.72	0.91	0.67	0.96
1925	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1926	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1927	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1928	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1929	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1930	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1931	0.85	1.00	0.75	0.87	0.81	0.97	0.56	0.84	0.60	0.90	0.68	0.98	0.80	1.00	0.73	0.94	0.67	0.82	0.83	0.99	0.78	0.93	0.77	0.98	0.70	0.89	0.64	0.95
1932	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1933	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1934	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1935	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1936	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1937	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1938	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1939	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1940	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1941	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1942	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1943	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1944	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1945	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1946	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1947	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1948	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1949	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1950	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1951	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1952	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1953	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1954	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1955	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1956	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1957	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1958	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1959	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1960	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1961	0.97	1.00	0.90	1.00	0.94	1.00	0.80	1.00	0.83	1.00	0.88	1.00	0.94	1.00	0.90	1.00	0.85	1.00	0.95	1.00	0.92	1.00	0.92	1.00	0.87	1.00	0.85	1.00
1962	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1963	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1964	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1965	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1966	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1967	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1968	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1969	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1970	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1971	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1972	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1973	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1974	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Demand Deficiency Criteria (%)

Treated	10	50	30	40	30	10	10	30	50	20	40	20	40	20
Untreated	50	50	50	75	75	75	60	60	60	50	50	60	60	75

Deficeincy over 5% required? (1 = Yes, 0 = No)

Year														
1923	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1924	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1925	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1926	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1927	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1928	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1929	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1930	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1931	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1932	0	0	0	0	0	0	0	0	0	1	1	1	1	1
1933	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1934	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1935	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1936	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1937	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1938	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1939	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1940	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1941	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1942	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1943	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1944	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1945	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1946	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1947	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1948	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1949	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1950	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1951	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1952	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	1	1	1	1	1	1	1	1	0	0	1	1	1
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Demand Deficiency Criteria (%)																														
Treated	10		50		30		40		30		10		10		30		50		20		40		20		40		20	
Untreated	50		50		50		75		75		75		60		60		60		50		50		60		60		75	
Water Delivery (% of demand)																														
Year	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated
1975	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1976	0.95	1.00	0.88	1.00	0.92	1.00	0.78	1.00	0.81	1.00	0.86	1.00	0.92	1.00	0.88	1.00	0.83	1.00	0.94	1.00	0.90	1.00	0.90	1.00	0.86	1.00	0.84	1.00		
1977	0.50	0.90	0.50	0.50	0.50	0.70	0.25	0.60	0.25	0.70	0.25	0.90	0.40	0.90	0.40	0.70	0.40	0.50	0.50	0.80	0.50	0.60	0.40	0.80	0.40	0.60	0.25	0.80		
1978	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1979	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1980	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1981	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1982	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1983	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1984	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1985	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1986	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1987	1.00	1.00	0.98	1.00	1.00	1.00	0.91	1.00	0.94	1.00	0.99	1.00	1.00	1.00	0.99	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	0.97	1.00		
1988	0.77	0.98	0.70	0.79	0.73	0.90	0.53	0.82	0.55	0.87	0.58	0.96	0.69	0.97	0.65	0.88	0.63	0.78	0.75	0.94	0.71	0.85	0.67	0.93	0.64	0.83	0.56	0.92		
1989	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1990	1.00	1.00	0.95	1.00	1.00	1.00	0.85	1.00	0.89	1.00	0.97	1.00	1.00	1.00	0.97	1.00	0.90	1.00	1.00	1.00	0.98	1.00	1.00	1.00	0.94	1.00	0.93	1.00		
1991	1.00	1.00	0.88	1.00	0.95	1.00	0.76	1.00	0.80	1.00	0.88	1.00	0.97	1.00	0.89	1.00	0.82	1.00	0.99	1.00	0.92	1.00	0.93	1.00	0.86	1.00	0.84	1.00		
1992	0.86	1.00	0.74	0.85	0.79	0.95	0.58	0.86	0.61	0.91	0.66	0.98	0.78	0.99	0.72	0.93	0.67	0.82	0.82	0.99	0.76	0.91	0.74	0.97	0.69	0.88	0.63	0.95		
1993	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1994	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1995	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1996	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1997	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
1998	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		

Demand Deficiency Criteria (%)														
Treated	10	50	30	40	30	10	10	30	50	20	40	20	40	20
Untreated	50	50	50	75	75	75	60	60	60	50	50	60	60	75
Deficeincy over 5% required? (1 = Yes, 0 = No)														
Year														
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	1	1	1	1	1	1	1	1	1	1	1	1	1
1977	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	1	1	0	0	0	1	0	0	0	0	0
1988	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	1	1	0	0	0	1	0	0	0	0	0
1991	0	1	0	1	1	1	0	1	1	0	0	1	1	1
1992	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of year out of 76 years of record -------> Sum =	5	8	7	10	10	8	7	8	10	7	7	9	9	9
% of years with a deficiency of greater than 5% ---------->	***7%***	***11%***	***9%***	***13%***	***13%***	***11%***	***9%***	***11%***	***13%***	***9%***	***9%***	***12%***	***12%***	***12%***

APPENDIX F

DEPARTMENT OF WATER RESOURCES – MAKING WATER CONSERVATION A CALIFORNIA WAY OF LIFE

Final

MAKING WATER CONSERVATION A CALIFORNIA WAY OF LIFE

Primer of 2018 Legislation on Water Conservation and Drought Planning
Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman)

PREPARED BY

California Department of Water Resources

AND

State Water Resources Control Board

NOVEMBER 2018

Table of Contents

GLOSSARY

The following key terms are listed below for easy reference. Where applicable, existing definitions from the statute and regulations are provided. Additional terms that are relevant to the 2018 legislation and its implementation are introduced in the document where appropriate. However those terms are not defined in the current statute or regulation and may be modified throughout implementation.

agricultural water supplier

(For agricultural water management plan) A water supplier or contractor for water, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water, as defined in CWC §10608.12(a).

(For farm-gate delivery reporting) A water supplier or contractor for water, either publicly or privately owned, providing 2,000 acre-feet or more of surface water annually for agricultural purposes or serving 2,000 or more acres of agricultural land, as defined in CWC §531(b).

drought risk assessment

A method that examines water shortage risks based on the driest five-year historic sequence for the agency's water supply, as described in CWC §10635(b), as defined in CWC §10612.

irrigable land

Undefined in the legislation; to be defined through implementation.

irrigated land

Undefined in the legislation; to be defined through implementation.

performance measures

Actions to be taken by urban retail water suppliers that will result in increased water use efficiency by commercial, institutional and industrial (CII) water users. Performance measures may include, but are not limited to, educating CII water users on best management practices, conducting water use audits, and preparing water management plans. Performance measures do not apply to process water, as defined in CWC §10608.12(n)).

potable reuse

Direct potable reuse, indirect potable reuse for groundwater recharge, and reservoir water augmentation, as defined in CWC §13561, as defined in CWC §10608.12(o).

process water

Water used by industrial water users for producing a product or product content or water used for research and development, as defined in CWC §10608.12(p).

recycled water

Water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource, as defined in CWC §13050(n), as defined in CWC §10608.12(q).

urban retail water supplier

A water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes, as defined in CWC §10608.12(t)

urban water supplier

The combination of urban retail or wholesale water suppliers, defined by CWC §10608.12(t) and §10608.12(w), respectively; the term is also defined by CWC §10617.

urban water use efficiency standards

The standards effective through CWC §10609.4 (indoor residential use) or adopted by State Water Board (outdoor residential, water loss, and CII outdoor irrigation of landscape areas with dedicated meters) pursuant to CWC §10609.2.

urban water use objective

An estimate of aggregate efficient water use for the previous year based on adopted water use efficiency standards and local service area characteristics for that year, as described in CWC §10609.20, as defined in CWC §10608.12(u).

urban wholesale water supplier

A water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes, as defined CWC §10608.12(w).

water loss

The total of apparent losses and real losses (California Code of Regulations, title 23, §638.1(a) and §638.1(k), respectively) in an urban water supplier's system. Apparent losses means losses due to unauthorized consumption and/or nonphysical (paper) losses attributed to inaccuracies associated with customer metering or systematic handling errors. Real losses means the physical water losses from the pressurized potable water system and the supplier's potable water storage tanks, up to the point of customer consumption.

water shortage contingency plan

A document that incorporates the provisions detailed in CWC §10632(a) and is subsequently adopted by an urban retail water supplier, as defined in CWC §10617.5.

water supply and demand assessment

A method that looks at current year and one or more dry year water supplies and demands for determining water shortage risks per CWC §10632.1, as defined in CWC §10618.

ACRONYMS AND ABBREVIATIONS

2017 Framework	*Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16*
AB	Assembly Bill
AWMP	Agricultural Water Management Plan
CDFA	California Department of Food and Agriculture
CEC	California Energy Commission
CII	Commercial, industrial, and institutional
CPUC	California Public Utilities Commission
CWC	California Water Code
DRA	Drought Risk Assessment
DWR	California Department of Water Resources
GPCD	gallons per capita daily
Legislature	California State Legislature
MWELO	Model Water Efficient Landscape Ordinance
SB	Senate Bill
SGMA	Sustainable Groundwater Management Act
State Water Board	State Water Resources Control Board
UWMP	Urban Water Management Plan
WSCP	Water Shortage Contingency Plan

USEFUL LINKS

- Executive Order B-37-16, Making Water Conservation a California Way of Life: https://www.gov.ca.gov/wp-content/uploads/2017/09/5.9.16_Attested_Drought_Order.pdf
- Senate Bill 606, as chaptered: http://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB606
- Assembly Bill 1668, as chaptered: http://leginfo.ca.gov/pub/15-16/bill/asm/ab_1651-1700/ab_1668_bill_20160927_chaptered.pdf
- Senate Bill X7-7, as chaptered: http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200920107SB7
- DWR Water Use and Efficiency Program: https://water.ca.gov/Programs/Water-Use-And-Efficiency
- State Water Board Water Conservation Portal: https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/

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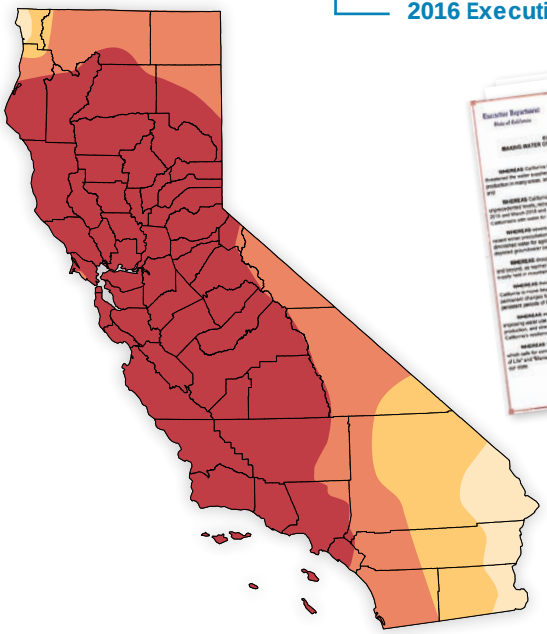
Introduction

01 Introduction

In 2018, the California State Legislature (Legislature) enacted two policy bills, (Senate Bill (SB) 606 (Hertzberg) and Assembly Bill (AB) 1668 (Friedman)), to establish a new foundation for long-term improvements in water conservation and drought planning to adapt to climate change and the resulting longer and more intense droughts in California. These two bills amend existing law to provide expanded and new authorities and requirements to enable permanent changes and actions for those purposes, improving the state's water future for generations to come.

SB 606 and AB 1668 are direct outcomes of Governor Brown's Executive Order B-37-16 issued in May 2016. The recommendations in the April 2017 report entitled ***Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16*** (2017 Framework) and subsequent extensive legislative outreach efforts informed the development of SB 606 and AB 1668. The 2017 Framework was prepared by the California Department of Water Resources (DWR), State Water Resources Control Board (State Water Board), California Public Utilities Commission (CPUC), California Department of Food and Agriculture (CDFA), and California Energy Commission (CEC) in response

California Drought 2012-2016



2016 Executive Order B-37-16

2017 Framework Report to Implement Executive Order B-37-16

2018 Legislation

- Recommendations for New and Expanded Authorities → SB 606
- Activities Under Existing Authorities → AB 1668

to Executive Order B-37-16 to establish a long-term framework for water conservation and drought planning. The 2017 Framework built on the conservation realized during the recent drought, as well as implementation of the Governor's California Water Action Plan.[1] The resulting 2017 Framework outlined a suite of actions that can be implemented under existing authorities and, where necessary, recommended additional actions that can be implemented with new or expanded authorities given by the Legislature. To that end, the Legislature enacted SB 606 and AB 1668, which provide complementary authorities and requirements that affect water conservation and drought planning for urban water suppliers, agricultural water suppliers, and small water suppliers and rural communities.

As an initial implementation action, DWR and the State Water Board prepared this primer to summarize the authorities, requirements, and schedules included in the new legislation. Where appropriate, roles and responsibilities of State agencies, water suppliers, and other parties are highlighted. During the implementation process, DWR, the State Water Board, and other State agencies will further develop data, information, guidelines, and other technical assistance to help realize the bills' intended outcomes. These agencies will solicit broad stakeholder and public participation throughout implementation.

The content of this primer is organized by the four primary goals in Executive Order B-37-16 and the 2017 Framework: (1) use water more wisely, (2) eliminate water waste, (3) strengthen local drought resilience, and (4) improve agricultural water use efficiency and drought planning. The majority of the new and expanded authorities relate to achieving the goal of using water more wisely, with the addition of a chapter in the California Water Code (CWC), Chapter 9 (commencing with §10609) of Part 2.55 of Division 6. The table on the following page presents major new and expanded authorities provided by SB 606 and AB 1668. For ease of reference, relevant law citations are included in the discussion, and applicable authorizing bills, SB 606 (SB)and AB 1668 (AB), are identified. Descriptions of new requirements and authorities are presented along with milestones and legislated deadlines. Callout boxes are used to highlight specific details or topics. Corresponding statutory roles and responsibilities are noted, where appropriate.

This document does not address actions described in the Executive Order B-37-16 and the 2017 Framework that rely on existing authorities other than to the extent necessary to describe changes made by SB 606 and AB 1668.

[1] The California Water Action Plan was first released in 2014 and then updated in 2016.

Making Water Conservation a California Way of Life – Major Areas of Coverage in SB 606 and AB 1668 of 2018

Primary Goals	Major Areas of Coverage in SB 606 (SB) and AB 1668 (AB)
Use Water More Wisely	• Water budget-based method for quantifying urban water use objectives • Urban retail water use efficiency standards adoption and water use objectives • Urban retail water use objective implementation, reporting, and enforcement • Expanded civil liability for violations
Eliminate Water Waste	• Affirmation for continued implementation of existing requirements enacted by SB 555 of 2015 for setting urban retail water loss standard, methodology, and reporting requirements • Recommendations to Legislature on expanding water loss reporting requirements for urban wholesale water suppliers
Strengthen Local Drought Resilience	• Emergency declaration based on local water shortage • Urban water shortage contingency planning, methodology, reporting, and enforcement • Amendments to existing urban water management reporting and enforcement • Countywide drought planning for small water suppliers and rural communities
Improve Agricultural Water Use Efficiency and Drought Planning	• Water budget-based method for quantifying agricultural water use efficiency • Amendments to existing agricultural water delivery reporting and requirements • Drought resiliency and response planning, and requirements for agricultural water use

Use Water More Wisely

02 Use Water More Wisely

SB 606 and AB 1668 do not change existing implementation of the Water Conservation Act of 2009[2] through 2020. Rather, the legislation provides new and expanded authorities needed for implementation of a water budget-based approach to conservation and water use efficiency as recommended in the 2017 Framework. This approach is described in a new CWC chapter (commencing with §10609) related to the urban water use objective and water use reporting, to be realized through new urban water use efficiency standards to be adopted by the State Water Board, in coordination with DWR, by June 30, 2022. The approach aims at advancing the State's goals to mitigate for and adapt to climate change.

Most new authorities and requirements for urban water use efficiency are in AB 1668, with a few supplemental provisions in SB 606. The resulting CWC §10609 requires DWR and the State Water Board to establish standards for (1) indoor residential use; (2) outdoor residential use; (3) outdoor CII use with dedicated irrigation meters; and (4) water losses. The legislation also requires DWR and the State Water Board to establish performance measures for CII water use and appropriate variances for unique uses that can have a material effect on water use of an urban retail water supplier. The Legislature recognizes the substantial diversity of businesses and institutions throughout the state, and requires collection of additional data as part of implementation.

The legislation also requires urban retail water suppliers to calculate and report their urban water use objectives following adoption of the new standards. New State policies reflected in these CWC amendments could have substantial effects on long-term urban water use and management by urban water suppliers. For this reason, the legislation requires a thorough review of the progress, outcomes, and effects of near-term implementation. In addition, the legislation requires DWR and the State Water Board to seek broad stakeholder and public input throughout implementation.

In this primer, the significant CWC amendments that provide new authorities and requirements for using water more wisely are grouped by six major topics: (1) urban water use efficiency standards and urban water use objective; (2) CII performance measures; (3) State-provided data; (4) reporting requirements; (5) compliance, enforcement, and legislative oversight; and (6) streamlining data reporting. All new requirements associated with urban water use efficiency standards are addressed in **USE WATER MORE WISELY** with the exception of the water loss standard that is included in **ELIMINATE WATER WASTE.**

*An **urban water use efficiency standard** is a numeric standard for each category in CWC §10609.2, as set by the Legislature (indoor residential, see §10609.4) or as set by the State Water Board, in coordination with DWR (outdoor residential, water loss, and CII outdoor irrigation of landscape with dedicated meters, see §10609.2).*

*An **urban water use objective** is an estimate of aggregate efficient water use for the previous year based on adopted water use efficiency standards and local service area characteristics for that year (CWC §10608.12(u) AB).*

*An **urban retail water supplier** is a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes (CWC §10608.12(t) AB).*

[2] Also known as SB X7-7; commencing with CWC §10608.

URBAN WATER USE EFFICIENCY STANDARDS AND WATER USE OBJECTIVE

The legislation sets standards for indoor residential use and requires the State Water Board, in coordination with DWR, to adopt efficiency standards for outdoor residential use, water losses, and CII outdoor landscape areas with dedicated irrigation meters, as described in this section. These volumetric standards apply to an urban retail water supplier that will use the efficiency standards to calculate its urban water use objective, which is later compared with its actual aggregate water use for reporting purposes.

The Legislature deemed the State Water Board's actions for adopting and implementing water use efficiency standards to be Class 8 actions for protecting the environment, as defined in Section 15308 of Title 14 of the California Code of Regulations. Therefore, these actions are categorically exempt from provisions of the California Environmental Quality Act (CWC §10609.34 SB).

All new requirements for urban water use objectives are effective after June 2022 when the State Water Board adopts urban water use efficiency standards, performance measures, and variances. The legislation does not modify the current statewide goal of a 20 percent reduction in urban per capita water use by 2020 (i.e., suppliers' 2020 targets) as established under the Water Conservation Act of 2009[3]. AB 1668 requires that implementation of the new authorities and requirements result in statewide conservation exceeding current statewide targets[3] (CWC §10609.2(d) AB). The following provides details on the legislated requirements for developing and adopting water use efficiency standards, applications of the standards in urban water use objective calculations, and additional implementation oversight.

Urban Water Use Efficiency Standards

SB 606 and AB 1668 contain specific requirements for developing and adopting water use efficiency standards. The legislation:

- Requires DWR, in coordination with the State Water Board, to conduct necessary studies and investigations and authorizes the agencies to recommend to the Legislature efficiency standards for indoor residential use that include benefit and impact assessments for applying such standards by January 1, 2021. These jointly-recommended standards may more appropriately reflect the best practices for indoor residential water use than the

[3] AB 1668 requires the long-term water use efficiency standards be set at a level designed so that the aggregate water use objectives, "...together with other demands excluded from the long-term standards such as CII indoor water use and CII outdoor water use not connected to a dedicated landscape meter..." will exceed the 2020 statewide conservation targets (CWC §10609.2(d) AB).

default standards set by the Legislature in CWC §10609.4(a) AB. DWR will develop these recommendations in coordination with the State Water Board and collaboratively with stakeholders (CWC §10609.4(b) AB).

- Requires DWR, in coordination with the State Water Board, to conduct necessary studies and investigations and develop recommendations to the State Water Board by October 1, 2021 for:
  - Standards for outdoor residential water use that apply to residential irrigable lands, including provisions for swimming pools, spas, and ornamental water features that are artificially supplied with water, and incorporating principles of the Model Water Efficient Landscape Ordinance (MWELO)[4] (CWC §10609.6 AB).
  - Standards for CII outdoor irrigation of landscape areas with dedicated irrigation meters or other means of measurement, and shall incorporate principles of the MWELO (CWC §10609.8 AB).
  - Appropriate variances for unique uses that can have a material effect on an urban retail water supplier's urban water use objective and the corresponding thresholds of significance (CWC §10609.14 AB).
  - Guidelines and methodologies that identify how an urban retail water supplier calculates its urban water use objective (CWC §10609.16 AB).
- Requires the State Water Board, in coordination with DWR, to adopt long-term standards for outdoor residential water use, outdoor irrigation with dedicated irrigation meters in connection with CII water use, and a volume for water loss by June 30, 2022. Before adoption, the State Water Board shall make proposed standards and identified potential effects available for public comment by May 30, 2022 (CWC §10609.2 AB).
- Requires the State Water Board to adopt appropriate variances, guidelines, and methodologies for calculating urban water use objectives (CWC §10609.2(e) AB).
- Requires the State Water Board, in coordination with DWR, to adopt water loss standards for urban retail water suppliers no earlier than January 1, 2019, and no later than July 1, 2020, pursuant to CWC §10608.34[5] (CWC §10609.12 AB). See **ELIMINATE WATER WASTE** for additional related requirements.

*Different from other water use efficiency standards, DWR and the State Water Board may develop recommendations to the Legislature on standards for indoor residential use. On the **water supplier level**, effective standards will follow provisions in CWC §10609.4(a) AB:*

- *55 gallons per capita daily (GPCD) until January 1, 2025*
- *The greater of 52.5 GPCD or a standard recommended by DWR and the State Water Board for the 2025 standard from January 1, 2025, through December 31, 2029*
- *The greater of 50 GPCD or a standard recommended by DWR and the State Water Board for the 2030 standard after January 1, 2030*

These standards do not require reporting or measurements on the customer level.

For efficiency standards related to outdoor residential irrigation and outdoor CII landscape areas with dedicated meters, "principles of the model water efficient landscape ordinance" means those provisions of the MWELO applicable to the establishment or determination of the amount of water necessary for efficient landscape irrigation. These provisions include, but are not limited to, the following (CWC §10609.9 AB):

- *Evapotranspiration adjustment factors, as applicable*
- *Landscape area*
- *Maximum applied water allowance*
- *Reference evapotranspiration*
- *Special landscape areas, including provisions governing evapotranspiration adjustment factors for different types of water used for irrigating landscape*

[4] Adopted by DWR pursuant to the Water Conservation in Landscape Act of 2017 (commencing with CWC §65591).

[5] Enacted by SB 555 of 2015.

AB 1668 requires that when adopting water use efficiency standards, the State Water Board shall consider the effects of the proposed standards on local wastewater management, developed and natural parklands, and urban tree health (CWC §10609.2(c)AB).

An urban retail water supplier may have certain unique uses that can have a material effect on its urban water use objective. DWR will recommend appropriate variances and, for each variance, the associated threshold of significance for consideration in adoption by the State Water Board. Appropriate variances may include, but are not limited to, the following (CWC §10609.14 AB):

1. *Significant use of evaporative coolers*
2. *Significant populations of horses and other livestock*
3. *Significant fluctuations in seasonal populations*
4. *Significant landscaped areas irrigated with recycled water having high levels of total dissolved solids*
5. *Significant use of water for soil compaction and dust control*
6. *Significant use of water to supplement ponds and lakes to sustain wildlife*
7. *Significant use of water to irrigate vegetation for fire protection*
8. *Significant use of water for commercial or noncommercial agricultural use*

Each urban retail water supplier should request and may receive approval from the State Water Board for use of adopted variances in calculating its urban water use objective. The State Water Board shall make the approved variances by urban retail water supplier and associated supporting data available on its website.

To accommodate unforeseen circumstances of individual urban retail water suppliers, SB 606 allows the State Water Board to waive urban water use efficiency standard requirements for a period of up to five years. However, the permissible conditions are limited to an urban retail water supplier with deliveries that are significantly affected by changes in water use because of damages from a disaster. The State Water Board is also required to consider the breadth of the damage and the time necessary for the damaged areas to recover from the disaster (CWC §10609.38 SB).

Urban Water Use Objective

SB 606 establishes a method to estimate the aggregate amount of water an urban retail water supplier would have used in the previous year if all that water had been used in compliance with adopted efficiency standards. The aggregate amount, or "urban water use objective," is an estimate of aggregate efficient water use from the previous calendar or fiscal year based on adopted water use efficiency standards and local service area characteristics for that year, as described in CWC §10609.20 (CWC §10608.12(u)AB). More specifically, the annual urban water use objective is the sum of the following (CWC §10609.20(c)SB)[6]:

1. Aggregate estimated efficient indoor residential water use.
2. Aggregate estimated efficient outdoor residential water use.
3. Aggregate estimated efficient outdoor irrigation of landscape areas with dedicated irrigation meters or equivalent technology in connection with CII water use.
4. Aggregate estimated efficient water losses.
5. Aggregate estimated water use for approved variances.

By comparing the amount of water actually used in the previous year with the urban water use objective for that year, an urban retail water supplier can determine if it has achieved the required level of water use efficiency for the previous year. With this comparison, local urban retail water suppliers will be in a better position to help eliminate unnecessary use of water, that is, water used in excess of that needed to accomplish the intended beneficial use (CWC §10609(a)AB).

Emphasis on the aggregate amount of all categories of urban water use in meeting the urban water use objective provides an urban retail water supplier with flexibility[7] in promoting and implementing water conservation measures in its own service area. This emphasis also means that urban water use efficiency requirements are applicable on the water supplier

[6] The allowable bonus incentive for potable water reuse is discussed separately later in this subsection.

[7] That the urban water use objective may be calculated on either a fiscal or calendar year provides flexibility, as does the ability to determine what measures are to be implemented.

level and not on the individual customer level. An urban retail water supplier that does not meet its objective may be required by the State Water Board to enact policies and programs that result in additional water savings.

To maintain consistency with State policy encouraging potable reuse[8], SB 606 allows a bonus incentive for an urban retail water supplier that delivers water from a groundwater basin, reservoir, or other source that is augmented by potable reuse water. The bonus incentive is to adjust the supplier's urban water use objective by the volume of potable reuse water delivered to residential customers and landscape areas with dedicated irrigation meters in connection with CII water use. The bonus incentive shall be limited in accordance with one of the following: (A) the bonus incentive shall not exceed 15 percent of the urban water supplier's water use objective for any potable reuse water produced at an existing facility; and, (B) the bonus incentive shall not exceed 10 percent of the urban water supplier's water use objective for any potable reuse water produced at any facility that is not an existing facility. An existing facility is defined as one with a completed environmental review on or before January 1, 2019, that becomes operational on or before January 1, 2022, and that uses microfiltration and reverse osmosis technologies to produce the potable reuse water (CWC §10609.20(d)SB). See **REPORTING REQUIREMENTS** for more information on annual reporting of urban water use and calculation of urban water use objective.

CII PERFORMANCE MEASURES

AB 1668 requires DWR, in coordination with the State Water Board, to conduct necessary studies and investigations to develop recommendations on performance measures for CII water use by October 1, 2021, for consideration in adoption by the State Water Board (CWC 10609.10(a)AB). Prior to recommending performance measures for CII water use, DWR is required to solicit broad public participation from stakeholders and other interested parties related to the following considerations (CWC §10609.10(b)AB):

- CII water use classification system.
- Minimum size thresholds for converting mixed CII meters to dedicated irrigation meters.
- Technologies that could be used in lieu of requiring dedicated irrigation meters.
- Best management practices including water audits and water management plans for CII customers above a certain size, volume of use, or other threshold.

DWR's recommendations shall be consistent with the October 21, 2013, report to the Legislature by the CII Task Force titled, *Water Use Best Management Practices*[9], including the technical and financial feasibility recommendations provided in that report, and shall support the economic productivity of CII sectors (CWC §10609.10(c)AB).

For the studies, investigations, and report related to a standard for indoor residential water use that DWR will conduct in coordination with the State Water Board, AB 1668 requires collaboration with and input from a broad group of stakeholders. That group includes, but is not limited to, environmental groups; experts in indoor plumbing; and water, wastewater, and recycled water agencies (CWC §10609.4(b)(2)AB).

[8] Potable reuse includes direct and indirect reuse, as defined in CWC §13561.

[9] See https://www.water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Files/CII-Volume-I-july-2014.pdf and https://www.water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Files/CII-Volume-II-july-2014.pdf

STATE-PROVIDED DATA

AB 1688 recognizes the need for studies and investigations to support development of urban water use efficiency standards. As part of DWR's implementation efforts, it will conduct these studies and investigations in coordination with the State Water Board and in collaboration with stakeholders. AB 1688 specifically identifies the need for landscape area data that are required for the analysis of residential outdoor water use, and other supporting data required by urban retail water suppliers to calculate their urban water use objectives:

- Requires DWR, by January 1, 2021, to provide urban retail water suppliers with data regarding the area of residential irrigable lands to calculate aggregated outdoor residential use. The data should be reasonably accurate for the intended uses, taking into consideration California's diverse landscapes and community characteristics (CWC §10609.6(b) and (c)SB).
- Requires DWR to provide landscape area data and other data for calculating an urban water use objective at a level of detail sufficient to allow an urban retail water supplier to verify its accuracy at the parcel level (CWC §10609.20(e)SB).
- Requires DWR to provide or otherwise identify data related to unique local conditions to support calculation of an urban water use objective (CWC §10609(b)(2)(C)AB).

DWR, in collaboration with stakeholders, is conducting a statewide residential landscape area measurement study for California's urban retail water suppliers. The study includes pilots to develop a reliable method for estimating irrigable landscape areas for residential outdoor use. DWR will provide the landscape area data to suppliers by January 1, 2021 (CWC §10609.6(b) and (c)AB).

REPORTING REQUIREMENTS

To support implementing urban water use efficiency standards and meeting urban water use objectives, SB 606 and AB 1668 include schedule and content provisions for a critical reporting requirement – the annual water use report. The legislation also includes changes in Urban Water Management Plan (UWMP) preparation requirements. See **Related Requirements for Urban Water Management Plan Preparation, ELIMINATE WATER WASTE,** and **STRENGTHEN LOCAL DROUGHT RESILIENCE** for related requirements.

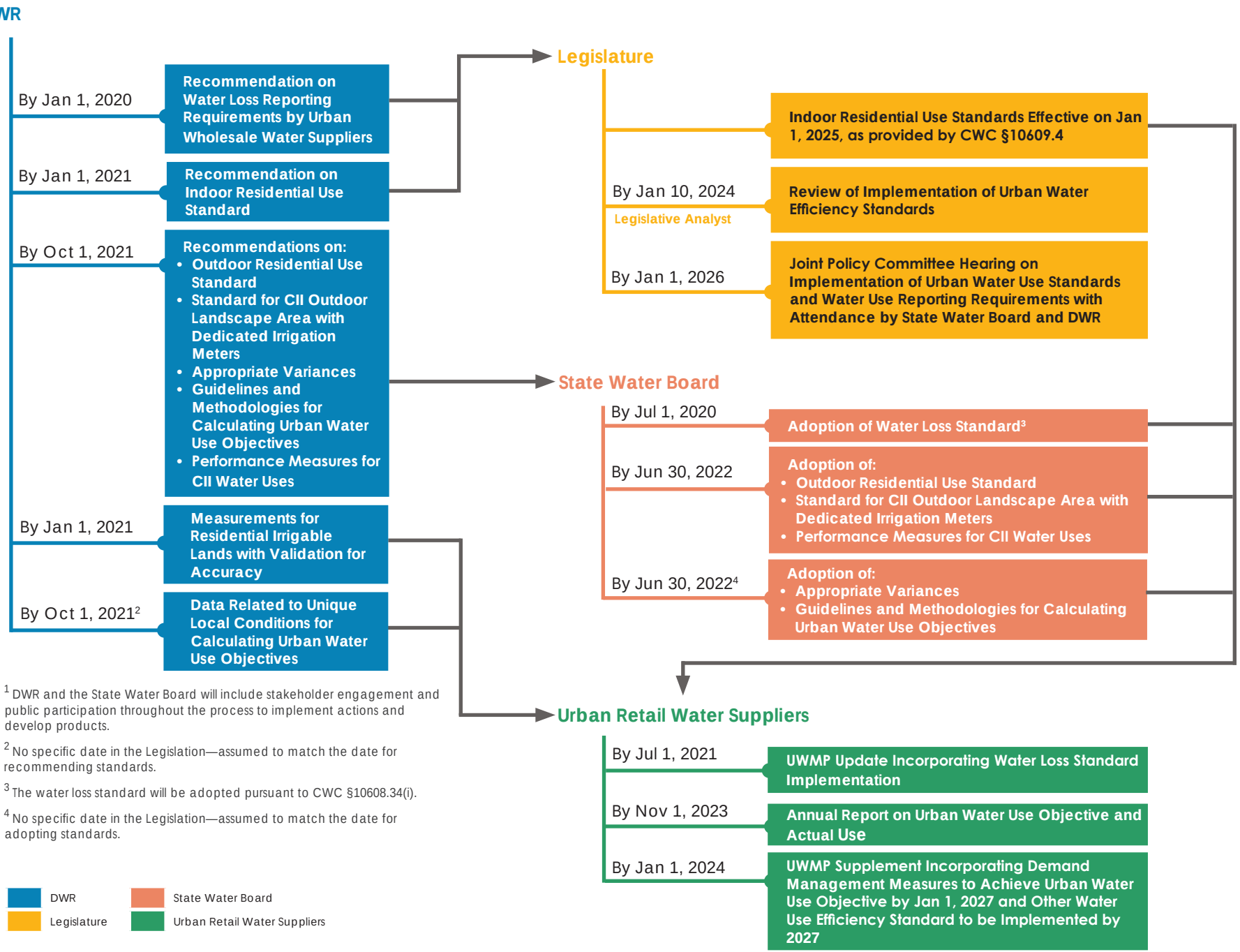
Annual Water Use Report

SB 606 and AB 1668 require each urban retail water supplier, by November 1, 2023, and by November 1 every year thereafter, to:

- Calculate its urban water use objective including estimated indoor residential water use, outdoor residential water use, outdoor irrigation of landscape areas with dedicated irrigation meters or equivalent technology in connection with CII water use, water losses, water use in accordance with approved variances, and applicable bonus incentive for potable reuse (CWC §10609.20SB and §10609.14AB).
- Calculate its actual water use including residential water use, outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use, and water losses (CWC §10609.22SB).

In addition to the annual water use report required under CWC §10609.24(a)SB, SB 606 authorizes the State Water Board to issue a regulation or informational order requiring urban wholesale and retail water suppliers to provide monthly reports related to water production, water use, or water conservation (CWC §10609.28 SB). This provision provides the State Water Board direct authority to readopt a reporting requirement established in the recent drought emergency to ensure continuation of certain reporting.

Major Actions and Products Required to Implement Water Use Efficiency Standards and Urban Retail Water Supplier's Annual Reporting Requirements[1]



[1] DWR and the State Water Board will include stakeholder engagement and public participation throughout the process to implement actions and develop products.

[2] No specific date in the Legislation—assumed to match the date for recommending standards.

[3] The water loss standard will be adopted pursuant to CWC §10608.34(i).

[4] No specific date in the Legislation—assumed to match the date for adopting standards.

Summary of Urban Retail Water Supplier's Urban Water Use Objective Calculation

Urban Retail Water Supplier's Urban Water Use Objective (CWC §10609.20(c))

Aggregate estimated efficient indoor residential water use

+

Aggregate estimated efficient outdoor residential water use

+

Aggregate estimated efficient outdoor irrigation of landscape areas with dedicated irrigation meters or equivalent technology in connection with CII water use

+

Aggregate estimated efficient water losses

+

Aggregate estimated water use for variances approved by the State Water Board

+

Allowable Bonus Incentive Adjustments (CWC §10609.20(d)), which shall be limited in accordance with one of the following:

- Volume of potable reuse water from existing facility, with completed environmental review by Jan 1, 2019, that becomes operational by Jan 1, 2022, not to exceed **15% of urban water use objective**
- Volume of potable reuse water from new facility, not to exceed **10% of urban water use objective**

=

Urban Retail Water Supplier's Urban Water Use Objective, Adjusted For Bonus Incentive, for annual reporting purposes and comparison to the actual water use in the previous year

- Submit an annual report to DWR on the previous year's urban water use (CWC §10609(b)(2)(E)AB; and §10609.24SB).

For the preparation of an annual water use report for the previous year, SB 606 and AB 1668 also provide several specific requirements, flexibility, and clarifications. The legislation:

- Requires the calculated urban water use objective, actual urban water use, documentation of implementation of performance measures for CII water use, description of progress made towards meeting an urban water use objective, and relevant supporting data (CWC §10609.24SB).
- Provides the flexibility for reporting urban water use objective and actual water use on a calendar or fiscal year basis (CWC §10609.20(b) and §10609.22(b)SB).
- Allows calculation of an urban water use objective using landscape area and other provided data by DWR or alternative data, if demonstrated to be equivalent or superior in quality and accuracy to DWR's data. DWR may provide technical assistance to an urban retail water supplier to determine the appropriateness of using alternative data for this purpose (CWC §10609.20(e)SB).

Related Requirements for Urban Water Management Plan Preparation

Following the State Water Board's adoption of urban water use efficiency standards, an urban retail water supplier shall adopt and submit to DWR, by January 1, 2024, a supplement to its adopted 2020 UWMP that includes a narrative describing water demand management measures that the supplier plans to implement to achieve its urban water use objective by January 1, 2027, pursuant to urban water use efficiency standards and their implementation. This supplement is exempt from the public notice, hearing, and adoption requirements associated with UWMP updates and amendments (CWC §10621(f)(2) and §10631(e)(1)(B)SB).

There are additional provisions related to the preparation and adoption of a UWMP by an urban retail water supplier. See **ELIMINATE WATER WASTE** and **STRENGTHEN LOCAL DROUGHT RESILIENCE** for more UWMP requirements that a water supplier should consider in streamlining its efforts to comply with UWMP preparation, adoption, and submittal requirements.

SB 606 contains a provision that could affect reporting requirements and enforcement during emergency conditions. SB 606 extends the effective period of such an emergency regulation adopted by the State Water Board in response to drought conditions or Governor's proclamation of a state of emergency from 270 days to one year after its adoption (CWC §1058.5(c)SB).

Reporting requirements and enforcement for urban water use objectives are always on the water supplier level (CWC §10609(a)AB) and not on the individual customer level. An urban retail water supplier can determine its own implementation priorities and adequate actions to achieve its urban water use objective.

COMPLIANCE, ENFORCEMENT, AND LEGISLATIVE OVERSIGHT

SB 606 and AB 1668 allow for the imposition of civil liability for inefficient water use, provide progressive authority for the State Water Board's enforcement of annual water use reporting, and provide a right for urban retail water suppliers to petition the State Water Board to reconsider its water right orders related to water use efficiency. Details are provided below.

Civil Liability

SB 606 authorizes civil liability to be imposed by local public agencies for violations of certain new water conservation requirements that will be developed through formal rule-making processes (CWC §377 SB).

SB 1668 authorizes civil liability for an urban retail water supplier that violates an order or regulation issued by the State Water Board under Chapter 9 (commencing with CWC §10609) of Part 2.55 of Division 6. Civil liability however, for violation of a regulation only applies to violations occurring after November 1, 2027.

Progressive Enforcement for Annual Urban Water Use Reporting

SB 606 provides the State Water Board with new authorities for enforcing the annual urban water use reporting requirement:

- Allows issuance of an informational order or conservation order to, or imposition of civil liability on, an urban water supplier for failure to submit an annual water use report (CWC §10609.24 SB).
- Allows for specific State Water Board enforcement actions on a legislatively-defined time table, see the figure on page 17 (CWC §10609.26 SB).

Water Right Protection

As the State Water Board also exercises oversight of the State's water rights system, both SB 606 and AB 1668 provide conditions for the State Water Board to adopt and implement water use efficiency standards. The legislation:

- Clarifies the State Water Board's adoption and implementation of water use efficiency standards are to have no effects on water rights or the applicability of CWC §1010 and §1011 related to water right holders' right to conserved water (CWC §10609.36(a) SB).
- Clarifies the conservation orders issued by the State Water Board for compliance with annual water use reporting requirements should not contain any actions to curtail or otherwise limit the exercise of a water right of the supplier or other water right holders (CWC §10609.26(d) SB).

- Extends existing rights to seek reconsideration of State Water Board decisions and orders to decisions and orders made under Part 2.55 (commencing with CWC §10608) of Division 6.

Legislative Oversight

In light of the new authorities and requirements for adopting and implementing urban water use efficiency standards, the Legislature imposed the following legislative oversight that:

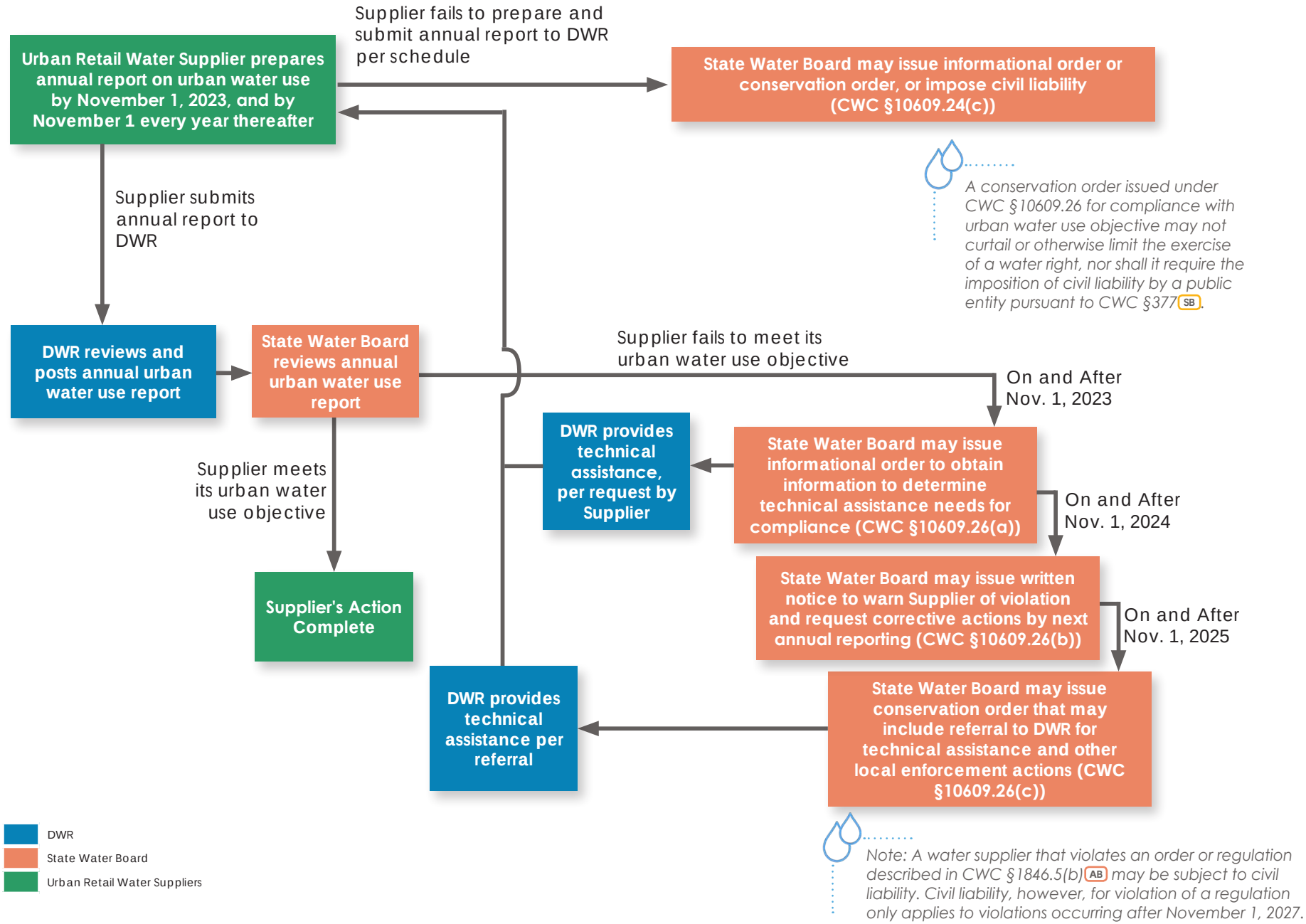
- Clarifies the need for a separate authorization from the Legislature for the State Water Board to update and amend the initially adopted urban water use efficiency standards after 2022 (CWC §10609.36(b) SB).
- Requires the Legislative Analyst, by January 10, 2024, to conduct a review of implementation of the urban water efficiency standards (CWC §10609.30 SB).
- Requires DWR and the State Water Board to appear before the appropriate policy committees of both houses of the Legislature on or around January 1, 2026, and report on implementation of the urban water use standards and water use reporting requirements (CWC §10609.32 SB).

STREAMLINING DATA REPORTING

SB 606 and AB 1668 include additional requirements for DWR and the State Water Board to identify opportunities for streamlining water data reporting and making data and their intended use accessible by the public. The legislation:

- Requires the State Water Board to post on its website a list of all urban retail water suppliers with approved variances, the specific variance or variances, and the data supporting approvals (CWC §10609.14(e) AB).
- Requires DWR and the State Water Board to identify urban water reporting requirements shared by both agencies to help streamline water data reporting, and post on each agency's website how the data are used for planning, regulatory, or other purposes (CWC §10609.15(a) AB).
- Requires DWR and the State Water Board to publish data pertaining to urban water use objective reporting requirements collected by both agencies and implement actions to improve data publication and public accessibility according to the principles and requirements of the Open and Transparent Water Data Act of 2016 (CWC §10609.15(c) AB).
- Requires DWR to post on its website annual urban water use reports and information received from urban retail water suppliers (CWC §10609.24(b) SB).

Urban Retail Water Supplier's Annual Urban Water Use Reporting Requirements and Corresponding Actions by DWR and State Water Board



Milestone Schedule: Use Water More Wisely

2020	*Jan 1 – DWR may update MWELO or make finding that no update is warranted.*
	Dec 31 – Urban water use targets cumulatively result in a 20-percent reduction from the baseline daily per capita water use.
2021	Jan 1 – DWR/State Water Board may submit recommendation on indoor residential water use standard to Legislature.
	Jan 1 – DWR provides residential irrigable land areas to urban water retailers.
	Jul 1 – Urban water suppliers submit UWMPs to DWR within 30 days of adoption.
	Oct 1 – DWR recommends standards for outdoor residential use, CII dedicated landscape irrigation, and unique urban water use variances.
	Oct 1 – DWR develops guidelines and methodologies for calculating urban water use objectives.
	Oct 1 – DWR recommends performance measures for CII water use.
2022	May 30 – State Water Board identifies long-term standards for efficient use of water and proposed standards' effects.
	Jun 30 – State Water Board adopts long-term standards for efficient use of water and related methodology and guidance.
	Jun 30 – State Water Board adopts performance measures for CII water use.
	Jul 1 – DWR submits UWMPs report to Legislature.
2023	*Jan 1 – DWR may update MWELO or make finding that no update is warranted.*
	Nov 1 – Urban water suppliers submit annual water use report to DWR on urban water use objective, actual urban water use, implementation of CII water use performance measures, and progress towards urban water use objective.
	Nov 1 forward – State Water Board may issue informational order to urban retail water supplier that is not meeting its urban water use objective.
2024	Jan 1 – Urban water suppliers adopt and submit to DWR supplement to adopted 2020 UWMPs on water demand management measures to be implemented by 2027 to achieve urban water use objective.
	Jan 10 – Legislative Analyst reports to Legislature and public on evaluation of implementation of water use efficiency standards and water use reporting.
	Nov 1 – Urban water suppliers submit annual water use report to DWR.
	Nov 1 forward -- State Water Board may issue a written notice (warning) to urban retail water supplier that is not meeting its water use objective.
2025	Nov 1 forward – State Water Board may issue conservation order to urban retail water supplier that is not meeting its water use objective.
	Nov 1 – Urban water suppliers submit annual water use report to DWR.
2026	*Jan 1 – DWR may update MWELO or make finding that no update is warranted.*
	Jul 1 – Urban water suppliers submit UWMPs to DWR within 30 days of adoption.
	Nov 1 – Urban water suppliers submit annual water use report to DWR.
2027	Jan 1 – Urban water suppliers achieve water use objective.
	Jul 1 – DWR submits UWMPs report to Legislature.
	Nov 1 – Urban water suppliers submit annual water use report to DWR.

Throughout this document, a milestone schedule for implementation by primary goal required by SB 606 and AB 1668 was compiled for easy reference (shown in **blue**). For completeness, other relevant requirements are also included (shown in ***dark grey***). In all milestone schedules, only the lead agency is noted for each item. See **Appendix A** for details on additional coordination and collaboration requirements.


Eliminate Water Waste

03 Eliminate Water Waste

Under the second primary goal in Executive Order B-37-16, Eliminate Water Waste[10], the 2017 Framework included three recommendations without need for new authorities: (1) the State Water Board to open a rulemaking process to establish permanent prohibitions on wasteful water practices, (2) the State Water Board and DWR to continue implementing CWC §10608.34 (enacted by SB 555 of 2015) to minimize urban retail water loss, and (3) the CEC to evaluate options for certification of innovative water loss and control technologies. SB 606 and AB 1668 require one new study by DWR, in coordination with the State Water Board, for extending water loss reporting requirements to urban wholesale water suppliers. (See **USE WATER MORE WISELY** for application of the water loss standard in the urban water use objective and associated reporting requirements.)

AFFIRMING EXISTING REQUIREMENTS FOR WATER LOSS STANDARD AND REPORTING

Both SB 606 and AB 1668 affirm the directive for water loss standard adoption and implementation to follow the existing requirements and process set forth in CWC §10608.34 (CWC §10631(d)(3)(A)SB and §10609.12AB). CWC §10608.34 requires the State Water Board to adopt standards for urban retail water loss no earlier than January 1, 2019, and no later than July 1, 2020. It also contains reporting requirements. Consequently, SB 606 requires each urban retail water supplier, by July 1, 2021, to adopt and submit to DWR its 2020 UWMP with additional information related to compliance with adopted water loss standards (CWC §10631(d)(3)(C)SB). The State Water Board will adhere to the procedures and requirements for stakeholder engagement and public participation in the rule making process. The water loss standard adoption by July 1, 2020, will satisfy the AB 1668 schedule for the State Water Board to adopt the long-term urban retail water use efficiency standards for water loss by June 30, 2022 (CWC §10609.2AB).

FEASIBILITY STUDY FOR EXTENDING WATER LOSS REPORTING REQUIREMENTS

SB 606 requires that DWR, in coordination with the State Water Board, investigate the feasibility of extending the water loss reporting requirement to urban wholesale water suppliers. Targeted urban wholesale water suppliers include private and public entities that provide more than 3,000 acre-feet of water annually for potable municipal purposes at a wholesale level. The legislation requires DWR to make a recommendation to the Legislature by January 1, 2020 (CWC §10608.35 SB). In developing its recommendation, DWR will solicit broad public participation from stakeholders and other interested persons.

Milestone Schedule: Eliminate Water Waste

2020	Jan 1 – DWR submits to Legislature recommendation on feasibility of developing and enacting water loss reporting requirements for urban wholesale water suppliers. *July 1 – State Water Board adopts rules requiring urban retail water suppliers to meet performance standards for the volume of water loss.*
2021	Jul 1 – Water Suppliers adopt their 2020 UWMPs and show if they have met adopted water loss standard.
2022	Jun 30 – Standards for volume of water loss adopted by State Water Board, pursuant to CWC §10608.34, are used for calculation of urban water use objective.

[10] Discussion of water loss in this section follows the categorization of action in Executive Order B-37-16 and the 2017 Framework. The section headings in this document do not in any manner affect the scope, meaning or intent of the actual statutory language discussed herein.

Strengthen Local Drought Resilience

04 Strengthen Local Drought Resilience

One of the major lessons learned from the historic 2012 through 2016 drought was that urban water suppliers, small water suppliers, and rural communities must strengthen both local drought resilience and the communication of response actions among various agencies and affected communities. Many urban water suppliers had implemented effective measures to minimize impacts from the drought; however, this outcome was not consistent throughout the state. SB 606 and AB 1668 provide new and expanded authorities and requirements to address these needs, as recommended in the 2017 Framework.

Under the new authorities and requirements, each urban wholesale and retail water supplier must prepare, adopt, and submit a Water Shortage Contingency Plan (WSCP) and conduct a Drought Risk Assessment (DRA) every five years in addition to conducting an annual water supply and demand assessment.[11]

Small water suppliers and rural communities are often more vulnerable during droughts because of their limited institutional and financial capacities to adapt to changed conditions. However, in recognition of potential diversity and jurisdictional complexities associated with drought planning in these areas, the 2017 Framework recommended allowing State agencies to work with local agencies, stakeholders, and communities on the development of more specific, functional recommendations. The new legislation requires DWR, in consultation with the State Water Board and stakeholders, to identify small suppliers and rural communities at risk of drought and water shortage vulnerability, and to develop by January 2020, recommendations to the Governor and Legislature for improving drought planning for those areas.

These new authorities and requirements for urban water suppliers and for small water systems and rural communities are summarized separately below.

URBAN WATER SUPPLIERS

Primarily through amending the Urban Water Management Planning Act (commencing with CWC §10610), SB 606 provides new and expanded authorities and requirements to strengthen local drought resilience for urban water suppliers, including wholesale and retail water suppliers, as well as public and private water suppliers. These are the same urban water suppliers required to submit UWMPs; that is, urban water suppliers providing either more than 3,000 acre-feet of water annually or with more than 3,000 urban connections.

[11] The annual water supply and demand assessment is the basis for the urban water supplier's annual water shortage assessment report.

Recognizing the needs for consistent and streamlined reporting requirements, SB 606 and AB 1668 include amendments for establishing consistent reporting requirements. As an example, SB 606 amends an existing UWMP requirement for a water supply reliability description for multiple dry years to be for a period of drought lasting five consecutive years, consistent with the methodology for the DRA (CWC §10631(f)[SB] and §10635[SB]).

New and Expanded Authorities

There are two categories of new and expanded authorities: one related to local planning requirements, and another related to coordinated implementation with delineated roles and responsibilities. Specifically, the legislation:

- Requires each urban water supplier to prepare, adopt, and periodically review a WSCP as part of its UWMP to describe the method, procedures, response actions, enforcement, and communications during six levels of water supply shortage conditions (CWC §10620(d)(2) and §10632[SB]).
- Requires each urban water supplier to conduct a DRA as part of its UWMP to assess water supply reliability (or vulnerability) for a period of drought lasting five consecutive water years starting the year following when the assessment is conducted, and considering both historical drought hydrology and reliability of each source of supply (CWC §10635(b)[SB]).

SB 606 recognizes that a regional approach to urban water management planning reduces costs and maximizes potential contributions to conservation, efficient water use, and improved local drought resilience. However, it emphasizes that each urban water supplier shall develop its own WSCP (CWC §10620(d)[SB]), consistent with the UWMP requirement (CWC §10620(a)[SB]).

To encourage an urban water supplier to remain vigilant as to its drought risks, SB 606 allows an urban water supplier to update its DRA within the 5-year cycle between UWMP updates (CWC §10635(b)[SB]).

Reporting Requirements

SB 606 adds new requirements and amends some existing requirements for urban water suppliers to prepare UWMPs to streamline the process and provide consistency with other provisions in SB 606 and AB 1668, as well as with other recent legislation (e.g., Sustainable Groundwater Management Act (SGMA), commencing with CWC §10720). The legislation:

- Requires each urban water supplier to update and submit its UWMP, by July 1 in years ending in 1 and 6, incorporating updated and new information from the 5 years preceding the plan update (CWC §10621(a)[SB]). The Legislature instituted several major changes in UWMP requirements for each supplier to:
    - Include in its UWMP a simple layperson's description of its water supply reliability conditions and its strategy for meeting future water supply reliability needs to provide a general understanding of its plan for overall urban water management (CWC §10630.5[SB]).
    - If groundwater is identified as an existing or planned source of water supply and the underlying groundwater basin is subject to SGMA, include the current version of any groundwater sustainability plan or alternative adopted for SGMA compliance and actions taken by the supplier in coordination with groundwater sustainability agencies or groundwater management agencies to maintain or achieve sustainable groundwater conditions (CWC §10631(b)(4)[SB]).

- Submit an updated WSCP to DWR within 30 days of its adoption (CWC §10644(b) SB). This requirement is made consistent with that for an adopted UWMP.
- Make the adopted WSCP available for public review within 30 days after submitting a copy to DWR. DWR is subject to the same requirement after receiving the WSCP (CWC §10645(b) SB). This requirement is made consistent with that for an adopted UWMP.

- Requires an urban water supplier, by June 1 of each year, to conduct an annual water supply and demand assessment pursuant to CWC §10632(a), and submit to DWR an annual water shortage assessment report with information on anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions as described in the WSCP. An urban water supplier that relies on imported water from the State Water Project or U.S. Department of the Interior, Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocation, or by June 1 of each year, whichever is later (CWC §10632.1 SB).

Coordinated Implementation

SB 606 provides complementary authorities and coordinated roles among different jurisdictions for implementation:

- Urban Water Suppliers:
  - Shall declare a water shortage emergency condition when available water supply is insufficient for human consumption, sanitation, and fire protection within its service area (CWC §350 SB).
  - Shall follow prescribed procedures and implement determined shortage response actions in its adopted WSCP where feasible and appropriate, or take reasonable alternative actions that are not specified in its WSCP, if needed, without amending its UWMP or WSCP, provided they are included in its annual water shortage assessment report (CWC §10632.2 SB).
- CPUC:
  - Shall request an urban water supplier include its most recent UWMP and WSCP as part of its general rate case filing (CWC §10621(c) SB).
- State Water Board:
  - Defer to implementation of locally-adopted WSCPs, to the extent practicable, during a state of emergency[12] based on drought conditions (CWC §10632.3 SB).

SB 606 specifies WSCP content requirements as the following (CWC §10632 SB):

- *Analysis of water supply reliability*
- *Procedures used for conducting an annual water supply and demand assessment*
- *Six standard water shortage levels or equivalent*
- *Shortage response actions*
- *Communication protocols and procedures*
- *Customer compliance, enforcement, appeal, and exemption procedures*
- *Legal authority*
- *Financial consequence*
- *Monitoring and reporting requirements and procedures*
- *Reevaluation and improvement procedures*

UWMP and WSCP adoption should follow applicable public notice, hearing, and adoption requirements. SB 606 encourages an urban water supplier to engage diverse social, cultural, and economic elements of the population within the service area when preparing its UWMP and WSCP (CWC §10641 and §10642 SB).

[12] Declared under the California Emergency Services Act (commencing with § 8550, Chapter 7 of Division 1 of Title 2 of the Government Code).

DWR will provide recommendations on how countywide drought and water shortage contingency plans can be included in county local hazard mitigation plans or otherwise integrated with complementary existing planning processes. DWR will also provide guidance that outlines goals of the countywide drought plans and WSCPs and recommend components including, but not limited to, all of the following (CWC 10609.42(b)[AB]):

1. *Assessment of drought vulnerability*
2. *Actions to reduce drought vulnerability*
3. *Response, financing, and local communication and outreach planning efforts that may be implemented in times of drought*
4. *Data needs and reporting*
5. *Roles and responsibilities of interested parties and coordination with other relevant water management planning efforts*

- DWR:
  - May adopt regulations deemed necessary or desirable to implement the Urban Water Management Planning Act and its subsequent amendments (CWC §10657[SB]).
  - Shall prepare and submit to the State Water Board, by September 30 of each year, an annual report on implementation summarizing (1) submitted water supply and demand assessment results and reported water shortage conditions, (2) regional and statewide analyses of water supply conditions developed by DWR, and (3) urban water supplier-specific information regarding various shortage response actions implemented as a result of annual water shortage assessments (CWC §10644(c)(1)(B)[SB]).

Legislative Oversight

SB 606 imposes additional legislative oversight by requesting DWR prepare and submit to the Legislature, by July 1 in years ending in 2 and 7, a report summarizing the adoption status of UWMPs and WSCPs (CWC §10644(c)(1)(A)[SB]). In addition, upon request by the Legislature, DWR shall prepare additional reports and data to support the Legislature in future hearings to review the effectiveness of UWMPs and WSCPs (CWC §10644(c)(1)(A)[SB]).

SMALL WATER SUPPLIERS AND RURAL COMMUNITIES

As demonstrated in the recent drought, small water systems and rural communities often are more vulnerable during droughts or other stressed water supply conditions because of their limited options and financial means. These small water systems and rural communities have vast diversity of geography, resources, and other characteristics. Therefore, to improve their drought resilience, they need to be anchored by and integrated with the capacity, function, and authority of the appropriate local jurisdictions for long-term effectiveness of drought preparedness and response measures.

The Legislature found that counties can have a significant role in improving drought planning for small water suppliers and rural communities. As a result, AB 1668 directs DWR, in consultation with the State Water Board, to develop recommendations and guidance to propose to the Governor and Legislature for addressing drought planning needs of small systems and rural communities throughout the state by January 1, 2020. As part of the recommendations development process, DWR shall use available data, in consultation with the State Water Board and other relevant state and local agencies and stakeholders, to identify water supply risks and vulnerabilities for small water suppliers and rural communities, and notify the public, counties, cities, and groundwater sustainability agencies of its findings (CWC §10609.42[AB]).

Milestone Schedule: Strengthen Local Drought Resilience

2020	Jan 1 – DWR identifies small water suppliers and rural communities at risk of drought and water shortage vulnerability, and makes notifications. Jan 1 – DWR proposes development and implementation of countywide drought and WSCPs for small water suppliers and rural communities to Governor and Legislature.
2021	Jul 1 – Urban water suppliers submit UWMP update with DRA and WSCP to DWR within 30 days of adoption.
2022	Jun 1[1,2] – Urban water suppliers submit annual water shortage assessment report[3] to DWR. Jul 1 – DWR submits UWMPs/WSCPs status report to Legislature. Sep 30 – DWR submits annual report to State Water Board.
2023	Jun 1[1,2] – Urban water suppliers submit annual water shortage assessment report[3] to DWR. Sep 30 – DWR submits annual report to State Water Board.
2024	Jan 1 – Urban water suppliers adopt and submit to DWR supplement to adopted 2020 UWMPs on water demand management measures to be implemented. Jun 1[1,2] – Urban water suppliers submit annual water shortage assessment report[3] to DWR. Sep 30 – DWR submits annual report to State Water Board.
2025	Jun 1[1,2] – Urban water suppliers submit annual water shortage assessment report[3] to DWR. Sep 30 – DWR submits annual report to State Water Board.
2026	Jun 1[1,2] – Urban water suppliers submit annual water shortage assessment report[3] to DWR. Jul 1[1,2] – Urban water suppliers submit UWMP update with DRA and WSCP to DWR within 30 days of adoption. Sep 30 – DWR submits annual report to State Water Board.
2027	Jun 1[1,2] – Urban water suppliers submit annual water shortage assessment report[3] to DWR. Jul 1 – DWR submits to Legislature UWMPs/WSCPs status progress report. Sep 30 – DWR submits annual report to State Water Board.

NOTE:

[1] For urban water suppliers that receive imported water, the due date is June 1 or 14 days after final allocation from State Water Project or U.S. Department of the Interior, Bureau of Reclamation, whichever is later.

[2] The inclusion of 2022 as the starting year is to match the availability of WSCPs that are to be adopted by urban water suppliers. DWR encourages urban water suppliers to conduct such assessments prior to 2022 and they may submit their information to DWR.

[3] The annual water supply and demand assessment is the basis for the urban water supplier's annual water shortage assessment report.

Improve Agricultural Water Use Efficiency and Drought Planning

05 Improve Agricultural Water Use Efficiency and Drought Planning

Agricultural communities were severely impacted in the recent drought, resulting in unsustainable groundwater use in some areas. Based on recommendations in the 2017 Framework, AB 1668 provides new authorities to add requirements for improving agricultural water use efficiency and drought planning by requiring a water budget-based approach to water management that is consistent with SGMA implementation, and by requesting the addition of a drought plan as part of an agricultural water supplier's agricultural water management plan (AWMP).

The schedule for an agricultural water supplier to complete, adopt, and submit its AWMP was changed to April 1 in years ending in 1 and 6. Agricultural water suppliers that are subject to AWMP and other reporting requirements are those providing water to more than 10,000 irrigated acres (excluding acreage irrigated with recycled water). However, as stated in CWC §10853, an agricultural water supplier that provides water to less than 25,000 irrigated acres, excluding recycled water, shall not be subject to the requirements unless sufficient funding has specifically been provided to that water supplier for the purpose of compliance with AWMP requirements. DWR will solicit input and feedback from stakeholders during the development of guidelines for preparation of AWMPs.

AGRICULTURAL WATER MANAGEMENT PLANS

As part of its AWMP, AB 1668 requires an agricultural water supplier to:

- Develop an **annual water budget** based on the quantification of all inflow and outflow components for the agricultural water supplier's service area. DWR is to provide tools and resources to assist agricultural water suppliers in developing and quantifying the components necessary to develop a water budget (CWC §10826(c) AB).
- Identify water management objectives based on the water budget and develops, prioritizes, and implements actions to meet those objectives and reduce water loss (CWC §10826(f) AB).
- Quantify the efficiency of agricultural water use in the service area using one of four methods published in DWR's 2012 report to the Legislature entitled "A Proposed Methodology for Quantifying Efficiency of Agricultural Water Use" (CWC §10826(h) AB).
- Include a drought plan for periods of limited water supply that contains resilience planning and drought response planning components describing actions by the agricultural water supplier for drought preparedness and management of water supplies and allocations during drought conditions (CWC §10826.2 AB).

Milestone Schedule: Improve Agricultural Water Use Efficiency and Drought Planning

2019	Apr 1 – Agricultural water suppliers submit annual farm-gate delivery data to DWR.
2020	Apr 1 – Agricultural water suppliers submit annual farm-gate delivery data to DWR.
2021	Apr 1 – Agricultural water suppliers submit annual farm-gate delivery data to DWR. Apr 1 – Agricultural water suppliers update AWMPs and submit no later than 30 days after adoption. Dec 31 - DWR submits status report on efficient water management practices to Legislature.
2022	Apr 1 – Agricultural water suppliers submit annual farm-gate delivery data to DWR. Apr 30 – DWR submits status report on AWMPs to Legislature.
2023	Apr 1 – Agricultural water suppliers submit annual farm-gate delivery data to DWR.
2024	Apr 1 – Agricultural water suppliers submit annual farm-gate delivery data to DWR.
2025	Apr 1 – Agricultural water suppliers submit annual farm-gate delivery data to DWR.
2026	Apr 1 – Agricultural water suppliers submit annual farm-gate delivery data to DWR. Apr 1 – Agricultural water suppliers update AWMPs and submit no later than 30 days after adoption. Dec 31 – DWR submits status report on efficient water management practices to Legislature.
2027	Apr 1 – Agricultural water suppliers submit annual farm-gate delivery data to DWR. Apr 30 – DWR submits status report on AWMPs to Legislature.

AB 1668 specifies content requirements of an agricultural water supplier's drought plan as the following (CWC §10826.2 AB):

- *Resilience planning*
  - *Data, indicators, and information needs*
  - *Methods and procedures for vulnerability assessment*
  - *Opportunities and constraints for improving resilience planning*
- *Drought response planning*
  - *Policies and a process for water shortage declaration*
  - *Methods and procedures for enforcement, appeal of, or exemption from triggered shortage response actions*
  - *Methods and procedures for monitoring and evaluation of plan effectiveness*
  - *Communication protocols and procedures*
  - *Revenue stabilization measures*

REPORTING REQUIREMENTS

AB 1668 adds additional specifications on the farm-gate delivery reporting for agricultural water suppliers that provide 2,000 acre-feet or more of surface water annually for agricultural purposes or serve 2,000 or more acres of agricultural land, as defined in CWC §531(b). Specifically, AB 1668 requires each agricultural water supplier to:

- Submit to DWR, by April 1 of each year, annual aggregated farm-gate delivery data organized by groundwater basin or sub-basin, if applicable, using electronic standardized formats specified by DWR (CWC §531.10 AB).

AB 1668 also amends reporting requirements for agricultural water suppliers that provide water to 10,000 or more irrigated acres, excluding recycled water. The legislation requires each agricultural water supplier to:

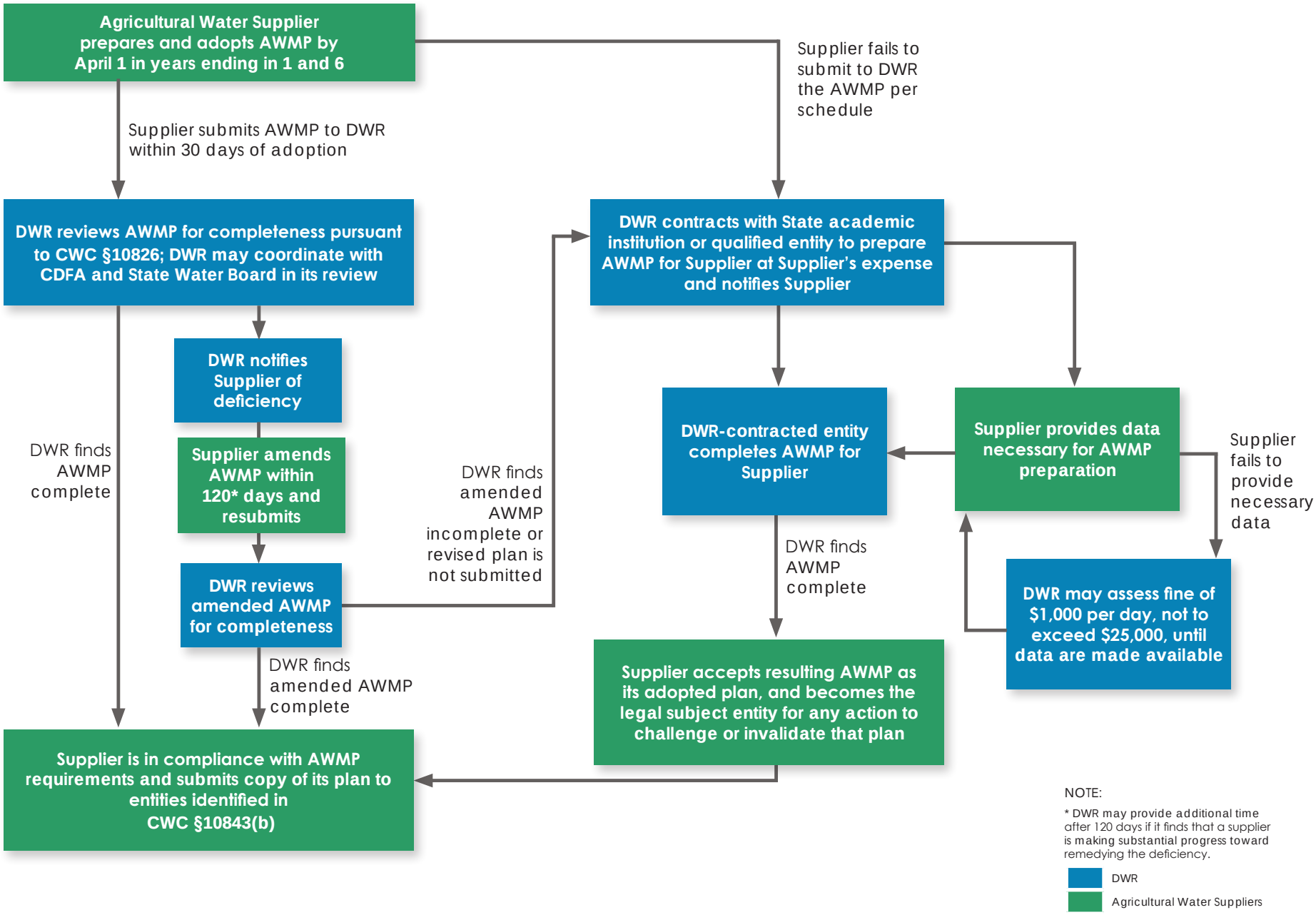
- Use a standardized form specified by DWR to report implemented efficient water management practices as requested by existing law (CWC §10608.48(e) AB).
- Adopt its AWMP, by April 1 in years ending in 1 and 6, with additional provisions for submission, review, and enforcement as depicted in the flowchart on the following page (CWC §10820 AB). The next deadline for adoption of an updated AWMP that satisfies the new requirements is April 1, 2021.

To accommodate the AWMP adoption deadline change, AB 1668 modifies DWR's reporting requirement to submit a report summarizing the status of AWMP adoptions by April 30, 2022, and thereafter in the years ending in 2 and 7 (CWC §10845 AB).

ADOPTION, REVIEW, AND ENFORCEMENT

AB 1668 provides new authorities and requirements for adoption and review of AWMPs, and for enforcement actions against non-compliant agricultural water suppliers. Under AB 1668, an agricultural water supplier shall submit its adopted AWMP to DWR no later than 30 days after adoption. Based on DWR's review, certain enforcement actions may be imposed by compelling data submittal with penalty or by referring to another entity to prepare the AWMP at the water supplier's expense (CWC §10820 AB). The flowchart on the following page shows the process for AWMP adoption, review, and enforcement.

Requirements for Agricultural Water Management Plan Preparation and Adoption by Agricultural Water Suppliers, and DWR's Review and Potential Enforcement Actions (CWC §10820 AB)



Implementation Schedule

06 Implementation Schedule

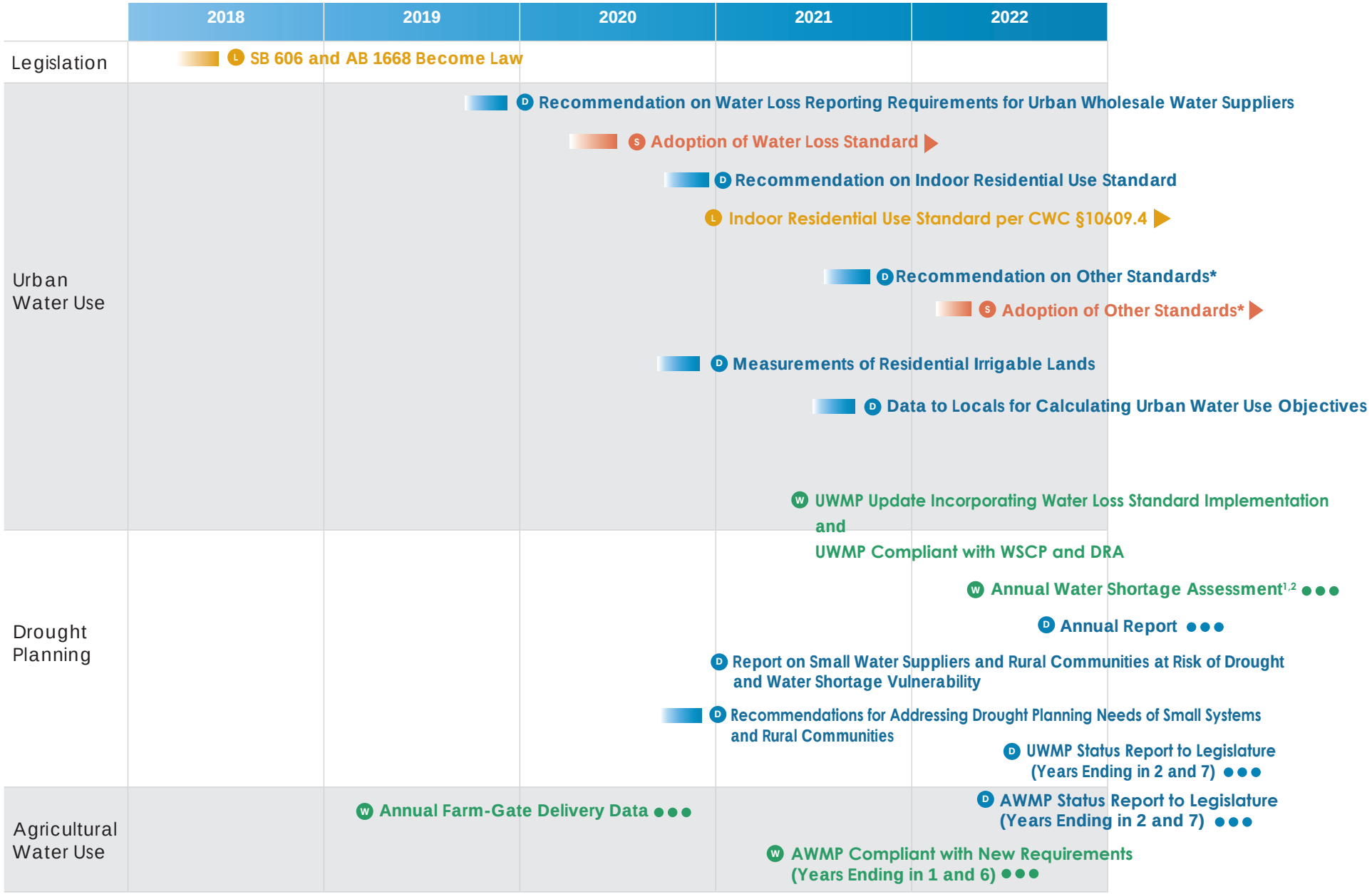
SB 606 and AB 1668 provide new and expanded authorities and requirements for long-term water conservation. A high-level schedule of major milestones established in SB 606 and AB 1668 is presented on the following pages. **Appendix A** includes additional details on the mandated schedule, requirements, milestones, and corresponding roles and responsibilities.

Appendix B includes a list of major State agency tasks to meet the new requirements associated with implementing SB 606 and AB 1668. **Appendix C** includes a list of major water supplier tasks to meet the new requirements associated with implementing SB 606 and AB 1668.

DWR and the State Water Board continue to implement existing requirements under SB X7-7 and SB 555. To satisfy SB 606 and AB 1668, DWR, in coordination with the State Water Board, is formulating a work and communication plan for developing datasets, information, guidance, and recommendations that are required by the legislation over the next few years. This work and communication will include (1) broad stakeholder engagement, (2) enhancement of DWR and the State Water Board's organizational capacities to accommodate the expanded scopes and responsibilities related to both technical and as-needed compliance assistance, and (3) collaboration and coordination with other State agencies for implementing the 2018 legislation.

SB 606 and AB 1668 include requirements for public access to data and their use, as well as related studies, reports, and investigations. Both DWR and the State Water Board currently provide public access to data and information and will continue to do so.

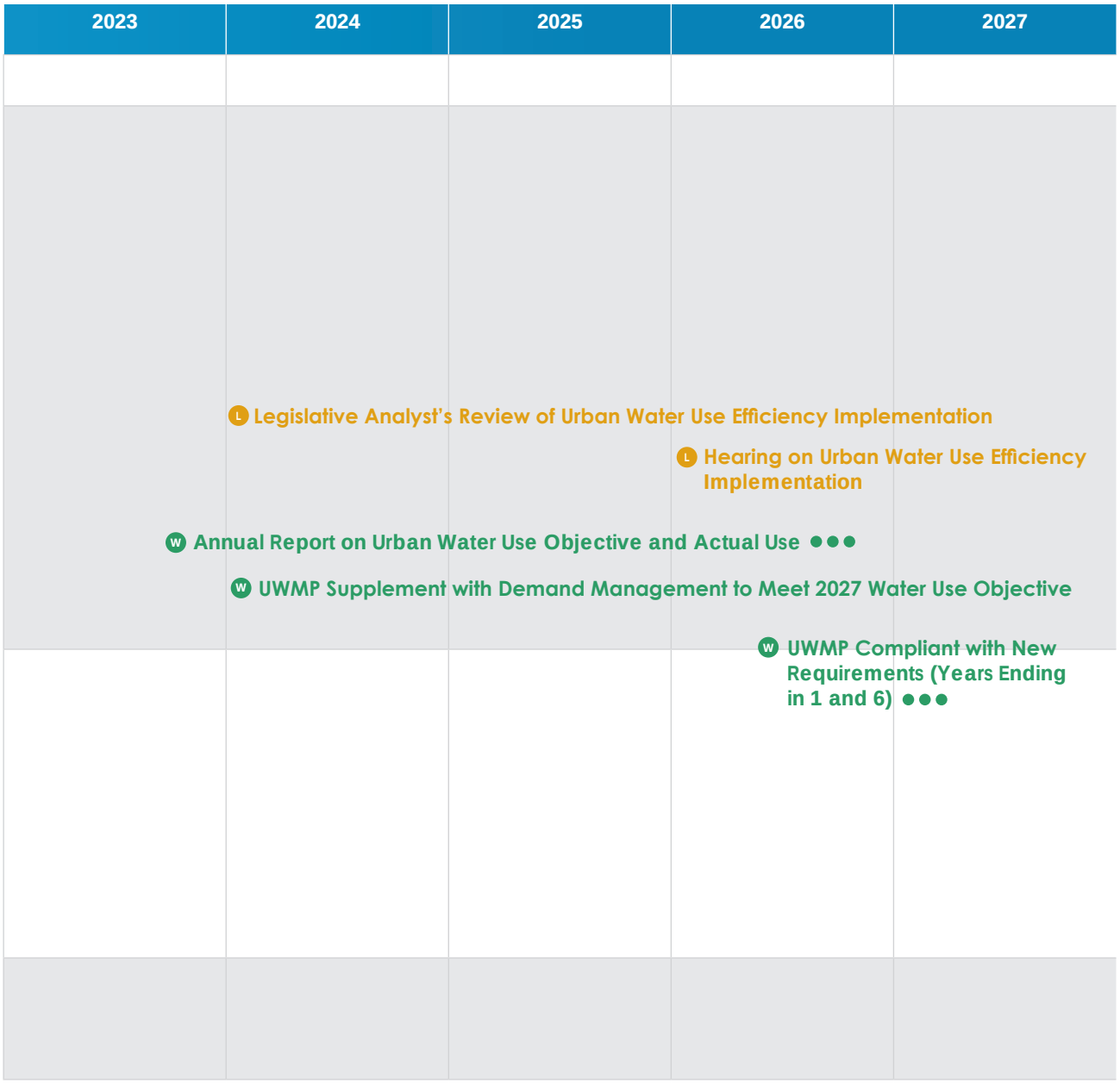
High-Level Schedule of Major Milestones Established in SB 606 and AB 1668



NOTE:

[1] For urban water suppliers that receive imported water, the due date is June 1 or 14 days after final allocation from State Water Project or U.S. Department of the Interior, Bureau of Reclamation, whichever is later. The inclusion of 2022 as the starting year is to match the availability of WSCPs that are to be adopted by urban water suppliers.

[2] DWR encourages urban water suppliers to conduct such assessments prior to 2022 and submit their information to DWR.



LEAD ENTITY LEGEND

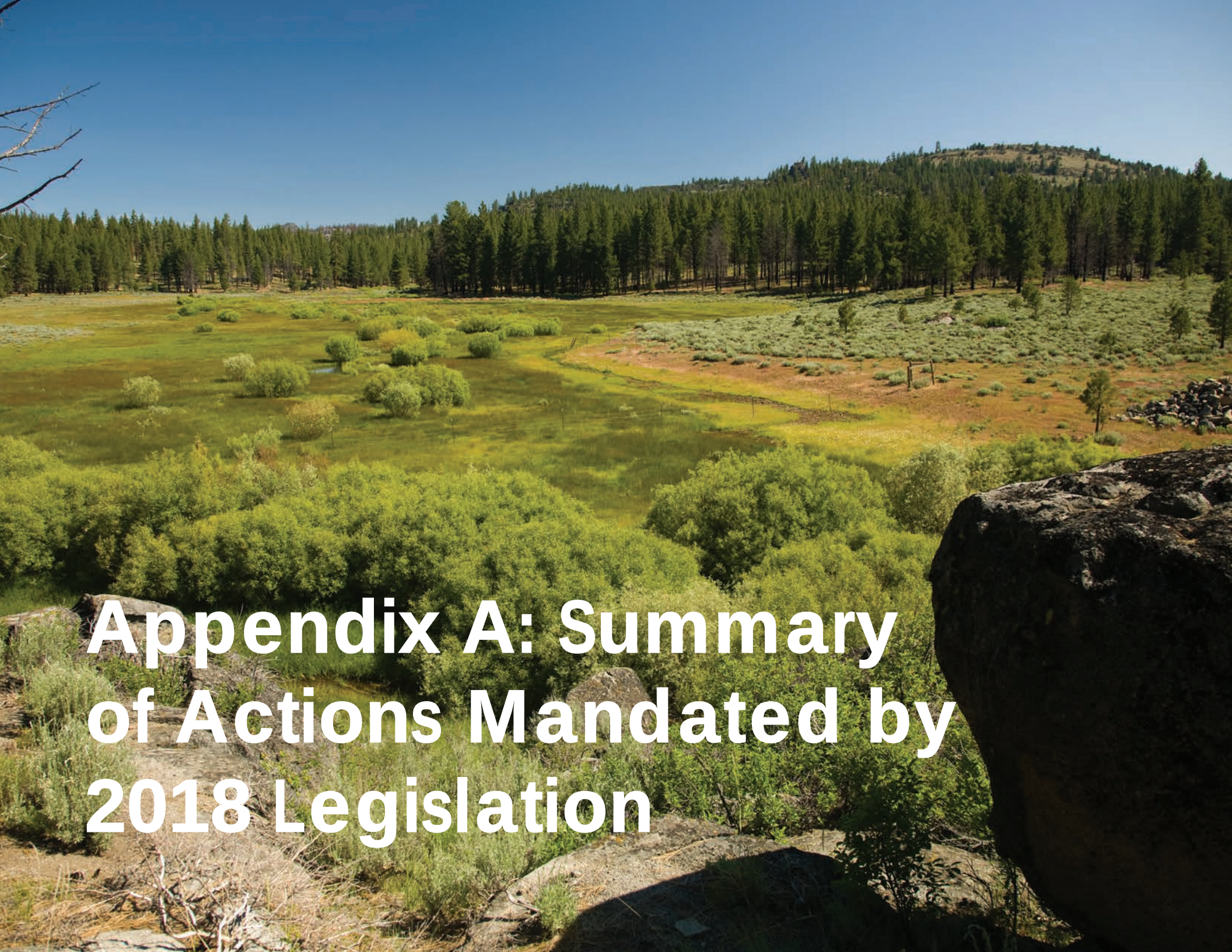
- L Legislature
- D DWR
- S State Water Board
- W Water Supplier

ACTIVITY LEGEND

- Coordination and Engagement (Length not to scale)
- ● Action/Submittal/Product
- ▶ Continued Implementation
- ●●● Repeated Requirements

NOTE:

* Other standards means:
  - Outdoor residential use standard
  - Standard for CII outdoor landscape area with dedicated irrigation meters
  - Performance measures for CII water use
  - Appropriate variances
  - Guidelines and methodologies for calculating urban water use objectives



Appendix A: Summary of Actions Mandated by 2018 Legislation

Appendix A **Summary of Actions Mandated by 2018 Legislation**

The following table identifies actions and entities with roles that are specified in Senate Bill (SB) 606 (Hertzberg) and Assembly Bill (AB) 1668 (Friedman). The California Department of Water Resources (DWR) and State Water Resources Control Board (State Water Board) recognize that stakeholder engagement, participation, coordination, and collaboration will be needed for development and implementation of mandated actions. The 2018 legislation includes many actions without a specific due date and some are sequentially dependent. The actions in this table are sorted chronologically with sequentially-dependent actions grouped together. The legislation also requires broad stakeholder and public participation during implementation. However, this table only includes "PP" (public participation) where those stakeholder interactions are explicitly called out in the legislation.

- **L** = Lead agency; Lead agency is responsible for implementing action.
- **CR** = Coordinating agency; Lead agency will coordinate with this particular agency to implement action.
- **CS** = Consulting agency; Lead agency will consult with this particular agency to implement action.
- **PP** = Public participation; Lead agency will solicit broad public and stakeholder participation throughout implementation.

Due Date	Action	CWC Section	Role of Entity						Related Existing Authorities and Requirements
			DWR	State Water Board	Legislative Analyst	Urban Retail Water Supplier	Agricultural Water Supplier	Stakeholders/ Public	
USE WATER MORE WISELY									
Jan 1, 2021	DWR, in coordination with the State Water Board, shall conduct the necessary studies and investigations to develop recommendations to the Legislature on standards for indoor residential use that include benefit and impact assessments for applying such standards. The studies and investigations shall be conducted with input from a broad group of stakeholders.	10609.4(b)	L	CR				PP	None.
Jan 1, 2021	DWR shall report the results of the studies and investigations on indoor residential water use to each house of the Legislature. DWR and the State Water Board may jointly recommend a new standard for indoor residential water use to the Legislature.	10609.4(b)	L	L	PP			PP	None.
Jan 1, 2021	DWR shall provide urban retail water suppliers with data regarding the area of residential irrigable lands with sufficient validation for accuracy for implementation of the residential outdoor standards.	10609.6(b); 10609(c)	L						None.

Due Date	Action	CWC Section	Role of Entity						Related Existing Authorities and Requirements
			DWR	State Water Board	Legislative Analyst	Urban Retail Water Supplier	Agricultural Water Supplier	Stakeholders/ Public	
Oct 1, 2021	DWR, in coordination with the State Water Board, shall conduct necessary studies and investigations to develop recommendations for standards for outdoor residential water use that incorporate the MWELO. The standards shall apply to residential irrigable lands and include provisions for residential water features.	10609.6; 10609.9	L	CR					None.
Oct 1, 2021	DWR, in coordination with the State Water Board, shall conduct necessary studies and investigations to develop recommendations for standards for outdoor irrigation of landscape areas with dedicated irrigation meters or other means of calculating outdoor irrigation use in connection with CII water use for adoption by the State Water Board. The standards shall incorporate the MWELO principles and exclude commercial agricultural use.	10609.8; 10609.9	L	CR					Section 10608.20(a)(2)(C)
Oct 1, 2021	DWR, in coordination with the State Water Board, shall conduct necessary studies and investigations on performance measures for CII water use. DWR, in coordination with the State Water Board, shall conduct broad public participation from stakeholders on the following: CII water use classification system, minimum size thresholds for converting mixed CII meters to dedicated irrigation meters, technologies that can be used in lieu of required dedicated irrigation meters, and CII water use best management practices.	10609.10(a) and (b)	L	CR				PP	Section 10608.20(a)(2)(C)
Oct 1, 2021	DWR, in coordination with the State Water Board, shall recommend performance measures for CII water use that includes a CII water use classification system for significant water uses, the thresholds for requirement of a dedicated irrigation meter, and best management practices.	10609.10(a)	L	CR				PP	Section 10608.20(a)(2)(C)

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Due Date	Action	CWC Section	Role of Entity						Related Existing Authorities and Requirements
			DWR	State Water Board	Legislative Analyst	Urban Retail Water Supplier	Agricultural Water Supplier	Stakeholders/ Public	
Jun 30, 2022	State Water Board, in coordination with DWR, shall adopt CII water use performance measures.	10609.10(d)(1)	CR	L					Section 10608.20(a)(2)(C)
After Jun 30, 2022[1]	Urban retail water suppliers shall implement the CII performance measures adopted by the State Water Board.	10609.10(d)(2)				L			Section 10608.20(a)(2)(C)
Oct 1, 2021	DWR, in coordination with the State Water Board, shall develop appropriate variances for unique uses that can have a material effect on an urban retail water supplier's urban water use objective and the corresponding thresholds of significance for each recommended variance.	10609.14	L	CR					None.
Not Specified	State Water Board, in coordination with DWR, shall adopt by regulation variances recommended by DWR.	10609.2(e)	CR	L					None.
Not Specified	State Water Board shall post on its website a list of urban retail water suppliers with approved variances, the specific variance or variances approved for each urban retail water supplier, and the data supporting approvals of each variance.	10609.14(e)		L					None.
Not Specified	Urban retail water agencies shall request and receive approval by the State Water Board prior to including any specific variances in calculating an urban retail water agency's water use objective.	10609.14(d)		L		L			None.

NOTE:

[1] Action will be implemented after performance measures for CII water use are adopted by the State Water Board. Pursuant to Section 10609.10(d)(1), the State Water Board shall adopt performance measures for CII water use on or before June 30, 2022.

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Due Date	Action	CWC Section	Role of Entity						Related Existing Authorities and Requirements
			DWR	State Water Board	Legislative Analyst	Urban Retail Water Supplier	Agricultural Water Supplier	Stakeholders/ Public	
Not Specified	DWR and the State Water Board shall publicly publish the urban water use reporting requirements commonly required by both agencies and implement actions for improved data publication and public accessibility, including the following: how each agency can integrate various datasets in a publicly accessible location, and identify and implement priority actions.	10609.15	L	L					Section 10608.52(a)
Oct 1, 2021	DWR, in coordination with the State Water Board, shall develop guidelines and methodologies that identify how an urban retail water supplier calculates its urban water use objective.	10609.16	L	CR					None.
Not Specified	DWR shall provide, or otherwise identify, data related to unique local conditions to support the calculation of an urban water use objective.	10609(b)(2)(C)	L						None.
Not Specified	State Water Board, in coordination with DWR, shall adopt by regulation guidelines and methodologies recommended by DWR pertaining to the calculation of an urban retail water supplier's urban water use objective.	10609.2(e)	CR	L					None.
Nov 1, 2023, and annually thereafter	Each urban retail water supplier shall calculate its urban water use objective no later than November 1, 2023 and November 1 each year thereafter.	10609.20				L			None.
May 30, 2022	State Water Board, in coordination with DWR, shall identify the proposed standards for 1) outdoor residential water use, and 2) outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use for public comments. State Water Board, in coordination with DWR, shall consider the proposed standards' potential effects on local wastewater management, developed and natural parklands, and urban tree health.	10609.2(b)(3) and (c)	CR	L				PP	None.

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Due Date	Action	CWC Section	Role of Entity						Related Existing Authorities and Requirements
			DWR	State Water Board	Legislative Analyst	Urban Retail Water Supplier	Agricultural Water Supplier	Stakeholders/ Public	
Not Specified	State Water Board shall hold at least one public meeting before taking any action on any standard/variance recommended by DWR.	10609.18		L				PP	None.
Jun 30, 2022	State Water Board, in coordination with DWR, shall adopt urban water use standards, performance measures (CII only), and related methodology and guidance.	10609.2(a) and (b); 10609.10(d)(1); 10609.16	CR	L					Section 10608.20(a)(2)(C)
Not Specified	DWR may adopt regulations regarding definitions of water, water use, and reporting periods. DWR shall solicit broad public participation to develop the definitions.	10657	L					PP	None.
Nov 1, 2023, and annually thereafter	Urban water suppliers shall submit annual reports to DWR by November 1, 2023 and by November 1 of each year thereafter on urban water use objectives, actual urban water use, implementation of CII water use performance measures, and progress towards urban water use objective.	10609.24(a)				L			None.
Nov 1, 2023, and annually thereafter	DWR shall post annual urban water use reports and information received from urban retail water suppliers.	10609.24(b)	L						None.
On or after Nov 1, 2023	State Water Board may issue an informational order on water production, water use, and water conservation to urban retail water suppliers not meeting their water use objective in order to identify technical assistance needs.	10609.26(a)(1); 10609.24(c)		L					None.
Jan 1, 2024	Urban water suppliers shall adopt and submit to DWR a supplement to their adopted 2020 UWMPs on implementation of demand management measures to achieve their urban water use objective.	10621(f)(2); 10631(e)(1)(B)				L			None.

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Due Date	Action	CWC Section	Role of Entity						Related Existing Authorities and Requirements
			DWR	State Water Board	Legislative Analyst	Urban Retail Water Supplier	Agricultural Water Supplier	Stakeholders/ Public	
On or after Nov 1, 2024	State Water Board may issue a written warning notice to urban retail water suppliers not meeting their water use objective.	10609.26(b)		L					None.
On or after Nov 1, 2025	State Water Board may issue a conservation order to urban retail water suppliers not meeting their water use objective. The order may consist of referral to DWR for technical assistance, requirements for education and outreach, requirements for local enforcement, and other efforts to assist urban retail water suppliers in meeting their water use objective.	10609.26(c)		L					None.
On or around Jan 10, 2024	Legislative Analyst shall provide a report to both houses of the Legislature and the public a report evaluating the implementation of the water use efficiency standards and water use reporting. DWR and the State Water Board shall provide the necessary data to the Legislative Analyst for the report.	10609.30	CR	CR	L				None.
Jan 1, 2026	DWR Director and State Water Board Chairperson shall appear before the appropriate policy committees of both houses of the Legislature and report on implementation of the urban water use standards and water use reporting requirements.	10609.32	L	L					None.
Jan 1, 2027	Urban retail water suppliers shall achieve urban water use objectives by Jan 1, 2027.	10631(e)(1)(B)				L			None.

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Due Date	Action	CWC Section	Role of Entity						Related Existing Authorities and Requirements
			DWR	State Water Board	Legislative Analyst	Urban Retail Water Supplier	Agricultural Water Supplier	Stakeholders/ Public	
ELIMINATE WATER WASTE									
Jan 1, 2020	DWR, in coordination with the State Water Board, shall conduct studies and investigations and make recommendation to Legislature on the feasibility of developing and enacting water loss reporting requirements for urban wholesale water suppliers. DWR, in coordination with the State Water Board, shall solicit broad stakeholder participation.	10608.35	L	CR				PP	Section 10608.34
Jun 30, 2022	Standards for volume of water loss adopted by State Water Board, in coordination with DWR, pursuant to CWC §10608.34, are used for calculation of urban water use objective.	10609.2(a)	CR	L					Section 10608.34
Jul 1, 2021, and each update thereafter	Urban retail water suppliers shall include in their UWMPs information on whether the supplier met its distribution loss standards.	10631(d)(3)(C)				L			Section 10631
STRENGTHEN LOCAL DROUGHT RESILIENCE									
July 1, 2021, and every five years thereafter	Urban water suppliers shall update, adopt, and submit to DWR UWMPs by July 1 in years ending in six and one. If regulated by the California Public Utilities Commission, most recent plan and WSCP to be included in supplier's general rate case filings. UWMPs must include a drought risk assessment for water service area.	10621(a); 10621(c); 10635(b); 10642				L		PP	Section 106.21(a); Section 10631
Jan 1, 2024	Urban water suppliers shall adopt and submit to DWR a supplement to the adopted 2020 UWMPs on water demand management measures to be implemented and compliance.	10621(f)(2)				L			None

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Due Date	Action	CWC Section	Role of Entity						Related Existing Authorities and Requirements
			DWR	State Water Board	Legislative Analyst	Urban Retail Water Supplier	Agricultural Water Supplier	Stakeholders/ Public	
Jun 1, 2022[2], and annually thereafter	Urban water suppliers shall conduct annual water supply and demand assessment by June 1 of each year and submit annual water shortage assessment report to DWR. If receiving water from the State Water Project or the Bureau of Reclamation, urban water suppliers shall submit annual water supply and demand assessment within 14 days of receiving its final allocations, or by June 1 of each year, whichever is later.	10632.1				L			None.
Jan 1, 2020	DWR, in consultation with the State Water Board, shall identify small water suppliers and rural communities that may be at risk of drought and water shortage vulnerability. DWR, in consultation with the State Water Board, shall notify counties/ groundwater sustainability agencies and make information available to the public on its website.	10609.42(a)	L	CS				CS	None.
Not Specified	Urban water suppliers shall include WSCP in UWMPs. Urban water suppliers may work with others participating in area-wide, regional, watershed, or basin-wide UWMP, AWMP, or groundwater sustainability plan development.	10620(d)(2); 10632(a)				L			Section 10632

NOTE:

[2] The inclusion of 2022 as the starting year is to match the availability of WSCPs that are to be adopted by urban water suppliers. DWR encourages urban water suppliers to conduct such assessments prior to 2022 and submit their information to DWR.

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Due Date	Action	CWC Section	Role of Entity						Related Existing Authorities and Requirements
			DWR	State Water Board	Legislative Analyst	Urban Retail Water Supplier	Agricultural Water Supplier	Stakeholders/ Public	
Jan 1, 2020	DWR, in consultation with the State Water Board, shall propose to the Governor and Legislature development and implementation of countywide drought and WSCPs for small water suppliers and rural communities. DWR, in consultation with the State Water Board, shall recommend how to include countywide drought and WSCPs in county local hazard mitigation plans or other processes. DWR's guidelines, developed in consultation with the State Water Board, shall outline goals of countywide drought and WSCPs and recommend components for the plan.	10609.42 (b)	L	CS				PP	None.
Jul 1, 2022, and every five years thereafter	DWR must include WSCPs in a report on status of UWMP adoption to the Legislature, and submit the report on or before July 1 in years ending in seven and two. DWR, in coordination with the State Water Board, shall provide a copy of the report to each urban retail water supplier concerned. DWR shall also prepare a report and provide data for any Legislative hearings, on request.	10644(c)(1)(a)	L						Section 10231.5
Sept 30, 2022, and annually thereafter	DWR must prepare and submit an annual report to the State Water Board summarizing water supply and demand assessment results, reported water shortage conditions, and regional and statewide analysis of water supply conditions by September 30 of every year.	10644(c)(1)(b)	L						None.

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Due Date	Action	CWC Section	Role of Entity						Related Existing Authorities and Requirements
			DWR	State Water Board	Legislative Analyst	Urban Retail Water Supplier	Agricultural Water Supplier	Stakeholders/ Public	
IMPROVE AGRICULTURAL WATER USE EFFICIENCY AND DROUGHT PLANNING									
Apr 1, 2019, annually thereafter	Agricultural water suppliers shall submit an annual report to DWR summarizing aggregated farm-gate delivery data on a monthly or bimonthly basis organized by basin by April 1 of each year.	531.10(a)(1)					L		Section 531.10.(a)
Annually	DWR shall post all aggregated farm-gate delivery reports on its website in a timely manner.	531.10(a)(3)	L						Section 531.10.(a)
Apr 1, 2021, and every five years thereafter	Agricultural water suppliers shall update AWMPs with newly required content and submit AWMPs to DWR by April 1, 2021. AWMPs shall be updated thereafter in years ending in six and one. Prior to adopting AWMPs, the agricultural water supplier shall make the proposed plan available for public inspection, and shall hold a public hearing on the plan.	10820(a)(2)(A) and (B); 10826.2; 10841					L		Section 18020; Section 10826
Every five years	DWR shall review submitted AWMPs, in coordination with the California Department of Food and Agriculture and the State Water Board, and notify non-compliant suppliers and identify specific deficiencies. The supplier shall have 120 days to remedy an identified deficiency. DWR, in coordination with the State Water Board, shall take action against and penalize suppliers either not submitting a plan or submitting a non-compliant plan and failing in revisiting it.	10820(b)	L	CR					None.

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CS = Consulting agency; Lead agency will consult with this particular agency to implement action

Due Date	Action	CWC Section	Role of Entity						Related Existing Authorities and Requirements
			DWR	State Water Board	Legislative Analyst	Urban Retail Water Supplier	Agricultural Water Supplier	Stakeholders/ Public	
Apr 30, 2022, and every five years thereafter	DWR shall submit a report on the status of AWMP adoption to the Legislature due April 30, 2022 and thereafter in the years ended in seven and two. DWR shall provide a copy of the report to each agricultural water supplier concerned, and shall also prepare reports and provide data for legislative hearings on request.	10845(a)	L						Section 10845(a)

KEY:

AWMP = Agricultural Water Management Plan

Bureau of Reclamation = U.S. Department of the Interior, Bureau of Reclamation

CII = commercial, industrial, and institutional

CR = Coordinating agency; Lead agency will coordinate with this particular agency to implement action

CS = Consulting agency; Lead agency will consult with this particular agency to implement action

CWC = California Water Code

DWR = California Department of Water Resources

L = Lead agency; Lead agency is responsible for implementing action

Legislature = California State Legislature

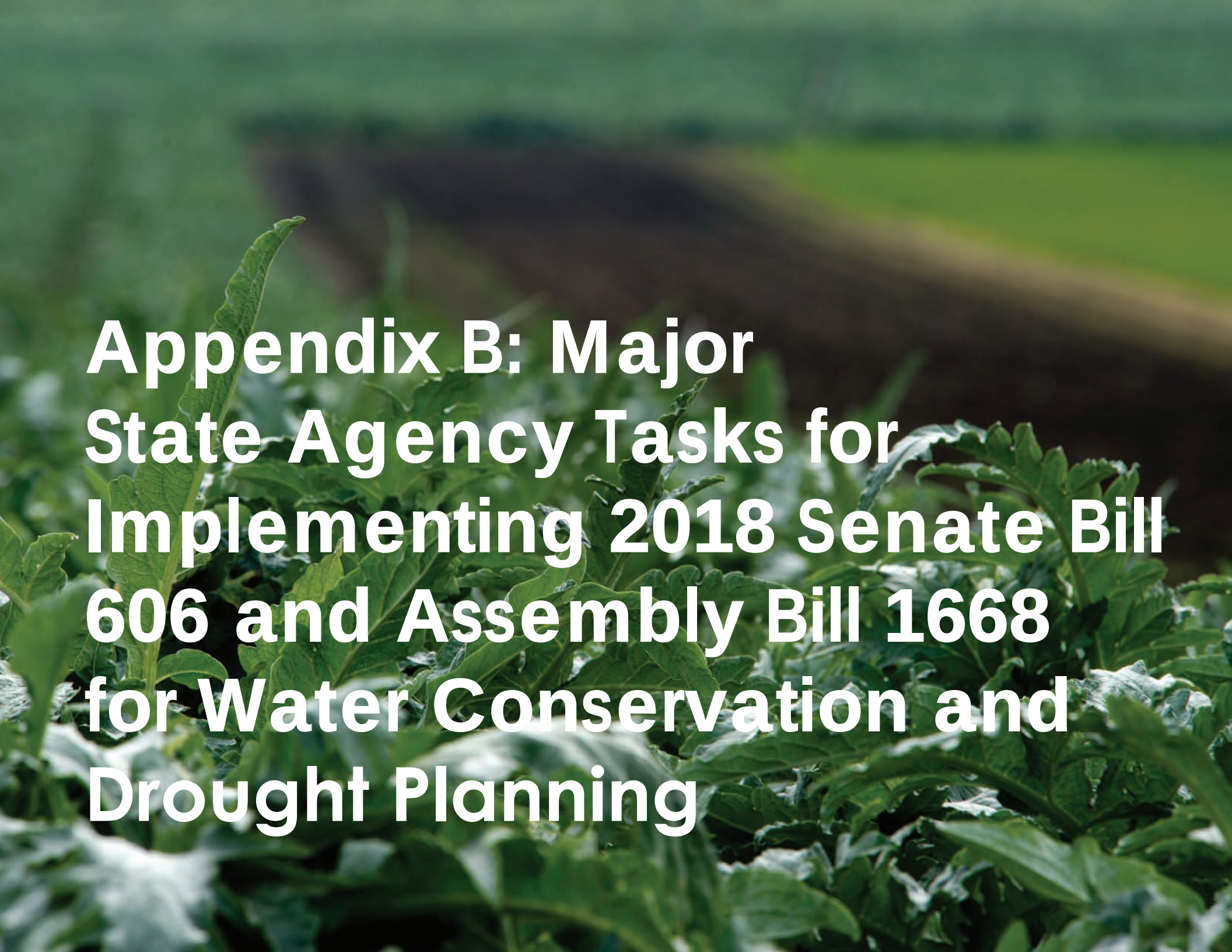
MWELO = Model Water Efficient Landscape Ordinanc

PP = Public participation; Lead agency will solicit broad public and stakeholder participation throughout implementation

State Water Board = State Water Resources Control Board

UWMP = Urban Water Management Plan

WSCP = Water Shortage Contingency Plan



Appendix B: Major State Agency Tasks for Implementing 2018 Senate Bill 606 and Assembly Bill 1668 for Water Conservation and Drought Planning

Appendix B Major State Agency Tasks for Implementing 2018 Senate Bill 606 and Assembly Bill 1668 for Water Conservation and Drought Planning

The California Department of Water Resources (DWR) and State Water Resources Control Board (State Water Board) have compiled a list of major tasks with deliverables and products to meet the new requirements associated with implementing Senate Bill (SB) 606 (Hertzberg) and Assembly Bill (AB) 1668 (Friedman) (see Table B-1). Table B-1 only includes deadlines that are specified in the legislation. In other instances, "TBD" is listed. Table B-2 presents the State Water Board's actions related to compliance and enforcement and drought planning.

DWR and the State Water Board will solicit input and feedback from stakeholders during task execution through the formation and conduct of advisory groups as well as other public venues. More information on these groups and venues will be available during implementation.

In chronological order by topic, the major tasks for DWR and the State Water Board, include:

Table B-1. SB 606 and AB 1668
Major Tasks[1] for DWR and State Water Board

Task #	Description	Deadline	Agency(ies)	CWC Section
Urban Water Use and Drought Planning				
1	May adopt regulation on monthly report relating to water production, water use or water conservation.	No date specified; After Jan 1, 2019	State Water Board	10609.28 SB
2	Streamline water suppliers' data reporting and make submitted data publicly available and accessible.	No date specified; begin data review and analysis Jul 2019	State Water Board and DWR	10609.15 AB
3	Recommend to Legislature feasibility of extending water loss reporting requirements to urban wholesale water suppliers.	Jan 1, 2020	DWR in coordination with State Water Board	10608.35(a) SB
4	Adopt water loss standard for urban retail water suppliers.	Jul 1, 2020	State Water Board	10631(d)(3)(C) SB; 10609.2 AB
5	Update UWMP Guidebook and Templates for new water shortage contingency planning, drought risk assessment, and other requirements (e.g., water loss standard implementation if not updated previously).	No date specified; TBD, prior to Jul 2021	DWR	10632 SB; 10631(d)(3) SB

NOTES:

[1] The list of major tasks includes tasks with major deliverables and products required by the new legislation, and other tasks deemed by DWR and the State Water Board necessary to implement the legislation. The detailed requirements on coordination with other state and local government agencies and stakeholders are not elaborated in the list but will be incorporated in task execution.

Table B-1. SB 606 and AB 1668 Major Tasks[1] for DWR and State Water Board				
Task #	Description	Deadline	Agency(ies)	CWC Section
Urban Water Use and Drought Planning (Continued)				
6	Recommend to Legislature indoor residential water use efficiency standards based on indoor residential water use study.	Jan 1, 2021	DWR in coordination with State Water Board	10609.4(b)(1) AB
7	Provide residential irrigable landscape area measurement to urban retail water suppliers.	Jan 1, 2021	DWR	10609.6(b) AB
8	Provide data regarding unique local conditions to support calculation of urban water use objective, including CIMIS dataset improvement and population data.	No date specified; TBD, prior to Oct 1, 2021, to match date for recommending standards	DWR	10609(b)(2)(c) AB
9	Develop and recommend to State Water Board outdoor residential water use efficiency standards.	Oct 1, 2021	DWR in coordination with State Water Board	10609.6(a)(1) AB
10	Develop and recommend to State Water Board CII water use standard for outdoor irrigation of landscapes with dedicated meters.	Oct 1, 2021	DWR in coordination with State Water Board	10609.8(a) AB
11	Develop and recommend to State Water Board on CII performance measures.	Oct 1, 2021	DWR in coordination with State Water Board	10609.10(a) AB
12	Develop and recommend to State Water Board on variances.	Oct 1, 2021	DWR in coordination with State Water Board	10609.14(a) AB
13	Develop and recommend to State Water Board guidelines and methodologies for water use objective calculation.	Oct 1, 2021	DWR in coordination with State Water Board	10609.16 AB
14	Identify potential effects of standards on wastewater management, parklands, and urban tree health.	May 30, 2022	State Water Board	10609.2(c) AB
15	Develop guidelines, forms, and web portal for annual water supply and demand assessment report.	No date specified; TBD, prior to Jun 1, 2022	DWR	10632.1 SB
16	Adopt water use efficiency standards for outdoor residential water use and outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use and CII water use performance measures[2].	Jun 30, 2022	State Water Board in coordination with DWR	10609.2 AB; 10609.10(d) AB

NOTES:

[1] The list of major tasks includes tasks with major deliverables and products required by the new legislation, and other tasks deemed by DWR and the State Water Board necessary to implement the legislation. The detailed requirements on coordination with other state and local government agencies and stakeholders are not elaborated in the list but will be incorporated in task execution.

[2] The standard for a water loss volume will be adopted in 2020 (see task #4).

Table B-1. SB 606 and AB 1668 Major Tasks[1] for DWR and State Water Board				
Task #	Description	Deadline	Agency(ies)	CWC Section
Urban Water Use and Drought Planning (Continued)				
17	Adopt guidelines and methodologies for water use objective calculation, and variances[3].	No date specified; TBD, prior to Jun 30, 2022, to match standard adoption and allow sufficient time for water suppliers to prepare their annual report by Nov 1, 2023	State Water Board	10609.2 AB
18	Prepare and submit to Legislature a report summarizing status of UWMP adoption.	Jul 1, 2022	DWR	10644(c)(1)(C) SB
19	Submit report to State Water Board on results of urban annual water supply and demand assessments and DWR analysis of regional and statewide water supply conditions.	Annually on Sep 30; starting 2022	DWR	10644(c)(1)(B) SB
20	Provide data to the Legislative Analyst Office for developing the review on implementation of urban water use efficiency standards for submitting to the Legislature .	No date specified; TBD, prior to Jan 10, 2024, in advance of Legislative Analyst report to Legislature	State Water Board and DWR	10609.30 SB
21	Chairperson of the State Water Board and Director of DWR Report on the implementation of the water use efficiency standards and water use reporting to the Legislature in the hearing before the appropriate policy committees of both houses.	On or around Jan 1, 2026	State Water Board and DWR	10609.32 SB
Small Water Systems and Rural Communities				
22	Develop report on small water suppliers and rural communities at risk of drought and water shortage vulnerability with website publication and notification to corresponding counties and groundwater sustainability agencies.	Jan 1, 2020	DWR in consultation with State Water Board and other relevant state agencies and local government and stakeholders	10609.42(a) AB
23	Recommend to Governor and Legislature for addressing drought planning needs of small water systems and rural communities.	Jan 1, 2020	DWR in consultation with State Water Board	10609.42(b) AB

NOTES:

[1] The list of major tasks includes tasks with major deliverables and products required by the new legislation, and other tasks deemed by DWR and the State Water Board necessary to implement the legislation. The detailed requirements on coordination with other state and local government agencies and stakeholders are not elaborated in the list but will be incorporated in task execution.

[3] State Water Board may continue to adopt additional acceptable variances afterward, if warranted.

Table B-1. SB 606 and AB 1668 Major Tasks[1] for DWR and State Water Board				
Task #	Description	Deadline	Agency(ies)	CWC Section
Agricultural Water Use				
24	Develop agricultural farm-gate delivery data submittal guidelines for annual report.	No date specified; TBD, prior to Apr 1, 2019, reporting deadline	DWR	531.10(a)(1) AB
25	Develop tools and resources to assist agricultural water suppliers in developing and quantifying components necessary to develop water budgets.	No date specified; TBD, prior to Apr 2021 reporting deadline	DWR	10826(c) AB
26	Develop tools to help agricultural water suppliers quantify efficiency of agricultural water use within their service areas.	No date specified; TBD, prior to Apr 2021 reporting deadline	DWR	10826(h) AB
27	Develop standardized reporting form for implementation of efficient water management practices and online submittal tool.	No date specified; TBD, prior to Apr 2021 reporting deadline	DWR	10608.48(e) AB
28	Update AWMP Guidebook.	No date specified; TBD, prior to Apr 2021 reporting deadline	DWR	10820(a)(2) AB
29	Prepare and submit to the Legislature a report on implementation of agricultural efficient water management practices.	Dec 31, 2021	DWR in consultation with State Water Board	10608.48(g) AB
30	Prepare and submit to Legislature a report summarizing status of AWMPs adopted.	Apr 30, 2022	DWR	10845(a) AB

NOTES:

[1] The list of major tasks includes tasks with major deliverables and products required by the new legislation, and other tasks deemed by DWR and the State Water Board necessary to implement the legislation. The detailed requirements on coordination with other state and local government agencies and stakeholders are not elaborated in the list but will be incorporated in task execution.

KEY:

AB = Assembly Bill
AWMP = Agricultural Water Management Plan
CII = commercial, industrial, and institutional
CIMIS = California Irrigation Management Information System
CWC = California Water Code
DWR = California Department of Water Resources
Legislature = California State Legislature
SB = Senate Bill
State Water Board = State Water Resources Control Board
TBD= To Be Determined
UWMP = Urban Water Management Plan
AB = AB 1668
SB = SB 606

Table B-2. Compliance and Enforcement Actions for State Water Board to Implement Water Conservation Provisions in SB 606 and AB 1668			
Item #	Description	Deadline	CWC Section
1	Provide progressive enforcement: May issue informational orders.	On or after Nov 1, 2023	10609.26(a)(1) SB
2	Provide progressive enforcement: May issue written notices.	On or after Nov 1, 2024	10609.26(b) SB
3	Provide progressive enforcement: May issue conservation orders.	On or after Nov 1, 2025	10609.26(c)(1) SB
4	Provide progressive enforcement: May impose civil liability (fine) for a violation of regulation.	After Nov 1, 2027	1846.5(b)(2) AB

KEY:

AB = Assembly Bill

CWC = California Water Code

DWR = California Department of Water Resources

SB = Senate Bill

State Water Board = State Water Resources Control Board

AB 1668

SB 606

Appendix C: Major Water Supplier Tasks for Implementing 2018 Senate Bill 606 and Assembly Bill 1668 for Water Conservation and Drought Planning

Appendix C Major Water Supplier Tasks for Implementing 2018 Senate Bill 606 and Assembly Bill 1668 for Water Conservation and Drought Planning

The California Department of Water Resources (DWR) and State Water Resources Control Board (State Water Board) have compiled a list of major tasks for urban and agricultural water suppliers to meet new requirements associated with implementing Senate Bill (SB) 606 (Hertzberg) and Assembly Bill (AB) 1668 (Friedman). These major tasks are as mandated in the 2018 legislation. Table C-1 presents the major tasks for urban retail water suppliers. Table C-2 presents the major tasks for urban wholesale water suppliers. Table C-3 presents the tasks for agricultural water suppliers. All tasks are presented in chronological order.

Table C-1. SB 606 and AB 1668
Major Tasks for Urban Retail Water Suppliers

Task #	Description	Deadline	CWC Section
1	Update and adopt UWMP and submit to DWR. If regulated by CPUC, include most recent plan in general rate case filings.	Jul 1, 2021, and every five years thereafter	10621(a) SB; 10621(c) SB
2	Prepare and adopt WSCP and DRA as part of UWMP[1]. If regulated by CPUC, include WSCP in general rate case filings.	Jul 1, 2021, and every five years thereafter	10621(c) SB; 10632(a) SB; 10635(b) SB
3	Prepare and submit to DWR annual water shortage assessment report[2].	Jun 1, 2022, and annually thereafter[3]	10632.1 SB
4	Submit annual report to DWR on urban water use objectives, actual urban water use, implementation of CII water use performance measures, and progress towards urban water use objective.	Nov 1, 2023, and annually thereafter	10609.24(a) SB
5	Adopt and submit to DWR supplement to adopted 2020 UWMP on implementation of demand management measures to achieve their urban water use objective.	Jan 1, 2024	10621(f)(2) SB

NOTES:

[1] If an urban water supplier revises its WSCP, the supplier must submit a copy of the revised WSCP to DWR not later than 30 days after adoption (CWC § 10644(b)).

[2] For urban water suppliers that receive imported water, the due date is June 1 or 14 days after final allocation from State Water Project or Bureau of Reclamation, whichever is later. The inclusion of 2022 as the starting year is to match the availability of WSCPs that are to be adopted by urban water suppliers. DWR encourages urban water suppliers to conduct such assessments prior to 2022 and submit their information to DWR.

[3] The annual water supply and demand assessment is the basis for the urban water supplier's annual water shortage assessment report.

KEY:

CII =	Commercial, industrial, and institutional	**DWR** =	California Department of Water Resources
CPUC =	California Public Utilities Commission	**UWMP** =	Urban Water Management Plan
DRA =	Drought Risk Assessment	**WSCP** =	Water Shortage Contingency Plan

Table C-2. SB 606 and AB 1668 Major Tasks for Urban Wholesale Water Suppliers			
Task #	Description	Deadline	CWC Section
1	Update and adopt UWMP, and submit to DWR. If regulated by CPUC, include most recent plan in general rate case filings.	Jul 1, 2021, and every five years thereafter	10621(a) SB; 10621(c) SB
2	Prepare and adopt WSCP and DRA as part of UWMP[1]. If regulated by CPUC, include WSCP in general rate case filings.	Jul 1, 2021, and every five years thereafter	10621(c) SB; 10632(a) SB; 10635(b) SB; 10640(a) SB
3	Prepare and submit to DWR annual water shortage assessment report[2].	Annually on Jun 1; starting 2022[3]	10632.1 SB

NOTES:

[1] If an urban water supplier revises its WSCP, the supplier must submit a copy of the revised WSCP to DWR not later than 30 days after adoption (CWC § 10644(b)).

[2] For urban water suppliers that receive imported water, the due date is June 1 or 14 days after final allocation from State Water Project or Bureau of Reclamation, whichever is later. The inclusion of 2022 as the starting year is to match the availability of WSCPs that are to be adopted by urban water suppliers. DWR encourages urban water suppliers to conduct such assessments prior to 2022 and submit their information to DWR.

[3] The annual water supply and demand assessment is the basis for the urban water supplier's annual water shortage assessment report.

KEY:

CPUC = California Public Utilities Commission
DRA = Drought Risk Assessment
DWR = California Department of Water Resources
UWMP = Urban Water Management Plan
WSCP = Water Shortage Contingency Plan

Table C-3. SB 606 and AB 1668 Major Tasks for Agricultural Water Suppliers			
Task #	Description	Deadline	CWC Section
1	Submit annual report to DWR summarizing aggregated farm-gate delivery data on a monthly or bimonthly basis organized by basin.	Apr 1, 2019, and annually thereafter	531.10(a) AB
2	Update AWMP with newly required content, including development of drought plan, and submit to DWR.	Apr 1, 2021, and every five years thereafter	10820(a)(2)(A) and (B) AB

KEY:

AWMP = Agricultural Water Management Plan
DWR = California Department of Water Resources

California Department of Water Resources

State Water Resources Control Board

APPENDIX G

DEPARTMENT OF WATER RESOURCES – ENERGY INTENSITY TABLES

Urban Water Supplier: *eorgetown Divide Public Utility Distric*

Table O-1C: Recommended Energy Intensity - Multiple Water Delivery Products

Enter Start Date for Reporting Period 1/1/2020
End Date 12/30/2020

	Urban Water Supplier Operational Control							
	Water Management Process						Non-Consequential Hydropower (if applicable)	
	Extract and Divert	Place into Storage	Conveyance	Treatment	Distribution	Total Utility	Hydropower	Net Utility
Total Volume of Water Entering Process (AF)	*13023*	*0*	*13023*	*1813*	*1813*	*N/A*	*3619*	*N/A*
Retail Potable Deliveries (%)	*14%*	*0%*	*14%*	*100%*	*100%*		*0%*	
Retail Non-Potable Deliveries (%)	*30%*	*0%*	*30%*	*0%*	*0%*		*0%*	
Wholesale Potable Deliveries(%)	*0%*	*0%*	*0%*	*0%*	*0%*		*0%*	
Wholesale Non-Potable Deliveries (%)	*0%*	*0%*	*0%*	*0%*	*0%*		*0%*	
Agricultural Deliveries (%)	*0%*	*0%*	*0%*	*0%*	*0%*		*0%*	
Environmental Deliveries (%)	*0%*	*0%*	*0%*	*0%*	*0%*		*0%*	
Other (%)	*56%*	*0%*	*56%*	*0%*	*0%*		*100%*	
Total Percentage [must equal 100%]	*100%*	*0%*	*100%*	*100%*	*100%*	*N/A*	*100%*	*N/A*
Energy Consumed (kWh)	*0*	*0*	*0*	*769,135.14*	*20,647.02*	*789782*	*0*	*789782*
Energy Intensity (kWh/AF)	*0.0*	*0.0*	*0.0*	*424.2*	*11.4*	*N/A*	*0.0*	*N/A*

Water Delivery Type	*Production Volume (AF)*	*Total Utility (kWh/AF)*	*Net Utility (kWh/AF)*
Retail Potable Deliveries	*1813*	*435.6*	*435.6*
Retail Non-Potable Deliveries	*3972*	*0.0*	*0.0*
Wholesale Potable Deliveries	*0*	*0.0*	*0.0*
Wholesale Non-Potable Deliveries	*0*	*0.0*	*0.0*
Agricultural Deliveries	*0*	*0.0*	*0.0*
Environmental Deliveries	*0*	*0.0*	*0.0*
Other	*7238*	*0.0*	*0.0*
All Water Delivery Types	*13023*	*60.6*	*60.6*

Quantity of Self-Generated Renewable Energy

0 kWh

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

Combination of Estimates and Metered Data

Data Quality Narrative:

Data sources from gages and production meters.

Narrative:

Water is diverted into GDPUD conveyance system. Portions enter the treated water system, raw water is delivered, conveyance losses and remianing used for ancillary power generation.

APPENDIX H

GEORGETOWN DIVIDE PUBLIC UTILITY DISTRCIT ORDINANCES

ORDINANCE 82-1

AN ORDINANCE ESTABLISHING RATES, RULES AND REGULATIONS FOR WATER SERVICE BY AND WITHIN THE GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT AND REPEALING ORDINANCE NOS. 77-10, 79-1, AND 81-1 RELATING TO SUCH RATES, RULES AND REGULATIONS

WHEREAS, the public interest, convenience and necessity requires that the provisions of the following ordinances heretofore adopted by the Board of Directors of the Georgetown Divide Public Utility District be consolidated, changed in certain respects, to wit: Ordinance 77-10, An Ordinance Establishing Rates, Rules, and Regulations for Water Service By and Within the Georgetown Divide Public Utility District and Repealing Ordinance Nos. 72-4, 74-7, 75-2, 75-4, 76-3, 77-4 and 77-5 Relating to Such Rates, Rules and Regulations, adopted on October 13, 1977; Ordinance 79-1, An Ordinance Amending Ordinance 77-10, An Ordinance Establishing Rates, Rules and Regulations for Water Service By and Within the Georgetown Divide Public Utility District, and Repealing Ordinance Nos. 72-4, 74-7, 75-2, 75-4, 76-3, 77-4, and 77-5 Relating to Such Rates, Rules and Regulations, by Amending Article 16 Thereof Relating to Pipeline and Storage Benefit Charges, adopted on February 16, 1979; and Ordinance 81-1, An Ordinance Establishing Rates, Rules and Regulations for Water Service By and Within the Georgetown Divide Public Utility District, and Repealing Ordinance Nos. 77-10, and 79-1 Relating to Such Rates, Rules and Regulations, adopted on February 4, 1981;

NOW, THEREFORE, BE IT ENACTED by the Board of Directors of the Georgetown Divide Public Utility District, El Dorado County, California, as follows:

ARTICLE 1 - DEFINITIONS

For the purpose of this Ordinance, the terms used herein are defined as follows:

Sec. 1-1. Applicant is the person making application for water service and shall be the owner of premises to be served by the water facilities for which such service is requested, or his authorized agent.

Sec. 1-2. Board is the Board of Directors of the District.

Sec. 1-3. Building is any structure used for human habitation or a place of business, recreation or other purpose containing water facilities.

Sec. 1-17. Single Family Residential Premises means a lot or parcel of real property under one ownership which includes one or more separate single family residential structures.

Sec. 1-18. Commercial or Multi-Family Residential Premises means a lot or parcel of real property under one ownership which includes one or more apartment houses, motels, office buildings, commercial buildings, and structures of like nature.

Sec. 1-19. Public Fire Protection Service means the services and facilities of the entire water supply, storage, and distribution system of the District, including the fire hydrants affixed thereto, and the water available for fire protection, excepting house service connections and appurtenances thereto.

Sec. 1-20. Regular Water Service means water service and facilities rendered for normal domestic and commercial purposes on a permanent basis, and the water available therefor.

Sec. 1-21. Service Connection Charge means the benefit entitlement of the lot or parcel of real property to a connection from the water main line to the limits of the road or easements in which the pipelines are located.

Sec. 1-22. Service or Service Connection means the pipeline and appurtenant facilities such as the curb stop, curb cock or valve used to extend water service from a distribution main to premises, but exclusive of the meter and meter box. Where services are divided at the curb or property line to serve several customers, each such branch service shall be deemed a separate service.

Sec. 1-23. Single Family Unit means the water capacity normally needed to serve a single family residential unit or the equivalent water usage for buildings used for purposes other than single family residences. SFU means Single Family Unit.

Sec. 1-24. Street is any public highway, road, street, avenue, alley, way, easement, or right of way.

Sec. 1-17. Single Family Residential Premises means a lot or parcel of real property under one ownership which includes one or more separate single family residential structures.

Sec. 1-18. Commercial or Multi-Family Residential Premises means a lot or parcel of real property under one ownership which includes one or more apartment houses, motels, office buildings, commercial buildings, and structures of like nature.

Sec. 1-19. Public Fire Protection Service means the services and facilities of the entire water supply, storage, and distribution system of the District, including the fire hydrants affixed thereto, and the water available for fire protection, excepting house service connections and appurtenances thereto.

Sec. 1-20. Regular Water Service means water service and facilities rendered for normal domestic and commercial purposes on a permanent basis, and the water available therefor.

Sec. 1-21. Service Connection Charge means the benefit entitlement of the lot or parcel of real property to a connection from the water main line to the limits of the road or easements in which the pipelines are located.

Sec. 1-22. Service or Service Connection means the pipeline and appurtenant facilities such as the curb stop, curb cock or valve used to extend water service from a distribution main to premises, but exclusive of the meter and meter box. Where services are divided at the curb or property line to serve several customers, each such branch service shall be deemed a separate service.

Sec. 1-23. Single Family Unit means the water capacity normally needed to serve a single family residential unit or the equivalent water usage for buildings used for purposes other than single family residences. SFU means Single Family Unit.

Sec. 1-24. Street is any public highway, road, street, avenue, alley, way, easement, or right of way.

Sec. 1-25. Treatment Plant Connection Benefit Charge means a treatment plant capacity charge for benefits to a lot or parcel of real property under one ownership.

Sec. 1-26. Water Department means the Board of Directors of the District performing functions related to the District water service, together with the General Manager, the Water Superintendent, the Office Manager, and other duly authorized representatives.

ARTICLE 2 - GENERAL PROVISIONS

Sec. 2-1. Effective Area. Except as herein otherwise expressly provided, this ordinance shall apply to and be effective within the boundaries of the District.

Sec. 2-2. Rules and Regulations. The following rules and regulations respecting water construction and provision of water and connection to the water supply, storage, and distribution facilities of District are hereby adopted, and all work in respect thereto shall be performed as herein required and not otherwise.

Sec. 2-3. Purpose. This Ordinance is intended, among other things, to provide certain minimum standards, provisions, and requirements for design, methods of construction, and use of materials in water facilities and water service connections hereafter installed, altered, or repaired, and with respect thereto shall not apply retroactively, that is, in the event of an alteration or repair hereafter made, it shall apply only to the new materials and methods used therein.

Sec. 2-4. Short Title. This Ordinance shall be known and may be cited as "Georgetown Divide Public Utility District Water Ordinance."

Sec. 2-5. Words and Phrases. For the purpose of this Ordinance, all words used herein in the present tense shall include the future; all words in the plural number shall include the singular number; and all words in the singular number shall include the plural number.

Sec. 2-6. Pressure Conditions. All applicants for service connections or water service shall be required to accept such conditions of pressure and service as are provided by the distribution system at the

location of the proposed service connection, and to hold the District harmless from any damages arising out of low pressure or high pressure water service conditions or from any interruptions in service.

Sec. 2-7. Maintenance of Water Pressure and Shutting Down for Emergency Repairs. The Board shall not accept any responsibility for the maintenance of pressure and it reserves the right to discontinue service while making repairs, replacements, and connections or performing other work in the operation of the water system. Consumers dependent upon a continuous supply should provide emergency storage.

Sec. 2-8. Tampering with District Property. No one, except an employee or representative of the Board, shall at any time in any manner operate the curb cocks or valves, main cocks, gates or valves of the District's water system, or interfere with meters or their connections, street mains, or other parts of the water system.

Sec. 2-9. Penalty for Violation. For the failure of the customer to comply with all or any part of this Ordinance, and any ordinance, resolution, or order fixing rates and charges of this District, a penalty for which has not hereafter been specifically fixed, the customer's service shall be discontinued and the water shall not be supplied such customer until he shall have complied with the rule or regulation, rate or charge which he has violated, or in the event that he cannot comply with said rule or regulation, until he shall have satisfied the District that in the future he will comply with all the rules and regulations established by ordinance of the District and with all rates and charges of this District. In addition thereto, he shall pay the District the sum of Ten Dollars ($10.00) for renewal of his service.

Sec. 2-10. Ruling Final. All rulings of the Board shall be final. All rulings of the General Manager shall be final, unless appealed in writing to the Board within five (5) days. When appealed, the Board's ruling shall be final.

Sec. 2-11. Relief on Application. When any person, by reason of special circumstances, is of the opinion that any provision of this

Ordinance is unjust or inequitable as applied to his premises, he may make written application to the Board, stating the special circumstances, citing the provision complained of, and requesting suspension or modification of that provision as applied to his premises.

If such application be approved, the Board may, by resolution, suspend or modify the provision complained of, as applied to such premises, to be effective as of the date of the application and continuing during the period of the special circumstances.

Sec. 2-12. Relief on Own Motion. The Board may, on its own motion, find that by reason of special circumstances any provision of this regulation and ordinance should be suspended or modified as applied to a particular premises and may, by resolution, order such suspension or modification for such premises during the period of such special circumstances, or any part thereof.

Sec. 2-13. Separability. If any section, subsection, sentence, clause, or phrase of this Ordinance, or the application thereof to any person or circumstance is for any reason held to be unconstitutional or invalid, such decision shall not affect the validity of the remaining portions of this Ordinance of the application of such provision to other persons or circumstances. The Board hereby declares that it would have passed this Ordinance or any section, subsection, sentence, clause or phrase hereof irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared to be unconstitutional.

ARTICLE 3 - WATER DEPARTMENT

Sec. 3-1. Creation. A Water Department has been heretofore created comprising the Directors and the following positions, to wit: The General Manager, a Water Superintendent, a District Inspector, and an Office Manager. The same person may be appointed to any or all of said positions. They shall be appointed to serve at the pleasure of the Board. If the same person is appointed General Manager and any other position, then said person shall be known as the General Manager and shall assume

and execute all the duties and responsibilities of each of the positions to which he is appointed.

Sec. 3-2. Plumbing, Water Facility, Inspection, Compensation. The Board of said District shall employ the District Engineer or such other person as may be designated by the Board to perform the duties of inspecting the installation, connection, maintenance, and use of all water facilities in said District, to be known as the District Inspector. He shall receive, as compensation for his services for making inspections required to be made by the ordinances, orders, and regulations from time to time enacted and ordered by said Board, a sum to be fixed by the Board. He shall serve during the pleasure of the Board.

Sec. 3-3. General Manager. The General Manager shall have full charge and control of the maintenance, operation and construction of the water works and system. He shall, with the consent and approval of the Board, have authority to employ and discharge all employees and assistants. He shall prescribe the duties of employees and assistants. He shall perform such other duties as are imposed from time to time by the Board, and shall report to the Board in accordance with the rules and regulations adopted by the Board.

Sec. 3-4. Water Superintendent - Duties. The Water Superintendent shall regularly inspect all physical facilities related to the District's water system, to see that they are in good repair and proper working order, and to note violations of any water regulations.

Sec. 3-5. Engineer, Inspector or Water Superintendent - Supervision. The Engineer, Inspector or Water Superintendent shall supervise all repair or construction work authorized by the Board, and perform any other duties prescribed elsewhere in this Ordinance or which shall be hereafter prescribed by the Board.

Sec. 3-7. Office Manager. The position of Office Manager is hereby created. He shall have charge of the office of the District and of the billing for and collecting the charges herein provided. He

shall perform such other duties as shall be determined by the General Manager.

Sec. 3-8. Id. - Duties. The Office Manager shall compute, prepare, and mail bills as hereinafter prescribed, make and deposit collections, maintain proper books of account, collect, account for, and refund deposits, do whatever else is necessary or directed by the District Auditor to set up and maintain an efficient and economical bookkeeping system, and perform any other duties now or hereafter prescribed by the Board.

Sec. 3-9. Performance of Duties. The foregoing duties of Engineer, Inspector, Water Superintendent, and Office Manager may be performed by existing District personnel or by an additional employee or employees or agent thereof.

Sec. 3-10. Compensation. The General Manager, Engineer, Inspector, Water Superintendent, and Office Manager shall receive such compensation as is prescribed by the Board.

ARTICLE 4 - NOTICES

Sec. 4-1. Notices to Customers. Notices to a water customer from the District will normally be given in writing, and either delivered or mailed to him at his last known address. Where conditions warrant and in emergencies, the District may resort to notification either by telephone or messenger.

Sec. 4-2. Notices from Customers. Notice from the customer to the District may be given by him or his authorized representative in writing, at the District's operating office. Where conditions warrant and in emergencies, the customer may resort to notification either by telephone or messenger.

ARTICLE 5 - STANDARD DISTRICT SPECIFICATIONS

Sec. 5-1. Design and Construction Standards. Minimum standards for the design and construction of water facilities within the

District shall be in accordance with the applicable provisions of the ordinances, rules and regulations, and with the STANDARD DISTRICT SPECIFICATIONS for District heretofore or hereafter adopted by the District, copies of which are on file in the District office. The District or the District Engineer may permit modifications or may require higher standards where unusual conditions are encountered.

Two complete sets of "as built" drawings showing the actual location of all mains, valves, fire hydrants, house services, meters, if any, and appurtenances shall be filed with the District before final acceptance of the work.

ARTICLE 6 - APPLICATION FOR REGULAR WATER SERVICE - WHERE NO MAIN EXTENSION REQUIRED

Sec. 6-1 Application for Water Service. Applications for regular water service, where no main extension is required, shall be made on the form of application approved by the Board from time to time.

Sec. 6-2. Undertaking of Applicant. Such application shall signify the customer's willingness and intention to comply with this and other ordinances or regulations relating to water service and to make payment for water service required.

Sec. 6-3. Payment for Previous Service. An application shall not be honored unless payment in full has been made for water service previously rendered to the applicant by the District.

Sec. 6-4. Installation of Services. Water services will be installed at the location and of the size determined by the Water Department. Service installations will be made only to property abutting on public streets or abutting on such distribution mains as may be constructed in alleys or easements, at the convenience of the Water Department. Services installed in new subdivisions prior to the construction of streets or in advance of street improvement must be accepted by the applicant in the installed location.

Section 6-5. Service Connections. Service connections will be installed in accordance with applicable provisions of Article 8.

ARTICLE 7 - GENERAL USE REGULATIONS

Sec. 7-1. Number of Services per Single Family Residential Premises. The applicant may apply for as many services as may reasonably be required for his single family residential premises, provided that the pipeline system for each single family residence shall be independent of the other single family residences on said premises and that they shall not be inter-connected.

Sec. 7-2. Supply to Separate Single Family Residential Structures. Each single family residence for which the application for water service is hereafter made, shall have a separate service connection, including a separate meter.

Sec. 7-3. Supply to Separate Commercial or Multi-Family Residential Premises. Each separate commercial or multi-family residential building for which application for a separate water service is hereinafter made, shall have a separate service connection, including a separate meter. Application for water service for more than one commercial or multi-family residential building on one lot or parcel of real property under one ownership shall have a separate service connection, including a separate meter, for all of the buildings under one application for water service.

Sec. 7-4. Number of Services Per Commercial or Multi-Family Residential Premises. The applicant may apply for as many services as may reasonably be required for his commercial or multi-family residential premises. The pipeline system from each service shall be independent of the others and they may not be inter-connected. One service with sufficient equivalent single family unit capacity may provide all of the service to any or all of the structures on the commercial or multi-family residential premises.

Se. 7-5. Water Waste. No customer shall knowingly permit leaks or waste of water. Where water is wastefully or negligently used on a customer's premises, seriously affecting the general service, the

District may discontinue the service if such conditions are not corrected within five (5) days after giving the customer written notice.

Sec. 7-6. Responsibility for Equipment on Customer Premises. All facilities installed by the District on private property for the purpose of rendering water service shall remain the property of the District and may be maintained, repaired, or replaced by the Water Department without consent or interference of the owner or occupant of the property. The property owner shall use reasonable care in the protection of the facilities. No payment shall be made for placing or maintaining said facilities on private property. No persons shall place or permit the placement of any object in a manner which will interfere with the free access to a meter box or will interfere with the reading of a meter.

Sec. 7-7. Changes in Customer's Equipment. Customers making any material changes in the size, character, or extent of the equipment or operations utilizing water service, or whose change in operations results in a large increase in the use of water, shall immediately give the District written notice of the nature of the change, and, if necessary, amend their application.

Sec. 7-8. Damage to Water System Facilities. The customer shall be liable for any damage to the District-owned customer water service facilities when such damage is from causes originating on the premises by an act of the customer or his tenants, agents, employees, contractors, licensees, or permittees, including the breaking or destruction of locks by the customer or others on or near a meter, and any damage to a meter that may result from hot water or steam from a boiler or heater on the customer's premises. The District shall be reimbursed by the customer for any such damage promptly on presentation of a bill.

Sec. 7-9. Ground Wire Attachments. All persons are forbidden to attach any ground wire or wires to any plumbing which is or may be connected to a service connection or main belonging to the District unless such plumbing is adequately connected to an effective driven ground installation on the premises. The District will hold the customer

liable for any damage to its property occasioned by such ground wire attachments.

Sec. 7-10. Cross Connections. The customer must comply with the state and federal laws governing the separation of dual water systems or installations of backflow protective devices to protect the public water supply from the danger of cross-connections. Backflow protective devices must be installed as near the service as possible and shall be open to test and inspection by the Water Department. Plans for installation of backflow protective devices must be approved by the Water Department prior to installation.

In special circumstances, when the customer is engaged in the handling of especially dangerous or corrosive liquids or industrial or process waters, the District may require the customer to eliminate certain plumbing or piping connections as an additional precaution and as a protection of the backflow preventive devices.

As a protection to the customer's plumbing system, a suitable pressure relief valve must be installed and maintained by him, at his expense, when check valves or other protective devices are used. The relief valve shall be installed between the check valves and the water heater.

Whenever backflow protection has been found necessary on a water supply line entering a customer's premises, then any and all water supply lines from the District's mains entering such premises, buildings, or structures shall be protected by an approved backflow device, regardless of the use of the additional water supply line.

The double check valve or other approved backflow protection devices may be inspected and tested periodically for water tightness by the District. The devices shall be serviced, overhauled, or replaced whenever they are found defective and all costs of repair and maintenance shall be borne by the customer.

The service of water to any premises may be immediately discontinued by the District if any defect is found in the check valve

installation or other protective devices, or if it is found that dangerous unprotected cross-connections exist. Service will not be restored until such defects are corrected.

Sec. 7-11. Interruptions in Service. The District shall not be liable for damage which may result from an interruption in service from a cause beyond the control of the Water Department to make improvements and repairs. Whenever possible, and as time permits, all customers affected will be notified prior to making such shutdowns. The District will not be liable for interruption, shortage, or insufficiency of supply, or for any loss or damage occasioned thereby, if caused by accident, act of God, fire, strikes, riots, war, or any other cause not within its control.

Sec. 7-12. Ingress and Egress. Representatives from the Water Department shall have the right of ingress and egress to the customer's premises at reasonable hours for any purpose reasonably connected with the furnishing of water service.

ARTICLE 8 - METERS AND METERED SERVICE CONNECTIONS

Sec. 8-1. District Property. All services shall be metered. The service connection, whether located on public or private property, is the property of the District, and the District reserves the right to repair, replace and maintain it as well as to remove it upon discontinuance of service.

Sec. 8-2. Meters. When an application for service is granted under Article 6, the District will install the meter and meter box. A 5/8 x 3/4-inch meter will be furnished without charge. The applicant will pay a $60 fee for the cost of installation. If the applicant desires a larger meter, the applicant shall pay the difference in cost between a 5/8 x 3/4-inch meter and that requested plus installation cost.

Only duly authorized employees or agents of the District will be permitted to install a meter and meter box.

Sec. 8-3. Meter Installations. Meters will be installed at the curb or within the easement, and shall be owned by the District and installed and removed at its expense after payment of the charges established therefor. No rent or other charge will be paid by the District for a meter or other facilities, including housing and connections, located on a customer's premises. All meters will be sealed by the District at the time of installation, and no seal shall be altered or broken except by one of its authorized employees.

Sec. 8-4. Change in Location of Meters. Meters may be relocated only if approved by the Board upon application. All cost of relocation shall be borne by the applicant.

Sec. 8-5. Location of Meters. The District reserves the right to determine the location of meters with respect to the boundaries of the premises to be served. The installation including the meter, shall be the property of the District. The service between the meter and the building served by the installation shall be the property of the customer and shall be maintained by the customer at his expense.

Sec. 8-6. Size of Meter. The size of the meter shall be determined by the size of the service connection requested by the applicant. These sizes shall be as follows: 5/8 x 3/4-inch, 25 GPM; 1 inch, 50 GPM 1-1/2 inch, 100 GPM; 2 inch, 160 GPM; 3 inch, 350 GPM. GPM means gallons per minute.

Sec. 8-7. Curb Cock. Every service connection installed by the District shall be equipped with a curb cock or wheel valve. On metered services, the valve is to be on the customer's side of the service installation, as close as is practicable to the meter location. Such valve or curb cock is intended for the exclusive use of the District in controlling the water supply through the service connection pipe. If the curb cock or wheel valve is damaged by the consumer's use to an extent requiring replacement, such replacement shall be at the consumer's expense.

Sec. 8-8. Meter Tests - Deposit. If a customer desires to have the meter serving his premises tested, he shall first deposit Ten Dollars ($10.00). Should the meter register more than two percent (2%) fast, the deposit will be refunded, but should the meter register less than two percent (2%) fast, the deposit will be retained by the Water Department.

Sec. 8-9. Adjustment for Meter Errors - Fast Meters. If a meter, tested at the request of a customer pursuant to Sec. 8-8, is found to be more than two percent (2%) fast, the excess charges for the time service was rendered the customer requesting the test, or for a period of six months, whichever shall be the lesser, shall be refunded to the customer.

Sec. 8-10. Adjustment for Meter Errors - Slow Meters. If a meter, tested at the request of a customer pursuant to Sec. 8-8, is found to be more than twenty-five percent (25%) slow, in the case of domestic service, or more than five percent (5%) slow, for other than domestic services, the District may bill the customer for the amount of the undercharge based upon corrected meter readings for the period, not exceeding six months, that the meter was in use.

Sec. 8-11. Non-Registering Meters. If a meter is found to be not registering, the charges for service shall be at the minimum monthly rate or based on the estimated consumption, whichever is greater. Such estimates shall be made from previous consumption for a comparable period or by such other method as is determined by the Water Department and its decision shall be final.

ARTICLE 9 - BILLING

Sec. 9-1. Billing Period. The regular billing period will be monthly, bi-monthly, or quarterly at the option of the District. The District may bill such charges with other charges for services rendered by the District.

Sec. 9-2. Meter Reading. Meters will be read, as nearly

service will also be turned off for non-payment of bills rendered under Ordinance No. 71-3.

Sec. 10-2. Charges a Debt. Failure to receive a bill does not relieve an owner or consumer of liability. Any amount due shall be deemed a debt to the District, and any person, firm, or corporation failing, neglecting or refusing to pay said indebtedness shall be liable to an action in the name of the District in any court of competent jurisdiction for the amount thereof.

Sec. 10-3. Reconnection Charge. A reconnection charge of Ten Dollars ($10.00) plus penalties as provided in Sec. 11-1 will be made and collected prior to renewing service following a discontinuance.

Sec. 10-4. Unsafe Apparatus. Water service may be refused or discontinued to any premises where apparatus or appliances are in use which might endanger or disturb the service to other customers.

Sec. 10-5. Cross-Connections. Water service may be refused or discontinued to any premises where there exists a cross-connection in violation of state or federal laws or this Ordinance.

Sec. 10-6. Fraud or Abuse. Service may be discontinued, if necessary, to protect the District against fraud or abuse.

Sec. 10-7. Non-compliance with Regulations. Service may be discontinued for non-compliance with this or any other ordinance or regulation relating to the water service to customer by District.

Sec. 10-8. Continuing Liability. The customer shall be liable for minimum use charges whether or not any water is used. The property remains liable for water standby or facilities charges in any event.

ARTICLE 11 - COLLECTION BY SUIT

Sec. 11-1. Penalty. Rates and charges which are not paid on or before the day of delinquency shall be subject to a penalty of ten percent (10%) and thereafter shall be subject to a further penalty of one-half of one percent (1/2 of 1%) per month on the first day of each month following.

as possible, on the same day of each billing period. Bills for periods containing less than ninety percent (90%) of a full billing period will be prorated.

Sec. 9-3. Opening and Closing Bills. Opening and closing bills for less than the normal billing period shall be prorated both as to minimum charges and quantity blocks. If the total period for which service is rendered is less than one month, the bill shall not be less than the monthly minimum charge applicable. Closing bills may be estimated by the Water Department for the final period as an expediency to permit the customer to pay the closing bill at the time service is discontinued.

Sec. 9-4. Charges. All charges are due and payable at the office of the District on the date of mailing the bill to the property owner or his agent as designated in the application or otherwise, and delinquent 30 days after the Post Office cancellation date. Service may be discontinued without further notice if payment is not made by the delinquent date.

Sec. 9-5. Payment of Bills. Bills for metered water service shall be rendered at the end of each billing period. Flat rate service and all standby or facilities charges shall be billed in advance. Bills shall be payable on presentation. On each bill rendered by the District shall be printed substantially the following: "If this bill is not paid within thirty (30) days after the Post Office cancellation date, service may be discontinued. A reconnection charge and penalties will be made and collected prior to renewing service following a discontinuance. Delinquent standby or facilities charges can become a lien on your property and may be collected on the county tax rolls."

Sec. 9-6. Water Used Without Regular Application Being Made. A person taking possession of premises and using water from an active service connection, without having made application to the District for water service, shall be held liable for the water delivered from the date

of the last recorded meter reading, and if the meter is found inoperative, the quantity consumed will be estimated. If proper application for water service is not made upon notification to do so by the District, and if accumulated bills for service are not paid immediately, the service may be discontinued by the District without further notice.

Sec. 9-7. Damages Through Leaking Pipes and Fixtures. When turning on the water supply as requested and the house or property is vacant, the District will endeavor to ascertain if water is running on the inside of the building. If such is found to be the case, the water will be left shut off at the curb cock on the inlet side of the meter. The Board's jurisdiction and responsibility ends at the meter and the Board will, in no case, be liable for damages occasioned by water running from open or faulty fixtures, or from broken or damaged pipes beyond the meter.

Sec. 9-8. Damage to Meters. The Board reserves the right to set and maintain a meter on any service connection. The water consumer shall be held liable, however, for any damage to the meter due to his negligence or carelessness and, in particular, for damage caused by hot water or steam from the premises.

ARTICLE 10 - DISCONTINUANCE OF SERVICE

Sec. 10-1. Disconnection for Non-payment. Service may be discontinued for non-payment of bills on or after the thirtieth day following the date of Post Office cancellation. At least five (5) days prior to such discontinuance, the customer will be sent a final notice informing him that discontinuance will be enforced if payment is not made within the time specified in said notice. The failure of the District to send, or any such person to receive, said notice shall not affect the District's power hereunder. A customer's water service may be discontinued if water service furnished at a previous location is not paid for within the time herein fixed for the payment of bills. If a customer receives water service at more than one location and the bill for service at any one location is not paid within the time provided for payment, water service at all locations may be turned off. Water

Sec. 11-2. Suit. All unpaid rates and charges and penalties herein provided may be collected by suit.

Sec. 11-3. Costs. Defendant shall pay all costs of suit, including reasonable attorney fees, in any judgment rendered in favor of District.

ARTICLE 12 - PUBLIC FIRE PROTECTION

Sec. 12-1. Use of Fire Hydrants. Fire hydrants are for use by the District or by organized fire protection agencies pursuant to contract with the District. Other parties desiring to use fire hydrants for any purpose must first obtain written permission from the Water Department prior to use and shall operate the hydrant in accordance with instructions issued by the Water Department. Unauthorized use of hydrants will be prosecuted according to law.

Sec. 12-2. Moving of Fire Hydrants. When a fire hydrant has been installed in the location specified by the proper authority, the District has fulfilled its obligation. If a property owner or other party desires a change in the size, type, or location of the hydrant, he shall bear all costs of such changes, without refund. Any change in the location of a fire hydrant must be approved by the proper authority.

Sec. 12-3. Water Pressure and Supply. The District assumes no responsibility for loss or damage due to lack of water or pressure, either high or low, and merely agrees to furnish such quantities and pressures as are available in its general distribution system. The service is subject to shutdowns and variations required by the operation of the system.

ARTICLE 13 - SPECIAL PROVISIONS

Sec. 13-1. Pools and Tanks. When an abnormally large quantity of water is desired for filling a swimming pool or for other purposes, arrangements must be made with the District prior to taking such water. Water to be used for other than domestic purposes, such as

swimming pools and tanks, will be supplied only through a meter and filter system approved by the State Board of Health. All meters, lines, checks, filters, and appurtenances are to be furnished and installed by customer, under the supervision of the Water Superintendent. The system is to be open for inspection by the Water Superintendent at all times.

Permission to take water in unusual quantities will be given only if it can be safely delivered through the District's facilities and if other consumers are not inconvenienced thereby.

Sec. 13-2. Responsibility for Equipment. The customer shall, at his own risk and expense, furnish, install, and keep in good and safe condition all equipment that may be required for receiving, controlling, applying, and utilizing water, and the District shall not be responsible for any loss or damage caused by the improper installation of such equipment or the negligence or wrongful act of the customer or of any of his tenants, agents, employees, contractors, licensees, or permittees in installing, maintaining, operating, or interfering with property caused by faucets, valves, and other equipment that are open when water is turned on at the meter, either originally or when turned on after a temporary shutdown.

Sec. 13-3. Service Connections. The service connections, extending from the water main to the boundary of the road or public easement right of way in which the water main is situate, and the meter, meter box, and curb cock or wheel valve, shall be maintained by the District. All pipes and fixtures extending or lying beyond the boundary of said road or easement right of way shall be installed and maintained by the owner of the property.

ARTICLE 14 - RATES

Sec. 14-1. Rate Resolution. Charges for the use of water within Improvement District shall be prescribed by the Board by resolution, which may be amended from time to time within the limits established by any bond proceedings. Such resolution shall be on file in the

office of the Secretary and copies thereof shall be available on request.

Sec. 14-2. Special Charges. At the time of making a new service connection to the District water system from any parcel of land and/or an increase in the size of an existing service connection to said water system from any parcel of land the special charges which are applicable thereto pursuant to the provisions of Articles 15, 16 and 17 of this Ordinance shall be paid prior to the making thereof. Payment of such charges shall entitle such parcel only to the limited benefits covered by the charges paid, and thereafter water service to such parcel shall remain subject to all of the provisions of said Articles 15, 16 and 17. The portions of such charges which represent treatment plant benefit charges and pipeline and storage benefit charges, respectively, shall be placed in the special funds, respectively, and used only for the special purposes, respectively, provided in said Articles 15 and 16.

Sec. 14-3. Payment of Special Charges By Special Assessments. In the event the Board has heretofore included or hereafter includes any parcels of land within the boundaries of an improvement district formed for the purpose of acquiring, constructing and financing by special assessments, in whole or in part, water facilities to serve such parcels, the confirmation and levy by the Board of an assessment in the proceedings to form such improvement district shall constitute payment of the special charges applicable to such parcels, respectively, pursuant to the provisions of Articles 15, 16 and 17 of this Ordinance insofar as and to the extent that the individual assessments levied on such parcels, respectively, include amounts for the special charges provided for in said Articles 15, 16 and 17.

Sec. 14-4. Payment of special charges for parcels of land outside of improvement districts, as provided for and contemplated by Articles 15, 16 and 17 of this Ordinance, either by special assessments levied in other improvement districts or otherwise, shall confer on such

parcels only the limited rights of service and use in the facilities of the improvement district to which such charges relate as are covered by said special charges so paid.

ARTICLE 15 - TREATMENT PLANT BENEFIT CHARGES

Sec. 15-1. Georgetown-Buckeye Treatment Plant. Any parcel for which a treatment plant benefit charge has not been assessed or otherwise paid for in an amount sufficient (at the rate applicable thereto at the time of any assessment or payment for such benefit) to cover the single family unit capacity attributable to a new connection to the portion of the District water system regularly served by the treatment plant constructed in the proceedings for Georgetown-Buckeye Water Improvement District, Assessment District 1971-1, and/or an increase in the size of an existing connection to said portion of said water system shall pay, prior to receiving such new connection or such increase in size of an existing connection, the amount of $250.00 for each unpaid for single family unit capacity attributable to such connection or increase in size of connection, on the basis of the following table:

Size of Connection	Attributable Capacity
5/8 x 3/4 inch	1 single family unit
1 inch	2 single family units
1-1/2 inch	5 single family units
2 inch	10 single family units
3 inch	20 single family units

All such treatment plant connection benefit charges collected pursuant to this Ordinance shall be placed in a special fund entitled "Treatment Plant Benefit Charges - Georgetown-Buckeye Treatment Plant". The proceeds of said fund shall be credited annually or at such other periods as the Board may prescribe by resolution upon the assessments levied upon all of the parcels of property within the boundaries of Georgetown-Buckeye Water Improvement District, Assessment District 1971-1, until the total amount of treatment plant benefit charges assessed and collected under this section of this Ordinance or Ordinance No. 75-2 (An

Ordinance Providing for Water Service by the Georgetown Divide Public Utility District to Parcels of Land Outside the Boundaries of Georgetown-Buckeye Water Improvement District, Assessment District 1971-1, and Establishing Rates, Rules and Regulations Therefore; and Amending Section 15-1 and Deleting Article 20 of Ordinance No. 72-4, An Ordinance Establishing Rates, Rules and Regulations for Water Service by the Georgetown Divide Public Utility District Within the Boundaries of Georgetown-Buckeye Water Improvement District, Assessment District 1971-1), or Ordinance No. 76-3 (An Ordinance Amending Section 15-1 of Ordinance No. 72-4 (As said Section Was Amended by Ordinance No. 75-2), Entitled An Ordinance Establishing Rates, Rules, and Regulations for Water Service by the Georgetown Divide Public Utility District Within the Boundaries of Georgetown-Buckeye Improvement District, Assessment District 1971-1) or Ordinance 77-10 (An Ordinance Establishing Rates, Rules and Regulations for Water Service by and Within the Georgetown Divide Public Utility District, and Repealing Ordinance Nos. 72-4, 74-7, 75-2, 75-4, 76-3, 77-4, 77-5, Relating to Such Rates, Rules and Regulations) shall equal $43,569.26. Thereafter, the proceeds from treatment plant benefit charges assessed and collected under said ordinances (in excess of said $43,569.26) shall be accumulated and used only for expansion and/or improvements of the treatment plant constructed in the proceedings for Georgetown-Buckeye Water Improvement District, Assessment District 1971-1.

Sec. 15-2. Auburn Lake Trails Treatment Plant. Any parcel of land for which a treatment plant benefit charge has not been assessed or otherwise paid for in an amount sufficient (at the rate applicable thereto at the time of any assessment or payment for such benefit) to cover the single family unit capacity attributable to a new connection to the portion of the District water system regularly served by the treatment plant constructed in the proceedings for Improvement District No. U-1, and/or an increase in the size of an existing connection to said portion

of said water system shall pay, prior to receiving such new connection or such increase in size of an existing connection, the amount of $350.00 for each unpaid for single family unit capacity attributable to such connection or increase in size of connection, on the basis of the following table:

Size of Connection	Attributable Capacity
5/8 x 3/4 inch	1 single family unit
1 inch	2 single family units
1-1/2 inch	5 single family units
2 inch	10 single family units
3 inch	20 single family units

All such treatment plant benefit charges collected pursuant to this section of this Ordinance or Ordinance No. 77-4 (An Ordinance Establishing Rates, Rules, and Regulations for Water Service by the Georgetown Divide Public Utility District Within the Boundaries of Greenwood Water Improvement District, Assessment District 1977-1) or Ordinance No. 77-10 (An Ordinance Establishing Rates, Rules and Regulations for Water Service By and Within the Georgetown Divide Public Utility District, and Repealing Ordinance Nos. 72-4, 74-7, 75-2, 75-4, 76-3, 77-4 and 77-5 Relating to Such Rates Rules and Regulations) shall be placed in a special fund entitled "Treatment Plant Benefit Charges - Auburn Lake Trails Treatment Plant" and used only for expansion and/or improvement to said treatment plant.

ARTICLE 16 - PIPELINE AND STORAGE BENEFIT CHARGES

Sec. 16-1. Amount. Prior to connection to the District water system of any building located within the District, except buildings within Improvement Districts U-1 or U-2, and for which pipeline and storage benefit charges were not assessed for such building in the proceedings for a water improvement district or otherwise paid for in the amount applicable thereto at the time of any assessment or payment for such benefit, said charges shall be paid in the amounts of: Pipeline - $300.00 per building; Storage - $350.00 per building. Notwithstanding the foregoing provisions of this section, said pipeline charge shall be deemed paid for the first such building connected or to be connected to the District water system for each separate parcel of land which existed at the time of construction of the water main to which such building is connected, if the owner of such parcel shared in the cost of said water main by

payment of all or a portion of the cost of said main.

Sec. 16-2. Special Funds. All pipeline and storage benefit charges collected pursuant to this Ordinance or Ordinance No. 72-4 (An Ordinance Establishing Rates, Rules, and Regulations for Water Service by the Georgetown Divide Public Utility District Within the Boundaries of Georgetown-Buckeye Water Improvement District, Assessment District 1971-1), 75-4 (An Ordinance Establishing Rates, Rules, and Regulations for Water Service by the Georgetown Divide Public Utility District Within the Boundaries of Garden Valley Water Improvement District, Assessment District 1975-1), 77-4 (An Ordinance Establishing Rates, Rules, and Regulations for Water Service by the Georgetown Divide Public Utility District Within the Boundaries of Greenwood Water Improvement District, Assessment District 1977-1), and Ordinance 77-10 (An Ordinance Establishing Rates, Rules, and Regulations for Water Service by and Within the Georgetown Divide Public Utility District, and Repealing Ordinance Nos. 72-4, 74-7, 75-2, 75-4, 76-3, 77-4, and 77-5 Relating to Such Rates, Rules, and Regulations) shall be placed in separate special funds, one such fund for each water improvement district or separate area within a water improvement district. The names of each of said funds shall include the designation "Pipeline Benefit Fund" and "Storage Benefit Fund" and the name of the water improvement district or separate area within a water improvement district. The "Pipeline Benefit Charge" and the "Storage Benefit Charge" collected for a building shall be placed in the fund for the water improvement district or the separate area within a water improvement district within which is the water main to which the building is connected.

Monies in each of said funds, respectively, shall be used only for maintenance and/or extension of water mains, and/or maintenance and/or expansion or construction of storage facilities of benefit to parcels of land served by the acquisitions and improvements made for the water improvement districts or separate areas within a water improvement district, the names of which are included in the names of such funds.

ARTICLE 17 - SERVICE CONNECTION CHARGES

Sec. 17-1. Amount. Prior to the making of a new connection or increasing the size of an existing connection to the District water system for which a service connection charge has not been paid, by special

assessment therefore in proceedings for a water improvement district, or otherwise, a service connection charge shall be paid. The amount thereof shall be (a) the actual costs of constructing a new or larger service line from the water distribution main to the boundary of the road easement in which such main is located, if same is required, or (b) the amount set forth in the following table for the size of the new connection or the size to which an existing connection is increased, to wit:

Size of Service Connection	Meter Capacity (GPM)	Amount of Charge
5/8 x 3/4 inch	25	$350.00
1 inch	50	$365.00
1-1/2 inch	100	$430.00
2 inch	160	$480.00

whichever is larger.

ARTICLE 18 - NON-ADJACENT PARCELS TO IMPROVEMENT DISTRICT PIPELINE

Sec. 18-1. The owners of all parcels of land included within a water improvement district which are not adjacent to a road or public easement in which a pipeline constructed pursuant to the proceedings for such district is situate will be responsible for providing, at the cost and expense of the owners of such parcels, the necessary water lines from their parcel to the service lines provided for their respective parcels at the limits of the road or public easement in which the pipeline which will serve said parcels is situate; provided, however, that if necessary and upon request, the District shall condemn at the cost and expense of the owner or owners requesting the same the requisite easements for such service lines.

ARTICLE 19 - APPORTIONMENT OF ASSESSMENT IN EVENT OF DIVISION OF LAND SUBJECT HERETO

Sec. 19-1. In the event any parcel of land assessed in improvement district proceedings conducted by the Board is thereafter divided into two or more separate parcels, the assessment on such parcel shall be assigned to the separate parcels as follows:

(a) Where there is one existing service connection to such parcel, to the separate parcel served by the existing service connection;

(b) Where there are two or more existing service connections to such parcel, to the separate parcel or parcels served by said existing connections; and

(c) Where there are no existing service connections to such parcel, to the separate parcel which is nearest the pipeline constructed in the proceedings.

Sec. 19-2. Notwithstanding the foregoing, the assessment can be made to a different one of the separate parcels than above specified where the choice is between one of two or more separate parcels all of which or none of which have existing connections therefrom, either as appropriate in the judgement of the Engineer or as agreed to be the owner or owners of the separate parcels involved in such choice.

Sec. 19-3. Engineering, administrative, legal and other costs of apportionment of assessments upon division of parcels of land shall be borne by the owner of the parcel before division or to the new parcel or parcels to which the assessment is assigned.

ARTICLE 20 - MODIFICATION OF CHARGES

Sec. 20-1. Where the division of parcels of land or use of land for industrial, commercial, subdivision or residential projects require more than an equivalent 10 single family unit (SFU) water capacity demand for service, the Georgetown Divide Public Utility District reserves the right to modify the foregoing charges to accurately reflect the financial implications of said parcel division or use, by reason of the potential for major influence on the capacity operation and service availability of any of the facilities serving any existing water improvement district. Said modification of charges shall be made by the District Board of Directors based upon information provided by the District Engineer and staff relative to all applicable water costs and present and future water service demands.

ARTICLE 21 - REPEAL

Sec. 21-1. Ordinance Nos. 77-10, 79-1 and 81-1, the full titles and dates of adoption of which are set forth in the preamble of this Ordinance, are hereby repealed and shall be of no further force and effect; provided only that the monies in the special funds designated in any of said ordinances shall be placed in the corresponding special funds provided for in the Ordinance.

ARTICLE 22 - EFFECTIVE DATE

Sec. 22-1. Adoption and Effective Date. This Ordinance shall take effect thirty (30) days after its passage. At least one week before the expiration of said thirty days, copies thereof shall be posted in three public places within the Improvement District, and it shall be published once in the Georgetown Gazette and Town Crier, a newspaper of general circulation published in the District.

* * * * * * * * * * *

PASSED AND ADOPTED at a regularly held regular meeting of the Board of Directors of GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT on this 14th day of April, 1982.

AYES: Directors Robert E. Flynn, John C. Lampson, Fred G. DeBerry, and Arthur E. Smoot.

NOES: None.

ABSENT: Director Lee J. Hoddy.

ROBERT E. FLYNN, President
Board of Directors
GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

ATTEST:

CHARLES F. GIERAU, Clerk and ex officio Secretary of the Board of Directors thereof.

(SEAL)

I hereby certify that the foregoing is a full, true and correct copy of Ordinance No. 82-1, duly and regularly adopted by the Board of Directors of the Georgetown Divide Public Utility District, El Dorado County, California, on April 14, 1982, 1982.

CHARLES F. GIERAU, Clerk of the
GEORGETOWN DIVIDE PUBLIC
UTILITY DISTRICT

(SEAL)

ORDINANCE 2005-01

AN ORDINANCE ESTABLISHING RULES AND REGULATIONS FOR IRRIGATION SERVICE IN THE GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

BE IT ENACTED by the Board of Directors of the GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT, County of El Dorado, State of California, as follows:

The rules and regulations for irrigation service within the GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT ("District") are adopted by the Board of Directors of said District as hereinafter set forth.

SECTION 1. General Conditions:

(a) Control of System: District Works shall be under exclusive control and management of District personnel duly appointed by the Board of Directors.

(b) The District shall not be liable for interruption, shortage or insufficiency of irrigation water supply, or for any loss or damage occasioned thereby.

(c) The District shall not be liable for damage to person or property resulting directly or indirectly from privately owned conduits, meters or measuring devices.

(d) Irrigation water is used at the customer's own risk and the customer agrees to hold the District, its officers and employees free and harmless from liability and damages that may occur as the result of defective water quality, shortages, fluctuation in flow or pressure, interruptions in service or for failure to deliver water.

(e) Pumping of water by the customer is done at the customer's risk. The District assumes no liability for damage to pumping equipment or other damages as a result of turbulent water, shortages, excess of water or other causes.

(f) No purchaser of water from the District acquires a proprietary or vested right by reason of use. No purchaser acquires a right to resell water or to use for a purpose other than that for which it

was applied nor to use it on premises other than indicated on the application. The terms, conditions, priorities and allocation of irrigation service may be altered and amended by the Board of Directors. The District does not guarantee irrigation service customers the right to future service.

(g) The District expressly asserts the right to recapture, reuse and resell all waters originating from District Works.

(h) Ditchtenders and other agents of the District shall have access to all lands irrigated from its water system and to all conduits for the purpose of inspection, examination, measurements, surveys or other necessary purposes of the District with the right of installation, maintenance, control and regulation of all meters and other measuring devices, gates, turnouts and other structures necessary or proper for the measurement and distribution of water.

(i) No bridges, crossing, pipe or other structures shall be placed in or over a canal without written permission of the District. Maintenance of the canal crossings shall not be the District's responsibility but shall rest with the owner of the crossing. Where the owner fails to maintain the crossing, the District may perform the necessary repairs or removal at the expense of the owner. Notice of the District's intent will be given, if possible, to the owner prior to the work commencing.

(j) No rubbish, garbage, refuse, chemicals or animal matter from any source may be placed in or allowed to be emptied into any ditch, canal or reservoir of the District.

(k) District canals or reservoirs shall not be used for swimming or bathing.

(l) Livestock shall not be permitted to contaminate the water supply nor destroy or damage the canal system or use thereof. Property owners are liable for any damage due to livestock.

(m) No conveyance system shall cause a cross connection with the District's water system with any other source of water.

(n) No buildings, corrals or other structures, fences, trees, lines or bushes shall be permitted upon rights-of-way or use thereof be made in any way except by written authority of the District. Construction of

fences and/or gates is not permitted without written approval of the specifications by the General Manager.

(o) Violation of Rules and Regulations: Failure to comply with rules and regulations of the District shall be sufficient cause for terminating irrigation service as determined by the Board of Directors.

(p) Any person dissatisfied with any determination of the District management shall have the right to appeal to the Board of Directors.

(q) Amendments: The Board of Directors of the District may at their discretion alter, amend or add to these rules and regulations. The Board of Directors will follow applicable laws during this process.

SECTION 2. Application for an Irrigation Service Account:

(a) No irrigation service will be rendered until a complete application for an Irrigation Service Account has been approved and is on file at the office of the District. Applications will be accepted between January 1st and March 1st for the impending irrigation season. The application for service shall state that the customer agrees to abide by the terms and conditions for service as established in the Irrigation Ordinance.

(b) Applications will be approved where the District Works have sufficient capacity to meet service requested. Applications will be considered for approval utilizing the following priority system:

Priority 1. Applications for Irrigation Service to parcels that received irrigation service during the immediate past irrigation season.

Priority 2. Applications for Irrigation Service to parcels with the most recent active Irrigation Service Account during the previous ten (10) irrigation seasons

Priority 3. New applications for irrigation service to parcels that have been made after the 2003 irrigation season with priority established by the earliest season applied for. Applications and priority are specific to the section of ditch the parcel is located near.

Competing applications within the same priority level, will be determined by public lottery.

(c) Applications for an increase to service will receive Priority 3 status for the requested increase.

(d) Applications must in all cases be signed by the holder of title to the property requesting irrigation service. If the property requesting irrigation service is leased, two months of charges must be paid in advance. The landowner of leased property shall be responsible for all charges or assessments.

(e) Applications for an Irrigation Service Account to benefit a parcel of land that is not adjacent to the District Works must be accompanied by a legally recorded easement that allows the conveyance of water to the parcel requesting irrigation service. The easement shall grant the District the right of ingress and egress for inspection, installation and maintenance purposes.

(f) New applications for Out-of-District Irrigation Service Accounts will not be approved by the Board of Directors. An existing Out-of-District Irrigation Service Account that is inactive for two or more years will be deleted from the District's accounts and the service will be permanently removed.

SECTION 3. Distribution of Water:

(a) The irrigation season shall generally be from May 1 through October 1 of each year. The Board of Directors shall consider changes to the irrigation season to respond to climactic conditions and may implement such changes by a majority vote.

(b) The District does not guarantee irrigation water under pressure from the District Works. Pressure requirements of the customer are the sole responsibility of the customer and the District shall not be liable for any damage to equipment used to provide pressure to the customer.

(c) Water is distributed under continuous flow. Water must be used continuously during all days and nights including holidays and Sundays and no allowances shall be made for failure to use water when it is made available. Failure to use water on schedule shall not entitle the customer to any rebate.

(d) Irrigation service is provided for the entire irrigation season. Customers shall pay for irrigation service for the entire irrigation season regardless of their interest or ability to use water.

(e) When interruptions to irrigation service due to failure of the District Works extend beyond five (5) days, proportionate adjustments for such water loss will be made.

(f) Irrigation customers shall pay a proportionate amount for irrigation service when the irrigation season is extended or shortened by the Board of Directors.

(g) Unauthorized connections or the taking of water in an amount greater than applied and paid for, by any means, is a misdemeanor under California Penal Code Section 498 and shall be subject to criminal prosecution under Section 498 and any other applicable laws. In addition, the District may bring a civil action for damages and may refuse future service to the parcel.

(h) Irrigation customers shall prevent any unnecessary or wasteful use of water. Should a customer permit wasteful use of water, the District may discontinue service if such condition is not corrected within five (5) days after giving the parcel owner written notice of intention to terminate service.

(i) No more than one parcel shall be served through each Irrigation Service Account except with the prior written approval of the Board of Directors. Any such approval shall be recorded against each parcel with the caveat that the agreement expires upon any change of ownership. Each Irrigation Service Account shall have independent service lines and sumps.

(j) The minimum irrigation service for each Irrigation Service Account shall be one miner's inch, from the open ditch system, and one-half miner's inch from the irrigation pipeline system. In the future, the District may consider reducing the minimum irrigation service to one-half miner's inch from the open ditch system and one-quarter miner's inch from the irrigation pipeline system.

(k) All pumped services shall utilize a sump provided by the customer and acceptable to the District.

(l) All Irrigation Service Accounts must have an appropriate measuring device which shall be installed by the District. The customer shall pay the cost thereof including costs of installation. The District shall approve the location of the measuring device.

(m) Customers receiving irrigation service who request a change in flow rate during the season shall be charged a fee set by the Board of Directors for the adjustment.

(n) Replacement of measuring devices shall be at the expense of the customer if the replacement is necessary due to abnormal wear or abuse.

(o) Alternate Boxes -The Board of Directors shall not approve any new applications for Alternate Boxes.

(p) Unusual costs incurred by the District to provide irrigation service shall be paid in full by the applicant or customer. An estimate of the expense shall be approved by the property owner prior to work commencing.

SECTION 4. Charges, Rates and Billings:

(a) The District will maintain a uniform rate schedule which may be changed from time to time upon action of the Board of Directors. The rate schedule, by reference, is attached hereto and made a part of these rules and regulations.

(b) Irrigation billings are made bi-monthly (every two months) in advance.

(c) All penalties shall be charged as outlined on the billings

(d) Disconnected irrigation service accounts shall pay a fee to re-establish service

(e) Irrigation service accounts requesting verification of flow will pay a fee if the delivered flow is within 10% of the contracted amount

SECTION 5. REPEAL

(a) Upon the effective date of this Ordinance 2005-__ all previously adopted Ordinances pertinent to the Rules and Regulations for

Irrigation Service will be superceded and repealed, including, but not limited to, Ordinance 79-2, 79-8, 87-1, and 04-01.

PASSED AND ADOPTED at a regularly held meeting of the Board of Directors of the GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT this tenth day of May, 2005.

AYES:	Bob Diekon, Norman Krizl, Doug Pickell, JoAnn Shepherd and Hy Vitcov
NOES:	None
ABSENT:	None

Bob Diekon, President
Board of Directors
GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

ATTEST:

Henry N. White, Clerk and ex officio
Secretary, Board of Directors
GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

****

I hereby certify that the foregoing is a full, true, and correct copy of Ordinance 2005-01 duly and regularly adopted by the Board of Directors of the Georgetown Divide Public Utility District, El Dorado County, California, at a meeting duly held on the tenth day of May, 2005.

Henry N. White, Clerk and ex officio Secretary of the
Georgetown Divide Public Utility District

APPENDIX I

2020 CONSUMER CONFIDENCE REPORT

Georgetown Divide Public Utility District

Domestic Water | **Irrigation Service** | **On-Site Waste Disposal**

1946 ~ 2020 Reflecting on the Past. Planning for the Future.

The Georgetown Divide Public Utility District is pleased to present this information to our customers, which includes the California State Water Resource Control Board, the **Consumer Confidence Report/Annual Water Quality Report.**

Dear Georgetown Divide Public Utility District (GDPUD) Customer,

During the 2020 calendar year the District continued to make key upgrades to the District's infrastructure to ensure the delivery of high-quality drinking water to residents of the Georgetown Divide communities. Key projects completed include:

Walton Lake Filter #3

- In December, 2020 treated water filter #3 was rebuilt at the Walton Lake Treatment Plant;
- Spanish Dry Diggins water storage tank was re-coated to ensure the highest water quality is delivered to the Districts water customers;
- A total of 2,400 feet was concrete lined between sections of the Main, Kelsey, and Cherry Acres Ditch;
- Aging roofs were repaired on the District's office and shop building.
- Auburn Lake Trails - Community Disposal System Feasibility Study.
- Gaging stations were installed along District water rights in compliance of SB88. Gages give the District a better ability to mange water supply throughout the year.

We hope you find this information valuable and invite your questions or comments on this newsletter or any District related topic.

Lined Section of Canal

CDS Feasibility Investigation Activity

Gaging Station

GDPUD 2020 News Briefs & Accomplishments

Below are highlights of 2020.

Residential & Commercial Domestic Water Service – The District produced approximately 590 million gallons of treated drinking water that was delivered to 3,843 residential and commercial customers in 2020 between the Walton Lake and Sweetwater treatment plants.

The District offers a low-income assistance program. https://www.gd-pud.org/apply-for-the-low-income-assistance-program

Irrigation Water – The District supplied nearly 4,055 acre-feet of water to irrigation customers spanning nearly the entire 70-mile ditch conveyance system between May and September.

Auburn Lake Trails Wastewater Services – During the 2020 reporting period, a total of approximately 1,031 annual and 86 escrow inspections were performed in the Auburn Lake Trails Wastewater Disposal Zone. In order to reduce inflow and infiltration into the Community Disposal System (CDS) three leaking septic tanks were replaced and two manholes were re-coated.

Spanish Dry Diggins Storage Tank

Infrastructure Improvements – Approximately 2,400 lineal feet of conveyance ditch was lined to increase water delivery reliability and reduce water loss within the raw water delivery system.

Spanish Dry Diggins Tank interior and exterior was recoated in 2020. The purpose of the re-coating is to maintain the integrity of the tank and to prevent corrosion and pitting which could lead to failure.

Multiple satellite gaging stations associated with District water rights were install in accordance with SB88

Operational – Updated Walton Lake Treatment Plant remote operational controls to enable operations to respond in a timely manner to emergencies.

District staff installed monitoring stations throughout the raw water conveyance system to track water usage.

Stumpy Meadows Reservoir spilled between January 1 and June 6, 2020.

Staff Gage

Fiscal – Both treated and irrigation water rates were frozen for 2020.

The District completed billing software update.

The District transferred 2,000 acre-feet to Westlands Water District at a price of $350 per acre-foot.

The District secured a United States Bureau of Reclamation WaterSMART Water and Energy Efficiency Grant $500,000 grant for 2022 Automated Meter Replacement Project.

Georgetown Divide Public Utility District

Domestic Water | **Irrigation Service** | **On-Site Waste Disposal**

1946 ~ 2020 Reflecting on the Past. Planning for the Future.

DEAR WATER USER,

This report contains important information about your drinking water quality. We are pleased to report that in 2020 as in years past, your water meets or exceeds all United States Environmental Protection Agency (USEPA) and State drinking water health standards. The District vigilantly safeguards its water supplies and once again, your water system has been in compliance with other water quality standards. Included in these pages are details on where your water comes from, what it contains and how it compares to state standards. For additional information on water quality, customers may contact Georgetown Divide Public Utility District (the Districts) Water Resources Manager, Adam Brown at (530) 333-4356 ext. 110.

Este informe constiene información muy importante sobre su agua beber. Favor de comunicarse Georgetown Divide Public Utility District a 6425 Main St., Georgetown, CA (530) 333-4356 para asistirlo en español.

Your Water Supply

Your water source originates in the Sierras within the localized Pilot Creek Watershed that flows into Stumpy Meadows Reservoir and is an extremely high-quality surface water source. Captured water is then transported via a Gold Rush-era canal and pipe system for treatment at the Walton Lake and Sweetwater Treatment Plants. The Walton Lake plant serves the communities of Georgetown, Garden Valley, Kelsey and Greenwood. The Sweetwater plant serves Cool and Pilot Hill. Both plants employ a multi-barrier treatment process to ensure the quality of your drinking water. The treatment process at each plant involves coagulation for the removal of fine particles, filtration using sand and anthracite, disinfection with liquid chlorine and reduction of corrosivity through use of sodium carbonate. Treated water is conveyed to customers through a network of storage tanks and pipes.

Water Quality Rules Explained

In order to ensure that tap water is safe to drink, the United States Environmental Protection Agency (USEPA) and the State Water Resources Control Board (State Board) prescribe regulations that limit the amount of contaminants in the water provided by public water systems. State Board regulations also establish limits for contaminants in bottled water that provide the same protection for public health. 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 USEPAs Safe Drinking Water Hotline (800) 426-4791. The California notification levels are available on the Department's website.

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/NotificationLevels.html

Some People are More Vulnerable

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised people such as people with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune disorders and some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers, USEPA and Centers for Disease Control (CDC) guidelines on appropriate means to lessen risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800) 426-4791.

Georgetown Divide Public Utility District Board of Directors

The Board of Directors meets regularly on the second Tuesday of each month, at 2:00 p.m. at the Districts office located at 6425 Main Street in Georgetown; however, due to COVID-19 boards meetings have been held via Zoom. Meetings will resume at the District office once the COVID-19 situation has passed. Your Board members are:

- Michael Saunders, President;
- Mitch MacDonald, Vice President;
- Mike Thornbrough, Treasurer;
- Donna Seaman, Director; and
- Gerry Stewart, Director.

District office hours are Monday through Friday.
8:00 am to 4:30 pm. Closed 12:30 pm to 1:00 pm (Lunch)

Natural Minerals Can Enter Water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, reservoirs and canals. As water travels over the surface of the land, 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 which may come from 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, mining or farming;
- Pesticides and herbicides which can 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, but can also originate from gas stations, urban stormwater runoff, septic systems and agricultural applications; and
- Radioactive contaminants which can be naturally occurring or be the result of oil and gas mining and mining activities.

About Contaminants

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The District 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 consumption. If you are concerned about lead in your water, you can have your water tested. In accordance with AB746, the District submitted for lead analysis, 24 drinking water samples from the five Black Oak Mine Unified School District school sites. Lead was not detected in any samples analyzed. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at https://www.epa.gov/lead.

WATERSHED HEALTH

Water Source Assessment

Source water protection is the primary barrier for providing safe drinking water. A contaminant that does not enter the water source does not need to be removed. An assessment of the District's drinking water source was completed in December 2018. The source is considered most vulnerable to the following activities; historic gas stations, historic mining operations, wastewater treatment systems, forest management activities, recreational use, storm drain and stormwater discharges and illegal dumping. No contaminants have been detected associated with the drinking water supply. You may request a copy of the complete watershed survey or a summary at the District office or by contacting Ali Rezvani, the State Board Stationary Engineer at (916) 449-5681.

Understanding the Consumer Confidence Report

The tables presented in this report list all of the drinking water contaminants that were **detected** during the 2020 calendar year, unless otherwise noted. The State allows the District to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. The presence of these contaminants does not necessarily indicate that water poses a human health risk.

Definitions

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

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 MCLs) as is economically and technologically feasible. Secondary MECLs 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 of expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency (U.S. EPA).

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

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.

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

LRAA: Locational Running Annual Average

NTU: Nephelometric Turbidity Units. A measurement of water clarity.

ND: Not detectable at testing limit
NS: No Standard
NA: Not Applicable
ppm: parts per million
ppb: parts per billion

Georgetown Divide Public Utility District Consumer

PUBLIC NOTICE TO DISTRICT CUSTOMERS

Constituent/ Parameter	Unit	MCL	PHG or (MCLG)	Treatment Plant		Sample Date	Violation	Typical Source of Contaminant
				Walton Lake	Sweetwater			
Primary Drinking Water Standards – Health Related								
Turbidity and Microbiological Primary Drinking Water Standards								
Turbidity	NTU	TT = 1	NA	0.27 peak 0.047 average	0.523 peak 0.072 average	2020	No	Soil runoff
		TT = 95% of samples <0.3		100%	100%	2020	No	
	Turbidity has no health effects, but is a measurement of the clarity of the water or the level of suspended matter in the water. Monitoring of turbidity provides GDPUD an indication of filtration performance. High turbidity can interfere with disinfection and provide a medium for microbial growth. In reporting turbidity, the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits are specified.							
Total Coliform Bacteria (Total Coliform Rule – Weekly Sample Analysis)	Absent/ Present	One positive monthly sample.	0	0	0	2020	No	Naturally present in the environment.
Fecal Coliform and E. Coli (Revised Total Coliform Rule – Weekly Sample Analysis)	Absent/ Present	A routine and repeat sample test positive for total coliform and one of the samples also fecal and E. Coli positive.	0	0	0	2020	No	Human and animal fecal waste.
Cryptosporidium (Long-Term 2 Enhanced Water Treatment Rule)	Oocysts/L	10	0	<0.1 to 0.1 0.011 average	<0.1 to <0.1 <0.1 average	2019	No	Human and animal fecal waste.
	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful bacteria may be present. Fecal coliforms and E. Coli are bacteria whose presence indicates the water may be contaminated with human or animal wastes.							
Disinfection Byproducts, Disinfectant Residuals and Disinfection Byproducts Precursors								
TTHMs (Total Trihalomethane)	ppb	80	NA	18.1 LRAA 7.9 to 29.0	33.8 LRAA 20.0 to 53.0	2020	Yes	By product of drinking water disinfection
Haloacetic Acids	ppb	60	NA	9.7 LRAA 4.9 to 20.80	20.0 LRAA 10.5 – 51.6	2020	Yes	By product of drinking water disinfection
Chlorine	ppm	MRDL = 4.0	MRDLG = 4	0.83 average 0.59 to 1.02	0.71 average 0.68 to 1.28	2020	Yes	Drinking water disinfectant added for treatment

Constituents with a Secondary Drinking Water Standard and General Mineral Constituent								
Iron	ppb	300	NS	ND	0.16	2020	Yes	Leaching from natural deposits; industrial wastes
Total Dissolved Solids (TDS)	ppm	1,000	NS	21	29	2020	Yes	Runoff/leaching from natural deposits
Specific Conductance (EC)	micromhos	1,600	NS	28	34	2020	Yes	Substances that form ions in water; seawater influence
Chloride	ppm	250	NS	0.70	0.91	2020	Yes	Runoff/leaching from natural deposits; seawater influence
Sulfate	ppm	250	NS	ND	ND	2020	Yes	Runoff/leaching from natural deposits; industrial waste
Aggressive Index		NS	NS	9.5 (slightly corrosive)	9.67 (slightly corrosive)	2018	NA	Natural or industrially influenced balance of hydrogen, carbon and oxygen in the water affected by temperature and other factors
Bicarbonate as Calcium Carbonate	ppm	NS	NS	14	13	2020	NA	Naturally occurring in water
Alkalinity as Calcium Carbonate	ppm	NS	NS	14	13	2020	NA	Naturally occurring in water
Calcium	ppm	NS	NS	2.1	2.6	2020	NA	Naturally occurring in water
Sodium	ppm	NS	NS	1.6	1.7	2020	NA	Sodium refers to the salt present in the water and is generally naturally occurring
Total Hardness	ppm	NS	NS	7.9	9.3	2020	NA	Naturally occurring in water, generally from magnesium and calcium
pH (daily treated water in 2020)	units	NS	NS	8.20 average 8.20 to 8.20	8.36 average 7.07 to 9.57	2020	NA	Naturally occurring in water.

APPENDIX J

EL DORADO COUNTY – FIRE HAZARD SEVERITY ZONES

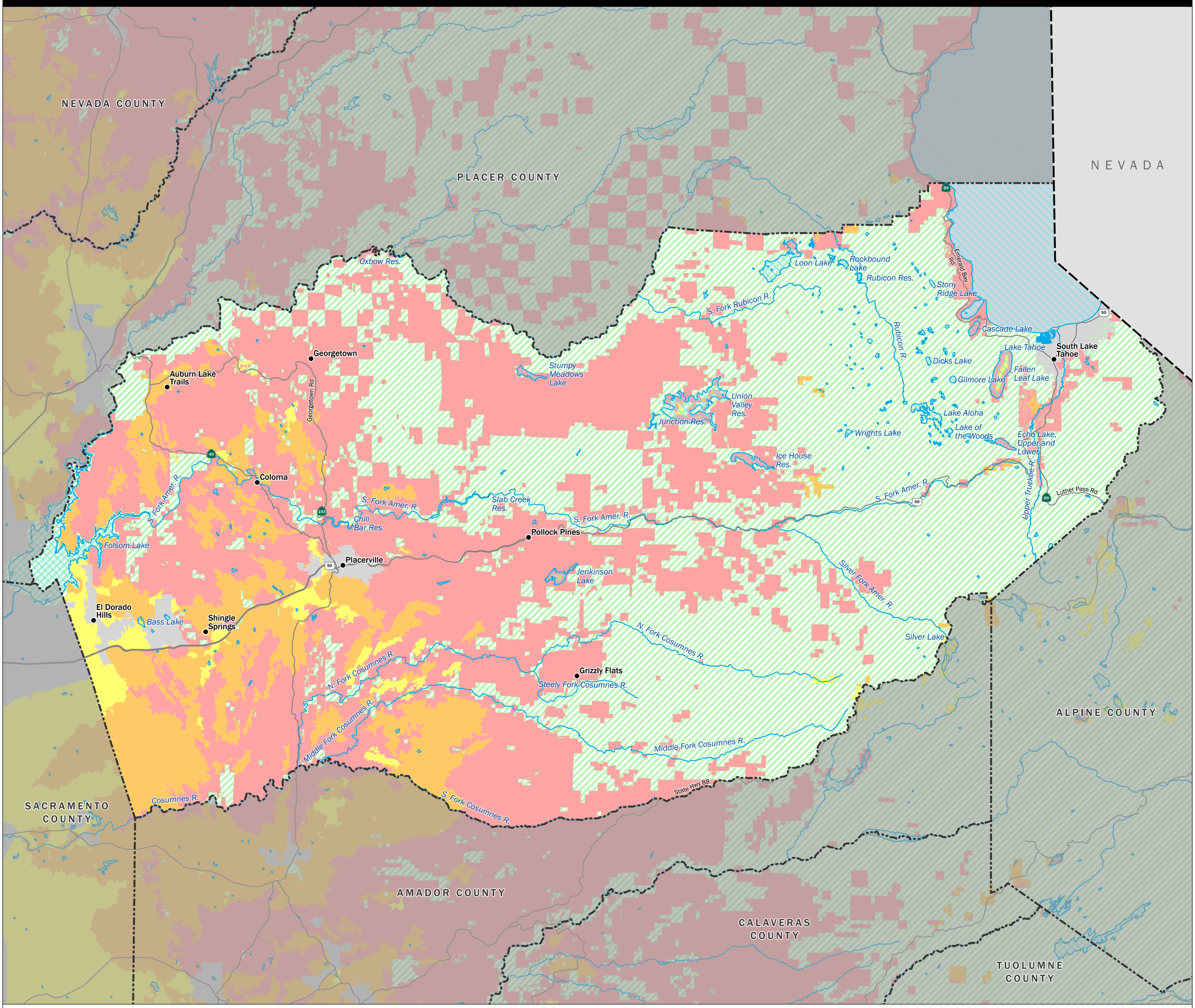
EL DORADO COUNTY

State Responsibility Area Fire Hazard Severity Zones

November 21, 2022

CAL FIRE SINCE 1885

FRAP
Fire and Resource Assessment Program
California Department of Forestry and Fire Protection



Fire Hazard Severity Zones in State Responsibility Area (SRA)

Very High	419,622 Acres
High	109,323 Acres
Moderate	19,587 Acres

Fire Protection Responsibility Areas (non-SRA)

- Federal Responsibility Area (FRA)
- Local Responsibility Area (LRA)

0 5 10 15 Miles

0 5 10 15 20 25 Km

Projection: NAD 83 California Teale Albers
Scale: 1:130,000 at 36" x 48"

Public Resources Code 4201-4204 directs the California Department of Forestry and Fire Protection (CAL FIRE) to map fire hazard within State Responsibility Areas (SRA) based on fuel loading, slope, fire weather, and other relevant factors present, including areas where winds have been identified by the department as a major cause of wildfire spread. These zones, referred to as Fire Hazard Severity Zones (FHSZ), classify a wildland zone as Moderate, High, or Very High fire hazard based on the average hazard across the area included in the zone.

Access PDF versions of the maps at **https://osfm.fire.ca.gov/fhsz-maps**. For more information, please visit the Frequently Asked Questions document for the 2023 Fire Hazard Severity Zones at **https://osfm.fire.ca.gov/fhsz** or scan the QR code at right. If you have further questions, please call 916-633-7655 or email **FHSZcomments@fire.ca.gov**.

Scan or click the QR code for more information and to visit the interactive FHSZ viewer.

Obtain FRAP maps, data, metadata, and publications at https://frap.fire.ca.gov. For more information, please call 916-633-7655 or email FHSZcomments@fire.ca.gov.

Gavin Newsom, Governor, State of California
Wade Crowfoot, Secretary for Natural Resources, California Natural Resources Agency
Mike Richwine, State Fire Marshal, California Department of Forestry and Fire Protection

Data Sources:
CAL FIRE Fire Hazard Severity Zones (FHSZSRA_DRAFT_23_1)
CAL FIRE State Responsibility Areas (SRA22_2)

APPENDIX K

EL DORADO COUNTY – LOCAL HAZARD MITIGATION PLAN

El Dorado County

Local Hazard Mitigation Plan

EL DORADO COUNTY SHERIFF

OFFICE OF EMERGENCY SERVICES

July 2018

Adopted by FEMA, March 2019
EDC Board Of Supervisor's Adoption, April 23, 2019

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Executive Summary

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. El Dorado County developed this Local Hazard Mitigation Plan (LHMP) update to make the County and its residents less vulnerable to future hazard events. This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 so that El Dorado County would be eligible for the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation and Hazard Mitigation Grant programs.

The County followed a planning process prescribed by FEMA, which began with the formation of a hazard mitigation planning committee (HMPC) comprised of key County representatives, and other regional stakeholders. The HMPC conducted a risk assessment that identified and profiled hazards that pose a risk to the County, assessed the County's vulnerability to these hazards, and examined the capabilities in place to mitigate them. The County is vulnerable to several hazards that are identified, profiled, and analyzed in this plan. Floods, levee failures, wildfires, and severe weather are among the hazards that can have a significant impact on the County.

Based on the risk assessment, the HMPC identified goals and objectives for reducing the County's vulnerability to hazards. The goals and objectives of this multi-hazard mitigation plan are:

Goal 1: Minimize risk and vulnerability of El Dorado County to the impacts of natural hazards and protect lives and reduce damages and losses to property, economy, public health and safety, and the environment.

- Minimize economic and resource impacts and promote long-term viability and sustainability of County resources
- Minimize impacts to both existing and future development from all hazards (through well-planned communities)
- Minimize impacts to natural and cultural resources
- Minimize impacts from climate change
- Minimize impacts to watersheds/Promote watershed health
- Prevent and reduce wildland fire risk and related losses
- Prevent and reduce flood risk and related damages, with a focus on repetitive loss structures and infrastructure

Goal 2: Provide protection for critical facilities, infrastructure, utilities and services from hazard impacts.

- Provide protection for critical infrastructure from the wildland fires, floods, and severe storms/weather (e.g., repeaters, cell towers, waters tanks, utilities)
- Improve infrastructure/system reliability for critical lifeline utilities, including stormwater systems, roadways (evacuation routes, emergency services and supplies); rail lines, and pipelines.
- Minimize risk of loss of life and injury to At-risk Populations

Goal 3: Improve public awareness, education, and preparedness for all hazards.

- Enhance public outreach, education, and preparedness program to include all hazards of concern (e.g. fire restrictions, water conservation measures, hazardous vegetation, air and water quality issues)
- Increase public knowledge of the risk and vulnerability to identified hazards and their recommended responses to disaster events to reduce losses
- Educate general public on evacuation planning and sheltering options for all hazard types and to encompass all groups (e.g., residents, visitors, second homeowners, vulnerable populations, animals)
- Increase community awareness and participation in hazard mitigation activities to include defensible space, hazardous vegetation abatement projects, and forest management projects and practices to reduce flood risk on private property
- Utilize multiple public outreach avenues such as schools, new technologies, and social media
- Coordination with other regional jurisdictions to facilitate (consistent/coordinated) public information function prior to, during and after an event (e.g., facebook, twitter, everbridge, web, tv, radio)

Goal 4: Increase communities' capabilities to mitigate losses and to be prepared for, respond to, and recover from a disaster event.

- Continued enhancements to Emergency Services capabilities integrating new technologies to reduce losses and save lives
- Improve interagency (local, state, federal) emergency coordination, planning, training, exercising, and communication to ensure effective community preparedness, response and recovery
- Improve interagency coordination with respect to implementation of mitigation activities such as fuels reduction and other multi-jurisdictional wildland fire projects
- Enhance the use of shared resources/Develop a strong mutual aid support system
- Maintain current service levels/provide for enhanced service levels
- Increase first responders awareness of vulnerable populations and other priority needs during a hazard event;(use of technology to pre-identify and communicate)
- Utilize lessons learned (debriefing) to improve response capabilities
- Promote efficient recovery from incidents to minimize impacts to lives, environment, and economy

Goal 5: Maintain FEMA Eligibility/Position the communities for grant funding.
Continued compliance with the NFIP/enhancement of floodplain management program through participation in the NFIP.

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Chapter 1 Introduction

Purpose

El Dorado County prepared this Local Hazard Mitigation Plan (LHMP) update to the 2012 Federal Emergency Management Agency (FEMA) approved El Dorado County Multi-Hazard Mitigation Plan. The purpose of this plan update is to guide hazard mitigation planning to better protect the people and property of the County from the effects of hazard events. This plan demonstrates the community's commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This plan was also developed, among other things, to ensure El Dorado County and participating jurisdictions' continued eligibility for certain federal disaster assistance: specifically, the FEMA Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Program (PDM), and the Flood Mitigation Assistance Program (FMA).

Background and Scope

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters, because additional expenses incurred by insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be reduced or even eliminated.

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of $4 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2005).

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. This plan documents El Dorado County's hazard mitigation planning process and identifies relevant hazards and vulnerabilities and strategies the County and participating jurisdictions will use to decrease vulnerability and increase resiliency and sustainability.

The El Dorado County LHMP update is a multi-jurisdictional plan that geographically covers the entire area within El Dorado County's jurisdictional boundaries. The following jurisdictions participated in the planning process and are seeking approval of the LHMP plan update:

- El Dorado County
- El Dorado County Office of Education and all school districts in El Dorado County
- El Dorado Irrigation District
- South Lake Tahoe Public Utility District (STPUD)

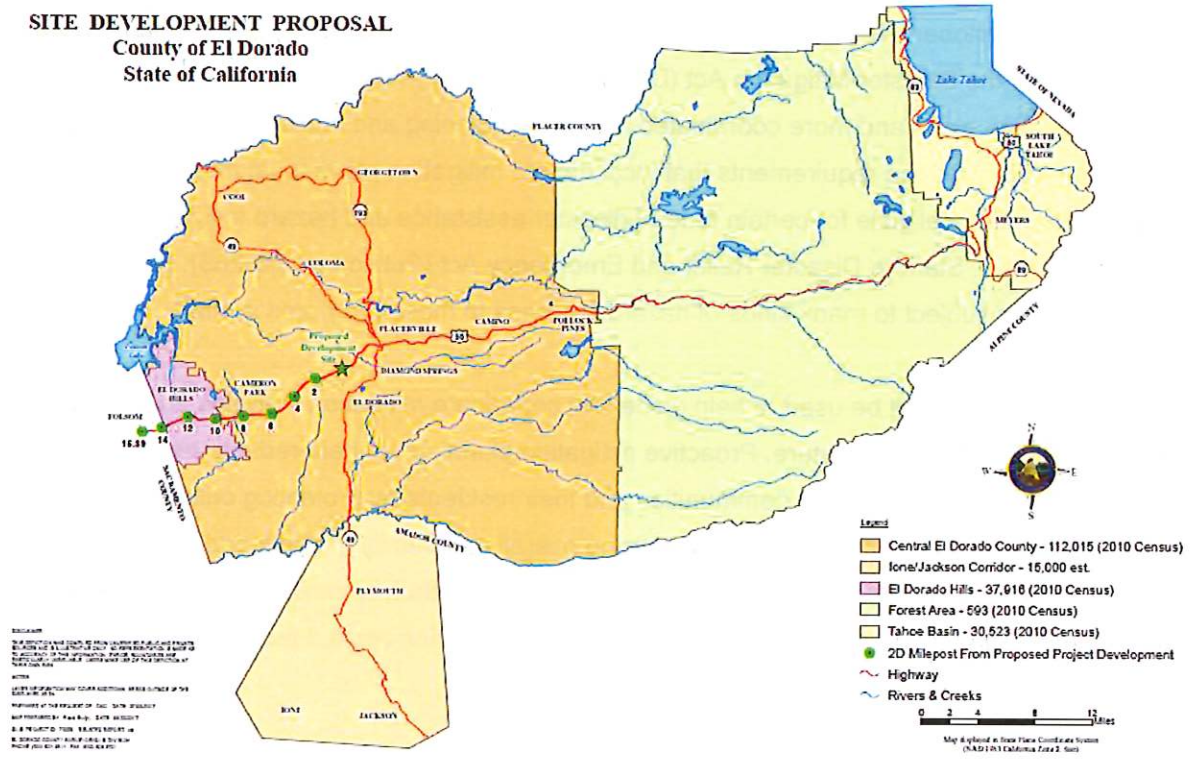
This plan update was prepared pursuant to the requirements and associated guidance of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act (DMA) or DMA 2000.) While the act emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that 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). Because El Dorado County is subject to many kinds of hazards, access to these programs is vital.

Information in this plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and their residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. El Dorado County has been affected by hazards in the past and is thus committed to reducing future impacts from hazard events and maintaining eligibility for mitigation-related federal funding.

Community Profile

El Dorado County is located in northern California and stretches from Sacramento County to Lake Tahoe and the Nevada border. The Counties of Sacramento, Placer, Amador and Alpine counties border El Dorado County. Regional access to the County is provided via Highway 50, which runs east-west through the entire County. El Dorado County includes the incorporated cities of Placerville and South Lake Tahoe and the unincorporated communities of Cameron Park, El Dorado Hills, Shingle Springs and Pollock Pines. El Dorado County is illustrated in Figure 1-1.

Figure 1-1 El Dorado County Base Map



History

According to history books, the Miwok & Maidu Indian tribes split the southwestern portion of what is now El Dorado County. The Maidu tribe had vast territories to the north, their 74 villages stretched roughly from the Nevada state line, over the mountains and down into the foothills of El Dorado County, while the Miwok went south with a small band along the Pacific coast, west of El Dorado County. The County's indigenous peoples, the Central Sierra Maidu arrived between 2000 and 600 years ago. The most visible remnants of the County's past are found in its Gold Rush Era buildings and artifacts dating from 1848, however the County's rich heritage also is well-grounded in its lumber, railroad, and transportation development past.

With this rich heritage, the County is, like many Central Sierra counties, home to numerous resources which are both concentrated along old, historic Main Streets and scattered throughout the hills, valleys, mountains and waterways of the County's public and private lands. The following graphic list shows some of the areas in El Dorado County that contain a significant number of historic structures, most occupied and used for residences, businesses and offices. Access to all of these historic sites is dependent upon the transportation infrastructure of El Dorado County.

Geography and Climate

El Dorado County, spanning the eastern part of the Central Valley of California, increases in elevation from urban Western El Dorado to the High Sierras of South Lake Tahoe, and the Nevada state line. Located on an area of over 1,786 square miles, 78 square miles of which are comprised of water, the County is generally divided into two geographically distinct areas: the West Slope – El Dorado Hills to Strawberry and the East Slope – Strawberry to South Lake Tahoe.

The County's topography is characterized by sweeping foothills areas, high mountains (Sierra Nevada) and the South Lake Tahoe Basin. Elevations range from 700 feet above mean sea level to more than 10,800 feet in the Sierra Nevada. Water resources within El Dorado County include the American River, Lake Tahoe and several mountain lakes.

The climate varies throughout the County, primarily based on elevation. Summers are longer, relatively hot, and dry in the lower elevations and are relatively cooler in the higher elevations of the Sierra Nevada. There is little precipitation in the County during the summer. Winters in the lower elevations are shorter and precipitation is primarily in the form of rain. In the higher elevations of the Sierra Nevada, winters vary from short and mild with moderate snowfall to moderately severe

with frequent snowfall. Most of the seasonal precipitation throughout the County occurs between October and April. More specific information about El Dorado County's climate can be found in Chapter 3 Risk Assessment.

Population

The July 1, 2017 United States Census estimates for the County and incorporated jurisdictions are shown on Table 1-1.

Table 1-1 El Dorado County Population Estimates – January 1, 2017

Jurisdiction	2017
Placerville (City of)	10,936
South Lake Tahoe (City of)	21,978
El Dorado County (Unincorporated)	156,073
Total Population	**188,987**

Source: U.S. Census Bureau

Plan Organization

This El Dorado County 2018 LHMP update is a multi-jurisdictional plan that geographically covers the entire area within El Dorado County's jurisdictional boundaries (i.e., the planning area). Participating jurisdictions within the El Dorado County Planning Area include: Unincorporated El Dorado County and the following agencies: El Dorado County Office of Education and all school districts in El Dorado County, El Dorado Irrigation District, and South Lake Tahoe Public Utility District.

- Chapter 2: Planning Process
- Chapter 3: Risk Assessment and Vulnerability Assessment
- Chapter 4: Mitigation Strategy
- Chapter 5: Plan Adoption
- Chapter 6: Plan Implementation and Maintenance
- Annexes
- Appendices

The Base Plan provides the overall framework for this multi-jurisdictional LHMP. It is the umbrella document that includes the planning process, methodologies, and procedural requirements for all participating jurisdictions (i.e., unincorporated County and all Annexes). As such, Chapters 1-6 of the Base Plan apply to the unincorporated County, the two incorporated communities and all special districts as participants to this LHMP update seeking FEMA approval of the plan. Because this is a multi-jurisdictional plan, the Base Plan addresses the LHMP hazard mitigation planning elements for all participating jurisdictions and includes data, information, and analysis specific to: The El Dorado County Planning Area (which includes all participating jurisdictions and the entire geographic boundary of El Dorado County) and Unincorporated El Dorado County.

The Annexes detail the hazard mitigation planning elements specific to the each participating jurisdiction to this 2018 El Dorado County LHMP Update. Each Annex is not intended to be a standalone document, but appends to, supplements, and incorporates by reference the information contained in the Base Plan document. As such, all Chapters 1-6 of the Base Plan, including the planning process and other procedural requirements and planning elements apply to and were met by each participant. The Annexes provide additional information specific to the each participant, with a focus on providing additional details on the risk assessment and mitigation strategy.

The Appendices provide additional information, data, and planning process documentation that applies to all participants to this El Dorado County 2018 LHMP Update.

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Chapter 2 Planning Process

Requirements §201.6(b) and §201.6(c)(1): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

1. **An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;**
2. **An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and**
3. **Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.**

The plan shall document the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Local Hazard Mitigation Committee

The Hazard Mitigation Committee's role was to:

- Assist in establishing the Hazard Mitigation Planning Committee (HMPC) as defined by the Disaster Mitigation Act (DMA);
- Meet the DMA requirements as established by federal regulations and following FEMA's planning guidance;
- Support objectives under the National Flood Insurance Program's Community Rating System and the Flood Mitigation Assistance program;
- Facilitate the entire planning process;
- Identify the data requirements that HMPC participants could provide and conduct the research and documentation necessary to augment that data;
- Assist in facilitating the public input process;
- Produce the draft and final plan documents; and
- Coordinate with the California Office of Emergency Services (Cal OES) and FEMA Region IX plan reviews.

Local Government Participation

The DMA planning regulations and guidance stress that each local government seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Participate in the process as part of the HMPC;
- Detail where within the planning area the risk differs from that facing the entire area;
- Identify potential mitigation actions; and
- Formally adopt the plan.

For the El Dorado County Planning Area's HMPC, "participation" meant the following:

- Providing facilities for meetings;
- Attending and participating in the HMPC meetings;
- Collecting and providing other requested data (as available);
- Managing administrative details;
- Making decisions on plan process and content;
- Identifying mitigation actions for the plan;
- Reviewing and providing comments on plan drafts; including annexes
- Informing the public, local officials, and other interested stakeholders about the planning process and providing opportunity for them to comment on the plan;
- Coordinating, and participating in the public input process; and
- Coordinating the formal adoption of the plan by the governing boards.

The County and all participants with annexes to this plan seeking FEMA approval met all of these participation requirements. In most cases one or more representatives for each participating agency attended the HMPC meetings described in Table 2-1 and also brought together a local planning team to help collect data, identify mitigation actions and implementation strategies, and review and provide data on plan drafts. Appendix A provides additional information and documentation of the planning process.

Table 2-1 El Dorado County Hazard Mitigation Planning Committee

Name	Position	Agency /Community
James Byers	Lieutenant	EDC Sheriff's Office of Emergency Services
Moke Auwae	Sergeant	EDC Sheriff's Office of Emergency Services
Todd Crawford	Deputy	EDC Sheriff's Office of Emergency Services
Leslie Schlag	Deputy	EDC Sheriff's Office of Emergency Services
Anne Novotny	Planner	EDC CDA Long Range Planning
Lillian MacLeod	Planner	EDC CDA Development Services Division
Jose Crummett	Manager	EDC GIS
Alex Gole	GIS Specialist	EDC GIS
Kristine Guth	Program Manager	EDC Health & Human Services Preparedness
John Edwards	Maintenance Supervisor	EDC CDA Department of Transportation
Charlene Carveth	Agriculture Commissioner	EDC Agriculture
Mark Moss	Hazardous Materials Supervisor	EDC CDA Environmental Management
Kathy Daniels	Director of Facilities	EDC Office of Education, Facilities
Greg Schwab	Chief	Georgetown Fire
Grant Ingram	Chief	Pioneer Fire
Michael Lilienthal	Battalion Chief	El Dorado Hills Fire
David Merino	Captain	El Dorado Hills Fire
Mike Webb	Division Chief	CAL FIRE / Cameron Park Fire
Tom Tinsley	Battalion Chief	CAL FIRE, AEU
Darin McFarlin	Captain	CAL FIRE, AEU
Bob Counts	Captain	CAL FIRE / Cameron Park CSD

Name	Position	Agency /Community
Steve Willis	Vice Chairperson	EDC Fire Safe Council
Pat Dywer	Chairperson	EDC Fire Safe Council
Randy Hackbarth	General Manager	Nashville Trail CSD
Katrina Jackson	Director	El Dorado Hills CSD
Chaney Hicks	General Manager	Rolling Hills CSD
Gordon Fawkes	Director	Rolling Hills CSD
Jodi Lauther	General Manager	Grizzly Flats CSD
Ron Kilburg	Safety and Security Manager	El Dorado Irrigation District, Safety & Security
Don Nizolek	Operations Manager	El Dorado Irrigation District, Operations
Greg Hawkins	Parks & Recreation Manager	El Dorado Irrigation District, P&R
Kim Sackman	Emergency Management Specialist	Sacramento Municipal Utility District, EM
Shannon Cotulla	Assistant General Manager	South Tahoe Public Utility District
Valerie Cox	Captain	Los Rios Community College PD, El Dorado Center
Richard Rodriguez	Senior Public Safety Specialist	PG&E, Public Safety Specialist
Kim Nielson	Emergency Services Coordinator	Cal OES, Inland Reg.

Specific individuals representing El Dorado County Departments, Fire Districts, Law Enforcement, Public Utilities, Community Service Districts, Cities, Hospitals, Schools, Tribal, Emergency Management, and other key stakeholders were invited to participate in the HMPC process and are identified in Appendix A.

An HMPC kick off meeting was completed on October 25, 2016 and another follow up meeting on December 7, 2016. Notifications were made to the public for review and comment on the draft LHMP plan through social media reaching 5,790 people. Public meetings were held in South Lake

Tahoe on January 24, 2017 and in Placerville on January 26, 2017. Agendas and sign in sheets for the meetings can also be found in Appendix A.

The Planning Process

El Dorado County OES utilized the process recommended by the California Office of Emergency Services (Cal OES) to develop this LHMP. Participants were asked to consider Social, Technical, Administrative, Political, Legal, Economic and Environmental (STAPLEE) criterion as they identified hazards, vulnerabilities, and mitigation strategies. A LHMP Planning Team was also established to research past disaster events that have occurred in or near the county, research new technologies that have been developed to address mitigation, analyze the information gathered and assemble that information into this plan.

Following a thorough hazard, risk and vulnerability analysis by all who have participated in this effort, mitigation strategies were then developed to eliminate, and/or mitigate the dangers that exist to life and property. When participants (Community members, first responders, Disaster Council, LHMP Planning Team) were asked to identify and rate in priority the hazards they had identified, there was a very clear consensus that wildfire was number one (1), with flooding number two (2), threats from avalanche and rock slides being number three (3), and acts of terrorism number four (4). The prioritization of mitigation actions followed this list of priorities. There was little interest from those involved in the plan update to address in the Mitigation Action Plan those hazards that have a low frequency of occurrence and low/high level of impact potential. By establishing achievable goals and objectives the various groups involved in the LHMP update planning process can see that their efforts are making a difference and involvement in other mitigation efforts can be achieved. The process included the following steps, listed in order in which they were undertaken:

1. Hazard Identification and Analysis
2. Community Vulnerability Assessment
3. Mitigation Capabilities Assessment
4. Mitigation Strategy
5. Mitigation Action Plan and Implementation Program

Step 1: Hazard Identification and Analysis, describes and analyzes the natural hazards present in El Dorado County that can threaten human life and damage property. It includes historical data of past occurrences, events that have occurred in other similar jurisdictions, and input from public and

private agencies, and the community at large.

Step 2: The Community Vulnerability Assessment, was completed through investigative research, community outreach for input, and GIS data and data received through research studies. It includes tabular and narrative descriptions on community characteristics, such as El Dorado County's geographic, economic and demographic profiles, and discusses future development trends and implications for hazard vulnerability. To graphically depict hazard vulnerability, this section also includes community vulnerability assessment maps. Also included is a qualitative risk index based upon hazard frequency, magnitude and impact. Including the demographic within El Dorado County that includes citizens within the community with Access and Functional Needs (AFN). Conclusions of both the quantitative and qualitative nature of risk and vulnerability form the basic foundation for concentrating and prioritizing mitigation planning and efforts.

Step 3: The Mitigation Capabilities Assessment, provides a comprehensive examination of El Dorado County's capacity to implement meaningful mitigation strategies, and identifies existing opportunities for program enhancement. Capabilities addressed in this section include staff and organizational capability, technical capability, policy and program capability, fiscal capability, legal authority and political willpower. The purpose of this assessment is to identify any existing gaps, weaknesses or conflicts in local programs/activities that may hinder mitigation efforts, or to identify those local activities that can be built upon in establishing a successful community hazard mitigation program. Community members were asked to provide insight on mitigation strategies to prevent, and or mitigate the hazards and vulnerabilities they had identified.

Step 4: The Mitigation Strategy, at the conclusion of these three background studies results in the formation of community goal statements and sets the stage for developing, adopting and implementing a meaningful Hazard Mitigation strategy for El Dorado County.

Step 5: The Mitigation Action Plan and Implementation Plan, these two steps help make the Plan strategic and functional for implementation purposes, and ultimately are the "action" components of the plan. El Dorado County concentrated on designing measures to ensure the Plan's ultimate implementation, and adopted evaluation and enhancement procedures to ensure the Plan is routinely updated.

Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

With El Dorado County's and participant's commitment to participate in the DMA planning process and the CRS program, the County's Office of Emergency Services (OES) to established the framework and organization for development of the plan. An initial meeting was held with key community representatives to discuss the organizational and process aspects of this plan update process.

The initial kick-off meetings were held on October 25, 2016 and December 7, 2016. Invitations to these kickoff meetings were extended to key county departments, the two incorporated communities, special districts located within the planning area, as well as to other federal, state, and local stakeholders, including representatives from the public, that might have an interest in participating in the planning process. Representatives from participating jurisdictions and HMPC members to the 2011 and 2015 plans were used as a starting point for the invite list, with additional invitations extended as appropriate throughout the planning process. Public comment was solicited through press release and social media on January 16, 2018. A meeting was held in South Lake Tahoe January 24, 2017. A final public meeting was held in Placerville on January 26, 2017 in which stakeholders and the community had an opportunity to comment on the draft plan.

El Dorado County

- Agricultural Commissioner
- Community Development Agency, Building Services Division
- Community Development Agency, Department of Transportation
- Community Development Agency, Development Services
- Community Development Agency, Environmental Management
- Community Development Agency, GIS
- Community Development Agency, Planning Services Division
- Disaster Council
- Emergency Medical Health Agency
- Fire Safe Council
- Health and Human Services, Emergency Preparedness Group
- Information Technology
- Mental Health

- Office of Education
- Office of Emergency Services
- Public Health
- Public Information Officer
- Sheriff

A list of participating HMPC representatives for each jurisdiction is included in Appendix A. This list details all HMPC members that attended one or more HMPC meetings. Each jurisdiction also utilized the support of many other support staff in order to collect and provide requested data and to conduct timely reviews of the draft documents as further detailed in each annex to this plan. Note that the above list of HMPC members also includes several other government and stakeholder representatives that were invited to participate and contributed to the planning process.

During the planning process, the HMPC communicated through face-to-face meetings, email and telephone conversations. The HMPC met formally twice during the planning period (October 2016 – January 2017) which adequately covers the four phases of DMA. Agendas and sign-in sheets for each of the meetings are included in Appendix A.

Where appropriate, stakeholder and public comments and recommendations were incorporated into the final plan, including the sections that address mitigation goals and strategies. Written public comments were provided by only two members of the public, with several agency stakeholders providing input and comments on the draft plan and other related data throughout the plan development process. All social media and public outreach efforts are on file with the El Dorado County OES and are included in Appendix A.

Early in the planning process, the HMPC determined that data collection, mitigation strategy development, and plan approval would be greatly enhanced by inviting other local, state and federal agencies and organizations to participate in the process. Based on their involvement in hazard mitigation planning, their landowner status in the County, and/or their interest as a neighboring jurisdiction, representatives from the following agencies were invited to participate on the HMPC:

- Cal OES
- Cal Fire AEU
- Fire Safe Councils
- El Dorado Irrigation Districts
- Georgetown Public Utility District
- South Tahoe Public Utility District
- Tahoe City Public Utility District
- Sacramento Public Utility District
- Arroyo Vista CSD
- Audubon Hills CSD
- Cameron Estates CSD
- Cameron Park CSD
- Connie Lane CSD
- Cosumnes River CSD
- East China Hill CSD
- El Dorado Hills CSD
- Fallen Leaf Lake CSD
- Garden Valley Ranch CSD
- Golden West CSD
- Greenstone Country CSD
- Grizzly Flats CSD
- Hickok Road CSD
- Hillwood CSD
- Holiday Lake CSD
- Knolls Property Owners CSD
- Lakeview CSD
- Marble Mountain CSD
- Mortara Circle CSD
- Nashville Trail CSD
- Rising Hill CSD
- Rolling Hills CSD
- Showcase CSD
- Sierra Oaks CSD
- West El Largo CSD
- United States Forest Service
- Cameron Park Fire District
- Diamond Springs/El Dorado Fire District
- El Dorado County Fire District
- El Dorado Hills Fire District
- Fallen Leaf Lake Fire District
- Garden Valley Fire District
- Georgetown Fire District
- Lake Valley Fire District
- Meeks Bay Fire District
- Mosquito Fire District
- Pioneer Fire District
- Rescue Fire District
- Tahoe Paradise Resort Improvement District
- Cameron Park Airport District
- Georgetown Divide Recreation
- El Dorado County Resource Conservation District
- Georgetown Divide Resource Conservation District
- Tahoe Resource Conservation District
- City of Placerville
- City of South Lake Tahoe
- Marshal Hospital
- Barton Hospital
- Shingle Springs Rancheria
- Los Rios College, El Dorado Center
- Lake Tahoe Community College

- Pacific Gas and Electric
- Sacramento Municipal Utility District

Coordination with key agencies, organizations, and advisory groups throughout the planning process allowed the HMPC to review common problems, development policies, and mitigation strategies as well as identifying any conflicts or inconsistencies with regional mitigation policies, plans, programs and regulations. Coordination involved contacting these agencies through a variety of mechanisms and informing them on how to participate in the plan update process and if they had any expertise or assistance they could lend to the planning process or specific mitigation strategies. Coordination with these groups included, holding face-to-face meetings, sending outreach e-mails, some with follow up phone calls; and making phone calls alone to out of area agencies. All of these groups and agencies were solicited asking for their assistance and input, telling them how to become involved in the plan update process, and inviting them to HMPC meetings.

Several opportunities were provided for the groups listed above to participate in the planning process. At the beginning of the planning process, invitations were extended to many of these groups to actively participate on the HMPC. Further as part of the public outreach process, all groups were invited to attend the public meetings and to review and comment on the plan prior to submittal to CAL OES and FEMA.

Other Community Planning Efforts and Hazard Mitigation Activities

Coordination with other community planning efforts is also paramount to the success of this plan. Hazard mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability to hazards. El Dorado County uses a variety of comprehensive planning mechanisms, such as general plans and ordinances, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this plan establishes a credible and comprehensive plan that ties into and supports other community programs. The development of this plan incorporated information from the following existing plans, studies, reports, and initiatives as well as other relevant data from neighboring communities and other jurisdictions.

- El Dorado County General Plan
- El Dorado County General Plan Technical Background Report

- El Dorado County Emergency Operations Plan
- El Dorado County Flood Insurance Study
- El Dorado County Flood Control & Water Conservation District Storm-water Management Manual
- El Dorado County Housing Element
- California State Hazard Mitigation Plan
- California State Drought Contingency Plan
- State of California Department of Conservation Farmland Mapping and Monitoring Program
- USDA Census of Agriculture
- El Dorado County Agricultural Commissioner Reports
- California Department of Food and Agriculture Invasive Species Report
- Community Wildfire Protection Plans

These and other documents were reviewed and considered, as appropriate, during the collection of data to support planning, which include the hazard identification, vulnerability assessment, and capability assessment. Data from these plans and ordinances were incorporated into the risk assessment and hazard vulnerability sections of the plan. Where the data from the existing studies and reports is used in this plan update, the source document is referenced throughout this plan update. The data was also used in determining the capability of the community in being able to implement certain mitigation strategies. Appendix B References provides a detailed list of references used in the preparation of this plan update.

Phase 2: Assess Risks

HMPC led the effort to identify, document, and profile all the hazards that have, or could have, an impact the planning area. Starting with the 2012 plan, natural hazards of concern were added, deleted, and modified for this LHMP Update. Data collection worksheets and participant annexes were developed and used in this effort to aid in determining hazards and vulnerabilities and where the risk varies across the planning area. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities.

The HMPC also conducted a capability assessment to review and document the planning area's current capabilities to mitigate risk from and vulnerability to hazards. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the HMPC

could assess those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified. A more detailed description of the risk assessment process, methodologies, and results are included in Chapter 3 Risk Assessment.

Phase 3: Develop the Mitigation Plan

HMPC facilitated brainstorming and discussion sessions that described the purpose and process of developing planning goals and objectives, a comprehensive range of mitigation alternatives, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. This information is included in Chapter 4 Mitigation Strategy.

Based on input from the HMPC regarding the draft risk assessment and the goals and activities identified, a complete first draft of the plan was developed. This complete draft was provided for HMPC review and comment. Other agencies were invited to comment on this draft as well. HMPC and agency comments were integrated into the second public review draft, which was advertised and distributed to collect public input and comments. The HMPC integrated comments and issues from the public, as appropriate, along with additional internal review comments and produced a final draft for the CAL OES and FEMA Region IX to review and approve, contingent upon final adoption by the governing boards of each participant.

Phase 4: Implement the Plan and Monitor Progress

In order to secure buy-in and officially implement the plan, the plan was adopted by the governing boards of each participant using the sample resolution contained in Appendix C. The true worth of any mitigation plan is in the effectiveness of its implementation. Up to this point in the planning process, all of the HMPC's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions. Each recommended action includes key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. An overall implementation strategy is described in Chapter 6 Plan Implementation and Maintenance.

Finally, there are numerous organizations within the El Dorado County Planning Area whose goals and interests interface with hazard mitigation. Coordination with these other planning efforts is paramount to the implementation and ongoing success of this plan and mitigation in El Dorado County and is addressed further in Chapter 6.

Implementation and Maintenance Process: 2012

The 2012 El Dorado County, California Local Hazard Mitigation Plan Update included a process for plan maintenance and implementation of the mitigation strategy as well as formal updates to the plan document. The 2012 process called for a formal plan update as required by DMA regulations every 5 years. El Dorado County Office of Emergency Services conducted informal reviews in an annual basis and conducted formal documented reviews when necessary.

As stated, documented reviews of the 2012 plan took place on an as needed basis by the County and participating jurisdictions, and the 2012 LHMP was integrated into many other planning mechanisms in the County. The entire LHMP was adopted and incorporated by reference into the El Dorado County General Plan Safety Element as part of their General Plan Update Process. The risk assessment portion of the 2012 LHMP was relied on and further integrated into other planning mechanisms. Table 2-2 lists the planning mechanism the 2012 LHMP was integrated into by El Dorado County.

Table 2-2 Incorporation of El Dorado County LHMP into Other Planning Mechanisms

Planning Mechanism 2012 LHMP Was Incorporated/Implemented Through	Details
2004 General Plan – Safety Element and other sections	2012 LHMP fully incorporated by reference into Safety Element of the most
2014 Emergency Operations Plan	LHMP risk assessment data incorporated into the Base EOP; other LHMP data use
Updates of El Dorado County Community Wildfire Protection Plans	LHMP risk assessment data and mitigation projects, specific to wildfires are used and considered in the CWPP
Capital Improvement Plans and Budgets	Mitigation projects are considered and included in annual CIPs as feasible

The plan implementation and maintenance process as set forth in the 2012 plan has been updated for this LHMP update. The revised update implementation and maintenance process for the El Dorado County 2018 LHMP update is set forth in Chapter 6 of this plan document.

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Chapter 3 Risk Assessment

Requirement §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

As defined by the Federal Emergency Management Agency (FEMA), risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The process allows for a better understanding of a jurisdiction's potential risk to natural hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This risk assessment followed the methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses (FEMA 386-2, 2002), which breaks the assessment down to a four-step process:

- Identify Hazards;
- Profile Hazard Events;
- Inventory Assets; and
- Estimate Losses.

Data collected through this process has been incorporated into the following sections of this chapter:

- Section 3.1: Hazard Identification: Natural Hazards identifies the natural hazards that threaten the planning area and describes why some hazards have been omitted from further consideration.
- Section 3.2: Hazard Profiles discusses the threat to the planning area and describes previous occurrences of hazard events and the likelihood of future occurrences.
- Section 3.3: Vulnerability Assessment assesses the planning areas' exposure to natural hazards; considering assets at risk, critical facilities, future development trends, and, where

possible, estimates potential hazard losses.

- Section 3.4: Capability Assessment inventories existing mitigation activities and policies, regulations, plans, and projects that pertain to mitigation and can affect net vulnerability.

This risk assessment covers the entire geographical extent of El Dorado County, including the incorporated communities and other participants. Since this plan covers multiple participants, the Hazard Mitigation Planning Committee (HMPC) is required to evaluate how the hazards and risks vary from participant to participant. While these differences are noted in this chapter, they are expanded upon in the annexes of the participants. If no additional data is provided in an annex, it should be assumed that the risk and potential impacts to the affected jurisdiction are similar to those described here for El Dorado County.

This LHMP update involved a comprehensive review and update of each section of the risk assessment. As part of the risk assessment update, new data was used, where available, and new analyses were conducted. Where data from existing studies and reports was used, the source is referenced throughout this risk assessment. Refinements, changes, and new methodologies used in the development of this risk assessment update are detailed in this Risk Assessment portion of the plan.

3.1 Hazard Identification: Natural Hazards

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type...of all natural hazards that can affect the jurisdiction.

The El Dorado County Hazard Mitigation Planning Committee (HMPC) conducted a hazard identification study to determine the hazards that threaten El Dorado County. This section details the methodology and results of this effort.

3.1.1 Results and Methodology

Using existing natural hazards data and input gained through planning meetings, the HMPC agreed upon a list of natural hazards that could affect El Dorado County. Hazards data from El Dorado County, California Office of Emergency Services (Cal OES), FEMA, California Department of Water Resources, the National Oceanic and Atmospheric Administration (NOAA), and many other sources were examined to assess the significance of these hazards to the operational area. Significance was measured in general terms and focused on key criteria such as frequency and resulting damage, which includes deaths and injuries, as well as property and economic damage. The natural hazards evaluated as part of this plan include those that have occurred historically or have the potential to cause significant human and/or monetary losses in the future. Only the more significant (or priority) hazards have a more detailed hazard profile and are analyzed further in Section 3.3 Vulnerability Assessment.

The following hazards in Table 3-1, listed alphabetically were identified and investigated for this plan update. As a starting point, the updated California State Hazard Mitigation Plan was consulted to evaluate the applicability of new hazards of concern to El Dorado County. Building upon this effort, hazards from the past plan were also identified, and comments explain how hazards were updated from the previous plan. All hazards from the 2012 plan were profiled in this plan.

Table 3-1 County Hazard Identification and Comparison

2017 Hazards	2012 Hazards	Comment
Avalanche	Avalanche	Similar analysis was performed.
Dam/Levee Failure	Damn Inundation	Updated dam data from Cal OES and Cal DWR was added.
Drought/Extreme Heat/Tree Mortality	-	Water shortage was added to this hazard and a greater emphasis placed on the hazard as a whole
Earthquake and Debris Flow	Earthquake, Sinkholes and Landslides	Similar analysis was performed.
Erosion	Erosion	The new DFIRM layer was intersected with the newest parcel and assessor's data.
Floods	Floods	Similar analysis was performed.
Seiche Wave	Seiche	Similar analysis was performed.
Severe Storms	Winter/Seasonal Storms	Similar analysis was performed.
Severe Thunderstorms and Tornadoes	Winter/Seasonal Storms	Severe Thunderstorms and Tornadoes were separated out and less emphasis placed at the hazard
Wildfire	Wildfire	Further analysis was performed using the most recent CAL FIRE data.

Table 3-2 was completed by the County and HMPC to identify, profile, and rate the significance of identified hazards. Only the more significant (or priority) hazards have a more detailed hazard profile and are analyzed further in Section 3.3 Vulnerability Assessment. Table 3-20 in Section 3.2.16 Natural Hazards Summary provides an overview of these significant hazards.

Table 3-2 El Dorado County Hazard Mitigation Worksheet

Hazard	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Significance
Avalanche	Limited	Likely	Limited	Low
Dam Failure	Significant	Occasional	Critical	High
Drought	Extensive	Likely	Critical	High
Earthquake	Significant	Occasional	Critical	Medium
Erosion	Limited	Occasional	Limited	Low
Flood (Localized)	Limited	Occasional/Highly Likely	Limited	Medium
Seiche (Lake Tsunami)	Limited	Unlikely	Limited	High
Severe Weather	Extensive	Highly Likely	Limited	Low
Severe Weather: Thunderstorms / Tornadoes	Extensive	Highly Likely	Critical	High
Wildfire	Extensive	Highly Likely	Critical	High

Geographic Extent

- Limited: Less than 10% of planning area
  Significant: 10-50% of planning area shutdown of facilities for more than 30 days; and/or multiple deaths
  Extensive: 50-100% of planning area
  Catastrophic: More than 50 percent of property severely damaged

Probability of Future Occurrences

- Occasional: Occurs every set number of years.
- Likely: Between 10 and 100% chance of facilities for more than a week; and/or injuries/illnesses treatable do occurrence in next year, or has a recurrence not result in permanent disability interval of 10 years or less.
- Highly Likely: Near 100% chance of in permanent disability occurrence in next year, or happens every year.

Magnitude/Severity

- Negligible: Less than 10 percent of property severely damaged
- Limited: 10-25 percent of property severely damaged;
- Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result

Significance

- Low: minimal potential impact in next 100 years, or has a recurrence interval
- Medium: moderate potential impact of greater than every 100 years.
- High: widespread potential impact.

3.1.2 Disaster Declaration History

One method the HMPC used to identify hazards was the researching of past events that triggered federal and/or state emergency or disaster declarations in the Planning Area. Federal and/or state disaster declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state governments' capacities are exceeded; a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), and/or the Small Business Administration (SBA). FEMA also issues emergency declarations, which are more limited in scope and without the long-term federal recovery programs of major disaster declarations. The quantity and types of damage are the determining factors.

A USDA declaration will result in the implementation of the Emergency Loan Program through the Farm Services Agency. This program enables eligible farmers and ranchers in the affected county as well as contiguous counties to apply for low interest loans. A USDA declaration will automatically follow a major disaster declaration for counties designated major disaster areas and those that are contiguous to declared counties, including those that are across state lines. As part of an agreement with the USDA, the SBA offers low interest loans for eligible businesses that suffer economic losses in declared and contiguous counties that have been declared by the USDA. These loans are referred to as Economic Injury Disaster Loans.

Details on federal and state disaster declarations were obtained by the HMPC, FEMA, and Cal OES and compiled in chronological order in Table 3-3. A review of state declared disasters indicates that El Dorado County received 25 state declarations between 1950 and 2017. Of the 25 state declarations: 18 were associated with severe winter storms, heavy rains, or flooding; 4 were for wildfires; 1 was for freeze and severe weather conditions; 1 was for drought; 1 was for an energy emergency. A review of federal disasters shows ten (10) federal disaster declarations in the past 20 years.

Table 3-3 El Dorado County State and Federal Disasters Declaration, 1997-2017

Hazard	Disaster #	Year	State Declaration	Federal Declaration	Location
Winter Storms	DR-1155	1997	Yes	N/A	El Dorado County
Hollow Fire	FM-2532	2004	Yes	N/A	El Dorado County
2005/06 Winter Storms	DR-1628	2005-2006	Yes	Yes	El Dorado County
2006 Spring Storms	DR-1646	2006	Yes	Yes	El Dorado County
Angora Fire	FM-2700	2007	Yes	Yes	Meyers, South Lake Tahoe
January Storms	2008-01	2008	Yes	N/A	El Dorado County
King Fire	FM-5081	2014	Yes	Yes	Pollock Pines/Camino
January 2017 Storms	DR-4301	2017	Yes	Yes	El Dorado County
Late January 2017 Storms	DR-4305	2017	Yes	Yes	El Dorado County
February 2017 Storms	DR-4308	2017	Yes	Yes	El Dorado County

Source: Cal OES, FEMA

This disaster history (combined FEMA and state) suggests that El Dorado County experiences events that are worthy of disaster declaration on average every two years.

3.2 Hazard Profiles

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

The hazards identified in Section 3.1 Hazard Identification Natural Hazards, are profiled individually in this section. In general, information provided by planning team members is integrated into this section with information from other data sources. These profiles set the stage for Section 3.3 Vulnerability Assessment, where the vulnerability is quantified for each of the priority hazards.

Each hazard is profiled in the following format:

- Hazard/Problem Description—This section gives a description of the hazard and associated issues followed by details on the hazard specific to El Dorado County. Where known, this includes information on the hazard extent, area, seasonal patterns, speed of onset/duration, and magnitude and/or any secondary effects.
- Past Occurrences—This section contains information on historical incidents, including impacts where known. The extent or location of the hazard within or near El Dorado County is also included here. Historical incident worksheets were used to capture information from participating jurisdictions on past occurrences.
- Frequency/Likelihood of Future Occurrence—The frequency of past events is used in this section to gauge the likelihood of future occurrences. Where possible, frequency was calculated based on existing data. It was determined by dividing the number of events observed by the number of years on record and multiplying by 100. This gives the percent chance of the event happening in any given year (e.g., three droughts over a 30-year period equates to a 10 percent chance of a experiencing a drought in any given year). The likelihood of future occurrences is categorized into one of the following classifications:
    - Highly Likely—Near 100 percent chance of occurrence in next year or happens every year
    - Likely—Between 10 and 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less
    - Occasional—Between 1 and 10 percent chance of occurrence in the next year or has a recurrence interval of 11 to 100 years
    - Unlikely—Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.

Section 3.2.16 Natural Hazards Summary provides an initial assessment of the profiles and assigns a level of significance or priority to each hazard. Those hazards determined to be of high or medium significance were characterized as priority hazards that required further evaluation in Section 3.3 Vulnerability Assessment. Those hazards that occur infrequently or have little or no impact on the Planning Area were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency and resulting damage, including deaths/injuries and property, crop, and economic damage. The ability of a community to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used by the HMPC to prioritize those hazards of greatest significance to El Dorado County, enabling the County to focus resources where they are most needed.

The following sections provide profiles of the natural hazards that the HMPC identified in Section 3.1 Hazard Identification. The severe weather hazards are discussed first because it is the secondary hazards generated by severe weather (e.g., flood and wildfire) that can result in the most significant losses. The other hazards follow alphabetically.

3.2.1 Severe Weather

Severe weather is generally any destructive weather event, but usually occurs in all areas of El Dorado County as storms that bring heavy rain, hail, lightning, and strong winds. While the storms may be localized, they can be extensive in their damage and impact.

The National Oceanic and Atmospheric Administration's National Climatic Data Center (NCDC) has been tracking severe weather since 1950. Their Storm Events Database contains data on the following: all weather events from 1993 to current (except from 6/1993-7/1993); and additional data from the Storm Prediction Center, which includes tornadoes (1950-1992), thunderstorm winds (1955-1992), and hail (1955-1992). This database contains 549 severe weather events that occurred in El Dorado County (El Dorado County is included in the following zones: Southern Sacramento Valley, Motherlode, West Slope Northern Sierra Nevada, Greater Lake Tahoe Area) between July 1, 2009, and December 31, 2017. Table 3-4 summarizes these events.

Table 3-4 NCDC Severe Weather Events for El Dorado County 7/1/2009 – 12/31/2017*

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Avalanche	8	5	0	0	0	$0	$0
Blizzard	1	0	0	0	0	$0	$0
Debris Flows	9	0	0	0	0	$6,540,000	$0
Dense Fog	11	0	3	0	0	$200,000	$0
Dense Smoke	2	0	0	0	0	$0	$0
Drought	45	0	0	0	0	$0	$0
Excessive Heat	4	6	2	1	0	$0	$0
Extreme	1	0	0	0	0	$0	$0
Flood	7	0	0	0	0	$1,750,000	$0
Frost/Freeze	2	0	0	0	0	$0	$0
Hail	10	0	0	0	0	$1,000	$0
Heat	3	15	0	0	0	$0	$0
Heavy Rain	72	0	1	0	0	$0	$0
Heavy Snow	173	1	3	0	1	$25,000	$0
High Wind	20	1	0	1	0	$1,480,000	$0
Strong Wind	36	1	2	2	1	$3,857,000	$0
Tornado	3	0	0	0	0	$1,002,000	$0
Wildfire	11	0	0	17	0	$500,225,000	$0
Winter Storm	80	1	2	0	0	$400,000	$0
Winter Weather	45	1	0	0	0	$0	$0
Total	**549**	**34**	**43**	**4**	**2**	**$515,480,000.**	**$0.00**

Source: NCDC (https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=ALL&beginDate_mm=07&beginDate_dd=01&beginDate_yyyy=2009&endDate_mm=12&endDate_dd=31&endDate_yyyy=2017&county=EL%2BDORADO%3A17&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=6%2CCALIFORNIA#)

*Note: Losses reflect totals for all impacted areas

The NCDC table above summarizes severe weather events that occurred in El Dorado County. Only a few of the events actually resulted in state and federal disaster declarations. It is further interesting to note that different data sources capture different events during the same time period,

and often display different information specific to the same events. While the HMPC recognizes these inconsistencies, they see the value this data provides in depicting the County's "big picture" hazard environment. As previously mentioned, most all of El Dorado County's state and federal disaster declarations have been a result of wildfires and severe weather. For this plan, Thunderstorms/Tornadoes are discussed in a separate section.

Due to size of the County and changes in elevation (i.e., from approximately 760 feet to more than 10,886 feet above mean sea level (msl) and climate, weather conditions can vary greatly across the County. For purposes of this hazard profile, the County will be divided into two distinct sections, as applicable: western El Dorado County, which is predominantly below an elevation of 4,000 feet above msl, is generally below the snowfall line (although snow has fallen at lower elevations), and includes the community of Camino and all land to the west (including all incorporated cities and towns); and eastern slope of El Dorado County, which is generally above 4,000 feet above msl, receives snowfall, and includes all of the County east of Pollock Pines. The profiles that follow provide information, where possible, from two weather stations located in these two different parts of the County: Placerville (elevation: 1,860 feet above msl) in west El Dorado County and the City of South Lake Tahoe (elevation: 6,230 feet above msl), in east El Dorado County.

Severe Weather and Climate Change

Climate change refers to any distinct change in measures of climate lasting for a long period of time, more specifically major changes in temperature, rainfall, snow, or wind patterns. Climate change may be limited to a specific region, or may occur across the whole Earth. Climate change may result from:

- Natural factors (e.g., changes in the Sun's energy or slow changes in the Earth's orbit around the Sun);
- Natural processes within the climate system (e.g., changes in ocean circulation); and
- Human activities that change the atmosphere's make-up (e.g., burning fossil fuels) and the land surface (e.g., cutting down forests, planting trees, building developments in cities and suburbs, etc.).

Climate change is a natural occurrence in which the earth has warmed and cooled periodically over geologic-time. The recent and rapid warming of the earth over the past century has been cause for concern, as this warming has been associated with the accumulation of human-caused greenhouse gases such as CO2, in the atmosphere. This warming has taken place almost everywhere over the

continents which strongly suggest that there is a global cause, rather than a mere coincidence of weather patterns that would result in patches of warming and cooling. The effects of climate change are varied: warmer and more varied weather patterns, melting ice caps, and poor air quality, for example.

The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. Extreme temperatures (hot) are often found in the Western part of El Dorado County (El Dorado Hills, Cameron Park, Placerville) and extreme temperatures (cold) are often found in east of Camino/Pollock Pines and in the Tahoe Basin. El Dorado County uses the National Weather Service's heat index to measure the extent and duration of heat events. El Dorado County uses the National Weather Service's forecast, advisories, watches and warnings to prepare for and respond to extreme cold and heat events. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Climate change can have direct implications on almost every hazard addressed in the plan, with earthquake and hazardous materials being possible exceptions. Climate Change has the potential to alter the nature and frequency of most hazards. The potential for climate change influences on hazards are further noted in each of the hazard discussions.

3.2.2. Severe Weather: Thunderstorms/Tornadoes

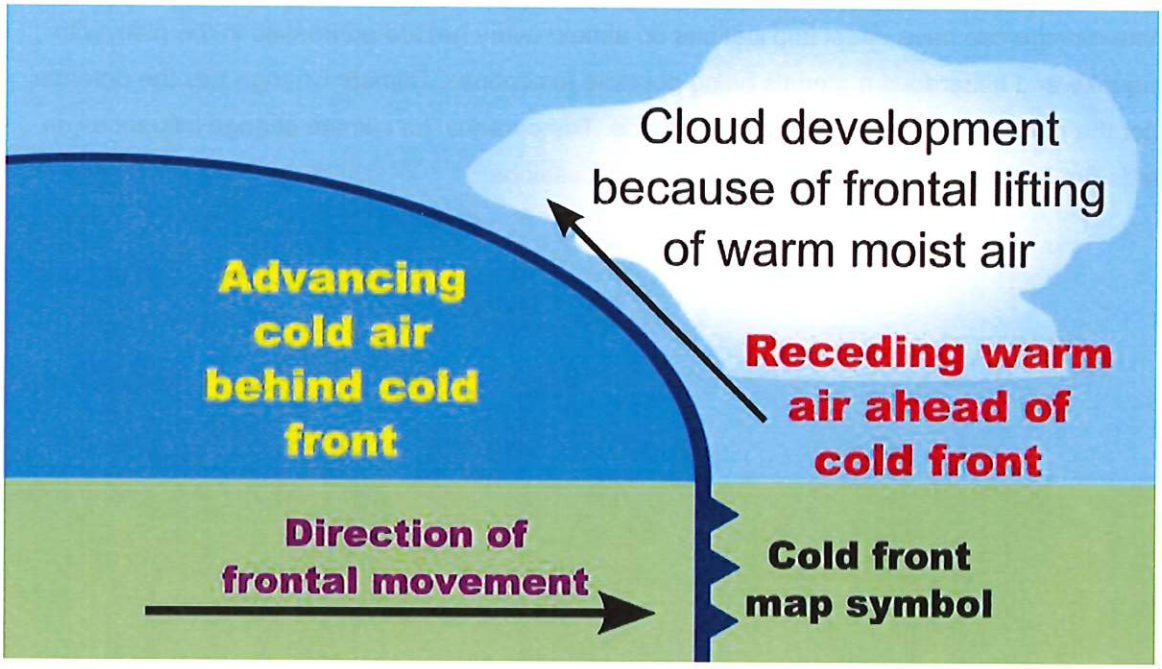
Hazard/Problem Description

Storms in El Dorado County are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the El Dorado County area falls mainly in the fall, winter, and spring months.

Heavy Rain and Thunderstorms

The NWS reports that thunderstorms result from the rapid upward movement of warm, moist air (see Figure 3-3). They can occur inside warm, moist air masses and at fronts. As the warm, moist air moves upward, it cools, condenses, and forms cumulonimbus clouds that can reach heights of greater than 35,000 ft. As the rising air reaches its dew point, water droplets and ice form and begin falling the long distance through the clouds towards earth's surface. As the droplets fall, they collide with other droplets and become larger. The falling droplets create a downdraft of air that spreads out at Earth's surface and causes strong winds associated with thunderstorms.

Figure 3-3 Formation of a Thunderstorm



Source: NASA. http://rst.gsfc.nasa.gov/Sect14/Sect14_1c.html

According to the HMPC, short-term, heavy storms can cause both widespread flooding as well as extensive localized drainage issues. With the increased growth of the area, the lack of adequate drainage systems has become an increasingly important issue. In addition to the flooding that often occurs during these storms, strong winds, when combined with saturated ground conditions, can down very mature trees.

El Dorado County—West (Placerville Weather Station, Period of Record 1915 to 2010)
https://wrcc.dri.edu/Climate/comp_table_state_show.php?stype=ppt_extreme_annual_avg&sstate=ca&stitle=Annual+Precipitation+Averages+and+Extremes&sparent=a-l

According to the WRCC, average annual precipitation in the western side of El Dorado County (Placerville) is 38.27 inches per year. The highest recorded annual precipitation is 74.55 inches in 1983; the highest recorded precipitation for a 24-hour period is 6.22 inches on February 14, 2000. The lowest recorded annual precipitation was 11.85 inches in 1976.

El Dorado County—East (Tahoe Weather Station, Period of Record 1914 to 2010)
https://wrcc.dri.edu/Climate/comp_table_state_show.php?stype=ppt_extreme_annual_avg&sstate=ca&stitle=Annual+Precipitation+Averages+and+Extremes&sparent=a-l

According to the WRCC, average annual precipitation in the eastern portion of El Dorado County is 31.63 inches per year. The highest recorded annual precipitation is 66.41 inches in 1996; the highest recorded precipitation for a 24-hour period is 9.34 inches on December 23, 1964. The lowest recorded annual precipitation is 9.34 inches in 1976.

Hail

Hail is formed when water droplets freeze and thaw as they are thrown high into the upper atmosphere by the violent internal forces of thunderstorms. Hail is sometimes associated with severe storms within the El Dorado County Planning Area. Hailstones are usually less than two inches in diameter and can fall at speeds of 120 miles per hour (mph). Severe hailstorms can be quite destructive, causing damage to roofs, buildings, automobiles, vegetation, and crops.

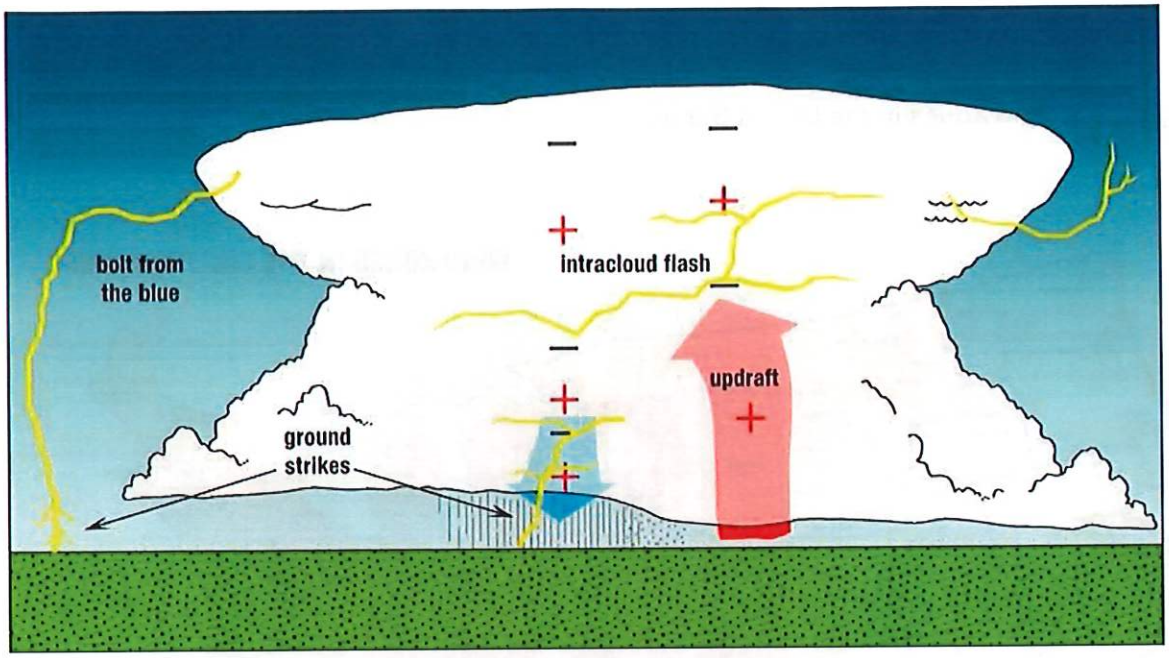
Lightning

Lightning is defined by the NWS as any and all of the various forms of visible electrical discharge caused by thunderstorms. Thunderstorms and lightning are usually (but not always) accompanied by rain. Cloud- to-ground lightning can kill or injure people by direct or indirect means. Objects can be struck directly, which may result in an explosion, burn, or total destruction. Or, damage may be indirect, when the current passes through or near an object, which generally results in less damage.

Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually it takes place inside the cloud and looks from the outside of the cloud like a diffuse brightening that flickers. However, the flash may exit the boundary of the cloud, and a bright channel, similar to a cloud-to-ground flash, can be visible for many miles.

Cloud-to-ground lightning is the most damaging and dangerous type of lightning, though it is also less common. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, a large minority of flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat (see Figure 3-4). Positive lightning also has a longer duration, so fires are more easily ignited. And, when positive lightning strikes, it usually carries a high peak electrical current, potentially resulting in greater damage.

Figure 3-4 Cloud to Ground Lightning



Source: National Weather Service

Winds

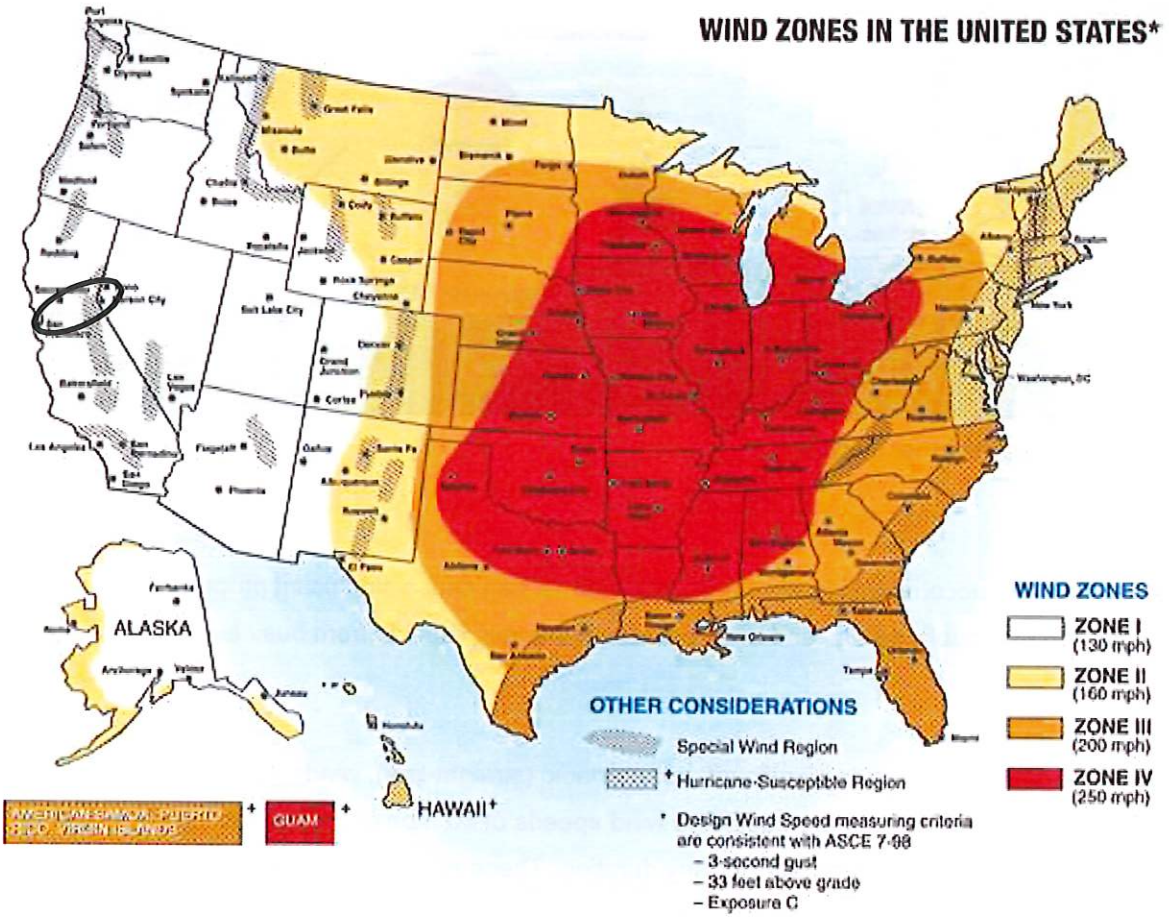
High winds, often accompanying severe thunderstorms, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss.

El Dorado County is subject to significant, non-tornadic (straight-line), winds. High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. These winds may occur as part of a seasonal climate pattern or in relation to other severe weather events such as thunderstorms. Straight-line winds may also exacerbate existing weather conditions by increasing the effect on temperature and decreasing visibility due to the movement of particulate matters through the air, as in dust and snow storms. The winds may also exacerbate fire conditions by drying out the ground cover, propelling fuel around the region, and increasing the ferocity of exiting fires. These winds may damage crops, push automobiles off roads, damage roofs and structures, and cause secondary damage due to flying debris.

Figure 3-5 depicts wind zones for the United States. The map denotes that El Dorado County falls

into Zone I, which is characterized by high winds of up to 130 mph. Portions of the County also fall into a Special Wind Region.

Figure 3-5 Wind Zones in the United States



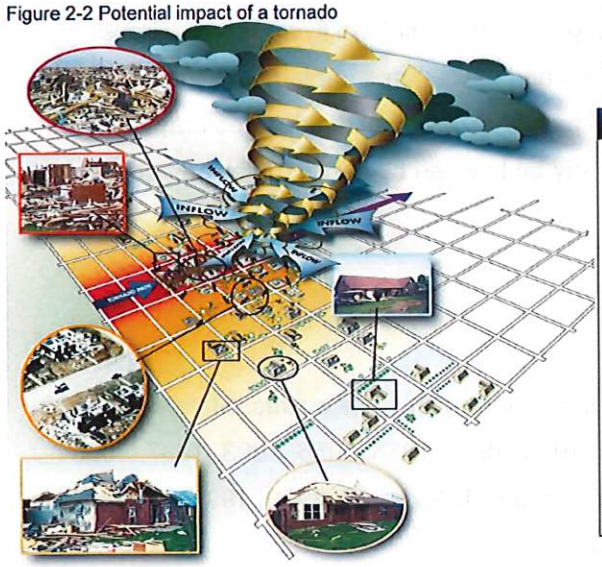
Source: Federal Emergency Management Agency

Tornadoes

Tornadoes and funnel clouds can also occur during these types of storms. Tornadoes are another severe weather hazard that can affect the El Dorado County Planning Area, primarily during the rainy season in the late fall and early spring. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes are the most powerful storms that exist. They can have the same pressure differential across a path only 300 yards wide or less as 300 mile wide hurricanes. Figure 3-6 illustrates the potential impact and damage from a tornado.

Figure 3-6 Potential Impact and Damage from a Tornado

Figure 2-2 Potential impact of a tornado



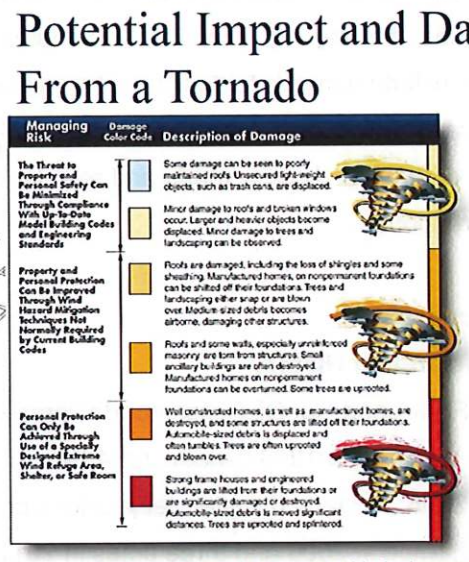


Figure 2-2 Potential damage table for impact of a tornado

Source: FEMA: Building Performance Assessment: Oklahoma and Kansas Tornadoes

Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it takes into account the materials affected and the construction of structures damaged by a tornado. Table 3-7shows the wind speeds associated with the Enhanced Fujita Scale ratings.

Table 3-7 Enhanced Fujita Scale

Enhanced Fujita (EF) Scale	Enhanced Fujita Scale Wind Estimate (mph)
EF0	65-85
EF1	86-110
EF2	111-135
EF3	136-165
EF4	166-200
EF5	Over 200

Source: National Oceanic and Atmospheric Administration Storm Prediction Center, www.spc.noaa.gov/faq/tornado/ef-scale.html

Tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees and power lines, broken gas lines, broken sewer and water mains, and the outbreak of fires. Agricultural crops and industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response.

Past Occurrences

Disaster Declaration History

A search of FEMA and Cal OES disaster declarations turned up multiple events. State disaster declarations occurred in 1958 (twice), 1964 (twice), 1969, 1973, 1983, 1986, 1993, 1997, 2006 (twice), and 2008. Federal disaster declarations occurred in 1958, 1964, 1969, 1983, 1986, 1995 (twice), 1997, twice in 2006 and three times in 2017.

NCDC Events

The NCDC data recorded 189 hail, heavy rain, wind, and tornado incidents for El Dorado County since 2004. A summary of these events are shown in Table 3-8 Specific events in the NCDC database showing damages, deaths, or injuries are detailed below the table. HMPC details are captured below the table as well.

Table 3-8 NCDC Severe Weather Events in El Dorado County 01/01/2004-06/30/2018

Event Type	Number of Events	Deaths	Deaths (indirect	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Hail	10	0	0	0	0	$1,000	$0
Heavy Rain	83	0	1	0	0	$0	$0
High Wind	51	1	1	1	0	$10,790,000	$11,000
Strong Wind	42	1	1	2	2	$4,022,600	$0
Thunderstorm Wind	0	0	0	0	0	$0	$0
Tornado	3	0	0	0	0	$1,002,0000	$0
Total	**189**	**2**	**3**	**3**	**2**	**$15,815,600**	**$11,000**

Source: NCDC
https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28C%29+Tornado&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=2004&endDate_mm=06&endDate_dd=30&endDate_yyyy=2018&county=EL%2BDORADO%3A17&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=6%2CCALIFORNIA

- December 9, 1996 – Damage was observed in South Lake Tahoe from strong gusty winds during the morning hours. Trees fell on a couple of homes, causing $50,000 in damage. From surrounding data, winds were estimated in the 55 to 65 mph range. No deaths or injuries were reported.
- November 7, 2002 – Wind gusts estimated at over 80 mph blew down trees in the South Lake Tahoe, CA area. Falling trees severely damaged one home and two vehicles. Tree limbs damaged four other homes and downed several power lines, causing scattered power outages. Sparking electric lines caused two brush fires, the largest of which scorched 30 acres. No injuries or deaths were reported. Damages of $300,000 were reported.
- December 14, 2002 – strong cold front moving through northern California on December 14 brought near-record high winds to northeast California and western Nevada. Wind gusts reports in the 60-80 mph range were common throughout the day across the entire region, with a few gusts near 100 mph. Remote wind sensors along the Sierra Crest measured wind gusts in excess of 130 mph. The strongest winds occurred just before the cold front

moved into the area at about 5:30 p.m. Hundreds of trees and thousands of tree limbs were blown down across the region. In addition, there was widespread damage to roofs, fences, commercial billboards and signs, and power lines. Numerous power outages occurred, some lasting for several days after the event in rural areas. A few relatively minor traffic accidents resulted from the low visibilities. From these, a few minor injuries were reported but fortunately no serious injuries or deaths were reported. The regional electric utility lost 140 power poles and 18 transmission line due to the strong winds, with damages and repair costs estimated at over $3M. Total regional wind damage costs were estimated at ~$10M.

- December 26, 2006 – A wind gust estimated at 61 knots (70 mph) knocked over a 6-ft diameter pine tree in South Lake Tahoe. The high winds also took down power lines across the area.
- August 18, 2010 – South-southwest to southwest winds on Lake Tahoe were sustained between 20 to 25 mph from late morning to early evening on the 18th. The winds (and waves it generated) were sufficient to sink 3 boats. $100,000 in damages were reported.
- December 11, 2014 – Winds gusted to 60 and 70 mph at the Truckee and South Lake Tahoe airports, respectively, on the morning of the 11th. Over the Sierra ridges, winds gusted as high as 135 mph. Numerous trees and power lines were downed, along with damage to several homes and vehicles due to fallen trees. The power outages, some lasting up to 2 days, caused South Lake Tahoe schools to be closed through the 12th. Finally, winds downed a tree which caused the death of a teenager in a heavily wooded area. Damages from this event were estimated at $700,000.

Likelihood of Future Occurrence

Highly Likely – Based on NCDC data and HMPC input, 189 heavy rain, hail, lightning, and thunderstorm wind incidents over a 14-year period (2004-2018) equates to over ten severe storm events every year and a 100 percent chance of a severe storm in any given year. This database doesn't report all heavy rain, hail, lightning, and wind events. Severe weather is a well-documented seasonal occurrence that will continue to occur annually in El Dorado County. The topography and climate of El Dorado County makes it more vulnerable to severe thunderstorms. It's very likely to see thunderstorms east of Placerville into the Tahoe Basin year-round.

Climate Change and Heavy Rains and Storms

According to the CAS, while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. This may bring stronger

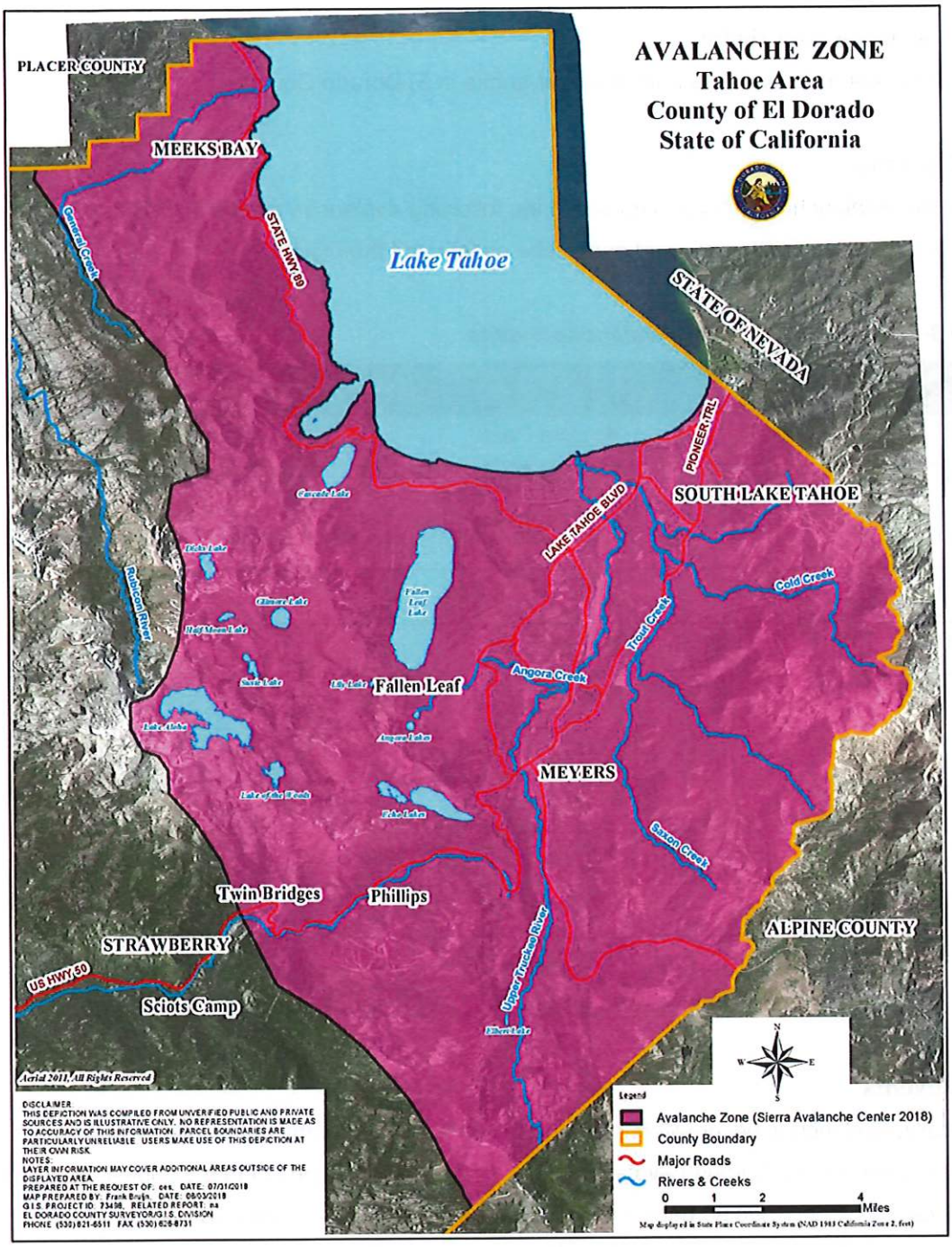
thunderstorm winds. It is unlikely that hail will become more common in the County. The amount of lightning and tornadoes is not projected to change.

3.2.3. Avalanche

Hazard/Problem Description

Avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Critical stresses develop more quickly on steeper slopes and where deposition of wind- transported snow is common. The vast majority of avalanches occur during or shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers, who venture into backcountry areas during or after winter storms. Roads and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches. The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement creates avalanches. Areas prone to avalanche hazards include hard to access areas deep in the backcountry. Avalanche hazards exist in eastern El Dorado County where combinations of the above criteria occur. This is shown on Figure 3-7.

Figure 3-7 El Dorado County – Avalanche Hazard Areas



Past Occurrences

Disaster Declaration History

There have been no disasters related to avalanche in El Dorado County.

NCDC Events

The Sierra Avalanche Center has recorded the following avalanche events in El Dorado County. Table 3-12 provides an overview of avalanche events and their locations.

Table 3-12 El Dorado County Avalanche Events

Year	Avalanche Location
2009	Angora Peak
2010	Angora Peak
2010	Mini Halls Chute – Indian Cliff Chutes
2010	Mini Hall Couloir
2010	Becker Peak
2010	Ralston
2011	Ralston Peak
2015	Echo Peak
2016	Tallac Corkscrew bowl
2017	Mt. Tallac-The Cross
2017	Porcupine Ridge

Sierra Avalanche Center, https://www.sierraavalanchecenter.org/incidents-map-archive

HMPC Events

Historically, avalanches occur within the County between the months of December and March, following snowstorms. Although avalanches have occurred on slopes of many angles, they most often occur on slopes ranging between 30 degrees and 45 degrees. Therefore ski resorts, residences, roads, businesses, and other structures and activities in these areas are vulnerable. Areas where the potential for avalanches to exist are zoned as moderate or high avalanche hazard zones and have been identified. Moderate hazard zones are usually on shallow slopes and located

immediately downhill of high zones. According to the 2004 El Dorado County Operational Area, Emergency Operations Plan, areas of particular concern include:

- Mt. Tallac;
- Heavenly Ski Resort;
- Echo Summit;
- Sierra Ski Resort;
- Kyburz;
- White Hall;
- Highway 50 Corridor
- Desolation Wilderness;

Likelihood of Future Occurrence

Likely—Injuries and loss of life from an avalanche are usually due to people recreating in remote areas at the wrong time. Given the topography and amount of snow falling on an annual basis in eastern El Dorado County, avalanches and resulting damages, including injuries and loss of life, will continue to occur.

Climate Change and Avalanche

According to the CAS, climate change may exacerbate the avalanche hazard in the County. Avalanches stemming from a weather pattern of heavy snowfalls followed by thawing may increase – a dangerous combination that can be expected with climate change.

3.2.7. Dam Failure

Hazard/Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped and fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failures can also result from any one or a combination of the following causes:

- Earthquake;
- Inadequate spillway capacity resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage, or piping or rodent activity;
- Improper design;
- Improper maintenance;
- Negligent operation; and/or
- Failure of upstream dams on the same waterway.

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property. A catastrophic dam failure could challenge local response capabilities and require evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major loss of life could result as well as potentially catastrophic effects to roads, bridges, and homes. Electric generating facilities and transmission lines could also be damaged and affect life support systems in communities outside the immediate hazard area. Associated water supply, water quality and health concerns could also be an issue. Factors that influence the potential severity of a full or partial dam failure are the amount of water impounded; the density, type, and value of development and infrastructure located downstream; and the speed of failure.

In general, there are three types of dams: concrete arch or hydraulic fill, earth and rock-fill, and concrete gravity. Each type of dam has different failure characteristics. A concrete arch or hydraulic fill dam can fail almost instantaneously; the flood wave builds up rapidly to a peak then gradually declines. An earth- rockfill dam fails gradually due to erosion of the breach; a flood wave will build

gradually to a peak and then decline until the reservoir is empty. And, a concrete gravity dam can fail instantaneously or gradually with a corresponding buildup and decline of the flood wave.

Dams and reservoirs have been built throughout California to supply water for agriculture and domestic use, to provide capacity for flood management, as a source of hydroelectric power, and to serve as recreational facilities. The largest reservoir in El Dorado County is Folsom Lake. Folsom Lake was built by the U.S. Army Corps of Engineers and it is now operated by the U.S. Bureau of Reclamation. It has a capacity of 976,000 acre-feet and it surface extends into both Placer and Sacramento Counties. Folsom Lake is contained by and series of dams and dikes. Failure of some of the dikes could pose a hazard to areas in El Dorado County.

The California Department of Water Resources Division of Safety of Dams has jurisdiction over impoundments that meet certain capacity and height criteria. Embankments that are less than six feet high and impoundments that can store less than 15 acre-feet are non-jurisdictional. Additionally, dams that are less than 25 feet high can impound up to 50 acre-feet without being jurisdictional. The California Department of Water Resources (Cal DWR) Division of Safety of Dams assigns hazard ratings to large dams within the State. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in three categories that identify the potential hazard to life and property:

High hazard indicates that a failure would most probably result in the loss of life
Significant hazard indicates that a failure could result in appreciable property damage
Low hazard indicates that failure would result in only minimal property damage and loss of life is unlikely

According to data provided by the California Department of Water Resources (DWR) and the El Dorado County General Plan (last amended March 20, 2018), there are multiple dams in El Dorado County constructed for flood control, storage, electrical generation, and recreational purposes. DWR identified 49 dams in El Dorado County. The El Dorado County General Plan has dam failure inundation zone maps for 11 of these dams.

Table 3-13 identifies the 12 dams, most with dam failure inundation maps Figure 3-8.

Table 3-13 El Dorado County Dam Failure Inundation Maps

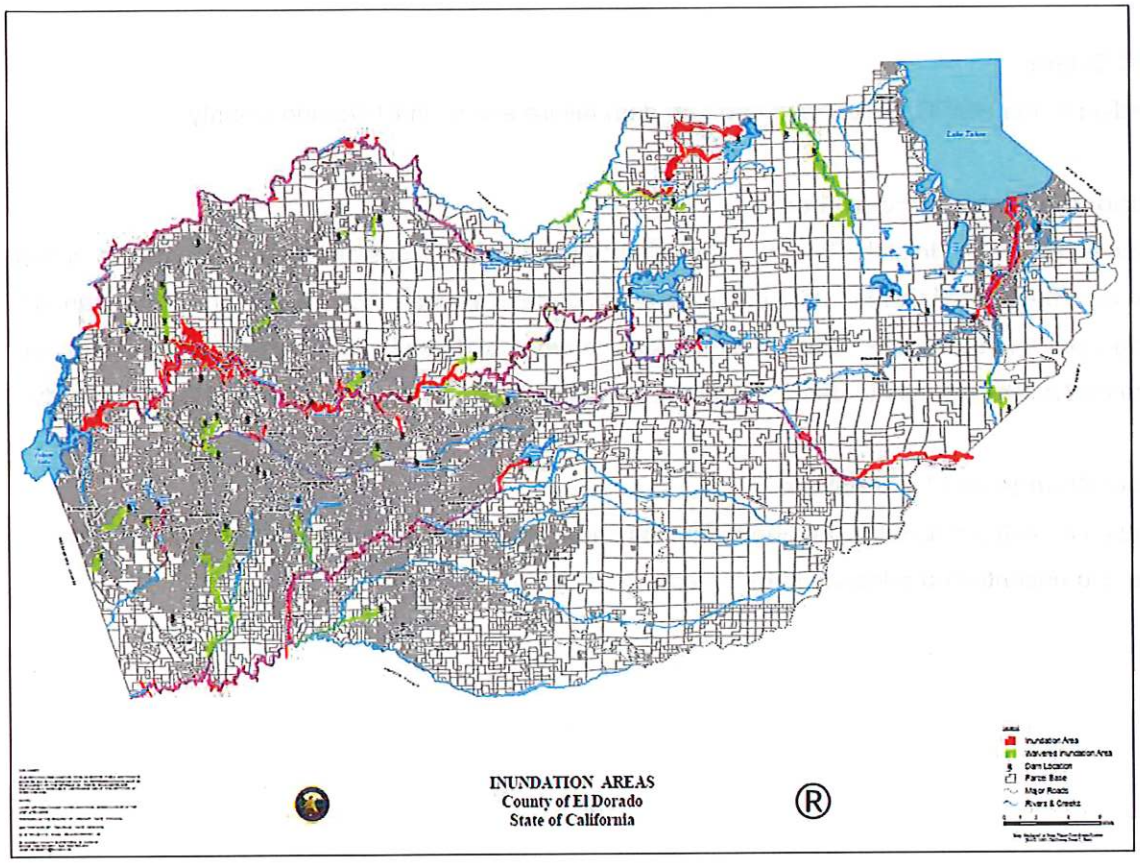
Name	Significance	Owner	River	Nearest City/Area	Map	Structural Height (ft)	Maximum Storage (acre-ft)
Blakely Dam	Low	Walker Land Company	N/A	Camino	Y	19	152
Cameron Park Lake Dam	Low	Cameron Park Community Services District (CSD)	N/A	Cameron Park	Y	29	480
Caples Lake Dam (located in Alpine County)	Significant	El Dorado Irrigation District (EID)	N/A	N/A	Y	71	21,580
Chili Bar	High	Pacific Gas & Electric (PG&E)	American River	Placerville	Y	111	3700
Echo Lake Dam	Extremely High	EID		Meyers	Y	14	1,900
Forebay Dam	High	EID		Pollock Pines	N	91	361
Ice House Dam	Extremely High	SMUD		Coloma Lotus	Y	150	37,120
Loon Lake Dam	Extremely High	SMUD		Coloma Lotus	Y	108	76,500
Slab Creek	Significant	SMUD		Coloma Lotus	Y	233	16,600
Sly Park	Extremely High	EID		Pollock Pines	N	182	41,000
Union Valley Dam	Extremely High	SMUD		Coloma Lotus	N	453	230,000
Stumpy Meadows Dam	Significant	Unk		Georgetown	Y	-	-
Weber Creek	High	EID		Placerville	Y	92	1,100

Source: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/All-Programs/Division-

of-safety-of-dams/Files/Publications/Dams-Within-Jurisdiction-of-the-State-of-California-Alphabetically-by-County.pdf *One Acre Foot=326,000 gallons

Inundation Maps Data Source:
https://www.edcgov.us/Government/planning/Pages/adopted_general_plan.aspx

Figure 3-8 El Dorado County Dam Inundation Areas



There are several dams, which, if they fail, may impact the people and resources of El Dorado County. Eleven dams in El Dorado County are at least 100 feet tall or have a capacity of 10,000 acre-feet of water. Failure of any one of these dams would flood downstream areas and could cause loss of life and property. Both unincorporated and incorporated areas of the County are identified on dam failure inundation maps prepared for the County. The inundation areas for each dam are generally downstream and include large rural and populated areas below the dams.

Past Occurrences

Disaster Declaration History

There have been no disasters declarations related to dam failure in El Dorado County.

NCDC Events

There have been no NCDC dam failure events in El Dorado County.

HMPC Events

According to the HMPC, there have been no dam failure events in El Dorado County.

Likelihood of Future Occurrence

Jurisdictional Dams: Unlikely/Smaller, non-jurisdictional Dams: Occasional—The County remains at risk to dam breaches/failures from numerous dams under a variety of ownership and control and of varying ages and conditions. Given the number and types of dams in the County and the history of past uncontrolled releases to dams, the potential exists for future dam issues in El Dorado County.

Climate Change and Dam Failure

Increases in both precipitation and heat causing snow melt could increase the potential for dam failure and uncontrolled releases in El Dorado County.

3.2.8. Drought and Water Shortage

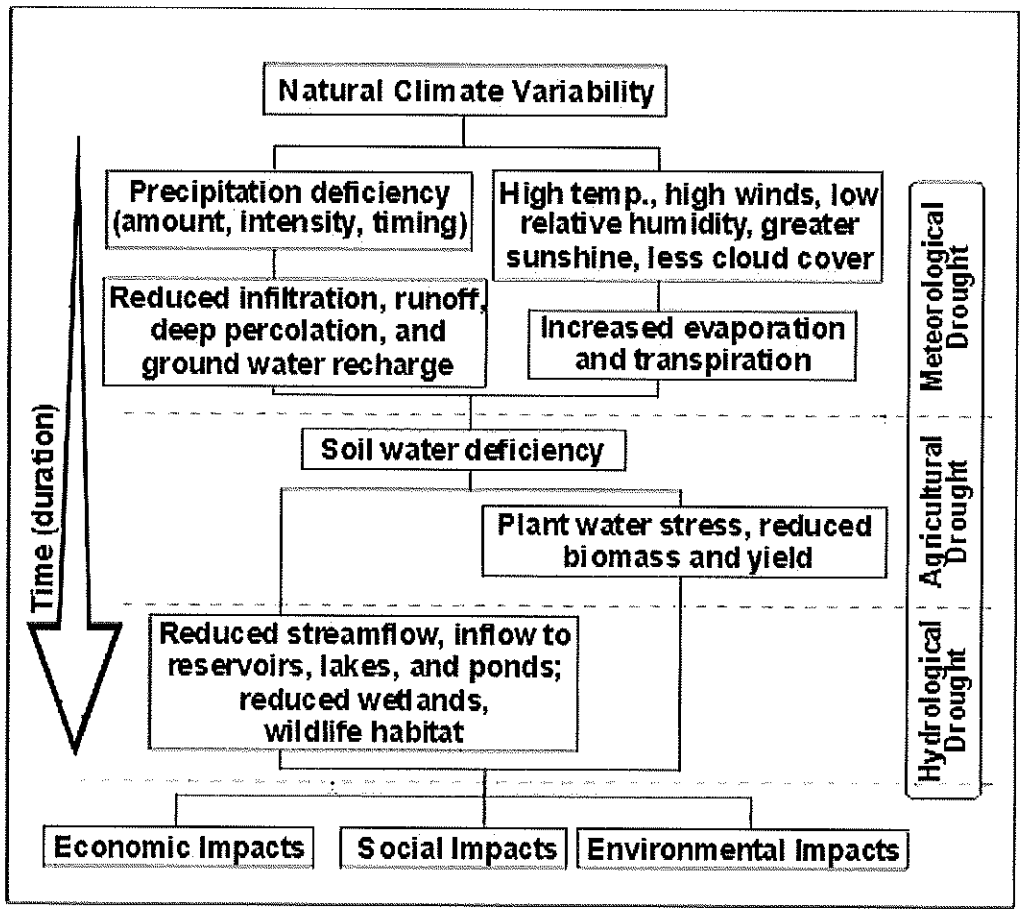
Hazard/Problem Description

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends. Water districts normally require at least a 10 year planning horizon to implement a multiagency improvement project to mitigate the effects of a drought and water supply shortage.

Drought is a complex issue involving (see figure 3-9) many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects:

Meteorological drought is usually defined by a period of below average water supply.
Agricultural drought occurs when there is an inadequate water supply to meet the needs of the state's crops and other agricultural operations such as livestock.
Hydrological drought is defined as deficiencies in surface and subsurface water supplies. It is generally measured as streamflow, snowpack, and as lake, reservoir, and groundwater levels.
Socioeconomic drought occurs when a drought impacts health, well-being, and quality of life, or when a drought starts to have an adverse economic impact on a region.

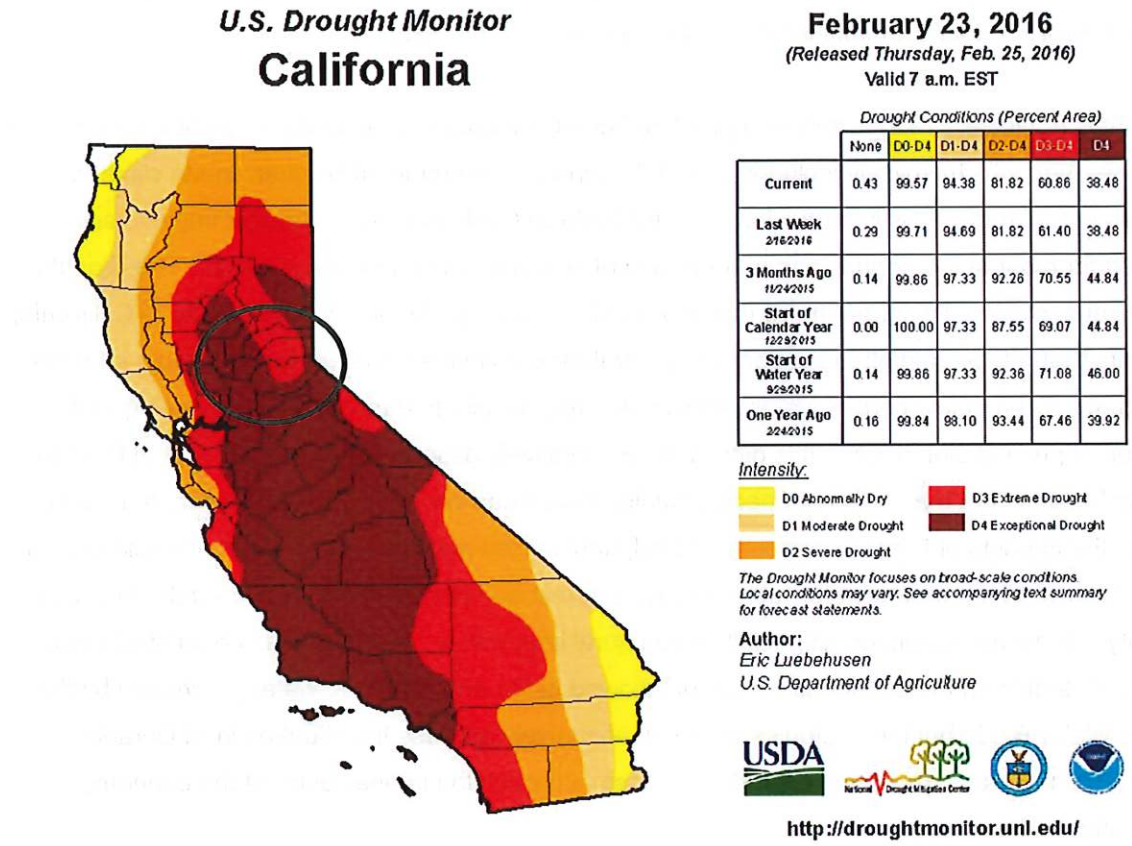
Figure 3-9 Causes and Impact of Drought



Source: National Drought Mitigation Center

Drought in the United States is monitored by the National Integrated Drought Information System (NIDIS). A major component of this portal is the U.S. Drought Monitor. The Drought Monitor concept was developed jointly by the NOAA's Climate Prediction Center, the NDMC, and the USDA's Joint Agricultural Weather Facility in the late 1990s as a process that synthesizes multiple indices, outlooks and local impacts, into an assessment that best represents current drought conditions. The final outcome of each Drought Monitor is a consensus of federal, state, and academic scientists who are intimately familiar with the conditions in their respective regions. A snapshot of the drought conditions in California El Dorado County can be found in Figure 3-10.

Figure 3-10 2016 Drought Status of El Dorado County



Source: US Drought Monitor

The California Department of Water Resources (DWR) says the following about drought:

> One dry year does not normally constitute a drought in California. California's extensive system of water supply infrastructure—its reservoirs, groundwater basins, and inter-regional conveyance facilities—mitigates the effect of short-term dry periods for most water users. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions.

The drought issue in California is further compounded by water rights. Water is a commodity possessed under a variety of legal doctrines. The prioritization of water rights between farming and federally protected fish habitats in California contributes to this issue

Drought is not initially recognized as a problem because it normally originates in what is considered good weather, which typically includes a dry late spring and summer in Mediterranean climates, such as in California. This is particularly true in Northern California where drought impacts are delayed for most of the population by the wealth of stored surface and ground water. The drought complications normally appear more than a year after a drought begins. In most areas of California, ranchers that rely on rainfall to support forage for their livestock are the earliest and most affected by drought. Even below normal water years could affect ranchers depending on the timing and duration of precipitation events. It is difficult to quantitatively assess drought impacts to El Dorado County because not many county-specific studies have been conducted. Some factors to consider include the impacts of fallowed agricultural land, habitat loss and associated effects on wildlife, and the drawdown of the groundwater table. The most direct and likely most difficult drought impact to quantify is to local economies, especially agricultural economies. The State has conducted some empirical studies on the economic effects of fallowed lands with regard to water purchased by the State's Water Bank; but these studies do not quantitatively address the situation in El Dorado County. It can be assumed, however, that the loss of production in one sector of the economy would affect other sectors.

The drawdown of the groundwater table is one factor that has been recognized to occur during repeated dry years. Lowering of groundwater levels results in the need to deepen wells, which subsequently lead to increased pumping costs. These costs are a major consideration for residents relying on domestic wells and agricultural producers that irrigate with groundwater and/or use it for frost protection. Some communities in higher elevations with shallow bedrock do not have a significant source of groundwater.

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. The most significant impacts associated with drought in El Dorado County are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Also, during a drought, allocations go down and water costs increase, which results in reduced water availability. Voluntary conservation measures are a normal and ongoing part of system operations and actively implemented during extended droughts. A

reduction of electric power generation and water quality deterioration are also potential problems. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding and erosion.

Water Shortage

Northern Sacramento Valley counties, including El Dorado County, generally have sufficient groundwater and surface water supplies to mitigate even the severest droughts of the past century. Many other areas of the State, however, also place demands on these water resources during severe drought. For example, Northern California agencies, including those from El Dorado County, were major participants in the Governor's Drought Water Bank of 1991, 1992 and 1994. Climate change, decreased groundwater supplies and decreased precipitation make El Dorado County vulnerable to drought and drought conditions on an annual basis. El Dorado County routinely monitors drought and precipitation conditions, including snow pack and groundwater supply using information provided by the Department of Water Resources, NOAA and NWS.

Past Occurrences

Disaster Declaration History

There has been several state disasters related to drought and water shortage in El Dorado County issued between 2012 – 2016. The community of Outingdale was largely impacted drought during this time.

NCDC Events

There were been 27 NCDC drought events in El Dorado County between 2012 – 2018, but no damages, injuries, or losses were reported in the NCDC database.

HMPC Events

Historically, California has experienced multiple severe droughts. According to the DWR, droughts exceeding three years are relatively rare in Northern California, the source of much of the State's developed water supply. The 1929-34 drought established the criteria commonly used in designing storage capacity and yield of large northern California reservoirs. Table 3-14 compares the 1929-34 drought in the Sacramento and San Joaquin Valleys to the 1976-77, 1987-92, and 2007-09 droughts. Figure 3-11 depicts California's Multi-Year Historical Dry Periods, 1850-2000.

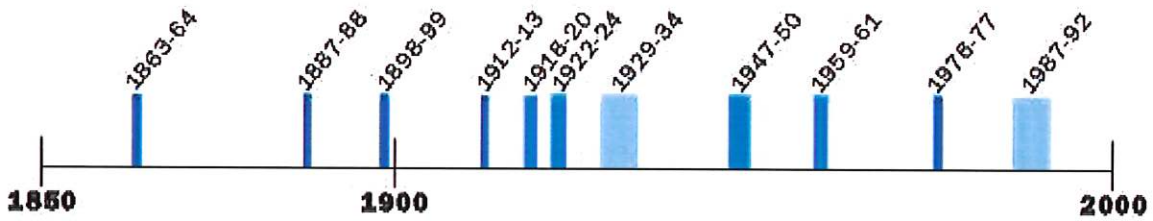
Table 3-14 Severity of Extreme Droughts in the Sacramento and San Joaquin Valleys

Drought Period	Sacramento Valley Runoff		San Joaquin Valley Runoff	
	(maf*/yr)	(percent Average 1901-96)	(maf*/yr)	(percent Average 1906-96)
1929-34	9.8	55	3.3	57
1976-77	6.6	37	1.5	26
1987-92	10.0	56	2.8	47
2007-09	11.2	64	3.7	61

Source: California's Drought of 2007-2009, An Overview. State of California Natural Resources Agency, California Department of Water Resources. Available at: http://www.water.ca.gov/drought/docs/DroughtReport2010.pdf

*maf=million acre feet

Figure 3-11 California's Multi-Year Historical Dry Periods, 1850-2000



Source: California Department of Water Resources, www.water.ca.gov/

Notes: Dry periods prior to 1900 estimated from limited data; covers dry periods of statewide or major regional extent.

The HMPC identified the following droughts as having significant impacts on El Dorado County:

- 1977 – A federal disaster declaration was declared as a result of a drought affecting El Dorado County and other surrounding counties. The restrictions included a 50 percent reduction in water usage by customers and rate increases. This shortage lasted until January 1978 when the board terminated the water shortage restrictions.
- 1988 – The next water shortage occurred in 1988. Again El Dorado County passed a resolution declaring a water emergency. All customers had their water use reduced by 25 percent and rates were again increased for excessive usage. The countywide emergency prohibited washing of sidewalks, driveways, parking lots and other hard surfaces, restricted

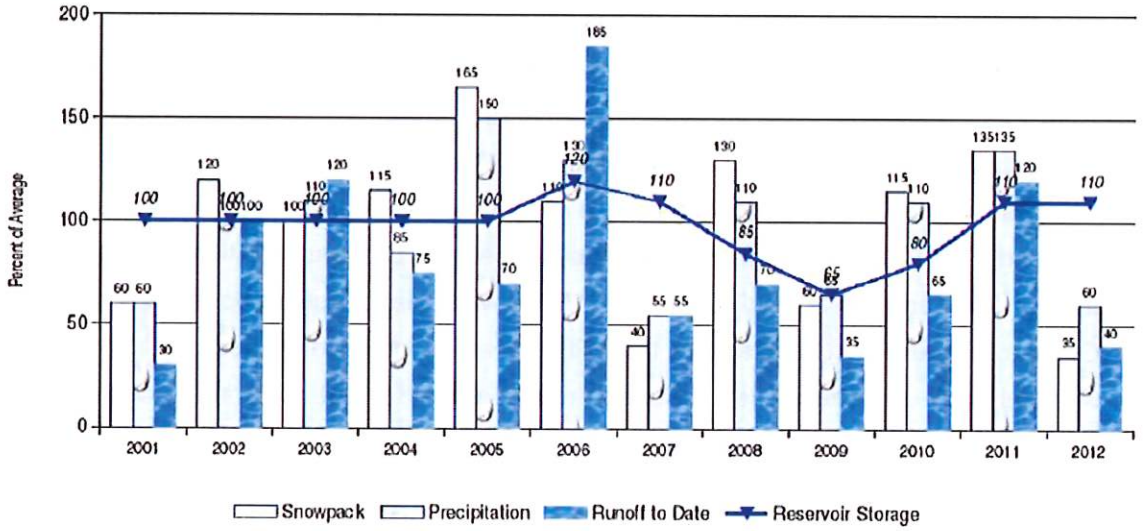
the washing of vehicles, airplanes, and trailers to 3 gallons of water, prohibited fire hydrant flushing and drills, prohibited filling of pools, and prohibited new agricultural land irrigation.

- 1991 – The most recent drought emergency declared by El Dorado County was in February 1991. Raw water customers had their water usage reduced by 50 percent annually and by 25 percent seasonally. Treated water users were given most of the same restrictions and prohibitions as in 1988. Due to a very late storm season, the emergency was lifted by April 1991.
- 2008 – The Governor of California declared a drought on June 4, 2008. As of July 2009, EID and STUPD report that they are implementing normal ongoing conservation measures. As a result of these drought conditions, it is anticipated that Lake Tahoe's water level will drop to near its natural rim. The last time it dropped below its natural rim was in 2004.
- 2014 – On January 17, 2014 the governor declared a State of Emergency for drought throughout California. This declaration came on the heels of a report that stated that California had the least amount of rainfall in its 163 year history. Californians were asked to voluntarily reduce their water consumption by 20 percent. Drought conditions worsened through 2014 and into 2015. On April 1, 2015, following the lowest snowpack ever recorded, Governor Brown announced actions that will save water, increase enforcement to prevent wasteful water use, streamline the State's drought response, and invest in new technologies that will make California more drought resilient. The governor directed the State Water Resources Control Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25 percent. This savings amounts to approximately 1.5 million acre-feet of water through the end of 2015.

Water Shortage

Figure 3-12 illustrates several indicators commonly used to evaluate water conditions in California. The percent of average values are determined by measurements made in each of the ten major hydrologic regions. The chart describes water conditions in California between 2001 and 2012. The chart illustrates the cyclical nature of weather patterns in California. Snow pack and precipitation increased between 2005 and 2006, began decreasing in late 2006, and began to show signs of recovery in 2009.

Figure 3-12 Water Supply Conditions, 2001 to 2012



Source: 2013 State of California Hazard Mitigation Plan

Since 2012, snowpack levels in California have dropped dramatically. 2015 estimates place snowpack as 5 percent of normal levels. Snowpack measurements have been kept in California since 1950 and nothing in the historic record comes close to 2015's severely depleted level. The previous record for the lowest snowpack level in California, 25 percent of normal, was set both in 1976-77 and 2013-2014. In "normal" years, the snowpack supplies about 30 percent of California's water needs, according to the California Department of Water Resources.

With a reduction in water, water supply issues based on water rights becomes more evident. Some agricultural uses, such as grapes and walnuts, are severely impacted through limited water supply. Drought and water supply issues will continue to be a concern to El Dorado County. Irrigation of agricultural lands continues to be a concern in El Dorado County.

Likelihood of Future Occurrence

Drought

Likely—Historical drought data for El Dorado County and region indicate there have been 5 significant droughts in the last several decades. However, based on this data and given the multi-year length of droughts, the HMPC determined that future drought occurrence in El Dorado County is likely.

Water Shortage

Occasional — Recent historical data for water shortage indicates that El Dorado County may at some time be at risk to both short and prolonged periods of water shortage. Based on this it is possible that water shortages will affect the County in the future should extreme drought conditions continue.

Climate Change and Drought and Water Shortage

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 of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The Climate Adaptation Strategy (CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies.

3.2.9. Earthquake

Hazard/Problem Description

An earthquake is caused by a sudden slip on a fault. 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. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales. One of the first was the Richter Scale, developed in 1932 by the late Dr. Charles F. Richter of the California Institute of Technology. The Richter Magnitude Scale is used to quantify the magnitude or strength of the seismic energy released by an earthquake. 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 Table 3-15). Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Table 3-15 Richter Scale

Richter Scale of Earthquake Energy:

Each level is 10 time stronger than the previous level

	Description	Occurrence	In Population	Movement
1	Small	Daily	Every minute	Small
2	Small	Daily	Every hour	Small
3	Small	Daily	Every day	Small
4	Small	Daily	Every week	Moderate sudden
5	Moderate	Monthly	Every 10 years	Strong Sudden
6	Moderate	Monthly	Every 30 years	Strong Sudden
7	Major	Monthly	Every 50 years	Severe Sudden
8	Great	Yearly	Every 100 years	Very Severe
9	Great	Yearly	Every 300 years	Very Severe
10	Super	Rarely	Every 1,000 years	Extreme

Source: sms-tsunami-warning.com, 2017

California is seismically active because it sits on the boundary between two of the earth's tectonic plates. Most of the state - everything east of the San Andreas Fault - is on the North American Plate. The cities of Monterey, Santa Barbara, Los Angeles, and San Diego are on the Pacific Plate, which is constantly moving northwest past the North American Plate. The relative rate of movement is about two inches per year. The San Andreas Fault is considered the boundary between the two plates, although some of the motion is taken up on faults as far away as central Utah.

Faults

A fault is defined as "a fracture or fracture zone in the earth's crust along which there has been displacement of the sides relative to one another." For the purpose of planning there are two types of faults, active and inactive. Active faults have experienced displacement in historic time, suggesting that future displacement may be expected. Inactive faults show no evidence of movement in recent geologic time, suggesting that these faults are dormant. This does not mean, however, that faults having no evidence of surface displacement within the last 11,000 years are necessarily inactive. For example, the 1975 Oroville earthquake, the 1983 Coalinga earthquake, and the 1987 Whittier Narrows earthquake occurred on faults not previously recognized as active. Potentially active faults are those that have shown displacement within the last 1.6 million years (Quaternary). An inactive fault shows no evidence of movement in historic (last 200 years) or geologic time, suggesting that these faults are dormant.

Two types of fault movement represent possible hazards to structures in the immediate vicinity of the fault: fault creep and sudden fault displacement. Fault creep, a slow movement of one side of a fault relative to the other, can cause cracking and buckling of sidewalks and foundations even without perceptible ground shaking. Sudden fault displacement occurs during an earthquake event and may result in the collapse of buildings or other structures that are found along the fault zone when fault displacement exceeds an inch or two. The only protection against damage caused directly by fault displacement is to prohibit construction in the fault zone.

El Dorado County lies between two seismically active regions in the western United States. Tectonic stresses associated with the North American-Pacific Plate boundary can generate damaging earthquakes along faults 30 to 100 miles to the west of the County. Eastern El Dorado County borders the Basin and Range province that entails most of Nevada and western Utah. This area is riddled with active faults that are responsible for and form the boundary between each basin or valley and the neighboring mountain range.

El Dorado County itself is traversed by a series of northwest-trending faults, called the Foothill Fault Zone, that are related to the Sierra Nevada uplift. This was the source of Oroville's 1975 earthquake (and an earlier event in the 1940s). Subsequent research of these events led to the identification and naming of the zone and questions about the siting and design of the proposed Auburn Dam. Earthquakes on nearby fault segments in the zone could be the source of ground shaking in El Dorado County.

The closest recently active fault in the western Sierra Nevada foothills is the Cleveland Hills fault, which is situated approximately 36 miles northwest of Auburn. Another potential earthquake source is the Midland Fault Zone on the western side of the Sacramento Valley. This was the source of the 1892 Vacaville-Winters earthquake.

Additionally, western El Dorado County may experience ground shaking from distant major to great earthquakes on faults to the west and east. For example, to the west, both the San Andreas Fault (source of the 8.0 estimated Richter magnitude San Francisco earthquake that caused damage in Sacramento in 1906, including the State Capitol, the full extent of which was not discovered until the mid-1970s) and the closer Hayward fault have the potential for experiencing major to great events. The US Geological Survey recently (February 2004) estimated that there is a 62 percent probability of at least one 6.7 or greater magnitude earthquake occurring that could cause widespread damage in the greater San Francisco Bay area before 2032.

Earthquake Hazards

Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction. This section briefly discusses issues related to types of seismic hazards.

Ground Shaking

Groundshaking is motion that occurs as a result of energy released during faulting. The damage or

collapse of buildings and other structures caused by groundshaking is among the most serious seismic hazards. Damage to structures from this vibration, or groundshaking, is caused by the transmission of earthquake vibrations from the ground to the structure. The intensity of shaking and its potential impact on buildings is determined by the physical characteristics of the underlying soil and rock, building materials and workmanship, earthquake magnitude and location of epicenter, and the character and duration of ground motion. Much of the County is located on alluvium which increases the amplitude of the earthquake wave. Ground motion lasts longer and waves are amplified on loose, water-saturated materials than on solid rock. As a result, structures located on alluvium typically suffer greater damage than those located on solid rock.

Seismic Structural Safety

Older buildings constructed before building codes were established, and even newer buildings constructed before earthquake-resistance provisions were included in the codes, are the most likely to be damaged during an earthquake. Buildings one or two stories high of wood-frame construction are considered to be the most structurally resistant to earthquake damage. Older masonry buildings without seismic reinforcement (unreinforced masonry) are the most susceptible to the type of structural failure that causes injury or death.

The susceptibility of a structure to damage from ground shaking is also related to the underlying foundation material. A foundation of rock or very firm material can intensify short-period motions which affect low- rise buildings more than tall, flexible ones. A deep layer of water-logged soft alluvium can cushion low- rise buildings, but it can also accentuate the motion in tall buildings. The amplified motion resulting from softer alluvial soils can also severely damage older masonry buildings.

Other potentially dangerous conditions include, but are not limited to: building architectural features that are not firmly anchored, such as parapets and cornices; roadways, including column and pile bents and abutments for bridges and overcrossings; and above-ground storage tanks and their mounting devices. Such features could be damaged or destroyed during strong or sustained ground shaking.

Liquefaction Potential

Liquefaction is a process whereby soil is temporarily transformed to a fluid form during intense and prolonged ground shaking. Areas most prone to liquefaction are those that are water saturated

(e.g., where the water table is less than 30 feet below the surface) and consist of relatively uniform sands that are loose to medium density. In addition to necessary soil conditions, the ground acceleration and duration of the earthquake must be of sufficient energy to induce liquefaction. Liquefaction during major earthquakes has caused severe damage to structures on level ground as a result of settling, titling, or floating. Such damage occurred in San Francisco on bay-filled areas during the 1989 Loma Prieta earthquake, even though the epicenter was several miles away. If liquefaction occurs in or under a sloping soil mass, the entire mass may flow toward a lower elevation. Also of particular concern in terms of developed and newly developing areas are fill areas that have been poorly compacted.

Settlement

Settlement can occur in poorly consolidated soils during ground shaking. During settlement, the soil materials are physically rearranged by the shaking to result in a less stable alignment of the individual minerals. Settlement of sufficient magnitude to cause significant structural damage is normally associated with rapidly deposited alluvial soils or improperly founded or poorly compacted fill. These areas are known to undergo extensive settling with the addition of irrigation water, but evidence due to ground shaking is not available.

Other Hazards

Earthquakes can also cause seiches, landslides, and dam failures. A seiche is a periodic oscillation of a body of water resulting from seismic shaking or other factors that could cause flooding. Earthquakes may cause landslides, particularly during the wet season, in areas of high water or saturated soils. Finally, earthquakes can cause dams to fail.

Past Occurrences

Disaster Declaration History

There have been no disaster declarations in the County.

NCDC Events

Earthquake events are not tracked by the NCDC database.

USGS Events

The USGS National Earthquake Information Center database contains data on earthquakes in El

Dorado County. The USGS database was searched for magnitude 5.0 or greater on the Richter Scale within 90 miles of the City of Placerville in El Dorado County. These results are detailed in Table 3-16.

Table 3-16 Magnitude 5.0 Earthquakes within 90 Miles of El Dorado County*

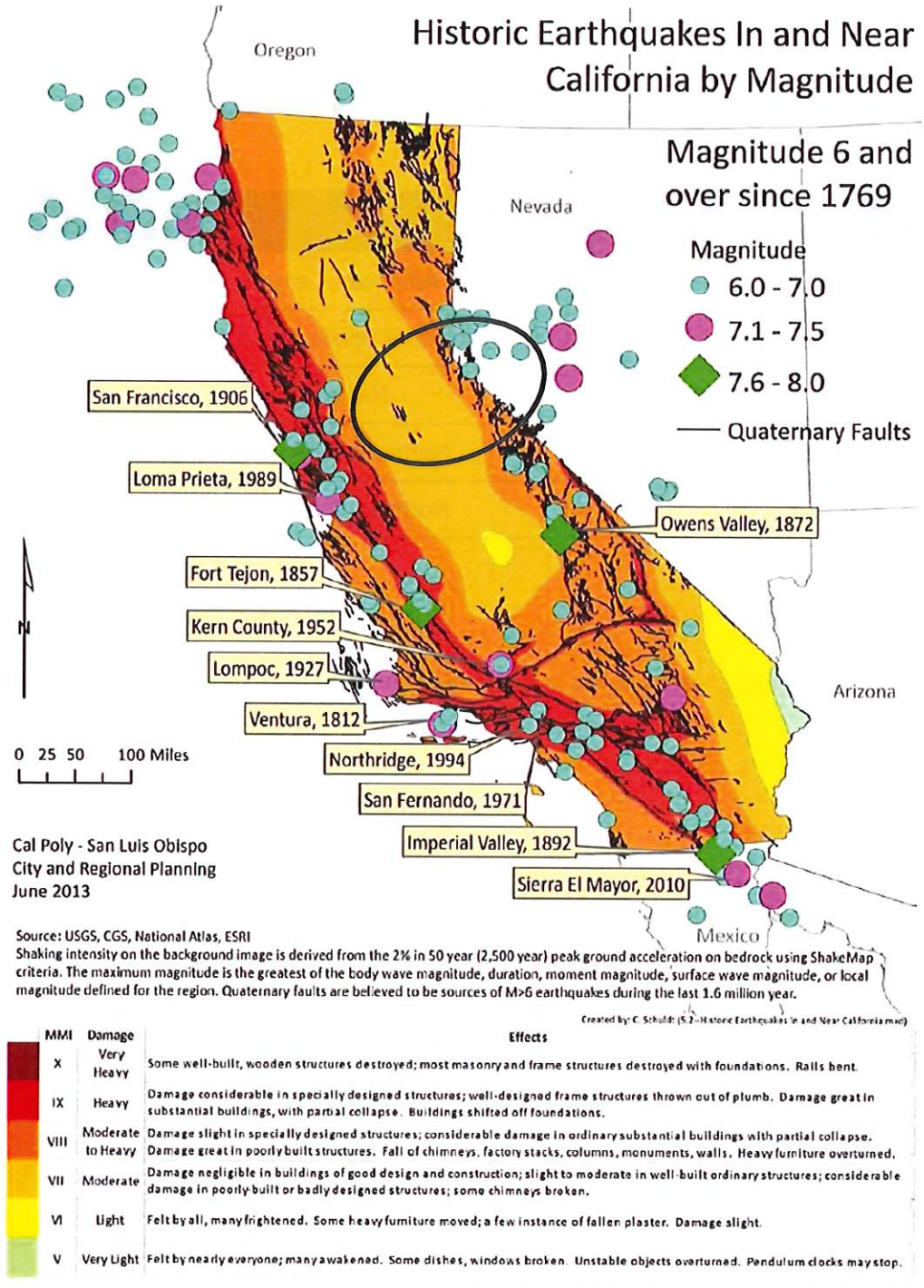
Date	Richter Magnitude	Location
8/24/2014	6.0	6km NW of American Canyon, California
5/24/2013	5.7	10km WNW of Greenville, California
4/26/2008	5	Nevada
8/10/2001	5.2	Northern California
9/3/2000	5	Northern California

Source: USGS

*Search dates 2000-2016

Figure 3-13 shows major historical earthquakes in California from 1769 to 2010.

Figure 3-13 Historic Earthquakes in California and El Dorado County



Source: 2013 State of California Multi-Hazard Mitigation Plan

HMPC Events

Historically, major earthquakes have not been an issue for El Dorado County. However, minor earthquakes have occurred in the County in the past. The HMPC has identified several earthquakes that were felt by area residents and/or caused damaging shaking in El Dorado County. Details on some of these events follow.

- 1908 – An estimated 4.0+ Richter magnitude earthquake occurred between Auburn and Folsom with an epicenter possibly associated with the Bear Mountain fault.
- 1975 – The Cleveland Hills fault was the source of the Oroville earthquake (Richter Magnitude: 5.7), which was felt in El Dorado County and neighboring areas.
- 2003/2004 – Volcanic magma (molten rock) migrating about 20 miles below the surface of the Sierra Nevada mountains caused a swarm of about 1,600 small earthquakes in late 2003 and early 2004. The 20 mile depth is about twice as deep as earthquakes caused by normal faulting in the region measured during the last 30 years. El Dorado County did not report any damages associated with these small earthquakes.
- 2008, 2013, 2014 – There were earthquakes in the El Dorado County vicinity in these years. No significant issues were reported in the County. Groundshaking was the primary concern.

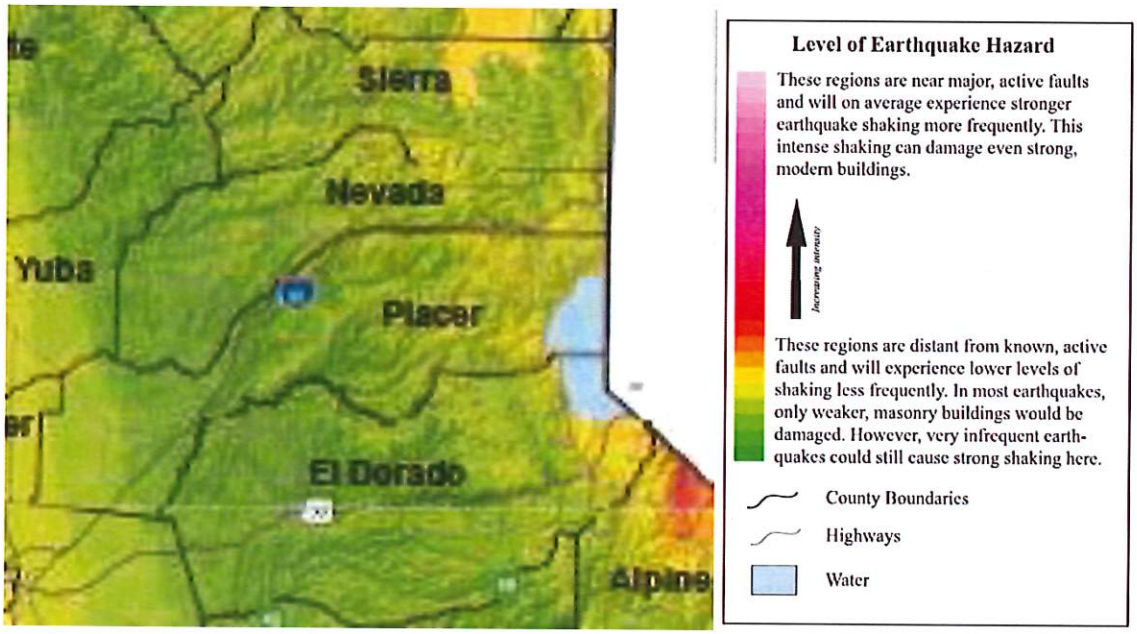
Likelihood of Future Occurrence

Occasional—No major earthquakes have been recorded within the county; although the county has felt ground shaking from earthquakes with epicenters located elsewhere. Based on historical data and the location of El Dorado County relative to active and potentially active faults, the County will experience a significantly damaging earthquake occasionally.

Mapping of Future Occurrences

Maps indicating the maximum expectable intensity of groundshaking for the County are available through several sources. Figure 3-14, prepared by the California Division of Mines and Geology, shows 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 2,500 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.

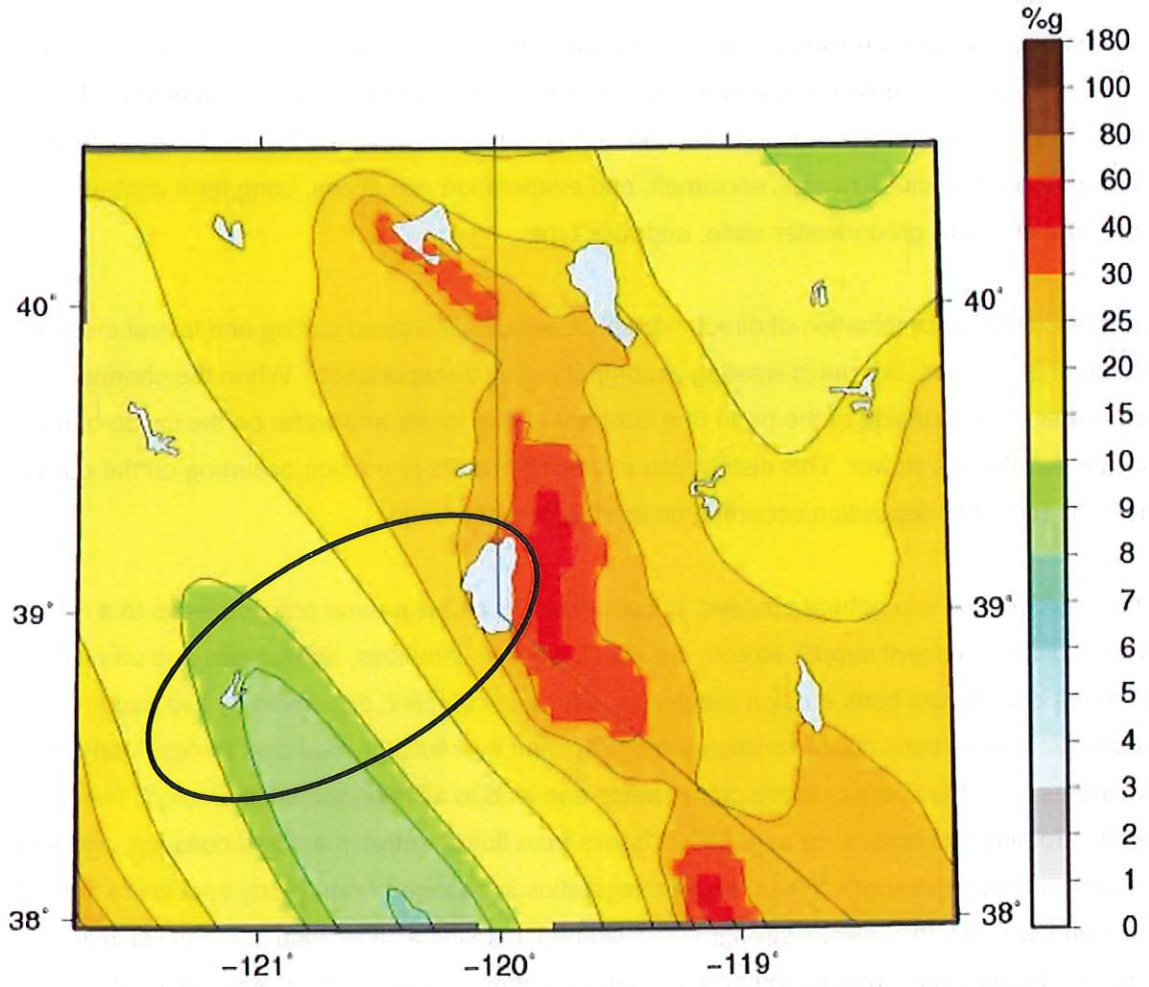
Figure 3-14 Maximum Expectable Earthquake Intensity



Source: California Division of Mines and Geology

The U.S. Geological Survey (USGS) issues National Seismic Hazard Maps as reports every few years. These maps provide various acceleration and probabilities for time periods. Figure 3-15 depicts the peak horizontal acceleration (%g) with 10% probability of exceedance in 50 years (a 500-year event) for the planning region. The figure demonstrates that the County falls in the 9%g (light green) in the west, 20%g (darker yellow) in the central, and in the 30%g area (tan) in the extreme eastern portion of the County. This data indicates that the expected severity of earthquakes in the region is somewhat limited, as damage from earthquakes typically occurs at peak accelerations of 30%g or greater.

Figure 3-15 Peak Horizontal Acceleration with 10% Probability of Occurrence in 50 Years



Source: USGS National Seismic Hazard Maps

Climate Change and Earthquake

Climate changes is unknown to increase earthquake frequency or strength.

3.2.10. Erosion

Hazard/Problem Description

Any flowing body of water (brook, creek, stream, river) is a stream. Stream flow is expressed as volume per unit time, usually cubic meters per second, cubic feet per second, sometimes cubic kilometers per second, or acre-feet per second or day. Stream flow varies tremendously with time. Short term controls include rainfall, snowmelt, and evaporation conditions. Long term controls include land use, soil, groundwater state, and rock type.

Streams erode by a combination of direct stream processes, like down cutting and lateral erosion, and indirect processes, like mass-wasting accompanied by transportation. When the channel bends, water on the outside of the bend (the cut-bank) flows faster and water on the inside of the bend (the point) flows slower. This distribution of velocity results in erosion occurring on the outside of the bend (cut) and deposition occurring on the inside of the bend.

Stream bank erosion is a natural process, but acceleration of this natural process leads to a disproportionate sediment supply, stream channel instability, land loss, habitat loss and other adverse effects. Stream bank erosion processes, although complex, are driven by two major components: stream bank characteristics (erodibility) and hydraulic/gravitational forces. Many land use activities can affect both of these components and lead to accelerated bank erosion. The vegetation rooting characteristics can protect banks from fluvial entrainment and collapse, and also provide internal bank strength. When riparian vegetation is changed from woody species to annual grasses and/or forbs, the internal strength is weakened, causing acceleration of mass wasting processes. Stream bank aggradation or degradation is often a response to stream channel instability. Since bank erosion is often a symptom of a larger, more complex problem, the long-term solutions often involve much more than just bank stabilization. Numerous studies have demonstrated that stream bank erosion contributes a large portion of the annual sediment yield.

Erosion in El Dorado County

As farmers settled the valleys, the Gold Rush drew prospectors to the hills. As mining in the Sierra Nevada turned to the more "efficient" methods of hydraulic mining, the use of environmentally destructive high-pressure water jets washed entire mountainsides into local streams and rivers. Hydraulic gold mining in the northern Sierra Nevada foothills produced 1.1 billion cubic meters of sediment. As a result, the enormous amounts of silt deposited in the riverbeds of the Central Valley increased flood risk. These low-lying, unconsolidated deposits reside below all dams and

reservoirs and are largely between modern levees. As a remedy to these rising riverbeds, levees were built very close to the river channels to keep water velocity high and thereby scour away the sediment.

Swiftly moving floodwaters cause rapid local erosion as the water carries away earth materials. This is especially problematic in leveed areas. Severe erosion removes the earth from beneath bridges, roads and foundations of structures adjacent to streams. By undercutting it can lead to increased rockfall and landslide hazard. The deposition of material can block culverts, aggravate flooding, destroy crops and lawns by burying them, and reduce the capacity of water reservoirs as the deposited materials displace water. Erosion increases the sediment that a stream must carry, results in the loss of fertile bottomland and causes a decline in the quality of habitat on land and in the stream. High velocity flows can erode material from the streambank. Erosion can occur at once or over time as a function of the storm cycle and the scale of the peak storms.

Erosion in El Dorado County

The American and Consumes Rivers flow through El Dorado County. Parts of Highway 50 (near Bridal Veil Falls) and County roads (Happy Valley) have eroded due to high velocity flows from storms.

Disaster Declaration History

There have been no disasters declarations in El Dorado County specifically for erosion activity. Erosion issues in El Dorado County have been a result of other hazards.

NCDC Events

The NCDC does not track erosion events.

HMPC Events

Members of the HMPC noted erosion problems along Highway 50 near Bridal Veil Falls, Happy Valley in the Mt. Aukum area and Ft. Jim Road in the Placerville area.

Likelihood of Future Occurrence

Occasional – Due to the number of linear feet of stream banks and drainages, the likelihood of future occurrences of erosion in El Dorado County is somewhat likely. Climate Change may affect flooding and erosion in El Dorado County. While average annual rainfall may increase or decrease

slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events.

3.2.11. Flood: 100/500 year

Hazard/Problem Description

Flooding is the rising and overflowing of a body of water onto normally dry land. History clearly highlights floods as one of the most frequent natural hazards impacting El Dorado County. Floods are among the most costly natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. A car will float in less than two feet of moving water and can be swept downstream into deeper waters. This is one reason floods kill more people trapped in vehicles than anywhere else. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs.

Floodwaters can transport large objects downstream which can damage or remove stationary structures, such as dam spillways. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be of critical importance to reduce life and safety impacts from any type of flooding.

Health Hazards from Flooding

Certain health hazards are also common to flood events. While such problems are often not reported, three general types of health hazards accompany floods. The first comes from the water itself. Floodwaters carry anything that was on the ground that the upstream runoff picked up, including dirt, oil, animal waste, and lawn, farm and industrial chemicals. Pastures and areas where cattle and hogs are kept or their wastes are stored can contribute polluted waters to the receiving streams.

Floodwaters also saturate the ground, which leads to infiltration into sanitary sewer lines. When wastewater treatment plants are flooded, there is nowhere for the sewage to flow. Infiltration and lack of treatment can lead to overloaded sewer lines that can back up into low-lying areas and homes. Even when it is diluted by flood waters, raw sewage can be a breeding ground for bacteria such as e. coli and other disease causing agents.

The second type of health problem arises after most of the water has gone. Stagnant pools can become breeding grounds for mosquitoes, and wet areas of a building that have not been properly cleaned breed mold and mildew. A building that is not thoroughly cleaned becomes a health hazard, especially for small children and the elderly.

Another health hazard occurs when heating ducts in a forced air system are not properly cleaned after inundation. When the furnace or air conditioner is turned on, the sediments left in the ducts are circulated throughout the building and breathed in by the occupants. If a city or county water system loses pressure, a boil order may be issued to protect people and animals from contaminated water.

The third problem is the long-term psychological impact of having been through a flood and seeing one's home damaged and irreplaceable keepsakes destroyed. The cost and labor needed to repair a flood-damaged home puts a severe strain on people, especially the unprepared and uninsured. There is also a long-term problem for those who know that their homes can be flooded again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

Warning and Evacuation Procedures

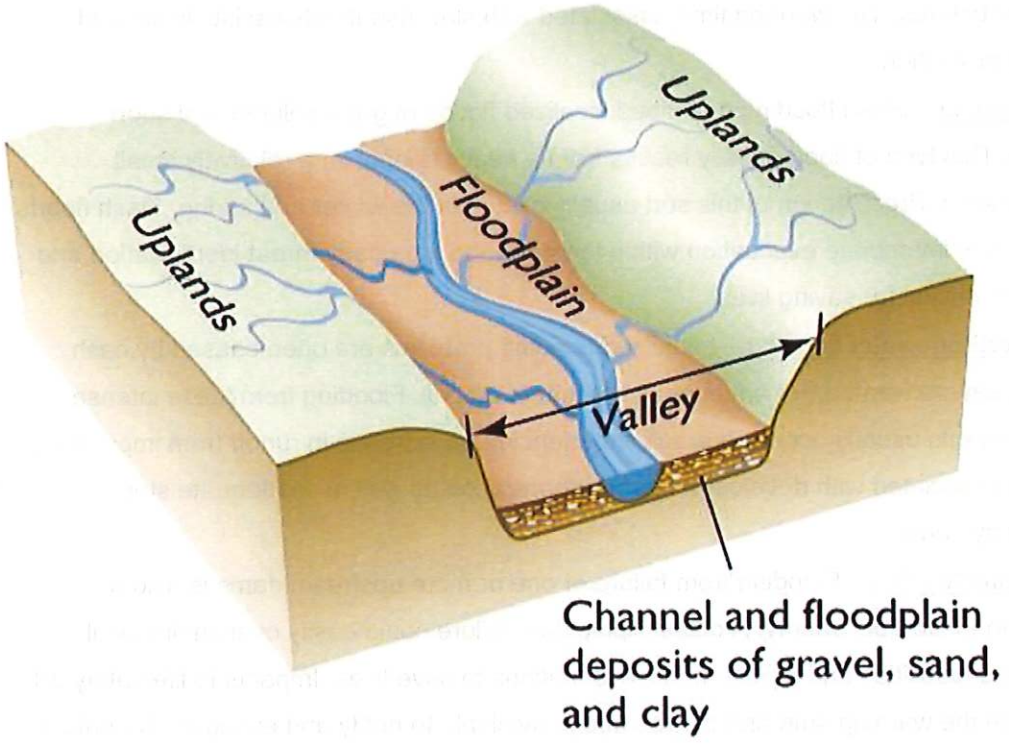
El Dorado County and its incorporated communities have a variety of systems and procedures established to protect its residents and visitors to plan for, avoid, and respond to a hazard event including those associated with floods and wildfires. This includes Pre-Disaster Public Awareness and Education information which is major component in successfully reducing loss of life and property in a community when faced with a potentially catastrophic incident. Much of this information is not specific to a given hazard event and is always accessible to the public on local County and City websites. Specific warning and evacuation systems and procedures include information relative to: Warning Systems, Code Red alert system, dam protocols, evacuation recommendations, and sheltering in place. Additional information on these warning and evacuation recommendations as well as post-disaster mitigation policies and procedures can be found in Section 3.4, Capabilities, of this Risk Assessment.

Floodplains

The area adjacent to a channel is the floodplain (see Figure 3-16). Floodplains are illustrated on inundation maps, which show areas of potential flooding and water depths. In its common usage,

the floodplain most often refers to that area that is inundated by the 100-year flood, the flood that has a one percent chance in any given year of being equaled or exceeded. The 100-year flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program. The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. The potential for flooding can change and increase through various land use changes and changes to land surface, which result in a change to the floodplain. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

Figure 3-16 Floodplain Schematic



Source: FEMA

El Dorado County is susceptible to various types of flood events as described below.

- Riverine flooding – Riverine flooding, defined as when a watercourse exceeds its "bank-full" capacity, generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. This type of flood occurs in river systems whose tributaries may drain large geographic areas and include one or more independent river basins. The onset and duration of riverine floods may vary from a few hours to many days. Factors that directly affect the amount of flood runoff include precipitation amount, intensity and distribution, the amount of soil moisture, seasonal variation in vegetation, snow depth, and water-resistance of the surface due to urbanization. In El Dorado County, riverine flooding is largely caused by heavy and continued rains, often combined with snowmelt, increased outflows from upstream dams, and heavy flow from tributary streams. These intense storms can overwhelm the local waterways as well as the integrity of flood control structures. The warning time associated with slow rise floods assists in life and property protection.
- Flash flooding – Flash flooding describes localized floods of great volume and short duration. This type of flood usually results from a heavy rainfall on a relatively small drainage area. Precipitation of this sort usually occurs in the winter and spring. Flash floods often require immediate evacuation within the hour and thus early threat identification and warning is critical for saving lives.
- Localized/Stormwater flooding – Localized flooding problems are often caused by flash flooding, severe weather, or an unusual amount of rainfall. Flooding from these intense weather events usually occurs in areas experiencing an increase in runoff from impervious surfaces associated with development and urbanization as well as inadequate storm drainage systems.
- Dam failure flooding – Flooding from failure of one or more upstream dams is also a concern to El Dorado County. A catastrophic dam failure could easily overwhelm local response capabilities and require mass evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major loss of life could result, and there could be associated health concerns as well as problems with the identification and burial of the deceased. Dam failure is further addressed in Section 3.2.7 Dam Failure.

El Dorado County encompasses multiple rivers, streams, creeks, and associated watersheds. The County is situated in a region that dramatically drops in elevation from the eastern portion (Sierra Nevada) to the western portion, where excess rain on snow can contribute to downstream flooding. Flood flows generally follow defined stream channels, drainages, and watersheds. Because flows within many of the creeks and rivers within El Dorado County can vary substantially from one another, the estimate for the average depth of the 100-year floodplain also varies and ranges anywhere from 1 foot to as high as 15 to 20 feet depending on numerous criteria.

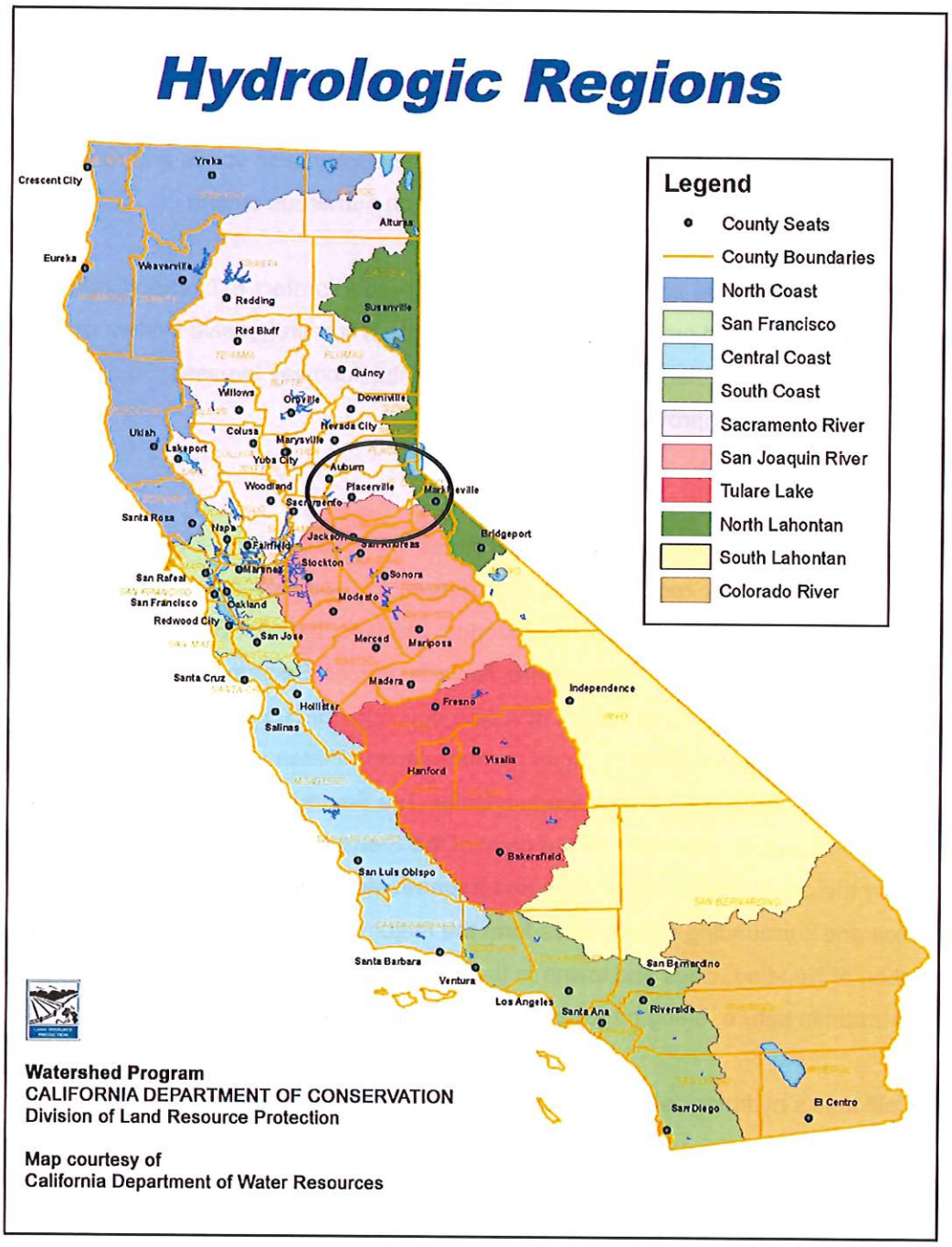
Various flood protection measures are either in place or planned to protect El Dorado County from future flood events. Existing flood protection measures include a comprehensive system of dams, levees, overflow weirs, pumping plants, channel improvements, floodway bypasses, detention and retention structures, and other improvements.

Major Sources of Flooding

California has 10 hydrologic regions. El Dorado County sits in the Sacramento hydrologic region. The Sacramento River hydrologic region covers approximately 17.4 million acres (27,200 square miles). The region includes all or large portions of Modoc, Siskiyou, Lassen, Shasta, Tehama, Glenn, Plumas, Butte, Colusa, Sutter, Yuba, Sierra, Nevada, Placer, Sacramento, El Dorado, Yolo, Solano, Lake, and Napa counties. Small areas of Alpine and Amador counties are also within the region. Geographically, the region extends south from the Modoc Plateau and Cascade Range at the Oregon border, to the Sacramento-San Joaquin Delta. The Sacramento Valley, which forms the core of the region, is bounded to the east by the crest of the Sierra Nevada and southern Cascades and to the west by the crest of the Coast Range and Klamath Mountains. The Sacramento metropolitan area and surrounding communities form the major population center of the region. With the exception of Redding, cities and towns to the north, while steadily increasing in size, are more rural than urban in nature, being based in major agricultural areas.

A map of the California's hydrological regions is provided in Figure 3-17.

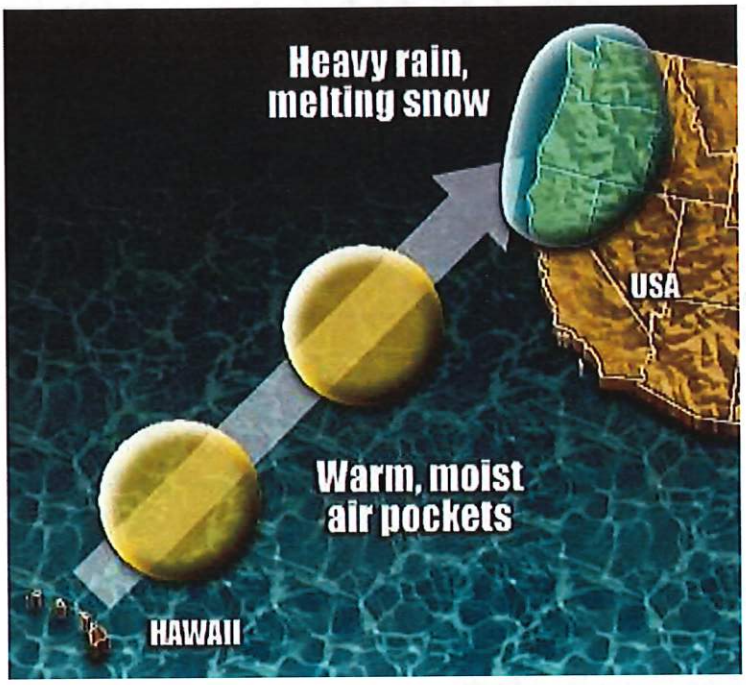
Figure 3-17 California Hydrologic Regions



Source: California Department of Water Resources

A weather pattern called the "Pineapple Express" contributes to the flooding potential of the area. A pineapple express brings warm air and rain to West. A relatively common weather pattern brings southwest winds to the Pacific Northwest or California, along with warm, moist air. The moisture sometimes produces many days of heavy rain, which can cause extensive flooding. The warm air also can melt the snow pack in the mountains, which further aggravates the flooding potential. In the colder parts of the year, the warm air can be cooled enough to produce heavy, upslope snow as it rises into the higher elevations of the Sierra Nevada or Cascades. Forecasters and others on the West Coast often refer to this warm, moist air as the "Pineapple Express" because it comes from around Hawaii where pineapples are grown. This is shown in Figure 3-18.

Figure 3-18 Pineapple Express Weather Pattern

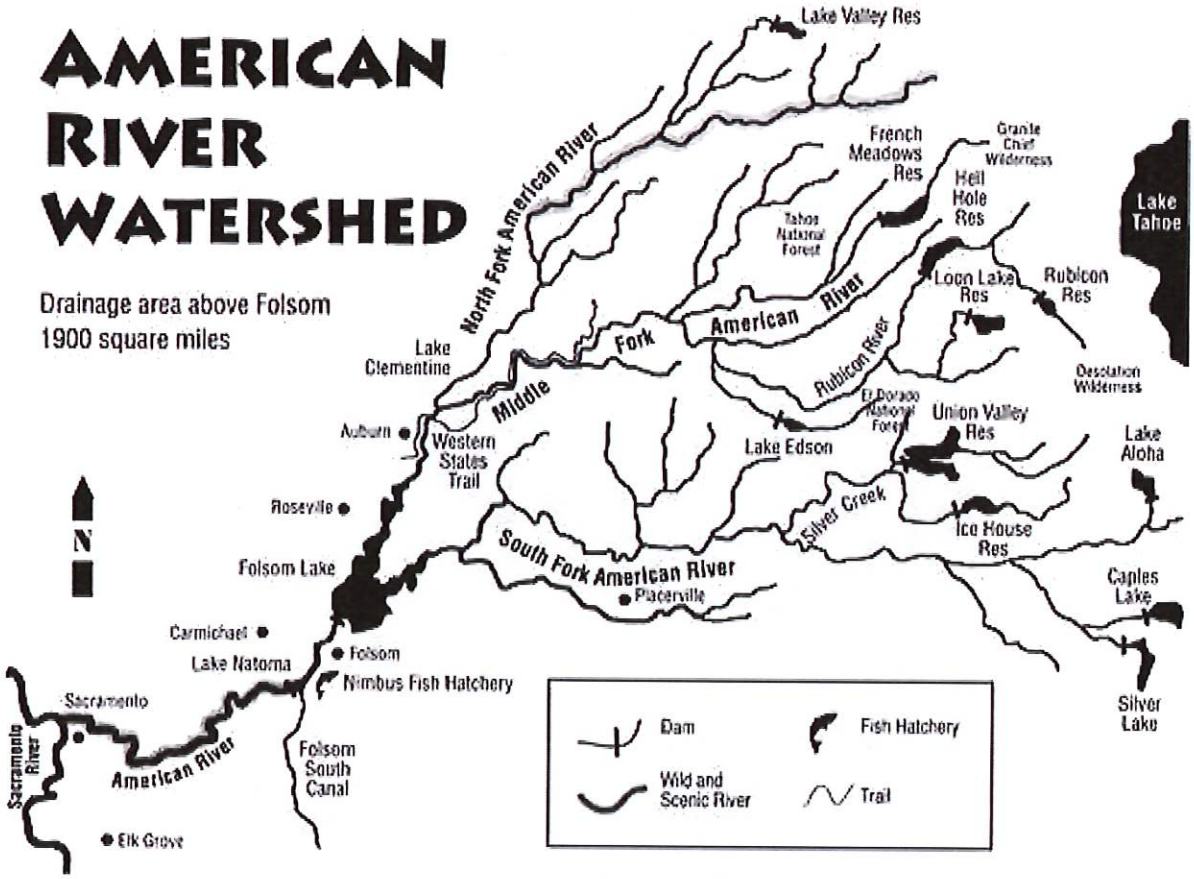


Source: USA TODAY research by Chad Palmer http://www.usatoday.com/weatherwpinappl.htm

The El Dorado County Waterway System

El Dorado County encompasses multiple rivers, streams, creeks, and associated watersheds. The County is situated in a region that dramatically drops in elevation from the eastern portion (Sierra Nevada) to the western portion, where excess rain on snow can contribute to downstream flooding. Damaging floods in El Dorado County occur primarily in the developed areas of the county. Flood flows generally follow defined stream channels, drainages, and watersheds.

Figure 3-19 El Dorado County Watershed Map



https://www.theamericanriver.com/rivers/american-river-watershed/

El Dorado County Flood Mapping Efforts

As part of the County's ongoing efforts to identify and manage their flood prone areas, El Dorado County relies on a variety of different mapping efforts. What follows is a brief description of FEMA and DWR mapping efforts covering El Dorado County.

Flood Hazard Awareness Maps

Flood Hazard Maps have been created by the El Dorado County Surveyor's Office for the purposes of identifying areas of the county where flood hazards from local creeks are known to exist. The maps delineate the established FEMA 100-year and 500-year floodplains (where established) including a 250 foot setback limit from the 100-year floodplain. The setback limit was selected to assist emergency responders and planners in identifying local flood hazard areas, but is not a regulatory limit. Critical emergency response facilities including police and fire stations are shown as are other facilities which may be useful during a flooding event including hospitals, schools, churches and miscellaneous public facilities. Street crossings potentially impacted by flooding are also highlighted in red and the locations of sand bags for flood fighting purposes are also shown. The County updates these maps periodically as new information becomes available. Figure 4-40 through Figure 4-44 depict the flood hazard maps.

FEMA Floodplain Mapping

FEMA established standards for floodplain mapping studies as part of the National Flood Insurance Program (NFIP). The NFIP makes flood insurance available to property owners in participating communities adopting FEMA-approved local floodplain studies, maps, and regulations. Floodplain studies that may be approved by FEMA include federally funded studies; studies developed by state, city, and regional public agencies; and technical studies generated by private interests as part of property annexation and land development efforts. Such studies may include entire stream reaches or limited stream sections depending on the nature and scope of a study. A general overview of floodplain mapping is provided in the following paragraphs. Details on the NFIP and mapping specific to the County and participating jurisdictions are in Section 4.3 Vulnerability Assessment and in the jurisdictional annexes.

Other Floodplain Maps and Analyses: Department of Water Resources

Also to be considered when evaluating the flood risks in El Dorado County are various floodplain maps developed by the California Department of Water Resources (DWR) for various areas throughout California, and in the Sacramento-San Joaquin Valley cities and counties.

DWR Flood Awareness Maps

The Flood Awareness Maps are designed to identify all pertinent flood hazard areas by 2015 for areas that are not mapped under the FEMA NFIP and to provide the community and residents an additional tool in understanding potential flood hazards.

Past Occurrences

Disaster Declaration History

A search of FEMA and Cal OES disaster declarations turned up multiple events. Recent State disaster declarations occurred in 1995, 1997, 2006, 2008, and 2017. Recent Federal disaster declarations occurred in 1955, 1962, 1963, 1997, 2005, 2006, and 2017. Many disasters in the Severe Weather: Heavy Rains profile in Section 4.2.5 also resulted in flood declarations.

NCDC Events

The NCDC tracks flooding events for the County. Table 3-17 shows events in El Dorado County since 1996. The total property damage and crop damage includes all areas impacted.

Table 3-17 NCDC Flood Events in El Dorado County 1993 to 12/31/2014

Date	Event	Deaths (direct)	Injuries (direct)	Property Damage	Crop Damage	Injuries (indirect)	Deaths (indirect)
1/01/1997	Flash Flood	0	0	$10,000,000	$0	0	0
1/24/1997	Flash Flood	0	0	$5,000,000	$0	0	0
2/02/1998	Flood	0	0	$4,300,000	$7,800,000	0	0
7/18/2002	Flash Flood	0	0	$0	$0	0	0
12/31/2005	Flood	0	0	$1,000,000	$0	0	0
1/01/2006	Flood	0	0	$3,200,000	$0	0	0
12/3/2014	Flood	0	0	$0	$0	0	0
6/05/2015	Flood	0	0	$0	$0	0	0
6/05/2015	Flood	0	0	$0	$0	0	0
1/03/2017	Flood	0	0	$0	$0	0	0
2/08/2017	Flood	0	0	$1,000,000	$0	0	0
2/08/2017	Flood	0	0	$250,000	$0	0	0
2/17/2017	Flood	0	0	$500,000	$0	0	0
3/21/2018	Flood	0	0	$100,000	$0	0	0
3/21/2018	Flood	0	0	$100,000	$0	0	0
3/22/2018	Flood	0	0	$0	$0	0	0
4/06/2018	Flood	0	0	$20,000	$0	0	0
4/06/2018	Flood	0	0	$0	$0	0	0
4/6/2018	Flood	0	0	$0	$0	0	0
TOTAL		**0**	**0**	**$25,470,000**	**$7,800,000**	**0**	**0**

HMPC Events

Historically, portions of El Dorado County have always been at risk to flooding because of its high annual percentage of rainfall, heavy snowfall in the winter, and the number of watercourses that traverse the County. Flooding events have caused severe damage in the all portions of the County. Existing watershed reports confirm that under existing conditions, flooding will continue to occur. Localized stormwater flooding also continues to be a problem throughout El Dorado County.

The HMPC provided additional information on the following historical flood events in the County.

- February 1986 – This flood was classified as an approximate 70-year event. Flooding was significant in in several areas of the county. Nearly all bridges and culverts were overtopped, with 30 sustaining embankment damage.
- January 1997 – A significant amount of rainfall and snowmelt runoff poured out of the Sierra Nevada from December 30, 1996 to January 1997. This was a very warm system and rain was falling at the 9,000 foot elevation.
- December 31, 2005 to January 1, 2006 – A series of warm winter storms brought heavy rain, mudslides, flooding, and high winds to Northern California. Localized flooding was reported across El Dorado County. US Highway 50 between Sacramento and South Lake Tahoe, was closed in both directions for multiple days due to a massive mudslide.
- January and February, 2017– After several years of drought, record rainfall led to localized flooding and infrastructure damage throughout El Dorado County. Several culverts, roads and Highway 50 at Bridal Veil Falls eroded and washed out. States of emergencies were declared for 2017 storms.

Likelihood of Future Occurrence

100-Year Flood

Occasional—The term "100-year flood" is misleading. It is not the flood that will occur once every 100 years. Rather, it is the flood that has a 1- percent chance of being equaled or exceeded in any given year. Thus, the 100-year flood could occur more than once in a relatively short period of time.

500-Year Flood

Unlikely—The 500 year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year.

Localized Flooding

Highly Likely—Based on historical data, localized flooding events occur frequently during periods of heavy rains.

Climate Change and Flood

According to the CAS, climate change may affect flooding in El Dorado County. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events.

3.2.12. Debris Flows (Landslide)

Hazard/Problem Description

According to the California Geological Survey, landslides refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Common names for landslide types include slump, rockslide, debris flow, debris slide, lateral spreading, debris avalanche, earth flow, and soil creep. Landslides may be triggered by both natural and human- induced changes in the environment that result in slope instability.

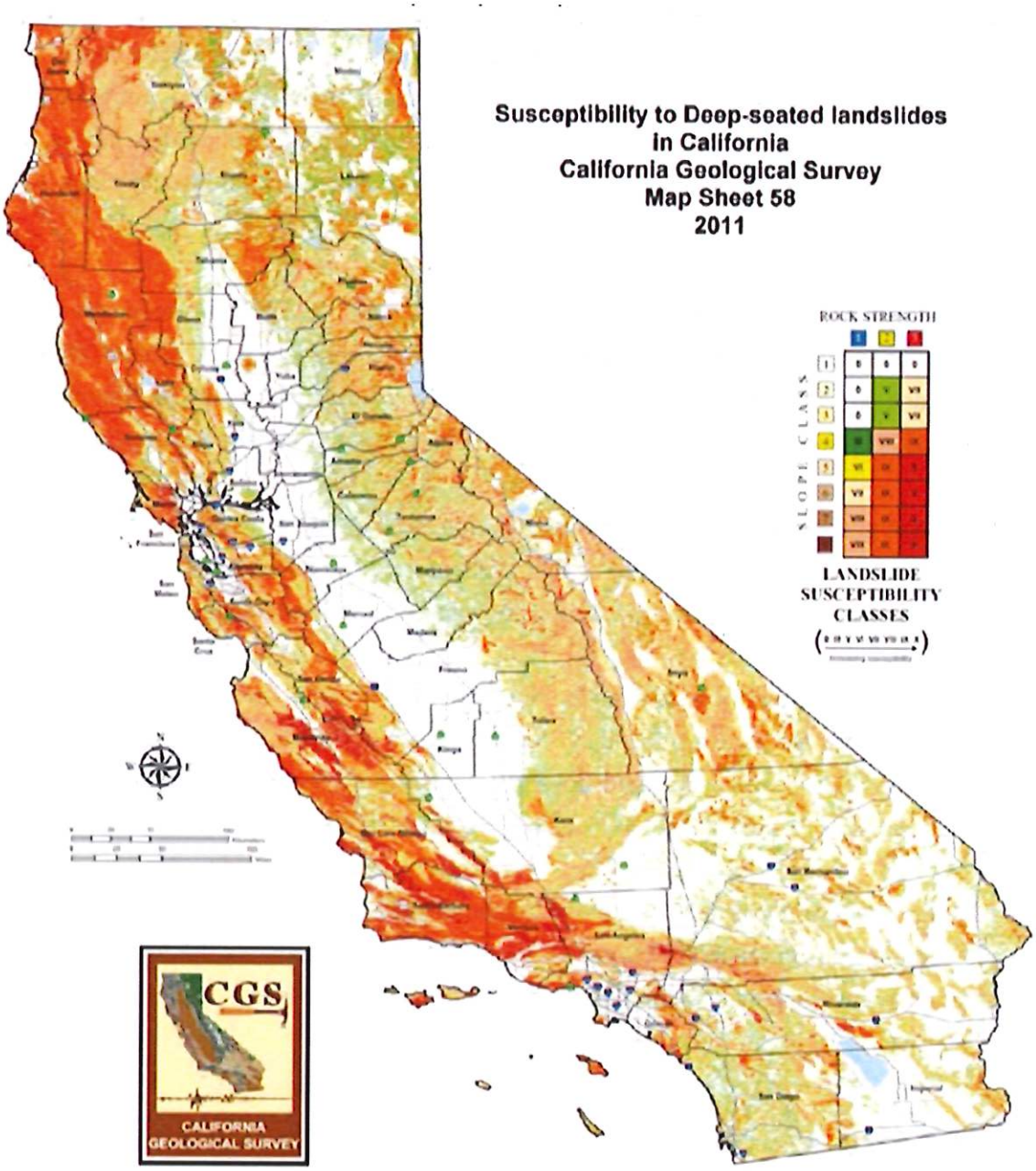
The susceptibility of an area to debris flows depends on many variables including steepness of slope, type of slope material, structure and physical properties of materials, water content, amount of vegetation, and proximity to areas undergoing rapid erosion or changes caused by human activities. These activities include mining, construction, and changes to surface drainage areas.

Debris flows often accompany other natural hazard events, such as floods, wildfires, or earthquakes. Debris flows can occur slowly or very suddenly and can damage and destroy structures, roads, utilities, and forested areas, and can cause injuries and death.

There are areas in El Dorado County that are particularly prone to debris flows. Slope instability and debris flow hazards are generally found in areas of eastern El Dorado County, as seen in active and inactive landslide deposits. Historical and potential debris flow areas identified by the HMPC include Highway 50 east of Pollock Pines and State Route 49 north of Cool.

Figure 3-20 was developed for the 2013 State of California Multi-Hazard Mitigation Plan. It indicates that most areas throughout El Dorado County are at low to moderate risk for landslides and an area in the eastern portion of the County is at high risk for landslides.

Figure 3-20 Debris Flow Risk Zones



Source: 2013 State of California Multi-Hazard Mitigation Plan

Past Occurrences

Disaster Declaration History

There has been one disaster declaration associated with debris flows in El Dorado County.

NCDC Events

The NCDC contains 10 records of debris flows in the County. Table 3-17 outlines debris flow events in El Dorado County

Table 3-17 NCDC Flood Events in El Dorado County 1993 to 12/31/2014

Date	Event	Deaths (direct)	Injuries (direct)	Property Damage	Crop Damage	Injuries (indirect)	Deaths (indirect)
2/23/1998	Debris Flow	0	0	$0	$0	0	0
12/22/2005	Debris Flow	0	0	$0	$0	0	0
12/22/2005	Debris Flow	0	0	$2,000	$0	0	0
12/2/2012	Debris Flow	0	0	$0	$0	0	0
9/25/2014	Debris Flow	0	0	$0	$0	0	0
9/27/2014	Debris Flow	0	0	$0	$0	0	0
12/22/2015	Debris Flow	0	0	$0	$0	0	0
1/9/2017	Debris Flow	0	0	$2,000	$0	0	0
1/10/2017	Debris Flow	0	0	$2,000	$0	0	0
1/10/2017	Debris Flow	0	0	$0	$0	0	0
2/21/2017	Debris Flow	0	0	$6,500,000	$0	0	0
6/8/2017	Debris Flow	0	0	$0	$0	0	0
TOTAL		**0**	**0**	**$6,504,000**	**$0**	**0**	**0**

HMPC Events

Notable debris flows of record include the following debris flows along the Highway 50 corridor in the Whitehall, Kyburz, Pollock Pines, Fresh Pond, Pacific House/Bridal Veil Falls area and off of Highway 49 in the Chili Bar area:

- White Hall Debris Flow – Following the Cleveland Fire, The Wayne Road Landslide was the most significant of the three landslides. The Wayne Road Landslide is actually the result of two separate failures occurring in separate drainages. The drainages meet just upslope of the impacted area directly west of the intersection of Sandy Way and Wayne Road. Based on information provided by local residents and El Dorado County personnel, the homes in the area were also impacted by debris flows in 1982 and in 1986. The 1982 event was larger than the 1986 event. El Dorado County personnel stated that, following the 1986 landslide, several small sedimentation basins were constructed north of Sandy Way in an attempt to contain future slide debris. These sedimentation basins were obliterated by slide debris during the 1997 event. Slide debris consisted of saturated, loose, silty sand and sandy silt with rock ranging in size from gravel to boulders up to 4 feet in diameter. The debris plugged existing culverts and several feet of slide debris were deposited against the sides of several residences.
- Bridal Veil Falls/Pacific House – The Sandy Way Landslide occurred approximately one-quarter mile west of the Wayne Road Landslide, originating just west of Squaw Summit Road, and deposited significant debris upslope of several residences on Sandy Way.

With heavy rain events, debris flows/mudslides may occur, causing road closures for hours and days at a time in some areas. Highway 50 and Highway 49 are areas of recent landslides. Also post fire conditions especially in the King and Cleveland Fires burn scar areas are a concern during El Nino winters, with debris flows occurring and also contributing to sediment and debris loads in the American River tributaries. El Dorado County has monitored debris conditions in the post fire area and have incurred mobilization and other expenses as a result.

Figure 3-21 depicts the debris flow areas described above.

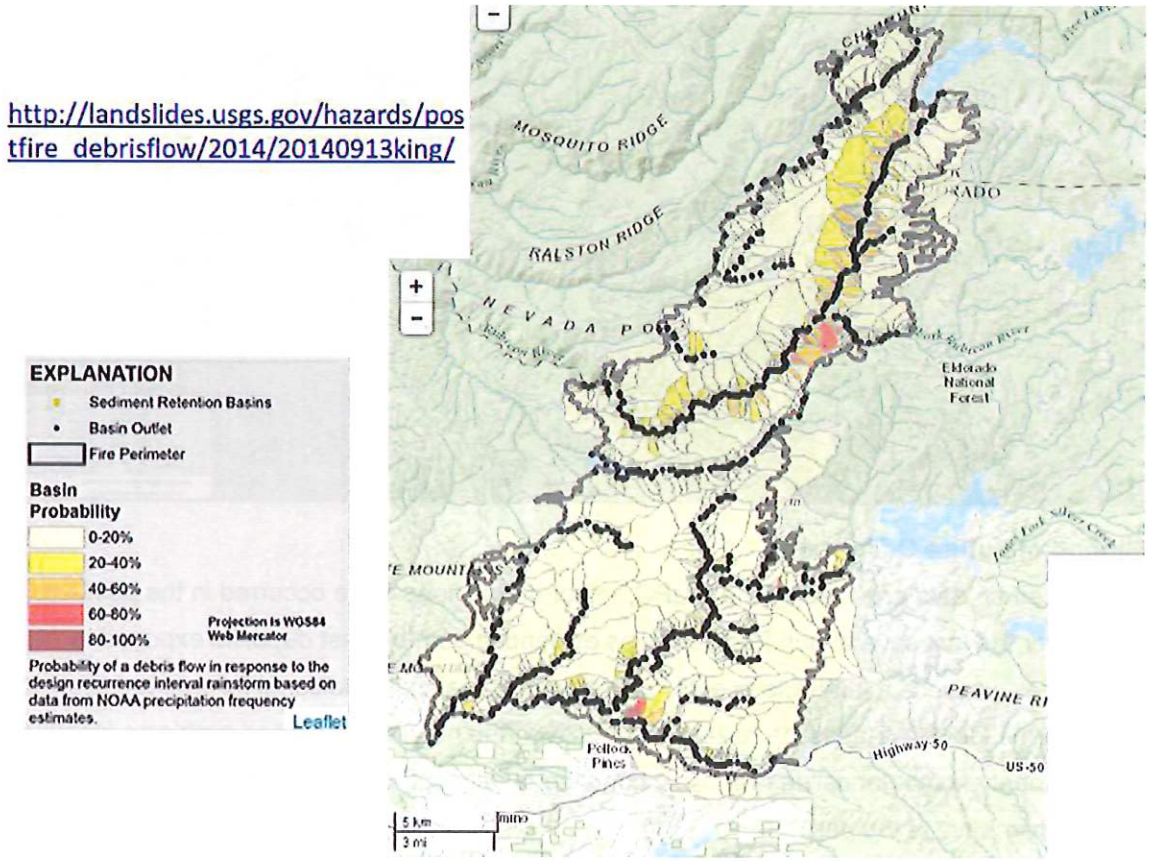
Figure 3-21 El Dorado County Potential Debris Flow Areas (Highway 50 Corridor)

Likelihood of Future Occurrence

Likely—Based on data provided by the HMPC, minor debris flows have occurred in the past, probably over the last several hundred years, as evidenced both by past deposits exposed in erosion gullies and recent landslide events. With significant rainfall, additional failures are likely to occur within the identified landslide hazard areas. Given the nature of localized problems identified within the County, minor landslides will likely continue to impact the area when heavy precipitation occurs, as they have in the past.

In addition, areas affected by recent fires show an increased area of landslide risk. The King Fire in 2014 burned a large area of the County. The USGS put together debris flow probabilities in the burn scar area. Future occurrences for this area are shown on Figure 3-22.

Figure 3-22 Future Landslide Probability in the King Fire Burn Scar



Source: USGS

Climate Change and Landslide and Debris Flows

According to the CAS, climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides and landslides.

3.2.13. Seiche (Lake Tsunami)

Hazard/Problem Description

U.S. Army Corps of Engineers defines seiche as:

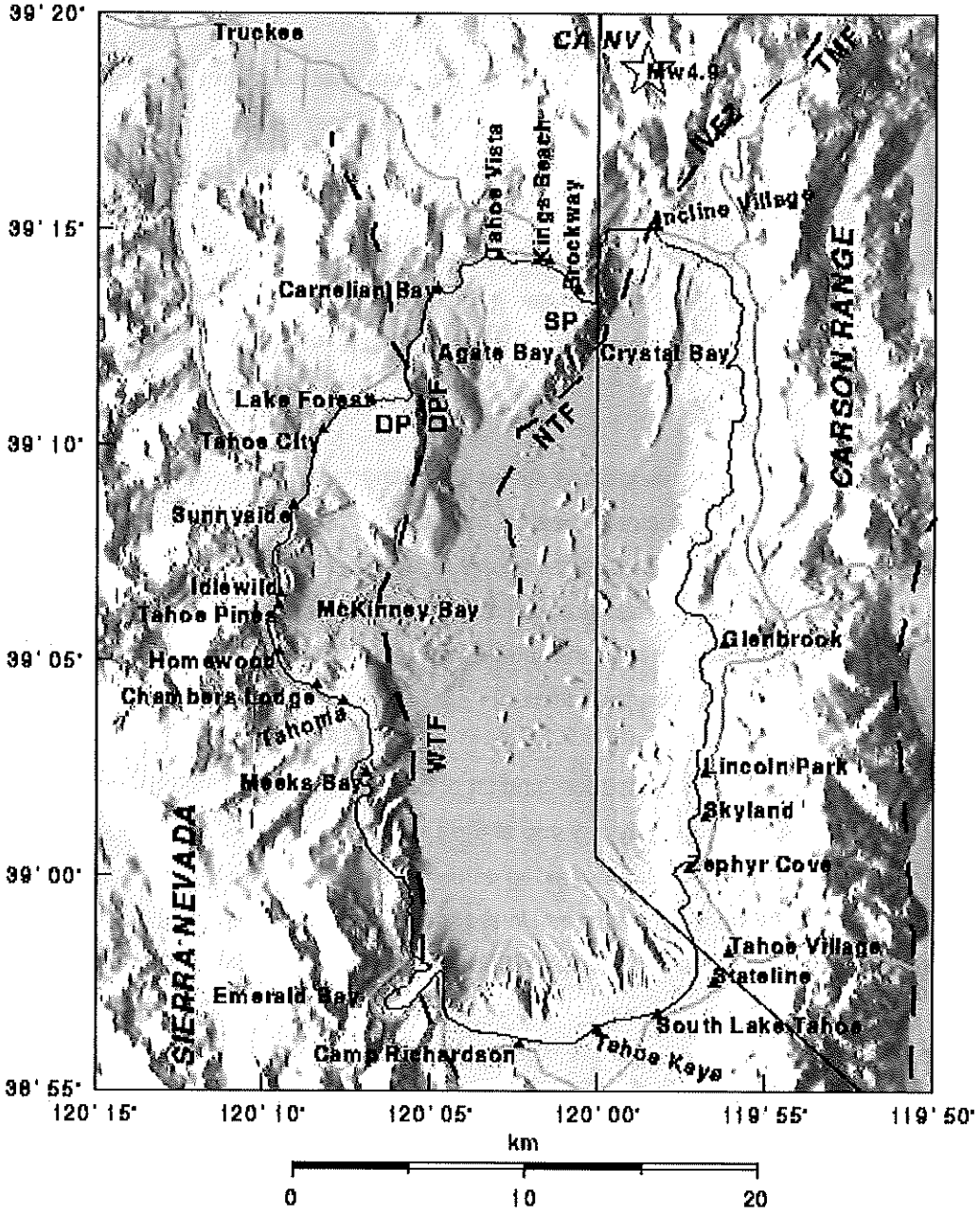
> A standing wave oscillation of an enclosed water body that continues, pendulum fashion, after the cessation of the originating force, which may have been either seismic or atmospheric. An oscillation of a fluid body in response to a disturbing force having the same frequency as the natural frequency of the fluid system. Tides are now considered to be seiches induced primarily by the periodic forces caused by the sun and moon.
> In the Great Lakes area, any sudden rise in the water of a harbor or a lake whether or not it is oscillatory (although inaccurate in a strict sense, this usage is well established in the Great Lakes area).

Seiches can be generated when the water is subject to changes in wind or atmospheric pressure gradients or, in the case of semi-enclosed basins, by the oscillation of adjacent connected water bodies having a periodicity close to that of the seiche or of one of its harmonics. Other, less frequent causes of seiches include heavy precipitation over a portion of the lake, flood discharge from rivers, seismic disturbances, submarine mudslides or slumps, and tides. The most dramatic seiches have been observed after earthquakes.

Another way a seiche can occur is a sudden land tilt or drop as a result of fault rupture or other seismic activity. Computer modeling by a group at the University of Nevada at Reno working with a Japanese tsunami expert showed ruptures along either fault could lift or drop the bottom the lake and possibly generate a tsunami. The tsunami in turn could trigger seiche waves within seconds that could crisscross the lake, reach heights of 30 feet or more, and persist for hours.

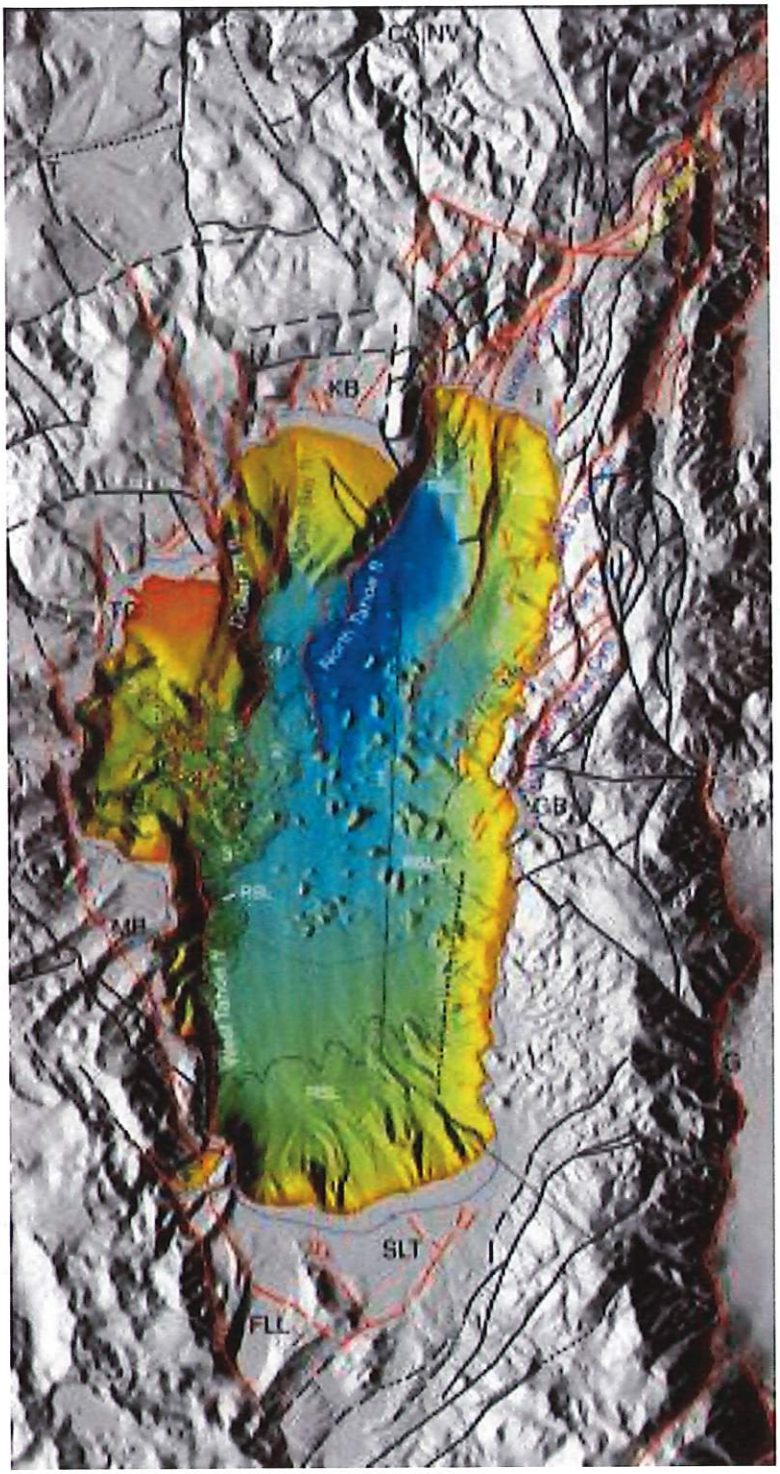
Within El Dorado County, locations with the highest probability of impact are shore areas of Lake Tahoe from 0 to 30 feet above mean lake water level. Japanese scientist Kenji Satake had created computer models that suggest the largest waves of a seiche event could hit Sugar Pine Point, Rubicon Point, and the casinos in South Lake Tahoe. Figure 3-23shows the topography of the Lake Tahoe Basin. Figure 3-24shows lake bathymetry, while Figure 3-25 shows fault locations.

Figure 3-23 Lake Tahoe Basin Topography



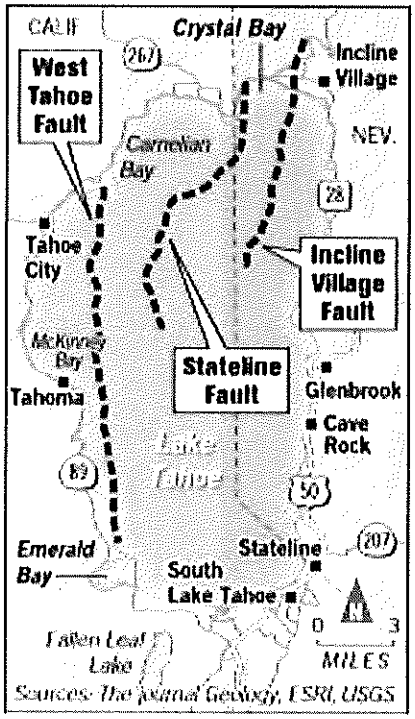
Source: The Potential Hazard from Tsunami and Seiche Waves Generated by Future Large Earthquakes within the Lake Tahoe Basin, California-Nevada, 1999-2000; Gene A. Ichinose, Kenji Satake, John G. Anderson, Rich A. Schweickert, and Mary M. Lahren; Nevada Seismological Laboratory; University of Nevada; (University of Nevada 2000 study)

Figure 3-24 Lake Tahoe Bathymetry



Source: University of Nevada Seismic Laboratory, (Schweickert); USGS

Figure 3-25 Lake Tahoe Fault Locations



Source: ESRI, USGS

Research from the University of Nevada estimates that an earthquake must be at least a magnitude 6.5 to cause a damaging seiche at Lake Tahoe. The three faults directly underneath the lake are considered capable of generating magnitude 7.0 or larger earthquakes. Computer models of seiche activity at Lake Tahoe prepared by the University of Nevada research team estimate that waves as high as 30 feet could strike the shore. These projections suggest largest waves might hit Sugar Pine Point, Rubicon Point, and the casinos in South Lake Tahoe.

In the event of a magnitude 7 earthquake occurring on either of two major faults under the lake, the lake bottom could drop as much as 4 meters. Water supported by the lake floor could drop a corresponding distance and generate waves that heavily impact the shoreline.

Figure 3-26 below shows three potential vertical displacement (uplift or subsidence) scenarios that could be caused by magnitude 7+ earthquakes along the three discrete fault systems in the Lake Tahoe region. These scenarios were done prior to the 2006 finding of the Stateline fault that

traverses Lake Tahoe. It was not included in these scenarios.

Scenario A represents an earthquake event along the North Tahoe-Incline Village Fault Zone (NT-IVFZ). This scenario projects significant subsidence (0.5-4.0 meters) to the east of the fault in the vicinity of Incline Village and across Crystal Bay and moderate uplift (0.25-1.0 meter) to the west and away from the lake. Shoreline areas near the fault rupture would be inundated due to permanent ground subsidence. Other shoreline areas would be temporarily inundated by tsunami and seiche waves. Seiche wave heights could exceed 3 meters within shallow bays and shores between Incline Village and Carnelian Bay, and exceed 6 meters at some locations in the South Lake area.

Scenario B represents an earthquake event along the West Tahoe-Dollar Point Fault Zone (WTFZ). This scenario projects significant subsidence (0.5-4.0 meters) across the lake bottom to the east of the fault and moderate uplift (0.25-1.0 meter) to the west across McKinney Bay and away from the lake. Scenario B projects a similar pattern of seiche wave heights as Scenario A except that wave heights in some areas could be as high as 10 meters.

Scenario C represents an earthquake event along the Genoa Fault Zone (GFZ) 7-10 miles east of the lake shore. This scenario projects minor to moderate uplift (0.25-0.75 meter) to the southwest of the lake. Scenario C produces waves with average heights of 0.5 meters, indicating that magnitude 7 earthquakes along faults outside of the lake are not likely to create a large seiche event.

Figure 3-26 Contours of Vertical Component Ground and Lake Bottom Displacements

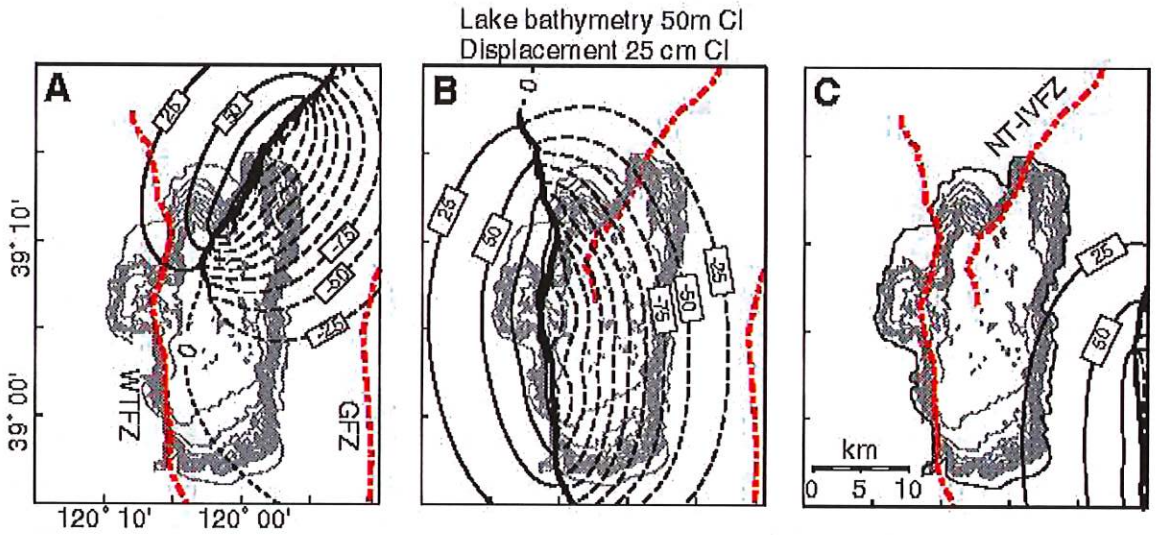


Figure 2. Contours of vertical component ground and lake bottom displacements for scenarios "A", "B" and "C". The dashed contours represent subsidence and solid uplift. The contour interval is 25 cm and only the first few contours are labeled. The thick dash-dotted lines are the three fault traces used in the scenarios: North Tahoe-Incline Village fault zone (NT-IVFZ), West Tahoe-Dollar Point fault zone (WTF) and Genoa fault zone (GFZ). All of the scenarios are Mw 7+ normal faulting earthquakes with a maximum slip of 4 meters tapered to zero at the ends of the fault with a trapazoid function.

Source: The Potential Hazard from Tsunami and Seiche Waves Generated by Future Large Earthquakes within the Lake Tahoe Basin, California-Nevada, 1999-2000; Gene A. Ichinose, Kenji Satake, John G. Anderson, Rich A. Schweickert, and Mary M. Lahren; Nevada Seismological Laboratory; University of Nevada; (University of Nevada 2000 study)

Past Occurrences

Disaster Declaration History

There have been no disasters declarations in El Dorado County for seiche activity.

NCDC Events

The NCDC does not track seiche events.

HMPC Events

There have been no occurrences of major seiche activity at Lake Tahoe in recent years. University of Nevada geologists have found deposits that extend for 10 miles along the McKinney Bay shore from Sunnyside through Tahoma. These deposits indicate a tsunami or seiche with 30-foot-high

waves occurred approximately 7,000 years ago.

Research performed by the Scripps Institute of Oceanography in 2005 using acoustic trenching to research the lake's topography indicates that McKinney Bay was formed when a massive landslide slipped into Lake Tahoe which likely caused major seiche activity at that time. Research from the University of Nevada shows evidence of a massive landslide that tumbled from Homewood on the Nevada side.

In 1955, a debris flow occurred in Emerald Bay. Seiche activity occurred. Evidence of the debris flow can still be seen on the hillside near Emerald Bay.

Recent occurrences of potential causal factors include a magnitude 4.9 earthquake near Incline Village in 1998.

Likelihood of Future Occurrences

Unlikely—There have been no occurrences of major seiche activity at Lake Tahoe in recent years. Based on past occurrences, the likelihood of future occurrence in the near future is unlikely. However, given the evidence of past historical events and the location of faults within the Tahoe area, a future seiche event at Lake Tahoe is a possibility.

Climate Change and Seiche

Climate change is unlikely to affect earthquake caused seiche; however, landslide caused seiche may be affected by climate change. A discussion on climate change and landslide can be found in Section 4.2.12.

3.2.14. Subsidence

Hazard/Problem Description

Land subsidence is defined as the sinking of the land over man-made or natural underground voids. Subsidence can result in serious structural damage to buildings, roads, irrigation ditches, underground utilities, and pipelines. It can disrupt and alter the flow of surface or underground water. Weight, including surface developments such as roads, reservoirs, and buildings and manmade vibrations from such activities as blasting or heavy truck or train traffic can accelerate the natural processes of subsidence. Fluctuations in the level of underground water caused by pumping or by injecting fluids into the earth can initiate sinking to fill the empty space previously occupied by water or soluble minerals. The consequences of improper use of land subject to ground subsidence can be excessive economic losses, including the high costs of repair and maintenance for buildings, irrigation works, highways, utilities, and other structures. This results in direct economic losses to citizens as well as indirect economic losses through increased taxes and decreased property values.

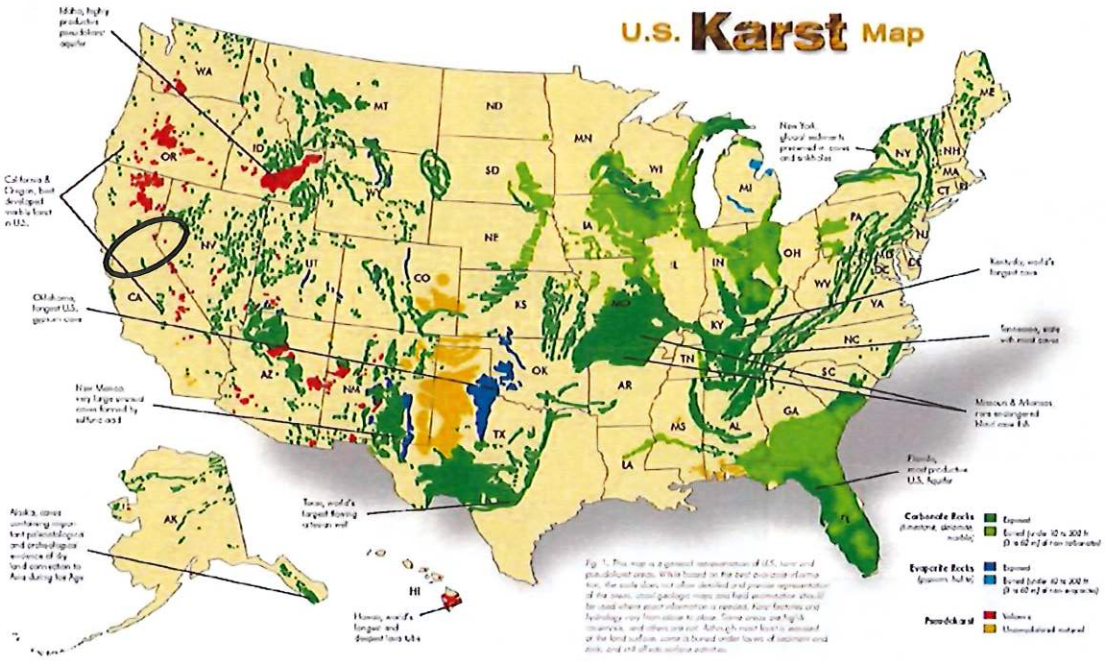
In El Dorado County, the type of subsidence of greatest concern is the settling of the ground over abandoned mine workings. Past mining activities have created surface subsidence in some areas and have created the potential for subsidence in other areas. El Dorado County is home to many abandoned mines. El Dorado County's vulnerability to subsidence rests with abandon mines and culverts. Most of these abandoned mines are located west of Pollock Pines with several located in the Placerville, Coloma, Diamond Springs, Georgetown, Cool, Swansboro, Somerset, Grizzly Flats, Mt. Aukum, Shingle Springs, Rescue and Cameron Park. Figure 3-27 shows the extent of the abandoned mines in El Dorado County.

Figure 3-27 Abandoned Mines in El Dorado County

Source: California Department of Conservation, Office of Mine Reclamation

In addition to mines, El Dorado County is at risk to subsidence from karst. Distinctive surficial and subterranean features developed by solution of carbonate and other rocks and characterized by closed depressions, sinking streams, and cavern openings are commonly referred to as karst. Originally the term defined surface features derived by solution of carbonate rocks, but subsequent use has broadened the definition to include sulfates, halides, and other soluble rocks. The term has been expanded also to cover interrelated forms derived by solution on the surface in the subsurface. Most of the problems created by karst pertain to subterranean karst and pseudokarst features that affect foundations, tunnels, reservoir tightness, and diversion of surface drainage. A map of karst in the United States and El Dorado County is provided in Figure 3-28. Areas in the eastern portion of the County show a risk to karst.

Figure 3-28 US Karst Map



Source: USGS

Past Occurrences

Disaster Declaration History

There have been no disaster declarations related to subsidence in El Dorado County.

NCDC Events

The NCDC database does not track subsidence.

HMPC Events

There have been no documented events of land subsidence in El Dorado County. However, given the history of mining activity, the potential for subsidence to occur exits,

Likelihood of Future Occurrence

Unlikely—Historically, land subsidence issues in the County have been minimal. However, given the history of mining activity within El Dorado County, the potential exists for subsidence to occur.

Climate Change and Subsidence

Climate change is unlikely to change the effects of subsidence (abandoned mines and karst) in the County. However, data is showing that the groundwater table is lowering causing subsidence in California which can be caused by the changes in precipitation and periods of drought.

3.2.15. Wildfire

Hazard/Problem Description

California is recognized as one of the most fire-prone and consequently fire-adapted landscapes in the world. The combination of complex terrain, Mediterranean climate, and productive natural plant communities, along with ample natural and aboriginal ignition sources, has created conditions for extensive wildfires. Wildland fire is an ongoing concern for El Dorado County. Generally, the fire season extends from early spring through late fall of each year during the hotter, dryer months. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, an accumulation of vegetation, and high winds.

Potential losses from wildfire include human life, structures and other improvements, natural and cultural resources, quality and quantity of water supplies, cropland, timber, and recreational opportunities.

Economic losses could also result. Smoke and air pollution from wildfires can be a severe health hazard. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Wildland Urban Interface

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. While wildfire risk is predominantly associated with wildland urban interface (WUI) areas, significant wildfires can also occur in heavily populated areas. The wildland urban interface is a general term that applies to development adjacent to landscapes that support wildland fire. The WUI defines the community development into the foothills and mountainous areas of California. The WUI describes those communities that are mixed in with grass, brush and timbered covered lands (wildland). These are areas where wildland fire once burned only vegetation but now burns homes as well. The WUI for El Dorado County consists of communities at risk as well as the area around the communities that pose a fire threat.

There are two types of WUI environments. The first is the true urban interface where development abruptly meets wildland. The second WUI environment is referred to as the wildland urban intermix. Wildland urban intermix communities are rural, low density communities where homes are intermixed in wildland areas. Wildland urban intermix communities are difficult to defend because

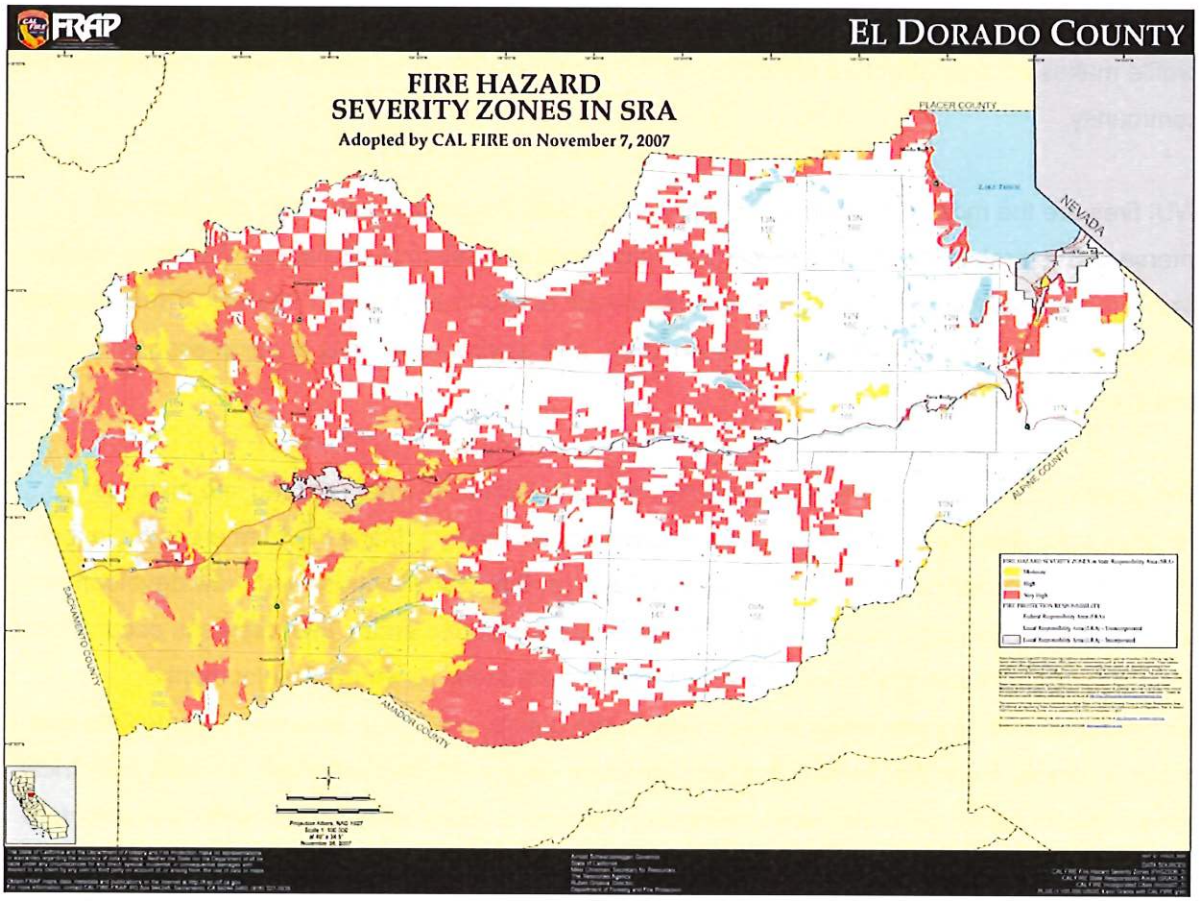
they are sprawling communities over a large geographical area with wild fuels throughout. This profile makes access, structure protection, and fire control difficult as fire can freely run through the community.

WUI fires are the most damaging. WUI fires occur where the natural and urban development intersect. Even relatively small acreage fires may result in disastrous damages. WUI fires occur where the natural forested landscape and urban-built environment meet or intermix. The damages are primarily reported as damage to infrastructure, built environment, loss of socio-economic values and injuries to people.

The pattern of increased damages is directly related to increased urban spread into historical forested areas that have wildfire as part of the natural ecosystem. Many WUI fire areas have long histories of wildland fires that burned only vegetation in the past. However, with new development, a wildland fire following a historical pattern now burns developed areas. WUI fires can occur where there is a distinct boundary between the built and natural areas or where development or infrastructure has encroached or is intermixed in the natural area. WUI fires may include fires that occur in remote areas that have critical infrastructure easements through them, including electrical transmission towers, railroads, water reservoirs, communications relay sites or other infrastructure assets. Human impact on wildland areas has made it much more difficult to protect life and property during a wildland fire. This home construction has created a new fuel load within the wildland and shifted firefighting tactics to life safety and structure protection.

El Dorado County Wildfires

Wildland fires affect grass, forest, and brush lands, as well as any structures located within them. Where there is human access to wildland areas, such as the Sierra Nevada and foothills areas, the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Within the County, the area starting in the foothills just east of El Dorado Hills and extending east, as well as north and south to the County lines is most vulnerable and prone to wildfire due to the climate, topography, and vegetation. The Fire Hazard Severity Zone Map (California Department of Forestry and Fire Protection) outlines the areas most vulnerable to wildfire and the extent of wildfire in El Dorado County.



http://www.fire.ca.gov/fire_prevention/fhsz_maps_eldorado

Wildfires may occur in all areas of El Dorado County, including the most populated areas of El Dorado Hills, Cameron Park/Shingle Springs, Placerville, Camino/Pollock Pines and South Lake Tahoe. El Dorado County also has a large area of National Forest Service land that is also vulnerable to wildfire. The Community Wildfire Protection Plan (CWPP) outlines the vulnerability and extent of wildfire in El Dorado County. El Dorado County uses National Weather Service red flag warmings, advisories and watches to address planning for wildfire in collaboration with Fire Prevention agencies and Fire Safe Councils.

Generally, there are four major factors that sustain wildfires and allow for predictions of a given area's potential to burn. These factors include fuel, topography, weather, and human actions.

Fuel – Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by 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. Also to be considered as a fuel source are manmade structures, 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. As a result of effective fire suppression since the 1930s, vegetation throughout the county has continued to grow and accumulate, and hazardous fuels have increased. As such, certain areas in and surrounding El Dorado County are extremely vulnerable to fires as a result of dense vegetation combined with a growing number of structures being built near and within rural lands. These high fuel hazards, coupled with a greater potential for ignitions, increases the susceptibility of the County to a catastrophic wildfire.

Topography – An area's terrain and land slopes 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 a wind, the faster a fire will spread and the more intense it will be. Winds can be significant at times in El Dorado County. North winds in El Dorado County are especially conducive to hot, dry conditions, which can lead to "red flag" days indicating extreme fire danger. In addition to wind speed, wind shifts can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. Lightning also ignites wildfires, often in difficult to reach terrain for firefighters.

Human Actions – Most wildfires are ignited by human action, the result of direct acts of arson, carelessness, or accidents. Many fires originate in populated areas along roads and around homes, and are often the result of arson or careless acts such as the disposal of cigarettes, use of equipment or debris burning. Recreation areas that are located in high fire hazard areas also result in increased human activity that can increase the potential for wildfires to occur. Electrical hazards have also been known to ignite wildfires.

Factors contributing to the wildfire risk in El Dorado County include:

- Overstocked forests, severely overgrown vegetation, and lack of defensible space around

structures;

- Excessive vegetation along roadsides and hanging over roads, fire engine access, and evacuation routes;
- Drought and overstocked forests with increased beetle infestation or kill in weakened and stressed trees;
- Narrow and often one-lane and/or dead-end roads complicating evacuation and emergency response as well as the many subdivisions that have only one means of ingress/egress;
- Inadequate or missing street signs on private roads and house address signs;
- Nature and frequency of lightning ignitions; and
- Increasing population density leading to more ignitions.
- Power transmission and distribution lines run throughout the county

CAL FIRE has mapped fuel hazards in the County based on vegetation, fire history, and slope, with the hazards ranked as medium, high or very high. All of the above factors create the potential for very active to severe fire behavior in the El Dorado County.

Consequently, wildland fires that burn in natural settings with little or no development are part of a natural ecological cycle and may actually be beneficial to the landscape. Century old policies of fire exclusion and aggressive suppression have given way to better understanding of the importance fire plays in the natural cycle of certain forest types.

Past Occurrences

Disaster Declaration History

A search of FEMA and Cal OES disaster declarations turned up multiple events. State disaster declarations occurred in 2007, 2014. Federal disaster declarations occurred in 2007 and 2014.

NCDC Events

The NCDC has tracked wildfire events in the County dating back to 1990. Significant Events in El Dorado County are shown in Table 3-18.

Table 3-18 NCDC Wildfire Events in El Dorado County 1992 to 2016

Date	Event	Injuries (direct)	Deaths (direct)	Property Damage
9/29/1992	Wildfire	2	2	$240,207,000
9/17/2006	Wildfire	0	0	$13,100,000
6/24/2007	Wildfire	0	0	$153,000,000
7/25/2014	Wildfire	0	0	$13,000,000
9/13/2014	Wildfire	12	0	$162,500,000
6/28/2016	Wildfire	3	0	$4,500,000
10/14/2016	Wildfire	0	0	$327,000
TOTAL		**17**	**2**	**$586,634,000**

Source: NCDC

*Deaths, injuries, and damages are for the entire event, and may not be exclusive to the County.

HMPC Events

The HMPC also provided the following information on historical fires in El Dorado County.

- September 1992 Cleveland Fire – The Cleveland Fire was a large arson fire that started just north of Hwy 50 off Ice House Road. On the third day of the fire, an Air Tanker crash claimed the lives of two pilots. 41 structures were destroyed, millions of dollars of private Sierra Pacific Industry timber were destroyed, Hwy 50 was closed for over a week, and the El Dorado Canal (water supply for Pollock Pines and Camino) was severely damaged. A total of 22,485 acres were destroyed.
- September 2006 Ralston Fire – The Ralston Fire was a large wildland fire in the area of the North Fork of the Middle Fork of the American River. Approximately 8,400 acres burned.
- June 2007 Angora Fire –The Angora fire (in the Lake Tahoe Basin) burned 3,100 acres of forest and wooded subdivisions and destroyed more than 250 homes as well as 75

commercial and other structures.

- July 2014 Sand Fire – On July 25, the Sand Fire was ignited five miles north of the Amador County town of Plymouth by a vehicle driving over dry vegetation. A total of 4,240 acres were burned, claiming 19 residences and 47 outbuildings.
- September 2014 King Fire–The King Fire started in Pollock Pines and eventually crossed into Placer County. 97,717 acres were estimated to have burned. 12 residences were destroyed, as well as 68 other minor structures. 12 injuries occurred that can be attributed to the fire. The burn area from the fire is shown in Figure 3-29.
- 2016 Trailhead Fire – On June 28, the Trailhead Fire was ignited in the Middle Form American River canyon in both Placer and El Dorado Counties.
- 2016 Emerald Fire– The Emerald Fire started October 14, near the Cascade Lake area and Emerald Bay off Highway 89. Wind gusts and sustained wind contributed to the spread of this fire.

Figure 3-29 Fire Perimeter from the King Fire

Source: NOAA/NWS

Likelihood of Future Occurrence

Highly Likely — From May to October of each year, El Dorado County faces a serious wildland fire threat. Fires will continue to occur on an annual basis in El Dorado County. The threat of wildfire and potential losses are constantly increasing as human development and population increase and the wildland urban interface areas expand. Due to its high fuel load and long, dry summers, most of El Dorado County continues to be at risk from wildfire.

Climate Change and Wildfire

Warmer temperature can exacerbate drought conditions. Drought often kills plants, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle.

3.2.16. Natural Hazards Summary

Table 3-20 summarizes the results of the hazard identification and hazard profile for the El Dorado County Planning Area based on the hazard identification data and input from the HMPC. For each hazard profiled in Section 3.2, this table includes the likelihood of future occurrence and whether the hazard is considered a priority hazard for the El Dorado County Planning Area.

Table 3-20 Hazard Identification/Profile Summary and Determination of Priority Hazard: El Dorado County Planning Area

Hazard	Likelihood of Future	Priority Hazard
Avalanche	Likely	N
Dam Failure	Unlikely; Occasional	Y
Drought and Water Shortage	Likely: Occasional	Y
Earthquake	Occasional	Y
Flood: 100/500 year	Occasional; Unlikely	Y
Flood: Localized Stormwater Flooding	Highly Likely	Y
Landslides and Debris Flows	Likely	N
Seiche (Lake Tsunami)	Unlikely	Y
Severe Weather: Extreme Heat	Highly Likely	N
Severe Weather: Heavy Rains, Snow and Storms (Thunderstorms/Hail, Lightning/Wind/Tornadoes)	Highly Likely	Y
Soil Bank Erosion	Highly Likely	N
Wildfire	Highly Likely	Y

3.3 Vulnerability Assessment

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

El Dorado County Vulnerability to Specific Hazards

The Disaster Mitigation Act regulations require that the HMPC evaluate the risks associated with each of the hazards identified in the planning process. This section summarizes the possible impacts and quantifies, where data permits, the El Dorado County Planning Area's vulnerability to each of the hazards identified as a priority hazard in the Natural Hazards Summary. Where specific hazards vary across the County, additional information can be found in the jurisdictional annexes. Based on information developed for the hazard profiles, the priority hazards evaluated further as part of this vulnerability assessment include:

- Avalanche
- Dam Failure
- Drought
- Earthquake/Debris Flow
- Erosion
- Flood: 100/200/500-year
- Flood: Localized/Stormwater Flooding
- Seiche Wave
- Severe Weather: Extreme Temperatures
- Severe Weather: Heavy Rain and Storms
- Wildfire

An estimate of the vulnerability of the Planning Area and Unincorporated County to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- Extremely Low—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- Low—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- Medium—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—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.
- Extremely High—Very widespread with catastrophic impact.

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of buildings subject to the identified hazard can be counted and their values tabulated. Other information can be collected in regard to the hazard area, such as the location of critical community facilities, historic structures, and valued natural resources. Together, this information conveys the impact, or vulnerability, of that area to that hazard.

Avalanche Vulnerability Assessment

General Avalanche Hazard from National Perspective

An avalanche is a rapid flow of snow down a slope, from either natural triggers or human activity. Typically occurring in mountainous terrain, an avalanche can mix air and water with the descending snow. Powerful avalanches have the capability to entrain ice, rocks, trees, and other material on the slope; however avalanches are always initiated in snow, are primarily composed of flowing snow, and are distinct from mudslides, rock slides, rock avalanches, and serac collapses from an icefall. In mountainous terrain avalanches are among the most serious objective hazards to life and

property, with their destructive capability resulting from their potential to carry an enormous mass of snow rapidly over large distances.

In the United States, 514 avalanche fatalities have been reported in 15 states from 1950 to 1997. Each year, avalanches claim more than 150 lives worldwide, a number that has been increasing over the past few decades. Thousands more are caught in avalanches, partly buried or injured. One of the major reasons for increasing avalanche fatalities is the boom in mountain industries and recreation. Skiing, hiking and other winter sports draw millions of people to the mountains. To support these activities, more roads, buildings, and towns are forced into avalanche prone areas.

Although avalanches can occur on any slope given the right conditions, in the United States certain times of the year and certain locations are naturally more dangerous than others. Wintertime, particularly from December to April, is when most avalanches will "run" (slide down a slope). However, avalanche fatalities have been recorded for every month of the year.

A large avalanche in North America might release 300,000 cubic yards of snow, the equivalent of 20 football fields filled 10 feet deep with snow. Slab avalanches are the most common and most deadly avalanches, where layers of a snowpack fail and slide down the slope. Since 1950, 235 people in the U.S. have been killed in slab avalanches.

Several factors may affect the likelihood of an avalanche, including weather, temperature, slope steepness, slope orientation (whether the slope is facing north or south), wind direction, terrain, vegetation and general snowpack conditions. Different combinations of these factors can create low, moderate or extreme avalanche conditions.

Avalanches are most likely to run either during or immediately after a storm where there has been significant snowfall. The 24 hours following a heavy snowstorm are the most critical. The extra weight of new snow alone can cause a slab to break off and fall down the slope. Snowfall amounts of one foot or more (frequent in mountainous areas) create the most hazardous situations, producing avalanches that are often large enough to block highways and cause major destruction. Snow amounts of six to twelve inches pose some threat, particularly to skiers and recreationists. Snow amounts less than six inches seldom produce avalanches.

Perhaps the most significant factor (but not the only one) is how the snowpack has developed over

the season. Only the surface and maybe the top few layers of snow are visible, but layers of snow several feet deep may ultimately determine whether the slope will fail.

Snowpack conditions are extremely important because many layers of snow build up over the winter season. Each layer is built up under different weather conditions and will bond differently to the subsequent layers. Snowflakes, or snow crystals, within the snowpack eventually become more rounded due to melting/re-freezing and settlement. This metamorphism allows them to compress and generally form stronger bonds.

Between snows, the temperature may rise and melt the exposed surface layers, which when they re-freeze create a smoother, less stable surface for the next snowfall. Failure is much more likely to occur during or after the next few snowfalls. Rain between snows creates a slicker surface as well, and can weaken the bonds between snow layers.

Most avalanches occur on slopes between 30 and 45 degrees, but can occur on any slope angles given the right conditions. Very wet snow will be well lubricated with water, meaning it might avalanche on a slope of only 10 to 25 degrees.

Avalanche Hazard in El Dorado County

Typically limited to the steeper slopes of the Sierra Nevada Mountains, the majority of the land in this "avalanche zone" is owned by the Federal Government. Private ownership development, when allowed, is done only after carefully considering appropriate setbacks from the known avalanche starting zones, tracks and runout zones. Generally the roadways running through this "avalanche zone" are also privately owned and therefore not a significant hazard for El Dorado County.

The above discussion concerning areas with potential avalanche hazard is limited to certain areas along the Eastern edge of the County in the higher elevations. There have been reported incidents of avalanches in isolated portions of the County, but this is a very uncommon occurrence with no defined history of significant damages. Although the above discussion shows that small portions of privately owned and potentially developable land and therefore roads of El Dorado County can include areas where avalanche could occur, it is not common to most areas.

Avalanche control along the mountain passes of Highway 50, the main east-west roadway through El Dorado County, is a 24-hour a day, seven-day a week job for Caltrans from November, when the

first snow normally falls, until Spring. Caltrans monitors slope conditions determining when any particular slope is ripe for an avalanche. By triggering smaller, controlled avalanches, Caltrans reduces the potential for a large wall of snow from cascading down onto the highway, trapping motorists and causing injuries or deaths. These controlled "mini" avalanches are triggered by a projectile fired into the suspect slope from a LoCAT, a compressed air launcher, sending the unstable snow down the slope where Caltrans teams wait to clear the highway.

Dam Failure Vulnerability Assessment

Likelihood of Future Occurrence
Jurisdictional Dams – Unlikely
Non-jurisdictional Dams – Occasional
Vulnerability—High

Dam failure flooding can occur as the result of partial or complete collapse of an impoundment. Dam failures often result from prolonged rainfall and flooding. The primary danger associated with dam failure is the high velocity flooding of those properties downstream of the dam.

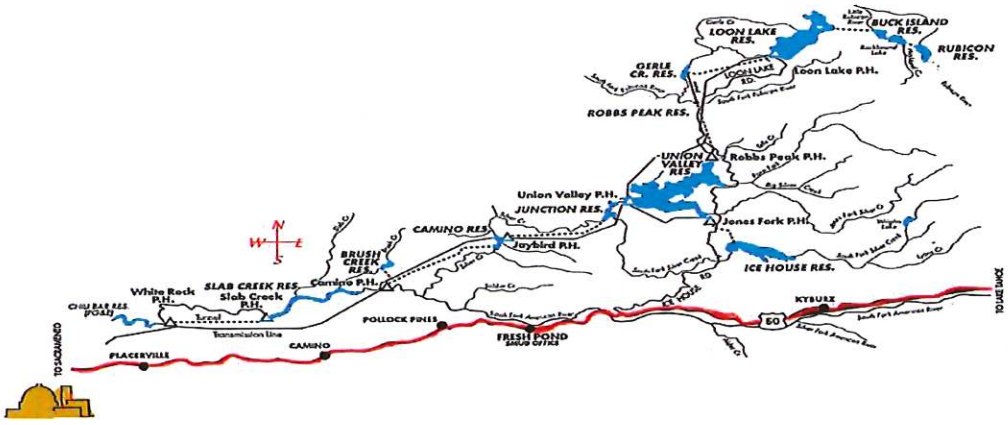
A dam failure can range from a small, uncontrolled release to a catastrophic failure. Vulnerability to dam failures is confined to the areas subject to inundation downstream of the facility. Secondary losses would include loss of the multi-use functions of the facility and associated revenues that accompany those functions.

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Based on the risk assessment, it is apparent that a major dam failure could have a devastating impact on the Planning Area. Dam failure flooding presents a threat to life and property, including buildings, their contents, and their use. Large flood events can affect crops and livestock as well as lifeline utilities (e.g., water, sewerage, and power), transportation, jobs, tourism, the environment, and the local and regional economies.

There are 59 known dams in El Dorado County. These range from dams creating large reservoirs intended to provide sources for irrigation, water supply, or power generation, to smaller impoundments which are part of water distribution or treatment systems or intended to provide a recreational amenity for visitors or residents. The following Figure 4-74 shows the distribution of all

of the larger impoundments found in El Dorado County and many of the smaller dams as well. The failure of any of these dams would cause downstream flooding and would likely result in loss of life and property. The potential magnitude of a dam failure depends on the time of year and the base flow of the river when the failure occurs. During the winter months, when river flows are higher, the impact to the area would be much greater and evacuation times much less. According to the California Department of Water Resources (DWR), El Dorado County does not have a history of major dam failure. Nine dams located within the County have been identified as having the potential of inundating habitable portions of the County in the unlikely event of dam failure. These nine dams are Echo Lake Dam (El Dorado Irrigation District [EID]), Union Valley Dam (Sacramento Municipal Utility District [SMUD]), Ice House Dam (SMUD), Chili Bar Reservoir (Pacific Gas and Electric Company [PG&E]), Stumpy Meadows Dam (Georgetown Divide Public Utility District [GDPUD]), Weber Creek Dam (EID), Slab Creek Dam (SMUD), Loon Lake Auxiliary Dam (SMUD), and Blakely Dam (EID). In addition to these nine dams, the Caples Lake Dam (EID) and the Cameron Park Lake/Warren Hollister Dam (EID) have been identified by the County as having considerable potential to inundate inhabited areas in the unlikely event of dam failure. The maps showing the locations and inundation areas of these dams can be found at the County Office of Emergency Services

Figure 3-30 Location of: Larger Impoundments in El Dorado County



Future Development

Flood Damage Prevention Ordinance (1986)

The County has enacted a floodplain ordinance that is compatible with FEMA guidelines in order to regulate development within the 100-year floodplain. This ordinance is applied in conjunction with the County's Zoning Ordinance. Under the Flood Damage Prevention Ordinance, development within the 100-year floodplain may occur; however, certain engineering and zoning standards apply in order to reduce injury and loss of life, to reduce structural damage caused by flooding, and to reduce public expenditures for additional flood control structures. Development within the floodway is also prevented unless no increase in flood elevation would result from the development.

Drought/Tree Mortality Vulnerability Assessment

Likelihood of Future Occurrence

Drought – Likely

Tree Mortality - Likely

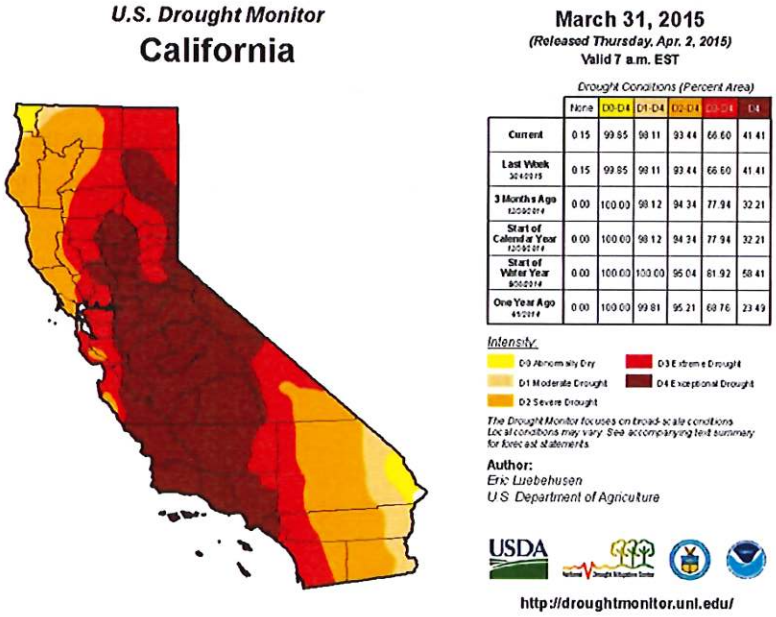
Vulnerability—Extremely High

Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue for agricultural, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the County continues to grow, so will the demand for water.

Based on historical information, the occurrence of drought in California, including El Dorado County, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts is often extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of El Dorado County to drought is countywide, but impacts may vary and include reduction in water supply, agricultural losses, and an increase in dry fuels.

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult. The U.S Drought Monitor is a useful reference tool that compiles reported drought impacts nationwide. Figure 4-75 shows drought conditions for the El Dorado County Planning Area as of March 31, 2015.

Figure 3-31 U.S. Drought Monitor for California, 2015



Source: National Drought Mitigation Center

The most significant qualitative impacts associated with drought in the Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. A reduction of electric power generation and water quality deterioration are also potential problems. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

It is difficult to quantitatively assess drought impacts to El Dorado County because not many county-specific studies have been conducted. Some factors to consider include: the impacts of fallowed agricultural land, habitat loss and associated effects on wildlife, and the drawdown of the groundwater table. The most direct and likely most difficult drought impact to quantify is to local economies, especially agricultural economies. The State has conducted some empirical studies on the economic effects of fallowed lands with regard to water purchased by the State's Water Bank; but these studies do not quantitatively address the situation in El Dorado County. It can be assumed, however, that the loss of production in one sector of the economy would affect other sectors. This is especially true of agriculture in El Dorado County, which is highly vulnerable to

drought conditions. It is estimated that the impact of agriculture and livestock to the County of El Dorado's economy totaled approximately $441 million in 2013 and tourism accounting for a $224 million impact to the economy in the year 2008. In 2014, the King Fire burned over 97,000 acres of drought stressed land in El Dorado and Placer Counties and suppression efforts totaled over $90 million.

The drawdown of the groundwater table is one factor that has been recognized to occur during repeated dry years. Lowering of groundwater levels results in the need to deepen wells, which subsequently lead to increased pumping costs. These costs are a major consideration for residents relying on domestic wells and agricultural producers that irrigate with groundwater and/or use it for frost protection. Land subsidence can also occur when the groundwater table is depleted.

The impacts of drought in El Dorado County can be reduced by traditional mitigations practices such as reduced municipal and agriculture usage and increased water storage.

Drought, Tree Mortality, and Bark Beetles

In October 2015, Governor Brown proclaimed a State of Emergency due to unprecedented tree mortality caused by extreme drought and drought-related bark beetle infestations. The Governor's Proclamation contains 18 distinct actions that direct state agencies, utilities and local governments to remove dead or dying trees in high hazard areas across the entire State of California. On March 28, 2016, the El Dorado County Board of Supervisors declared a state of emergency due to pervasive tree mortality in the County.

The trees that die due to bark beetles and the drought create an increased fuel load in the forest. This fuel load creates for a high risk for wildfire. In addition, the dead trees also create a hazard due to their likelihood of falling. Data collected by State and Federal agencies demonstrates that drought conditions and bark beetle infestation have killed over 102 million trees in the State of California and that tens of millions more are likely to die over the next five to six years. Surveys conducted by the U.S. Forest Service in May estimate that new mortality (between October 2015 and May 2016) in El Dorado County has affected an estimated 177,000 conifer trees. In total, it is estimated by the National Forest Service that El Dorado County has 512,000 dead trees, according to a 2016 overflight of the County. Many of these trees are located in the Eldorado National Forest or on private land. However, some of these trees endanger County infrastructure (e.g. County roads and County buildings).

Figure 3-32 Tree Mortality in El Dorado County

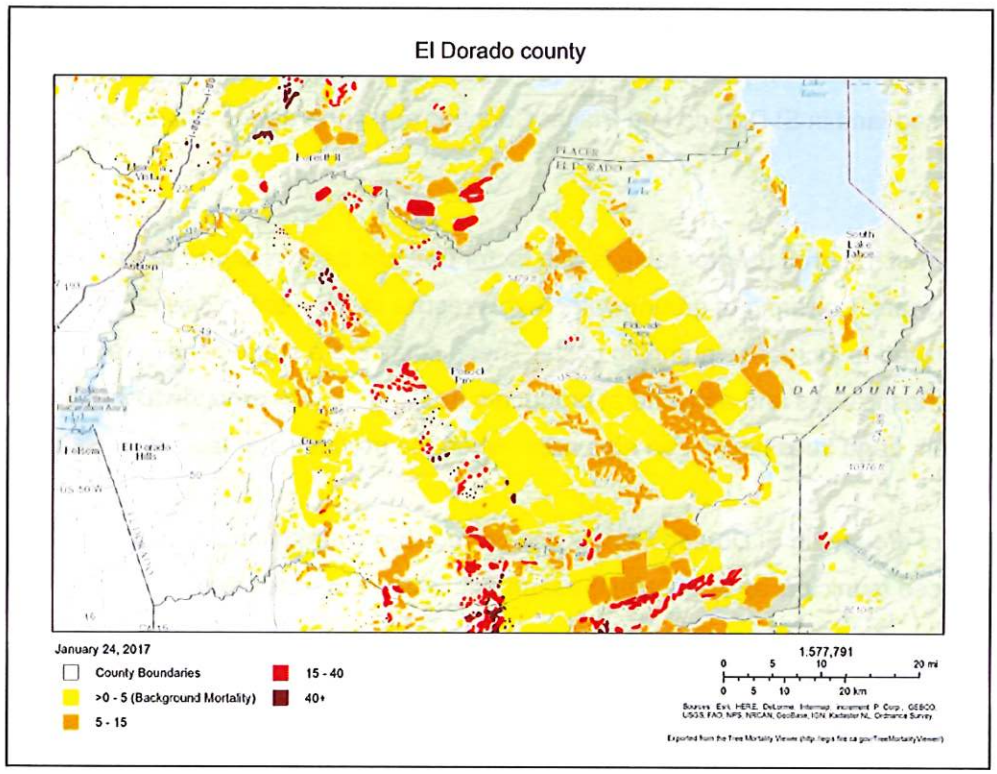


Image provided by the Tree Mortality Viewer, http://egis.fire.ca.gov/TreeMortalityViewer/

Earthquake Vulnerability Assessment

Likelihood of Future Occurrence - Occasional

Vulnerability—Medium

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. Ground shaking is the primary earthquake hazard. Many factors affect the survivability of structures and systems from earthquake-caused ground motions. These factors include proximity to the fault, direction of rupture, epicentral location and depth, magnitude, local geologic and soils conditions, types and quality of construction, building configurations and heights, and comparable factors that relate to utility, transportation, and other network systems. Ground motions become structurally damaging when average peak accelerations reach 10 to 15 percent of gravity, average peak velocities reach 8 to 12 centimeters per second, and when the Modified Mercalli Intensity Scale is about VII (18-34 percent peak ground acceleration), which is considered to be very strong (general

alarm; walls crack; plaster falls).

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault. In general, newer construction is more earthquake resistant than older construction because of improved building codes and their enforcement. Manufactured housing is very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry, as was seen in the Oroville, Coalinga, Santa Cruz, and Paso Robles earthquakes.

Common impacts from earthquakes include damage to infrastructure and buildings (e.g., crumbling of unreinforced masonry, failure of architectural facades, rupturing of underground utilities, and road closures). Earthquakes also frequently trigger secondary hazards, such as dam failures, landslides and rock falls, explosions, and fires that can become disasters themselves.

Estimating Potential Losses

Earthquake losses will vary across the El Dorado County Planning Area depending on the source and magnitude of the event. The law requires the State Geologist to establish regulatory zones (known as Earthquake Fault Zones) around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning and controlling new or renewed construction. That list does not include El Dorado County, due to its location being relatively distant from any known faults that meet the criteria of the mapping program. There is one fault zone on land under the County's jurisdiction, the Rescue Lineament Bear Mountain fault zone. This fault zone cuts across the western end of the County trending north to south. However, there has been no appreciable movement in this fault and no record of damages sustained.

Erosion Vulnerability Assessment

Likelihood of Future Occurrence—Occasional
Vulnerability—Limited

The American and Consumes Rivers flow through El Dorado County. Parts of Highway 50 (near Bridal Veil Falls) and County roads (Happy Valley) have eroded due to high velocity flows from storms.

Debris Flow Vulnerability Assessment

Likelihood of Future Occurrence—Likely
Vulnerability—Medium

Debris flow is the downward and outward movement of slope-forming soil, rock, and vegetation, which is driven by gravity. Debris flows may be triggered by both natural and human-caused changes in the environment, including heavy rain, rapid snow melt, steepening of slopes due to construction or erosion, earthquakes, volcanic eruptions, changes in groundwater levels, and deforestation caused by wildland fires.

There are several types of debris flow: rock falls, rock topple, slides, and flows. Rock falls are rapid movements of bedrock, which result in bouncing or rolling. A topple is a section or block of rock that rotates or tilts before falling to the slope below. Slides are movements of soil or rock along a distinct surface of rupture, which separates the slide material from the more stable underlying material. Mudflows, sometimes referred to as mudslides, mudflows, lahars or debris avalanches, are fast-moving rivers of rock, earth, and other debris saturated with water. They develop when water rapidly accumulates in the ground, such as heavy rainfall or rapid snowmelt, changing the soil into a flowing river of mud or "slurry." Slurry can flow rapidly down slopes or through channels, and can strike with little or no warning at avalanche speeds. Slurry can travel several miles from its source, growing in size as it picks up trees, cars, and other materials along the way. As the flows reach flatter ground, the mudflow spreads over a broad area where it can accumulate in thick deposits.

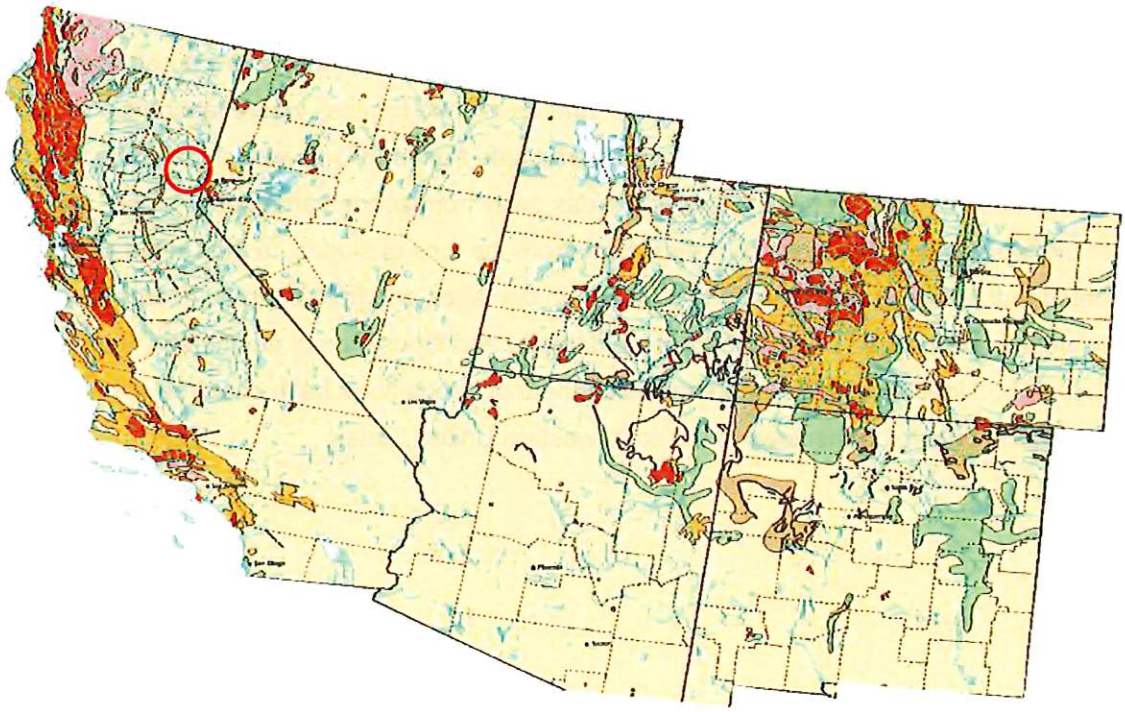
Debris Flows are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompany these events. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides. Some debris flows move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly.

Among the most destructive types of debris flows are those that accompany volcanic eruptions. A spectacular example in the United States was a massive debris flow resulting from the 1980 eruptions of Mount St. Helens, Washington. Areas near the bases of many volcanoes in the Cascade Mountain Range of California, Oregon and Washington are at risk from the same types of

flows during future volcanic eruptions.

Areas that are generally prone to debris flow hazards include previous debris flow areas, the bases of steep slopes, the bases of drainage channels, and developed hillsides where leach-field septic systems are used. Areas that are typically considered safe from debris flows include areas that have not moved in the past, relatively flat-lying areas away from sudden changes in slope, and areas at the top or along ridges which are set back from the tops of slopes. In the United States, it is estimated that debris flows cause up to $2 billion in damages and from 25 to 50 deaths annually. Globally, debris flows cause billions of dollars in damage and thousands of deaths and injuries each year. Figure 3-33 identifies areas where large numbers of debris flows have occurred and areas which are susceptible to debris flows in the southwestern United States.

Figure 3-33 Debris Flow Overview Map of the Southwestern United States



EXPLANATION

LANDSLIDE INCIDENCE

- Low (less than 1.5% of area involved)
- Moderate (1.5%-15% of area involved)
- High (greater than 15% of area involved)

LANDSLIDE SUSCEPTIBILITY/INCIDENCE

- Moderate susceptibility/low incidence
- High susceptibility/low incidence
- High susceptibility/moderate incidence

Susceptibility not indicated where same or lower than incidence. Susceptibility to landsliding was defined as the probable degree of response of [the areal] rocks and soils to natural or artificial cutting or loading of slopes, or to anomalously high precipitation. High, moderate, and low susceptibility are delimited by the same percentages used in classifying the incidence of landsliding. Some generalization was necessary at this scale, and several small areas of high incidence and susceptibility were slightly exaggerated.

Debris Flow Hazard in El Dorado County

The topography of El Dorado County displays a wide range of landforms ranging from vertical cliffs to gently undulating foothills. Combined with often times complex underlying geology that gives rise to a wide range of surficial soil types, native topography can provide a challenging environment for safe development.

In general, the greater the existing slope the greater the overall threat of debris flow. The El Dorado County Geohazards Maps indicate general areas of the developable properties that has slopes in excess of 30%. It is to be expected that areas of greater than 30% slope will exist outside the delineated areas as will areas of less than 30% slope exist inside the delineated areas due to constraints imposed by the general nature of the USGS topographic maps that were used in the compilation of slopes. Local mapping of project areas is recommended in conjunction with geologic interpretation prior to the development of slopes in excess of 30%.

The diverse geology of El Dorado County includes areas underlain by serpentine. This generic rock type is particularly prone to slope failure as evidenced by native slope failures and failure of man-made slopes such as those experienced along the Highway 50 Corridor in the vicinity between Riverton and Strawberry. Slope failure of the steep slopes along the American River have littered the adjacent slopes with boulders and other debris. Typically limited to the slopes along the upper American River, development in this area should be done only after carefully considering appropriate setbacks from the break point where the topography dramatically changes. It is important to note that slope failure along Highway 50, as evidenced in January of 1997 even though within the boundaries of El Dorado County fell under Caltrans jurisdiction.

Downslope development on relatively flat land at the base of steep cliffs should occur only after the potential for rockfall is evaluated. Surface mapping of rock exposures along with observation of conditions in the local area of a project assists in the determination of site-specific areas subject to rockfall damage.

The above discussion concerning areas with potential debris flow hazard is limited to certain areas near cliff-like features or on very steep slopes, none of which are often subject to development. There have been reported incidents of debris flows and general slope failure in isolated portions of the County, but this is a very uncommon occurrence with no defined history of significant damages. Although the above discussion shows that portions of the privately owned and potentially

developable land of El Dorado County can include areas where debris flows could occur, it is not common to most areas. Overall, the hazard is much less than can be expected to occur in much of the more densely developed portions of the State (see Figure 4-77), where the geologic conditions are much more prone to landslide and general instability.

Flood: 100/500 year Vulnerability Assessment

Likelihood of Future Occurrence

100-year – Occasional

500-year - Unlikely

Vulnerability—High

Flooding is a significant problem in El Dorado County. Historically, the El Dorado County Planning Area has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 100- and 500-year floodplains and in other localized areas.

Historically, much of the growth in the County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in storm water runoff. Other problems connected with flooding and storm water runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Flood Hazard Assessment

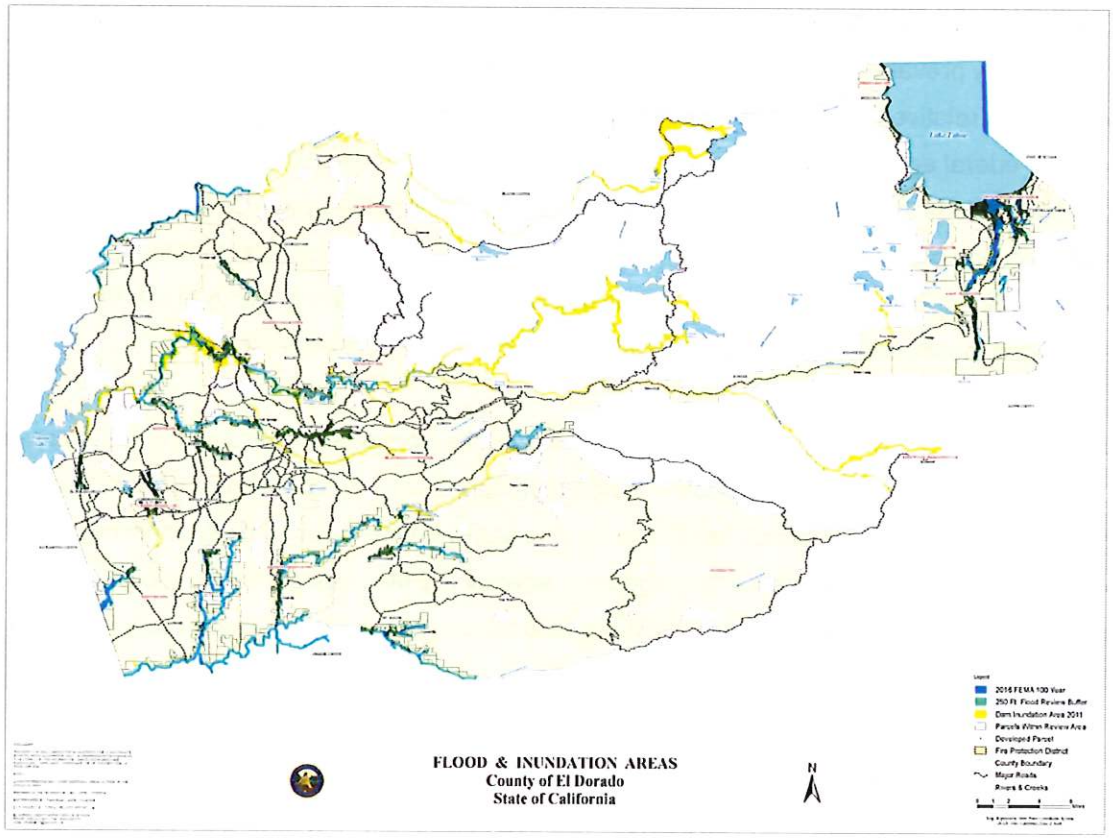
El Dorado County's flood potential is strongly affected by the physical geography of the County. Located on the western slope of the Sierra Nevada Mountain Range and in an area of moderate seasonal rainfall, the runoff characteristics of the watersheds strongly determine the possibility of flooding. The western areas of the county are made up mostly of rolling foothills. The eastern areas of the County are at higher elevations. The City of Placerville, the County Seat, is at about 2,000 feet above sea level, while the City of South Lake Tahoe is at about 6,500 feet elevation. Some mountain peaks in El Dorado County reach in excess of 10,000 feet. The elevation range for

the county is 200 to 10,881 feet above sea level. Due to the elevation of much of the watersheds of El Dorado County, much of the precipitation is in the form of snowfall, which melts over a long duration with snow prevailing at the higher elevations long into the summer. The overall slope of the watersheds is relatively steep, and most of the higher elevations of the County is owned or controlled by Federal agencies, and therefore not subject to private ownership or development. The seven watersheds that form El Dorado County are Lake Tahoe, the upper Carson River, lower American River, and North & South Forks of the American River, the upper Mokelumne River and the upper Cosumnes River. Most are dammed in the lower elevations along much of the stream courses, and are mostly contained within government or special district ownership. .

Therefore, except for a few tributaries, the larger rivers and the immediate environs are not in areas where much private development can occur. In addition, due to the overall gradient of the streams and rivers, they reside within relatively steep canyons or valleys, where very little floodplain has been formed. The Federal Emergency Management Agency (FEMA) has published Flood Information Rate Maps (FIRM), which are available to local jurisdictions to indicate where modeling has shown the 100-year floodplains to be

The following graphic, Figure 3-34 indicates where the 100-year floodplains exist in El Dorado County.

Figure 3-34, 100 year Floodplain in El Dorado County



Flood & Inundation Areas, County of El Dorado, Revised 12-14-16 by EDC GIS, Project ID# GI0072757A (https://edcapps.edcgov.us/maplibrary/html/gi0072757a.html)

Because of a lack of extensive low-lying areas and a great deal of upland areas, the majority of El Dorado County is not subject to flooding. The primary flood-prone areas on the west slope of the County are the following: South Fork, American River from Kyburz to Riverton and below Chili Bar Dam; Coloma Canyon Creek between Greenwood and Garden Valley; Weber Creek from Placerville to the American River, including Cold Springs, Dry; Creek, and Spring Creek tributaries; Shingle Creek from Shingle Springs to the Amador County line; Deer Creek from Cameron Park to Sacramento County line; Big Canyon Creek from El Dorado to the Cosumnes River, including the Slate, Little; Indian, and French Creek tributaries; New York Creek; Middle Fork of the Cosumnes River within the Somerset - Fair Play vicinity, and its confluence with the North Fork of the Cosumnes River; Cedar Creek from Omo Ranch to the Cosumnes River (FEMA 1996; Maurer, pers. comm., 2003).

Insurance Coverage, Claims Paid, and Repetitive Losses

In the past five years, since the previous publication of the 2012 LHMP, the State of California has experience drought conditions statewide. During the revision of the 2017 LHMP approximately 50 counties suffered major damages from strong winter storms and strong atmospheric river storms. The devastating storm conditions continued for approximately 1 ½ months causing major damages within the county and state. Public and private infrastructure was damaged in El Dorado County from large amounts of rain and snow melt causing slides, numerous road slippages, and flooding. El Dorado County proclaimed a local emergency for the whole time period and requested State and Federal assistance. At the time of the revision, a Federal Declaration was approved for the first of four damaging storms. Numerous affected counties are urging the state to ask for a Federal Declaration that covers all of storms that did significant damage. El Dorado County Operational Area alone has suffered damages from these storms in the area of $38,500,000.00 (based on IDE's).

In the past, specific areas in El Dorado County have been identified and/or experienced infrastructure damage including public, commercial, and residential buildings, roadways, utility delivery systems, and other infrastructure damage and associated costs due to flooding and severe winter storms. These areas include:

2005 - Approximate dollar value loss $100,000:

- City of South Lake Tahoe
- South Lake Tahoe Basin
- Myers
- Mosquito
- El Dorado
- Coloma

2006 - Approximate dollar value loss 1.5 million dollars:

- City of South Lake Tahoe
- City of Placerville
- Meeks Bay
- El Dorado
- Deer Creek

- Latrobe
- Georgetown
- Cameron Park
- Nashville
- Mount Aukum
- Sly Park (EID Campground)
- Rancho Ponderosa
- Camino Heights
- Pollock Pines
- Cool
- Garden Valley
- El Dorado Irrigation facilities and distribution systems

2007 - No flood/winter storm damage reported.

2008 - Approximate dollar value loss $525,000*:

- City of South Lake Tahoe
- City of Placerville
- South Lake Tahoe Basin
- Myers
- Camino
- Garden Valley
- Pollock Pines
- Grizzly Flat
- Omo Ranch
- Cameron Park
- Georgetown

*In addition to dollar value loss, there was loss of human life of a utility worker while engaged in restoring power to the Georgetown area as a direct result of winter storm damage in 2008.

2017 – Approximate dollar amount of $38,500,000:

- City of Placerville

- City of South Lake Tahoe
- Meyers
- Nashville
- Pollock Pines
- Cameron Park
- Sacramento Municipal Utility District
- El Dorado Irrigation District
- CalTrans
- EDC Department of Transportation
- EDC Parks and Recreation

Repetitive Losses- There have been 3 properties in El Dorado County that have experienced repetitive losses due to flooding during the listed years:

• Residence #1, Cameron Park, CA	1995 / 1997	$8,398.25
• Residence #2, Somerset, CA	1996 / 2005	$204,472.17
• Residence #3, El Dorado, CA	2017/2017	Approx. $75,000.00

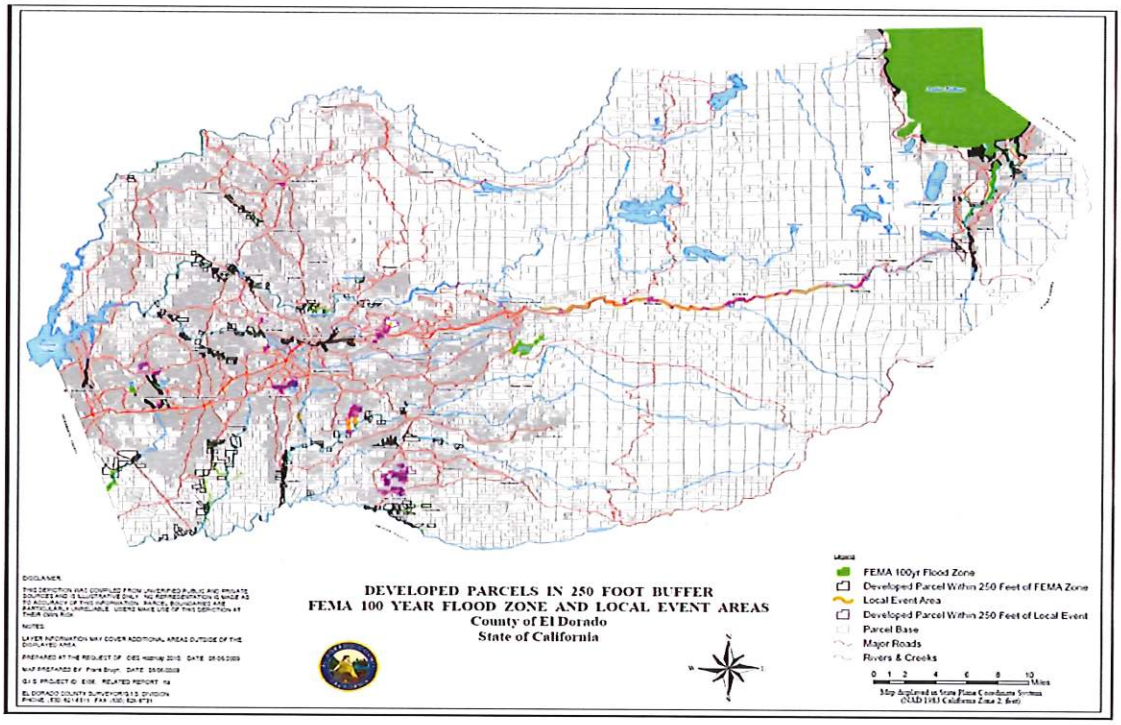
The current FEMA Flood Areas Map of El Dorado County (2016) has been compared to data documented from prior flooding events in order to assess potential property damage. These additional areas, which are not currently on the FEMA Flood Areas Map, have been noted on the El Dorado County GIS map Project # 5186 map titled, "Developed Parcels in 250 Foot Buffer FEMA 100 Year Flood Zone and Local Event Areas". This data was used in conjunction with the FEMA Flood Area Map to identify El Dorado County's flood vulnerability and risk assessment. As part of El Dorado County's zoning requirements, a 250 foot buffer zone is used to assemble potential flood zones. All of the developed parcels and critical infrastructure that could be impacted by these flood zones have been identified utilizing Assessor records for value of property and experts on potential critical infrastructure. It is estimated El Dorado County's total dollar loss would be approximately $1.7 billion for these identified areas.

El Dorado County does participate in the National Flood Insurance Program and a certificate is currently on file within El Dorado County Planning Department.

The following graphic, Figure 3-35 (Developed Parcels In 250 Foot Buffer FEMA 100 Year Flood

Zone & Local Event Areas, County of El Dorado, State of California, 8-06-09, GIS project #5186, El Dorado County Surveyor /G.I.S.) identifies the updated areas.

Figure 3-35



Overall Community Impact

Floods and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the County during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially devastating economic impacts to certain areas of the County. However, many of the floods in the County are minor, localized flood events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Health hazards associated with mold and mildew, contamination of drinking water, etc.;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and

- Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.
- Impact on the overall mental/behavioral health of the community.

Future Development and Future Flood Conditions

Flood: Localized Stormwater Flooding Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely
Vulnerability—Medium

Physical Environment:

Drainage Basins:

The west slope of El Dorado County contains three major watersheds, each of which drains into one of these major rivers: the Middle Fork American River, the South Fork American River, and the Cosumnes River. These watersheds are further divided into smaller drainage basins that feed the tributaries of these three major rivers. Developed drainage infrastructure exists in many of the drainage basins, particularly in the following nine drainage basins (Spiegelberg, pers. comm., 2003): Coloma Canyon between Greenwood and Garden Valley (7.5 square miles); Finnon Reservoir drainage (4 square miles); Weber Creek from the Pollock Pines area to the American River, including the Cold Springs, Dry Creek, and Spring Creek tributaries (40 square miles); Deer Creek from Cameron Park to the Sacramento County line (72 square miles); Big Canyon Creek from El Dorado to the Cosumnes River, including the Slate, Little Indian, and French Creek tributaries (36 square miles); Middle Fork of the Cosumnes River within the Somerset/Fair Play vicinity (23 square miles); Cedar Creek from Omo Ranch to the Cosumnes River (37 square miles); Jenkinson Reservoir drainage (18 square miles); New York Creek (2.6 square miles); and Allegheny Creek (1.9 square miles).

Storm Water Hazards

Flooding is the primary hazard related to storm water runoff. Urban development generally increases the amount of impervious surfaces. When rainfall or snowmelt exceeds the ground infiltration rate (i.e., the ability of the ground to absorb water), storm water runs off and collects in drainage facilities, which may be in the form of roadways, storm drains, and natural creeks and

rivers. The net effects of additional impervious surfaces are increases in the flow rate and volume of water in the drainage channels during and after a storm event. When the volume of water exceeds the capacity of the drainage channel to convey it, flooding can result. Hazards associated with localized flooding include the overtopping of roadways, inundation of areas near the drainage channels, and structural damage. Storm water runoff may also contribute to regional flooding.

Other problems connected with increased stormwater runoff include erosion, sedimentation, and degradation of water quality. Stormwater can become polluted by eroded soil, pesticides, paint, fertilizers, animal waste, litter, oil and other automotive fluids, and household chemicals. Increased stormwater runoff can increase erosion and facilitate the movement of pollutants and soils into bodies of water. Increased sedimentation may be a detriment to aquatic wildlife habitats, and the use of downstream water bodies for beneficial uses (e.g., recreation, irrigation, water consumption) may be impaired (EMD 2002a).

Regulatory/Planning Environment

Federal Programs

National Flood Insurance Program

El Dorado County participates in the National Flood Insurance Program (NFIP), a federal program administered by the Federal Emergency Management Agency (FEMA). Under the NFIP, the County is required to regulate for 100-year flood protection. A 100-year flood is considered a severe flood with a reasonable possibility of occurrence for purposes of land use planning, property protection, and human safety. The U.S. Army Corps of Engineers (USACE), under contract to FEMA, prepared a flood insurance study report and a series of Flood Insurance Rate Maps (FIRMs) for numerous county waterways. The study and maps depict the location of calculated 100-year flood zones, flood elevations, floodways, 500-year flood boundaries, and flood insurance rate zones. The County participates in the NFIP by reviewing specific development proposals to ensure that structures that may be in a 100-year floodplain are protected from flood damage and that any changes in the floodplain do not cause unacceptable increases in the elevation of the 100-year water surface (HDR Engineering 1995).

National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) permit program was established by the Clean Water Act of 1972 to regulate municipal and industrial discharges to surface waters of

the United States. The discharge of wastewater to surface waters is prohibited unless an NPDES permit allowing that discharge has been issued. The NPDES permit program is overseen by the U.S. Environmental Protection Agency's (EPA's) stormwater program; the State of California is authorized to administer the NPDES program within California. Starting in 1990, Phase I of EPA's stormwater program required NPDES permits for stormwater runoff from all of the following (EPA 2002): "medium" and "large" municipal separate storm sewer systems (MS4s) generally serving populations of 100,000 or greater and denoted by EPA as MS4s; construction activity disturbing 5 acres of land or greater, and ten categories of industrial activity.

Phase II of the NPDES permit program was the next step in EPA's effort to protect water resources from polluted stormwater runoff. The Phase II program expands the Phase I program by requiring smaller operators of MS4s in urbanized areas and operators of small construction sites, through the use of NPDES permits, to implement programs and practices to control polluted stormwater runoff (EPA 2002). The County submitted an application for the NPDES Phase II permit and participated in the voluntary project which resulted in a Draft report of "Voluntary Domestic Well Assessment Project". (http://www.waterboards.ca.gov/gama/docs/edc_draft120905version.pdf)

State Regulations

Subdivision Map Act (1907)

One of the powers granted to local jurisdictions by the Subdivision Map Act is the authority to impose drainage improvements or drainage fees and assessments. Specifically, local jurisdictions may require the provision of drainage facilities, proper grading and erosion control, dedication of land for drainage easements, or payment of fees needed for construction of drainage improvements. The types and applicable standards of the improvements may be specified in the local ordinance.

El Dorado County Regulation and Programs

County Grading, Erosion, and Sediment Control Ordinance

The County Grading, Erosion, and Sediment Control Ordinance (Grading Ordinance) (Chapter 15.14 of the County Code) establishes provisions for public safety and environmental protection associated with grading activities on private property. Section 15.14.090 of the Grading Ordinance, which has incorporated the recommended standards for drainage Best Management Practices (BMPs) from the High Sierra Resource Conservation and Development Council BMP guidelines handbook, prohibits grading activities that would cause flooding where it would not otherwise occur

or would aggravate existing flooding conditions. The Grading Ordinance also requires all drainage facilities, aside from those in subdivisions that are regulated by the County's Subdivision Ordinance, be approved by the County Department of Transportation. Pursuant to the ordinance, the design of the drainage facilities in the County must comply with the County of El Dorado Drainage Manual, as described below.

El Dorado County Subdivision Ordinance

The County's Subdivision Ordinance (El Dorado County Code Title 16) requires the submission of drainage plans prior to the approval of tentative maps for proposed subdivision projects. The drainage plans must include an analysis of upstream, onsite, and downstream facilities and pertinent details, and details of any necessary offsite drainage facilities. The tentative map must include data on the location and size of proposed drainage structures. In addition, drainage culverts consistent with the drainage plan may be required in all existing drainage courses, including roads.

El Dorado County Department of Transportation Drainage Program

The County Department of Transportation has an ongoing drainage program with a goal of developing a Capital Improvement Program and funding mechanism for the construction of essential drainage infrastructure and to repair and/or replace inadequate drainage facilities throughout the county. The first phase of the drainage program, development of standard procedures for drainage system designs, was completed with the adoption of the County of El Dorado Drainage Manual in 1995.

The second phase of the drainage program involves updating FEMA mapping of four specific drainage basins in the county: Deer Creek in Cameron Park, New York Creek in El Dorado Hills, Carson Creek in the El Dorado Hills Business Park, and the El Dorado Townsite. Three of these basin studies have been completed and are discussed below. These basin studies provide area-specific analysis and identify areas where drainage improvements are required. The third phase of the drainage program is the development of funding mechanisms to address drainage problems in the study areas. With funding mechanisms in place, capital improvement and maintenance programs can be implemented. The capital improvement program may establish methods of prioritizing existing and future drainage deficiencies and requirements with respect to potential damage, risk, and cost.

County of El Dorado Design and Improvement Standards Manual

The County's Design and Improvement Standards Manual was adopted in 1990 and provides required erosion and sediment control measures that are applicable to subdivisions, roadways, and other types of developments.

County of El Dorado Drainage Manual

The County of El Dorado Drainage Manual provides standard procedures for future designs of drainage improvements. The Drainage Manual supercedes the stormwater drainage system design standards in the County's Design Improvements Standards Manual. The Drainage Manual requires that a hydrologic and hydraulic analysis be submitted for all proposed drainage facilities. The analysis must include an introduction/background, location map/description, catchment description/delineation, hydrologic analysis, hydraulic and structural analysis, risk assessment/impacts discussion, unusual or special conditions, conclusions, and technical appendices. This analysis is usually required on projects undergoing discretionary review. However, under the Building Code and Grading Ordinance, the County also reviews ministerial development, including required drainage plans, to ensure that appropriate runoff design and controls are in place.

Drainage Basin Studies

Three regional drainage studies have been completed on the west slope. A study of the El Dorado townsite has not been completed.

Carson Creek Regional Drainage Study

The Final Report of the Carson Creek Regional Drainage Study (Bottorff 1996) was completed in 1996 for the 15-square-mile Carson Creek watershed, most of which is located in the southwestern portion of El Dorado County. The purpose of this drainage study is to provide a unified plan for stormwater management in the El Dorado County portion of the watershed. The study recognizes the drainage needs of individual projects, assesses the impacts of the proposed drainage improvements on the entire catchment area, and satisfies the requirements of the County of El Dorado Drainage Manual.

The Carson Creek Regional Drainage Study uses results from previous drainage studies within the watershed, as well as land use information and drainage improvements included in the previous studies, to develop a regional drainage model. The drainage study was based on the maximum

development allowed by the 1996 General Plan, and development projects that were proposed at that time. The study assumes that the portion of the watershed in Sacramento County would remain as open space. The study concluded that runoff for the 100-year storm would result in minor downstream impacts in Sacramento County and that the increase in existing flood inundation areas would be negligible. The study recommended that future drainage improvements be designed and analyzed in context of the regional drainage model. Specific drainage improvements, such as culvert upgrades, channel improvements, and construction of a regional detention storage facility were also recommended. (Bottorff 1996.)

New York Creek Basin Drainage Study

The New York Creek Basin Drainage Study (Ensign & Buckley 1995) analyzes the watershed of New York Creek and its Governor Drive tributary. Assumptions for future land uses within the watershed were based on data from the El Dorado Hills Specific Plan and the El Dorado Hills/Salmon Falls Area Plan. The study concluded that in order to minimize the overtopping of roadways during the 100-year peak flow condition, improvements would be required at eight roadway crossings across New York Creek and the Governor Drive tributary. Even with the construction of these improvements and regular maintenance activities (e.g., channel clearing), flooding and overtopping may occur at roadway crossings. This drainage study also included cost estimates for the recommended improvements.

Cameron Park Drainage Study

The Cameron Park Drainage Study analyzed the flooding potential of a 72-square-mile area in the upper reaches of Deer Creek in order to identify needed drainage channel improvements. The option of using detention to reduce peak flow was not analyzed. The General Plan land use map available during the preparation of the drainage study in 1995 was the source of future land use data in the Cameron Park Drainage Study, the hydrologic and hydraulic analyses of which were based on the full build out of the watershed consistent with the land use designations. The study concluded that 16 roadway crossings at the build out of the 1995 draft General Plan may experience overtopping during a 100-year storm event if culvert or detention improvements were not implemented. The study included recommended culvert improvements while also recommending further studies regarding using detention to reduce the peak flow. This drainage study also included cost estimates for the recommended culvert improvements (Psomas and Associates 1995). In practice, the potential for flooding may be less than identified by the study. The drainage study was based on the draft General Plan in 1995, which was similar to the 1996

General Plan. Discretionary developments in the study area subsequent to the drainage study have constructed detention improvements as required by the County's Drainage Manual (Pesses, pers. comm., 2003). Furthermore, some of the projects in the drainage study area have been built at lower densities than the maximum allowed; thereby decreasing the potential for flooding conditions (Spiegelberg, pers. comm., 2003).

El Dorado County Special Districts

California Government Code §25210 allows for the formation of county service areas in unincorporated areas, providing an alternative method of furnishing extended governmental services and the levy of taxes to pay for the extended services. The County has established Drainage Zones of Benefit, as well as Road and Drainage Zones of Benefit, that are managed by the County's General Services Department for the purpose of generating funding for the construction of community drainage facilities.

Worldwide interest in dam and levee safety has risen significantly in recent years. Aging infrastructure, new hydrologic information, and population growth in floodplain areas downstream from dams and near levees have resulted in an increased emphasis on safety, operation and maintenance.

Seiche Wave Vulnerability Assessment

Likelihood of Future Occurrence—Unlikely
Vulnerability—High

A Seiche wave (pronounced "saysh") is a standing wave in an enclosed or partially enclosed body of water. Seiches and seiche-related phenomena have been observed on lakes, reservoirs, swimming pools, bays and seas. The key requirement for formation of a seiche is that the body of water be at least partially bounded, allowing the formation of the standing wave. The term was promoted by the Swiss hydrologist François-Alphonse Forel in 1890, who was the first to make scientific observations of the effect in Lake Geneva, Switzerland. The word originates in a Swiss French dialect word that means "to sway back and forth", which had apparently long been used in the region to describe oscillations in alpine lakes. The Great Lakes of North America have seen Sieche wave activity within the past 20 years ranging from one foot to ten feet waves with noted injuries and some deaths. Lakes in seismically active areas, such as Lake Tahoe in California/Nevada, are significantly at risk from seiches. Geological evidence indicates that the shores of Lake Tahoe may have been hit by seiches and tsunamis as much as 10 m (33 feet) high in prehistoric times, and local researchers have called for the risk to be factored into emergency plans for the region.

Risk for a Seiche wave for the area, as well as potential losses due to a Seiche Wave impact, is considered to be low relative to much of California. As indicated by the seismic activity map, Figure 111-12, the region of the state where El Dorado County is located, just east of Lake Tahoe, seldom suffers the effects of even a 2.5 magnitude earthquake. Given the fact that there are not many homes built at the current lake level or on the immediate shores of Lake Tahoe, a Seiche Wave would cause little damage to homes in the Un-incorporated areas of El Dorado County. There would be substantial damage to infrastructure such as county roads and two state highways that run through El Dorado County, Highway 50 and Highway 89.

Given this recognized area vulnerability, the State of California hosted a Functional Exercise involving a Seiche Wave (called Golden Guardian 2008) that impacted the South shore of Lake Tahoe. The exercise evaluated numerous local and state government agencies in response to such an event. The exercise details and detailed After Action report for Golden Guardian 2008 were reviewed and considered in this vulnerability assessment.

Since there has not been a Seiche Wave on record in the Lake Tahoe area, it would be difficult to get an accurate estimate of damages such an event would cause. Some of the damages to infrastructure in this type of event would include repair and/or replace infrastructure such as roadways which would include manpower hours and resources to make the repairs. The size of the Seiche Wave would also dictate the amount of the debris removal cost to the County and/or State would incur.

A small (0.4-foot) wave surge was reported in Lake Tahoe during the 1966 Truckee earthquake, which had a Richter Scale magnitude of between 6.0 and 6.9.

Future Development

Development in areas located around the lake in potential seiche impact areas consist of primarily infill and redevelopment of both residential and commercial areas.

Severe Weather: Freeze and Snow Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Freeze and snow events happen in El Dorado County each year. Winter weather and freeze can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County. The ability for the County to continue to operate during periods of winter storm and freeze is paramount. Vulnerable populations to winter weather and freeze include:

- Homeless
- Infants and children under age five
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

In addition to vulnerable populations, pets and livestock are at risk to freeze and cold. However many residents of El Dorado County are self-sufficient and accustomed to rural living and the climate extremes that are part of the territory. The residents of nursing homes and elder care facilities are especially vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of extreme cold and heavy snows.

The varying elevations in the County, in part, determine the extent to which a given area is affected by freeze and snow. The agricultural industry is especially vulnerable to extreme temperatures. Freezing temperatures can cause significant loss to crops, and excessive heat can cause high levels of mortality among livestock as well as damage to crops. Historically, extreme temperatures have caused large losses to agricultural crops and have resulted in several USDA disaster declarations.

Other impacts to the County as a result of winter snow storms include damage to infrastructure, frozen pipes, utility outages, road closures, traffic accidents, and interruption in business and school activities. Also of concern is the impact to populations with special needs such as the elderly

and those requiring the use of medical equipment. Delays in emergency response services can be of significant concern. Further, there are economic impacts associated with areas prone to heavy snow. Although the eastern portion of the county is the most vulnerable to the effects of snow, snowfall occurring in the lower elevations can create significant issues, as residents working and living in those areas may not be as prepared for snowfall.

Future Development

Future development built to code (for those areas with building codes) should be able to withstand snow loads from severe winter storms. Pipes at risk of freezing should be mitigated be either burying or insulating them from freeze as new facilities are improved or added. Current County codes provide such provisions for new construction. Vulnerability to extreme cold will increase as the average age of the population in the County shifts. Greater numbers of future senior citizens will result from the large number of baby boomers in the Planning Area. However, as previously mentioned, many of the residents of El Dorado County are self-sufficient and accustomed to rural living. An updated snow removal plan including an assessment of available snow removal equipment will be important as development occurs in more remote areas of the County.

Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning/Wind/Tornadoes) Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely

Vulnerability—High

According to historical hazard data, severe weather is an annual occurrence in El Dorado County. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future. Heavy rain and thunderstorms are the most frequent type of severe weather occurrences in the County. Wind and lightning often accompany these storms and have caused damage in the past. However, actual damage associated with the primary effects of severe weather have been limited. It is the secondary hazards caused by weather, such as floods, fire, and agricultural losses that have had the greatest impact on the County. The risk and vulnerability associated with these secondary hazards are discussed in other sections of this plan (Section 3.3.10 Flood: 100/500-year, Section 3.3.11 Flood: Localized Stormwater, and Section 3.3.5 Dam Failure).

Future Development

New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. While minimal damages have occurred to critical facilities in the past due to lightning, hail, or high winds and tornadoes, there still remains future risk. With development occurring in the region, future losses to new development may occur.

Wildfire Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Extremely High

Any fire occurring in vegetation areas regardless of ignition sources. A wildfire responds to the weather, topography, and fuels in its environment. Under extreme burning conditions, the behavior of a wildfire can be so powerful and unpredictable that fire protection agencies can only wait until conditions moderate before suppression actions can be taken. Since the fire itself, weather and topography cannot be mitigated that leaves us with the fuel to mitigate. Wildland fire fuel can be anything from the forest, to residential structures and fortunately they can be modified to mitigate the wildland fire hazard.

Wildfire is our greatest concern as these disaster events have impacted our county on numerous occasions, and as recently as 2014 with two separate devastating fires. The Sand fire in South County burned 4,240 acres of land, destroyed 19 homes, and 47 outbuildings before it was contained. The King fire was in the Pollock Pines area burning 97,717 acres of forest, destroying 15 homes, and 86 outbuildings including 2 historical cabins. Our wildland fire threat is so severe we devoted an entire section of this plan to that one specific hazard.

See section titled "Wildland Fire Hazard Mitigation Plan" submitted by the El Dorado County Fire Safe Council and AEU CAL FIRE for a comprehensive discussion of this hazard.

Future Development

Development in areas identified as high wildfire risk areas should planned appropriately and considered given previous occurrences of fire and fire behavior in the State. Planning for evacuation routes should be considered with any new developments.

Capability Assessment

Thus far, the planning process has identified the natural hazards posing a threat to the Planning Area and described, in general, the vulnerability of the County to these risks. The next step is to assess what loss prevention mechanisms are already in place. This part of the planning process is the mitigation capability assessment. Combining the risk assessment with the mitigation capability assessment results in the County's net vulnerability to disasters, and more accurately focuses the goals, objectives, and proposed actions of this plan.

El Dorado County General Plan (July 19, 2004)

A general plan is a legal document, required by state law, that serves as a community's "constitution" for land use and development. The plan must be a comprehensive, long-term document, detailing proposals for the "physical development of the county or city, and of any land outside its boundaries which in the planning agency's judgment bears relation to its planning" (Government Code §65300 et seq.). Time horizons vary, but the typical general plan looks 10 to 20 years into the future. The law specifically requires that the general plan address seven topics or "elements." These are land use, circulation (transportation), housing, conservation, open space, noise, and safety. The plan must analyze issues of importance to the community, set forth policies in text and diagrams for conservation and development, and outline specific programs for implementing these policies. Goals and policies related to mitigation from the General Plan are the following:

Public Facilities Element

GOAL 5.4: STORM DRAINAGE Manage and control storm water runoff to prevent flooding, protect soils from erosion, prevent contamination of surface waters, and minimize impacts to existing drainage infrastructure.

OBJECTIVE 5.4.1: DRAINAGE AND FLOOD MANAGEMENT PROGRAM

Initiate a County-wide drainage and flood management program to prevent flooding, protect soils from erosion, and minimize impacts on existing drainage facilities.

Policy 5.4.1.1: Require storm drainage systems for discretionary development that protect public health and safety, preserve natural resources, prevent erosion of adjacent and downstream lands, prevent the increase in potential for flood hazard or damage on either adjacent, upstream or downstream properties, minimize impacts to existing facilities, meet the National Pollution Discharge Elimination System (NPDES) requirements, and preserve natural resources such as wetlands and riparian areas.

Policy 5.4.1.2: Discretionary development shall protect natural drainage patterns, minimize erosion, and ensure existing facilities are not adversely impacted while retaining the aesthetic qualities of the drainage way.

Policy 5.4.1.3: The County will evaluate the funding requirements for a maintenance, operation, and infrastructure replacement program for regionally effective storm water drainage management.

GOAL 5.7: EMERGENCY SERVICES

Adequate and comprehensive emergency services, including fire protection, law enforcement, and emergency medical services.

OBJECTIVE 5.7.1: FIRE PROTECTION (COMMUNITY REGIONS)

Ensure sufficient emergency water supply, storage, and conveyance facilities are available, and that adequate access is provided for, concurrent with development.

Policy 5.7.1.1: Prior to approval of new development, the applicant will be required to demonstrate that adequate emergency water supply, storage, conveyance facilities, and access for fire protection either are or will be provided concurrent with development.

OBJECTIVE 5.7.2: FIRE PROTECTION (RURAL REGIONS AND RURAL CENTERS)

Sufficient emergency water supply, storage, and conveyance facilities for fire protection, together with adequate access are available, or are provided for, concurrent with development.

Policy 5.7.2.1: Prior to approval of new development, the responsible fire protection district shall be requested to review all applications to determine the ability of the district to provide protection services. The ability to provide fire protection to existing development shall not be reduced below acceptable levels as a consequence of new development. El Dorado County General Plan Public Services and Utilities Element July 2004 (Amended December 2015) Page 101 Recommendations such as the need for additional equipment, facilities, and adequate access may be incorporated as conditions of approval.

OBJECTIVE 5.7.3: LAW ENFORCEMENT

An adequate, comprehensive, coordinated law enforcement system consistent with the needs of the community.

Policy 5.7.3.1: Prior to approval of new development, the Sheriff's Department shall be requested to review all applications to determine the ability of the department to provide protection services. The ability to provide protection to existing development shall not be reduced below acceptable levels as a consequence of new development. Recommendations such as the need for additional equipment, facilities, and adequate access may be incorporated as conditions of approval.

OBJECTIVE 5.7.4: MEDICAL EMERGENCY SERVICES

Adequate medical emergency services available to serve existing and new development recognizing that levels of service may differ between Community Regions, and Rural Centers and Regions.

Policy 5.7.4.1: Prior to approval of new development, the applicant shall be required to demonstrate that adequate medical emergency services are available and that adequate emergency vehicle access will be provided concurrent with development.

Policy 5.7.4.2: Prior to approval of new development, the Emergency Medical Services Agency shall be requested to review all applications to determine the ability of the department to provide protection services. The ability to provide protection to existing development shall not be reduced below acceptable levels as a consequence of new development. Recommendations such as the need for additional equipment, facilities, and adequate access may be incorporated as conditions of approval.

Conservation and Open Space Element

GOAL 7.1: SOIL CONSERVATION Conserve and protect the County's soil resources.

OBJECTIVE 7.1.1: SOILS Long-term soil productivity.

Policy 7.1.1.1: Conserve and maintain important agricultural soils for existing and potential agricultural and forest uses by limiting non-agricultural/non-forestry development on those soils.

OBJECTIVE 7.1.2: EROSION/SEDIMENTATION Minimize soil erosion and sedimentation.

Policy 7.1.2.1: Development or disturbance of slopes over 30% shall be restricted. Standards for implementation of this policy, including but not limited to exceptions for access, reasonable use of the parcel, and agricultural uses shall be incorporated into the Zoning Ordinance

Policy 7.1.2.2: Discretionary and ministerial projects that require earthwork and grading, including cut and fill for roads, shall be required to minimize erosion and sedimentation, conform to natural contours, maintain natural drainage patterns, minimize impervious surfaces, and maximize the retention of natural vegetation. Specific standards for minimizing erosion and sedimentation shall be incorporated into the Zoning Ordinance.

Policy 7.1.2.3: Enforce Grading Ordinance provisions for erosion control on all development projects and adopt provisions for ongoing, applicant-funded monitoring of project grading.

Policy 7.1.2.4: Cooperate with and encourage the activities of the three Resource Conservation Districts in identifying critical soil erosion problems and pursuing funding sources to resolve such problems.

Policy 7.1.2.5: The Department of Transportation, in conjunction with the Resource Conservation Districts and Soil Conservation District, shall develop a road-side maintenance program to manage roads in a manner that maintains drainage and protects surface waters while reducing road-side weed problems.

Policy 7.1.2.6: The County shall encourage the Soil Conservation Service to update the 1974 Soil Survey and to digitize all soils mapping units on the Geographic Information System (GIS).

Policy 7.1.2.7: The County shall require agricultural grading activities that convert one acre or more of undisturbed vegetation to agricultural cropland to obtain an agricultural permit through the Agricultural Commissioner's office which may require approval of the Agricultural Commission. All erosion control measures included in the agricultural permit would be implemented. All agricultural practices, including fuel reduction and fire protection, that do not change the natural contour of the land and that use "best management practices" as recommended by the County Agricultural Commission and adopted by the Board of Supervisors shall be exempt from this policy.

GOAL 7.3: WATER QUALITY AND QUANTITY

Conserve, enhance, and manage water resources and protect their quality from

degradation.

OBJECTIVE 7.3.1: WATER RESOURCE PROTECTION Preserve and protect the supply and quality of the County's water resources including the protection of critical watersheds, riparian

zones, and aquifers.
Policy 7.3.1.1: Encourage the use of Best Management Practices, as identified by the Soil Conservation Service, in watershed lands as a means to prevent erosion, siltation, and flooding.

Policy 7.3.1.2: Establish water conservation programs that include both drought tolerant landscaping and efficient building design requirements as well as incentives for the conservation and wise use of water.

Policy 7.3.1.3: The County shall develop the criteria and draft an ordinance to allow and encourage the use of domestic gray water for landscape irrigation purposes. (See Title 22 of the State Water Code and the Graywater Regulations of the Uniform Plumbing Code).

OBJECTIVE 7.3.3: WETLANDS Protection of natural and man-made wetlands, vernal pools, wet meadows, and riparian areas from impacts related to development for their importance to wildlife habitat, water purification, scenic values, and unique and sensitive plant life.

Policy 7.3.3.1: For projects that would result in the discharge of material to or that may affect the function and value of river, stream, lake, pond, or wetland features, the application shall include a delineation of all such features. For wetlands, the delineation shall be conducted using the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual

Policy 7.3.3.3: The County shall develop a database of important surface water features, including lake, river, stream, pond, and wetland resources.

Policy 7.3.3.4: The Zoning Ordinance shall be amended to provide buffers and special setbacks for the protection of riparian areas and wetlands. The County shall encourage the incorporation of protected areas into conservation easements or natural resource protection areas. Exceptions to riparian and wetland buffer and setback requirements shall be provided to permit necessary road and bridge repair and construction, trail construction, and other recreational access structures such as docks and piers, or where such buffers deny reasonable use of the property, but only when appropriate mitigation measures and Best Management Practices are incorporated into the project. Exceptions shall also be provided for horticultural and grazing activities on agriculturally zoned lands that utilize "best management practices (BMPs)" as recommended by the County Agricultural Commission and adopted by the Board of Supervisors. Until standards for buffers and special setbacks are established in the Zoning Ordinance, the County shall apply a minimum setback of 100 feet from all perennial streams, rivers, lakes, and 50 feet from intermittent streams and wetlands. These interim standards may be modified in a particular instance if more detailed information relating to slope, soil stability, vegetation, habitat, or other site- or project-specific conditions supplied as part of the review for a specific project demonstrates that a different setback is necessary or would be sufficient to protect the particular riparian area at issue. For projects where the County allows an exception to wetland and riparian buffers, development in or immediately adjacent to such features shall be planned so that impacts on the resources are minimized. If avoidance and minimization are not feasible, the County shall make findings, based on documentation provided by the project proponent, that avoidance and minimization are infeasible.

Policy 7.3.3.5: Rivers, streams, lakes and ponds, and wetlands shall be integrated into new development in such a way that they enhance the aesthetic and natural character of the site while disturbance to the resource is avoided or minimized and fragmentation is limited.

OBJECTIVE 7.3.4: DRAINAGE Protection and utilization of natural drainage patterns.

Policy 7.3.4.1: Natural watercourses shall be integrated into new development in such a way that they enhance the aesthetic and natural character of the site without disturbance.

Policy 7.3.4.2: Modification of natural stream beds and flow shall be regulated to ensure that adequate mitigation measures are utilized.

OBJECTIVE 7.3.5: WATER CONSERVATION Conservation of water resources, encouragement of water conservation, and construction of wastewater disposal systems designed to reclaim and re-use treated wastewater on agricultural crops and for other irrigation and wildlife enhancement projects.

Policy 7.3.5.1: Drought-tolerant plant species, where feasible, shall be used for landscaping of commercial development. Where the use of drought tolerant native plant species is feasible, they should be used instead of non-native plant species.

Policy 7.3.5.2: A list of appropriate local indigenous drought tolerant plant materials shall be maintained by the County Planning Department and made available to the public.

Policy 7.3.5.3: The County Parks and Recreation Division shall use drought tolerant landscaping for all new parks and park improvement projects.

Policy 7.3.5.4: Require efficient water conveyance systems in new construction. Establish a program of ongoing conversion of open ditch systems shall be considered for conversion to closed conduits, reclaimed water supplies, or both, as circumstances permit.

Policy 7.3.5.5: Encourage water reuse programs to conserve raw or potable water supplies consistent with State Law.

Safety Element

GOAL 6.1: COORDINATION

A coordinated approach to hazard and disaster response planning.

OBJECTIVE 6.1.1: EL DORADO COUNTY MULTI-JURISDICTIONAL LOCAL

HAZARD MITIGATION PLAN The El Dorado County Multi-Jurisdictional Local Hazard Mitigation Plan shall serve as the implementation program for this Goal.

Policy 6.1.1.1: The El Dorado County Multi-jurisdictional Local Hazard Mitigation Plan (LHMP) shall serve as the implementation program for the coordination of hazard planning and disaster response efforts within the County and is incorporated by reference to this Element. The County will ensure that the

LHMP is updated on a regular basis to keep pace with the growing population.

GOAL 6.2: FIRE HAZARDS

Minimize fire hazards and risks in both wildland and developed areas.

OBJECTIVE 6.2.1: DEFENSIBLE SPACE

All new development and structures shall meet "defensible space" requirements and adhere to fire code building requirements to minimize wildland fire hazards.

Policy 6.2.1.1: Implement Fire Safe ordinance to attain and maintain defensible space through conditioning of tentative maps and in new development at the final map and/or building permit stage.

Policy 6.2.1.2: Coordinate with the local Fire Safe Councils, California Department of Forestry and Fire Protection, and federal and state agencies having land use jurisdiction in El Dorado County in the development of a countywide fuels management strategy.

OBJECTIVE 6.2.2: LIMITATIONS TO DEVELOPMENT

Regulate development in areas of high and very high fire hazard as designated by the California Department of Forestry and Fire Prevention Fire Hazard Severity Zone Maps.

Policy 6.2.2.1: Fire Hazard Severity Zone Maps shall be consulted in the review of all projects so that standards and mitigation measures appropriate to each hazard classification can be applied. Land use densities and intensities shall be determined by mitigation measures in areas designated as high or very high fire hazard.

Policy 6.2.2.2: The County shall preclude development in areas of high and very high wildland fire hazard or in areas identified as "urban wildland interface communities within the vicinity of Federal lands that are a high risk for wildfire," as listed in the Federal Register of August 17, 2001, unless such development can be adequately protected from wildland fire hazard, as demonstrated in a Fire Safe Plan prepared by a Registered Professional Forester (RPF) and approved by the local Fire Protection District and/or California Department of Forestry and Fire Protection.

OBJECTIVE 6.2.3: ADEQUATE FIRE PROTECTION

Application of uniform fire protection standards to development projects by fire districts.

Policy 6.2.3.1: As a requirement for approving new development, the County must find, based on information provided by the applicant and the responsible fire protection district that, concurrent with development, adequate emergency water flow, fire access, and firefighting personnel and equipment will be available in accordance with applicable State and local fire district standards.

Policy 6.2.3.2: As a requirement of new development, the applicant must demonstrate that adequate access exists, or can be provided to ensure that emergency vehicles can access the site and private vehicles can evacuate the area.

Policy 6.2.3.3: Day care centers shall be subject to conformance with all applicable sections of Title 19 of the Fire Code.

Policy 6.2.3.4: All new development and public works projects shall be consistent with applicable State Wildland Fire Standards and other relevant State and federal fire requirements.

OBJECTIVE 6.2.4: AREA-WIDE FUEL MANAGEMENT PROGRAM

Reduce fire hazard through cooperative fuel management activities.

Policy 6.2.4.1: Discretionary development within high and very high fire hazard areas shall be conditioned to designate fuel break zones that comply with fire safe requirements to benefit the new and, where possible, existing development.

Policy 6.2.4.2: The County shall cooperate with the California Department of Forestry and Fire Protection and local fire protection districts to identify opportunities for fuel breaks in zones of high and very high fire hazard either prior to or as a component of project review.

OBJECTIVE 6.2.5: FIRE PREVENTION EDUCATION

Inform and educate homeowners regarding fire safety and prevention.

Policy 6.2.5.1: The County shall cooperate with the U.S. Forest Service, California Department of Forestry and Fire Protection, and local fire districts in fire prevention education programs.

GOAL 6.3: GEOLOGIC AND SEISMIC HAZARDS

Minimize the threat to life and property from seismic and geologic hazards.

OBJECTIVE 6.3.1: BUILDING AND SITE STANDARDS

Adopt and enforce development regulations, including building and site standards, to protect against seismic and geologic hazards.

Policy 6.3.1.1: The County shall require that all discretionary projects and all projects requiring a grading permit, or a building permit that would result in earth disturbance, that are located in areas likely to contain naturally occurring asbestos (based on mapping developed by the California Department of Conservation [DOC]) have a California-registered geologist knowledgeable about asbestos-containing formations inspect the project area for the presence of asbestos using appropriate test methods. The County shall amend the Erosion and Sediment Control Ordinance to include a section that addresses the reduction of thresholds to an appropriate level for grading permits in areas likely to contain naturally occurring asbestos (based on mapping developed by the DOC). The Department of Transportation and the County Air Quality Management District shall consider the requirement of posting a warning sign at the work site in areas likely to contain naturally occurring asbestos based on the mapping developed by the DOC.

Policy 6.3.1.2: The County shall establish a mandatory disclosure program, where potential buyers and sellers of real property in all areas likely to contain naturally occurring asbestos (based on

mapping developed by the California Department of Conservation [DOC]) are provided information regarding the potential presence of asbestos subject to sale. Information shall include potential for exposure from access roads and from disturbance activities (e.g., landscaping).

Policy 6.3.1.3: The County Environmental Management Department shall report annually to the Board of Supervisors regarding new information on asbestos and design an information outreach program.

OBJECTIVE 6.3.2: COUNTY-WIDE SEISMIC HAZARDS

Continue to evaluate seismic related hazards such as liquefaction, landslides, and avalanche, particularly in the Tahoe Basin.

Policy 6.3.2.1: The County shall maintain updated geologic, seismic and avalanche hazard maps, and other hazard inventory information in cooperation with the State Office of Emergency Services, California Department of Conservation--Division of Mines and Geology, U.S. Forest Service, Caltrans, Tahoe Regional Planning Agency, and other agencies as this information is made available. This information shall be incorporated into the El Dorado County Operational Area Multi-Hazard Functional Emergency Operations Plans.

Policy 6.3.2.2: Future subdivision in the area around Fallen Leaf Lake shall be precluded.

Policy 6.3.2.3: An avalanche overlay zone shall be established and applied to all residential areas subject to avalanche. All new structures located within avalanche susceptible areas shall be designed to withstand the expected forces of such an event.

Policy 6.3.2.5: Applications for development of habitable structures shall be reviewed for potential hazards associated with steep or unstable slopes, areas susceptible to high erosion, and avalanche risk. Geotechnical studies shall be required when development may be subject to geological hazards. If hazards are identified, applicants shall be required to mitigate or avoid identified hazards as a condition of approval. If no mitigation is feasible, the project will not be approved.

GOAL 6.4: FLOOD HAZARDS Protect the residents of El Dorado County from flood hazards.

OBJECTIVE 6.4.1: DEVELOPMENT REGULATIONS

Minimize loss of life and property by regulating development in areas subject to flooding in accordance with Federal Emergency Management Agency (FEMA) guidelines, California law, and the El Dorado County Flood Damage Prevention Ordinance.

Policy 6.4.1.1: The County shall continue participation in the National Flood Insurance Program and application of flood plain zoning regulations.

Policy 6.4.1.2: The County shall identify and delineate flood prone study areas discovered during the completion of the master drainage studies or plans.

Policy 6.4.1.3: No new critical or high occupancy structures (e.g., schools, hospitals) shall be located in the 100-year floodplain of any river, stream, or other body of water.

Policy 6.4.1.4: Creation of new parcels which lie entirely within the 100-year floodplain as identified on the most current version of the flood insurance rate maps provided by FEMA or dam failure inundation areas as delineated in dam failure emergency response plans maintained by the County shall be prohibited.

Policy 6.4.1.5: New parcels which are partially within the 100-year floodplain or dam failure inundation areas as delineated in dam failure emergency response plans maintained by the County must have sufficient land available outside the FEMA or County designated 100-year floodplain or the dam inundation areas for construction of dwelling units, accessory structures, and septic systems. Discretionary applications shall be required to determine the location of the designated 100-year Floodplain and identified dam failure inundation areas on the subject property.

OBJECTIVE 6.4.2: DAM FAILURE INUNDATION

Protect life and property of County residents below dams.

Policy 6.4.2.1: Apply a zoning overlay for areas located within dam failure inundation zones as identified by the State Department of Water Resources Division of Safety of Dams.

Policy 6.4.2.2: No new critical or high occupancy structures (e.g., schools, hospitals) should be located within the inundation area resulting from failure of dams identified by the State Department of Water Resources Division of Safety of Dams.

El Dorado County Ordinances

The El Dorado County General Plan provides policy direction for land use, development, open space protection, and environmental quality; however, this policy direction must be carried out through numerous ordinances, programs, and agreements. The following ordinances are among the most important tools for implementing the General Plan and/or are critical to the mitigation of hazards identified in this plan.

Emergency Organizations and Functions (Chapter 2.21)

Sec. 2.21.010. - Purpose.

The declared purposes of this chapter are to provide for the preparation and carrying out of plans for the protection of persons and property within the County in the event of an emergency and to provide for the coordination of the emergency functions of the County with any incorporated city within the County (currently the City of Placerville and the City of South Lake Tahoe) and all other affected public agencies, corporations and organizations within the County in compliance with the California Emergency Services Act.

Sec. 2.21.020. - Definitions.

As used in this chapter, "emergency" is defined as the actual or threatened existence of conditions of disaster or of extreme peril to the safety of persons or property within the county caused by such conditions as fire, flood, storm, earthquake, drought, air pollution, epidemic, riot, sudden or severe energy shortage or other conditions including conditions resulting from war or imminent threat of war, which conditions are or are likely to be beyond the control of the services, personnel, equipment, and facilities of the county, requiring the combined forces of other political subdivisions to combat or mitigate.

Sec. 2.21.030. - Office of Emergency Services, Director of the Office of Emergency Services—Office created.

A. There is hereby created the County of El Dorado Office of Emergency Services.

B. The Director (hereinafter referred to as "Director") of the Office of Emergency Services shall be the Sheriff.

Sec. 2.21.040. - Director—Powers and duties.

A. The Director shall coordinate the efforts of the emergency organization of the County, as defined in Section 2.21.100, for the accomplishment of the purposes of this chapter in compliance with the California Emergency Services Act.

B. The Director is responsible for the coordination of services and staff of the emergency organization of the County; and may resolve questions of authority and responsibility that may arise between them.

C. The Director shall represent the County in all dealings with public or private agencies on matters pertaining to emergencies as defined in this chapter.

D. The Director shall designate the order of succession to that office, to take effect in the event the Director is unavailable to attend meetings and otherwise perform his or her duties during an emergency. The order of succession, and any subsequent changes thereto, shall be stated in the County Emergency Operations Plan and approved by the Board of Supervisors.

E. The Director is authorized to request the Board of Supervisors to proclaim the existence of a local emergency. The Director may proclaim the existence of a local emergency if the Board of Supervisors is not in session. Whenever a local emergency is proclaimed by the Director, the Board of Supervisors shall take action to ratify the proclamation within seven days thereafter or the proclamation shall have no further force or effect.

F. In the event of the proclamation of a state of emergency by the Governor, or the Director of California Office of Emergency Services (Cal OES), the existence of a state of war emergency, or when a local emergency as defined in Section 2.21.020 has been proclaimed to exist, the Director is empowered:

1. To make and issue rules and regulations on matters reasonably related to the protection of life and property as affected by the emergency; provided, however, the rules and regulations must be confirmed at the earliest practicable time by the Board of Supervisors.

2. To obtain vital supplies, equipment and such other properties found lacking and needed for the protection of life and property and to bind the County for the fair value thereof and, if required immediately, to commandeer them for public use.

3. To require the emergency services of any County officer or employee and, in the event of the proclamation of a state of emergency, to command the aid of as many citizens of the County as he or she deems necessary in execution of his or her duties. Such persons shall be entitled to all privileges, benefits, and immunities as are provided by state law for registered disaster service workers.

4. To requisition necessary personnel or material of any County department or agency.

5. To execute all of his or her ordinary power as Sheriff and all of the special powers conferred upon him or her by this statute, by any agreement approved by the Board of Supervisors, and by any other lawful authority.

Sec. 2.21.060. - Disaster Council—Created.

There is created the County of El Dorado Disaster Council.

State Law reference— Disaster Councils, Government Code § 8610.

Sec. 2.21.070. - Disaster Council—Membership.

Membership on the Disaster Council shall consist of the following:

A. The Director of the Office of Emergency Services or designee shall be Chair.

B. The El Dorado County Operational Area Fire and Rescue Coordinator or designee shall be Vice Chair. This position is appointed by the El Dorado County Fire Chiefs Association.

C. One representative or designee from each incorporated city within the County, to be appointed by the respective City Managers.

D. The Chief Administrative Officer of the County, or designee.

Sec. 2.21.080. - Disaster Council—Powers and duties.

The Disaster Council shall have the duty and the authority, and is so empowered to develop, review and recommend for adoption by the Board of Supervisors, emergency services plans and agreements. The Council shall also be responsible for recommendations of plans that pertain to state and local emergencies; it shall recommend revisions and updates to the County Emergency Operation Plan, Emergency and Mutual Aid Plan and agreements and recommending ordinances or resolutions which are necessary for the implementation of such plans and agreements. The Disaster Council shall also facilitate the exchange of information between emergency first responders and emergency planning personnel.

Fire Prevention (Chapter 8.08)

Section 020, Fire Hazards

This fire hazards ordinance requires all structures to maintain a fire break or clearing for a distance of 30 feet from the structure and keep the roofs free from all flammable debris. This part also sets requirements for burning permits, smoking restrictions in fire danger areas, and for the use and possession of fireworks.

Landscaping Standards (Chapter 130.33)

This Chapter identifies the use types which require the submittal of landscape plans, subject to the adopted Landscaping and Irrigation Standards (Resolution 198-2015), prior to the issuance of a building permit. Additionally, the Chapter contains landscaping standards to comply with the Water Conservation in Landscaping Act: Model Water Efficient Landscape Ordinance (California Government Code 65591—65599).

Development Impact Mitigation Fees for Special Districts (Chapter 13.20)

This chapter sets forth the requirements for the establishment and administration of development impact mitigation fees collected by the County on behalf of a Special District within the County. For purposes of this chapter, "Special District" includes a fire improvement district, a community services district, a recreation and park district, or any other public agency authorized by law to provide fire protection, public recreation, or any other community service. A Special District may request the establishment and administration of a development impact mitigation fee under this chapter only if the Special District lacks statutory authority to independently impose a development impact mitigation fee.

Grading, Erosion, and Sediment Control (Chapter 110.14)

The ordinance from which this chapter is derived is enacted for the purpose of regulating grading within the unincorporated area of the County to safeguard life, limb, health, property and public welfare; to avoid pollution of watercourses; and to ensure that the intended use of a graded site is consistent with the County general plan, any specific plans adopted thereto, the adopted stormwater management plan, State fire safe standards and applicable County ordinances including the zoning regulations set forth in Title 130 and the California Building Code.

This chapter establishes the administrative procedures for issuance of permits; and provides for approval of plans and inspection of grading construction. This chapter is not intended to supersede or otherwise preempt any applicable local, State, or Federal law or regulation. Where conflicts may occur between this chapter and such laws or regulations, the most restrictive shall apply.

Flood Damage Prevention Regulations (Chapter 130.32)

This Chapter implements General Plan Policy 6.4.1.1 requiring continued participation in the National Flood Insurance Program in order to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas. This Chapter serves to provide legally enforceable regulations applied uniformly throughout the community to all publicly and privately owned land within flood prone areas. These regulations are designed to:

1. Protect human life and health;

2. Minimize expenditure of public money for costly flood-control projects;

3. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

4. Minimize prolonged business interruptions;

5. Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone and sewer lines; and streets and bridges located in areas of special flood hazard;

6. Help maintain a stable tax base by providing for the sound use and development of special flood hazard areas so as to minimize future blighted areas caused by flood damage;

7. Ensure that potential buyers are notified that property is in a special flood hazard area;

8. Ensure that those who occupy the special flood hazard areas assume responsibility for their actions.

In order to accomplish its purposes, this Chapter includes regulations to:

1. Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion, or in flood heights or velocities;

2. Require that uses vulnerable to floods, including facilities that serve such uses, be protected against flood damage at the time of initial construction;

3. Control the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;

4. Control the filling, grading, dredging, and other development which may increase flood damage; and

5. Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

Subdivisions: Design Standards and Improvements (Chapter 120.04)

El Dorado County's subdivision ordinance regulates the design and improvement of land divisions and the dedication of public improvements needed in connection with land divisions. The ordinance includes provisions for the following hazard-related issues: erosion control, flooding and drainage, water supply, and fire suppression.

Zoning Ordinance (Chapter 130.10)

The purpose of the zoning ordinance is to classify and regulate the best use of buildings, structures, and land in the unincorporated area of El Dorado County in a manner consistent with the El Dorado County General Plan. This ordinance is designed to ensure management of land use in a manner that will assure the orderly development and beneficial use of the unincorporated areas of El Dorado County for residential, commercial, industrial, agricultural, forestry, open space and other purposes. To further these objectives, this ordinance includes requirements for reducing hazards to the public resulting from the inappropriate location, use or design of buildings and land uses in relation to natural and built hazards.

Building and Construction Codes Adopted (Title 110, Chapter 110.16)

The 2010 edition of the California Building Standards Code, known as the California Code of Regulations, Title 24, incorporating the following model codes, is adopted by reference with the general amendments set forth in Sections 110.16.020 through 110.16.170 and the amendments specific to each model code as noted:

- International Building Code, 2009 edition, published by the International Code Council including those sections of Appendix Chapter 1, Administration, not included above, with the additions, deletions and amendments set forth in Sections 110.16.020 through 110.16.140;
- Uniform Mechanical Code, 2009 edition, published by the International Association of Plumbing and Mechanical Officials with amendments set forth in Sections 110.16.150 and 110.16.160;
- Uniform Plumbing Code, 2009 edition, published by the International Association of Plumbing and Mechanical Officials with amendments set forth in Section 110.16.170;
- California Existing Building Code, 2007 edition, Appendix Chapter 1A Seismic Strengthening Provisions for Unreinforced Masonry Bearing Wall Buildings;

- International Fire Code, 2009 edition, published by the International Code Council;
- National Electrical Code, 2008 edition, published by the National Fire Protection Association;
- International Existing Building Code, 2006 edition, published by the International Code Council.

State and Federal Programs

In El Dorado County, a number of state and federal programs exist to provide technical and financial assistance to local communities for hazard mitigation. Some of the primary agencies/departments that are closely involved with local governments in the administration of these programs include:

- California Governor's Office of Emergency Services
- State of California Multi-Hazard Mitigation Plan
- California Department of Water Resources
- California Department of Forestry and Fire Protection (CAL FIRE)*
- California Environmental Protection Agency
- California Department of Fish and Game*
- California State Parks and Recreation Department*
- California State Lands Commission*
- Federal Emergency Management Agency (Region IX)
- U.S. Army Corps of Engineers*
- Bureau of Reclamation*
- USDA Forest Service*
- National Parks Service*
- USDA Natural Resources Conservation Service*
- U.S. Environmental Protection Agency (Region IX); and
- American Red Cross

*Owns and/or manages land and/or facilities (or has some sort of administrative role, e.g., fire protection) in the County; potential partner for mitigation activities

El Dorado County Sheriff's Office of Emergency Services

The El Dorado County Sheriff's Office of Emergency Services (OES) is the emergency management agency for El Dorado County. El Dorado County OES is headquartered in Placerville, the County seat. The office provides service countywide, in cooperation with cities and special districts, such as the fire department and law agencies.

OES' responsibilities include:

- Managing the County's overall response to natural and human-caused disasters;
- Assigning emergency responsibilities to the various departments of the County;
- Coordinating the response and recovery efforts of governmental and non-governmental agencies during disasters;
- Managing the County's Emergency Operations Center; and
- Conducting emergency drills and simulations.

OES also provides updated emergency-related information to the public on the County's website. This site provides weather and flooding information, which includes guidance on protecting your home from winter storms, where to get sandbags, preparation for what to do before, during and after floods, etc. Also provided are links to national, state, and local information on fires, earthquakes, highway and road information, and general federal and state emergency information.

NIMS Compliance

The Board of Supervisors officially adopted NIMS Compliance requirement for the County in 2005, which makes El Dorado County in compliance with federal guidance. El Dorado County OES also participates in annual NIMSCAST to update progress. The county has adopted and has used ICS since the late 1990s. As ICS is a core component of the NIMS compliance this contributed significantly to meeting the requirement.

Surveyor's Office and Geographic Information Systems (GIS)

The Surveyor's Office and GIS provides surveying review/oversight for private development projects within the unincorporated areas of El Dorado County. This office also assigns road names and addresses. The GIS system helps manage and integrate data with maps. They are responsible for maintaining computerized maps of parcels, roads, and political jurisdictions in El Dorado County.

El Dorado County Building Department

To help assure building safety, the Building Department works with local residents, builders, and developers to be sure residential and commercial building in the unincorporated area of the County meets County building codes. The department:

- Issues building permits for commercial and residential building
- Conducts building plan checks and inspections, including a third-party plan review option; and
- Assists the public with building concerns, and code enforcement issues.

El Dorado County Planning Department

The El Dorado County Planning Department provides information on land development, zoning, reviews and makes recommendations on land development applications, helps the Board of Supervisors and Planning Commission plan for growth by providing professional and technical expertise, leads the preparation of Community Plans as well as Countywide plans which set the guidelines for future growth, and enforces Chapter 17 (Zoning Ordinance) of the County Code. The department is also responsible for floodplain administration and administers the National Flood Insurance Program (NFIP) for unincorporated areas of the County. The NFIP is a FEMA program that makes flood insurance available to communities that have enacted local ordinances restricting development within the 100-year floodplain.

El Dorado County Department of Transportation

The Department of Transportation (DOT) is responsible for the funding, planning, designing, building, operating and maintaining the County Road System (CRS). The County Road System currently consists of approximately 1083 centerline miles of paved roadway, 76 bridges, a multitude of storm drainage systems and related transportation facilities. DOT is also responsible for management of the tree mortality program. The primary priorities of the Department of Transportation are:

1. Public safety - ensuring that our roads are safe for public use with due care in a manner in which it is reasonably foreseeable that they will be used.

2. Preservation of infrastructure - preserving and maintaining the public's multi-billion dollar investment in our roads, bridges and other facilities associated with the CRS.

El Dorado County Environmental Management Department

The Environmental Management Department maintains and oversees wastewater and solid waste issues for the County. The Division maintains sewer lines, cleans sewers, and operates and maintains wastewater treatment plants (WWTPs) operated by the County. The WWTPs fall under the regulatory oversight of the State and Regional Water boards. Facility permits limit the amount of wastewater processed and quality of treated discharged water. The Division also administers the countywide solid waste management program. The facilities fall under the regulatory oversight of the California Department of Resource Recycling and Recovery (CalRecycle) and the State and Regional Water Boards.

In a disaster, the CIWMB permitting regulations allow for an Emergency Waivers of Standards as allowed under Title 14, California Code of Regulations (14 CCR), Division 7, Chapter 3, Article 3, Section 17210 et seq. Specifically, the waiver enables an operator of an existing permitted solid waste facility to accept disaster debris and other non-hazardous wastes, in a manner not consistent with the terms and conditions of the relevant solid waste facility permit, during the recovery phase of a state of emergency or local emergency. Under emergency conditions, the normal processing and disposal options may not be feasible or sufficient to handle the overwhelming amount of debris left after a disaster.

Special Districts

There are numerous special districts that provide a variety of public services in El Dorado County. Special districts can provide one or more types of public services, facilities, or infrastructure within a prescribed boundary, and they play an important role in growth management because the availability of their services can encourage or discourage new development. Special districts can tax the properties within their boundaries to pay for the services they provide. Monthly fees may also be assessed. Some of the special districts that provide mitigation-related services in El Dorado County are presented below.

El Dorado County Fire Protection Districts

Fire protection districts provide a variety of services, which may include fire protection, rescue, emergency medical, hazardous material emergency response, and ambulance services.

El Dorado County Irrigation District (EID), South Tahoe Public Utility District (STPUD), Georgetown Public Utility District (GPUD) and other Public Utility Districts

Irrigation districts provide water for irrigation to users within their boundaries. They may also use water under their control for other beneficial purposes and provide flood protection measures.

El Dorado County Water Districts

Water districts' powers may include the acquisition and operation of works for the production, storage, transmission, and distribution of water for irrigation, domestic, industrial, and municipal purposes as well as any related drainage or reclamation works.

El Dorado County Resource Conservation Districts

Resource conservation districts address a wide variety of conservation issues such as forest fuel management, water and air quality, wildlife habitat restoration, soil erosion control, conservation education, and much more.

El Dorado County Community Service Districts

Several communities have organized into community service districts. They serve as independent local government use to provide services in unincorporated areas of the county.

El Dorado County Office of Education (EDCOE)

The El Dorado County Office of Education is supports the diverse educational needs of El Dorado County's student population not only in schools but throughout the community. EDCOE facilitates collaboration that maximizes resources for school districts and the county alike.

Other County Associations/Groups

American River Conservancy

The American River Conservancy serves our communities by ensuring healthy ecosystems within the Upper American and upper Cosumnes River Watersheds through land conservation, stewardship and education.

South Fork American River Cohesive Strategy Group (SOFAR)

Through the open and transparent collaboration among a dedicated group of diverse members, and using the best-available science, the Collaborative will promote a healthy, productive forest ecosystem across all lands. On a watershed scale, we will work to create a fire-resilient ecosystem that supports viable populations of all native species, sustainable fisheries, functioning and restored watersheds and water quality, protected cultural resources, and diverse recreational opportunities.

The Collaborative will make steady progress towards the three primary goals of the National Cohesive Strategy: Restoring and maintaining resilient landscapes, creating fire-adaptive communities, and responding to wildfires.

El Dorado County Fire Chief's Association

The El Dorado County Fire Chiefs' Association is comprised of fire chiefs located in El Dorado County. A primary purpose of the group is to develop the administrative abilities of fire chiefs of El Dorado County, and to act as an advisory association to all governmental agencies as it pertains to fire protection and emergency services in El Dorado County. As part of their efforts, they provide aid in the training, preparation, and coordination, prior to, during, and after a catastrophic emergency.

Lake Tahoe Regional Fire Chiefs' Association

Similar to the El Dorado County Fire Chiefs' Association, this association is comprised of fire chiefs located in the Lake Tahoe basin area.

El Dorado County Fire Safe Council

Their mission is "to protect the people of El Dorado County and their property from the effects of catastrophic wildfire through education, cooperation, innovation, and action." The council was organized in September 2001 and currently has over 150 individuals from the public and private sectors on our Council Communication Network who are committed to making El Dorado County more fire safe. Through community outreach and public education, we endeavor to make residents of the County aware of the risks of living within a Wildland Urban Interface and what they do to protect their home and property from wildfire. The Council and its partners have implemented many fire safe projects in the County, including the chipper program, defensible space inspections, and vegetation reduction projects.

Local Fire Safe Councils assist in educating Californians to protect their homes, communities, and environments from wildfire. These councils serve as forums for stakeholders to share and validate fire safety and fire planning information. There are fifteen active Fire Safe Councils in El Dorado County:

- Auburn Lake Trails FSC;
- Coloma-Lotus FSC;
- Cool-Pilot Hill FSC;
- Georgetown FSC;
- Grizzly Flats FSC;
- Lakehills FSC;
- Logtown FSC;
- Mosquito FSC;
- Patterson Ranch FSC;
- Pleasant Valley-Grange FSC;
- Pollock Pines-Camino FSC;
- Royal Equestrian FSC;
- Sandridge-Nashville FSC;
- Sierra Springs FSC, and;
- Volcanoville FSC.

El Dorado County Water Agency

El Dorado County Water Agency is the trusted, county-wide leader on water-resource issues, representing the long-term interest of our community, purveyors and residents through a dedicated team of professionals, responsive and accountable to the public we serve.

The establishment of the El Dorado County Water Agency allows the agency to develop a countywide water plan and to participate in statewide water planning. The agency is empowered to negotiate contracts with the Department of Water Resources, the U.S. Bureau of Reclamation and other local, state and federal agencies for water management and facility construction.

El Dorado County and Georgetown Divide Resource Conservation District (RCD)

Resource Conservation Districts are grassroots government organizations that advise and assist individual landowners and public agencies in planning and implementation of conservation practices for the protection, restoration, or development of land, water, and related natural resources.

The El Dorado County Resource Conservation District (1940) and the Georgetown Divide Resource Conservation District (1953) - (RCD's) are local, independent, non-enforcement, non-regulatory, self-governed districts organized under Division 9 of the Public Resources Code. Each District has a five member board of directors who serve without compensation for a four year term period.

Each RCD advises and assists individual landowners and public agencies in planning and implementation of conservation practices for the protection, restoration, or development of land, water, and related natural resources.

Tahoe Regional Planning Agency

Lake Tahoe is a magnificent blue body of water that is threatened by environmental degradation. Its famed clarity has steadily been declining due to human impact. The Tahoe Regional Planning Agency (TRPA) is charged with protecting this national treasure for the benefit of current and future generations. Its vision is to have a lake and environment that is clean, healthy, and sustainable for the community and future generations.

TRPA core values include environmental protection, public service and professionalism, teamwork and collaboration, communication, and management. TRPA worked with the Nevada Fire Safe Council, University of Nevada Cooperative Extension, and local fire districts to produce a guide to creating defensible space in Lake Tahoe's fragile environment.

The TRPA operates under the authority of the states of California and Nevada and the federal government through the Bi-State Compact, which was ratified by Congress and signed by the President of the United States. To implement the direction of the Compact, TRPA uses two main tools to protect and restore Lake Tahoe:

- An Environmental Improvement Program that implements restoration projects to heal past damage to the ecosystem
- A regulatory program that works to minimize the impact of developed properties on the watershed

Although the Compact designates TRPA as the leader of environmental standards in the Basin, we work in cooperative partnership with other organizations, agencies, and many private property owners to implement the programs above. Programs such as Aquatic Invasive Species and Forest Fuel Reduction are good examples of how partnerships in the Tahoe Basin are driving public safety improvements, environmental protection and restoration.

TRPA receives direction on decisions from a 15-member Governing Board, a 21-member Advisory Planning Commission as well as many stakeholders and members of the public like you. The Agency also reports on our activities regularly to the Nevada and California state legislatures.

Agricultural Commissioner

The Agricultural Commissioner is dedicated to assisting the residents of El Dorado County through our various programs and services, including, but not limited to: pesticide registration and regulation, nursery inspections and compliance, organic production, pest detection, weed abatement, crop statistics, wildlife services, land use information, and consumer and business protection through our weights and measures program.

El Dorado County Planning Commission

The Planning Commission is the Board's advisor on land use planning. The Commission reviews matters related to planning and development (e.g., specific plans, rezoning, use permits, and subdivisions). Depending upon provisions in the County Code, the Commission either approves/denies or makes recommendations to the Board regarding land use proposals.

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Chapter 4 Mitigation Strategy

Requirement §201.6(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the mitigation strategy process and mitigation action plan for the El Dorado County Local Hazard Mitigation Plan Update.

Mitigation strategies are supported by state government and federal programs, in line with the Disaster Mitigation Act. The need for hazard mitigation has become more recognized over the past few years due to the large number of natural hazards which have occurred in the U.S. and the increase in the costs to achieve post disaster recovery. Money spent prior to a hazardous event to reduce the impacts of a disaster can result in substantial savings in life and property following the event. The benefits of implementing a mitigation program usually far outweigh the costs. Because of this, the Federal Emergency Management Agency (FEMA) and the states have developed national and state Mitigation strategies and funding is becoming increasingly more available to support hazard mitigation efforts.

The advantages of developing a local LHMP program are numerous and include:

- Guidance in developing pre and post mitigation plans;
- Identifying priority projects and programs for funding; and
- Increasing the likelihood of State and Federal funding for pre- and post-hazard mitigation projects.

PLANNING and PRIORITIZATION PROCESS:

The data used to build the mitigation strategies and priorities was acquired through several sources and they include:

- Collecting data from previous disaster events that have occurred here and in similar jurisdictions;
- Actively engaging community members, and public agency representatives at scheduled-publicized meetings to identify and prioritize the hazards that exist, and what can, and should be done to eliminate, and or minimize these hazards; and
- An analysis of mitigation strategies that have proven to be cost effective in eliminating, and

or mitigating the effects of disaster events.

- Participation in our regularly scheduled multi-agency/disciplinary Disaster Council meetings where this subject has been an ongoing matter for discussion.
- Participation in the Bi-State Governor's Commission on the Angora Fire in South Lake Tahoe.
- Creation of a Multi-agency-disciplinary LHMP Planning Team.

Following a thorough hazard, risk and vulnerability analysis by all who have participated in this effort, mitigation strategies were then developed to eliminate, and/or mitigate the dangers that exist to life and property. When participants (Community members, first responders, Disaster Council, LHMP Planning Team) were asked to identify and rate in priority the hazards they had identified, there was a very clear consensus that wildfire was number one (1), with flooding number two (2), threats from avalanche and rock slides being number three (3)

Mitigation Strategy: Overview

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the hard work of the HMPC led to the mitigation strategy and mitigation action plan for this LHMP Update. As part of the plan update process, a comprehensive review and update of the mitigation strategy portion of the plan was conducted by the HMPC. Some of the initial goals and objectives from the 2012 plan were refined and reaffirmed, and others were added. The end result was a new set of goals, reorganized to reflect the status of 2012 actions, the updated risk assessment and the new priorities of this Plan Update. To support the new LHMP goals, the mitigation actions from 2012 were reviewed and assessed for their value in reducing risk and vulnerability to the planning area from identified hazards and evaluated for their inclusion in this Plan Update. The sections below identify the new goals and objectives of this Plan Update and detail the new mitigation action plan.

Taking all of the above into consideration, the HMPC developed the following umbrella mitigation strategy for this LHMP Update:

Communicate the hazard information collected and analyzed through this planning process as well as HMPC success stories so that the community better understands what can happen where and what they themselves can do to be better prepared.

- Implement the action plan recommendations of this plan.

- Use existing rules, regulations, policies, and procedures already in existence.
- Monitor multi-objective management opportunities so that funding opportunities may be shared and packaged and broader constituent support may be garnered.

Continued Compliance with NFIP

Given the flood hazard in the planning area, an emphasis will be placed on continued compliance with the National Flood Insurance Program (NFIP) by all communities and participation by El Dorado County and others, as appropriate, in the Community Rating System (CRS). Detailed below is a description of El Dorado County's flood management program to ensure continued compliance with the NFIP. Also to be considered are the numerous flood mitigation actions contained in this LHMP that support the ongoing efforts by the county to minimize the risk and vulnerability of the community to the flood hazard and to enhance their overall floodplain management program. A summary of the flood management programs and continued compliance with the NFIP for the incorporated communities are detailed in their jurisdictional annexes.

El Dorado County's Flood Management Program

El Dorado County is participated in the NFIP. Since then, the County has administered floodplain management regulations that meet the minimum requirements of the NFIP. Under that arrangement, residents and businesses paid the same flood insurance premium rates as most other communities in the country.

The County will continue to manage their floodplains in continued compliance with the NFIP. An overview of the County's NFIP status and floodplain management program are discussed on Table 4-1.

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	Not Applicable to El Dorado County – Non-jurisdictional
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	Not Applicable to El Dorado County – Non-jurisdictional

How many structures are exposed to flood risk within the community?	Unknown
Describe any areas of flood risk with limited NFIP policy coverage	Not Applicable to El Dorado County – Non-jurisdictional
Is the Community Floodplain Administrator or NFIP Coordinator certified?	Not at this time, but the County is pursuing certification for at least one Planning staff.
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	In El Dorado County, the Planning Director is the Flood Zone Administrator. Planning staff, through the power of delegation from the Planning Director, implement the Flood Zone Ordinance, Chapter 130.32 (Flood Damage Prevention) of Title 130 of the El Dorado County Code of Ordinances. The flood ordinance offers multiple remedies to document, identify, and mitigate potential flood impacts when a Special Flood Hazard Area (SFHA)/Flood Zone is in the vicinity of a proposed project, whether ministerial or discretionary. Parcels are flagged in multiple databases for the potential SFHA/Flood Zone review. The first test of flood review is to determine whether a parcel is actually in a SFHA. Should insufficient information exist to make a determination of whether the project is in or out of a SFHA/Flood Zone flood, a Flood Elevation Certificate (FEC) is generally required, although under the ordinance, other forms of documentation/mitigations may be acceptable. If a FEC is required, one must be received prior to building permit issuance and prior to finalizing.

	Multiple databases contain SFHA/Flood Zone information but they are all based upon GIS data from FEMA. Selected studies have been done in limited areas that supplement this information (e.g., Cameron Park Drainage Studies). Inspections are done by building inspectors in the field as determined by the flood review mitigations from the building permit application's approval. Under the Flood Ordinance, BMPs under Building Codes can be used to mitigate required flood proofing/flood resistance. Historically, SFHA/ Flood Zone work/documentation was inconsistent at best. However, within the past 6-10 years, the County has begun to keep better records of flood correspondence/flood information to facilitate/assist citizens for/on past SFHA/Flood Zone work.
What are the barriers to running an effective NFIP program in the community, if any?	Community resistance to the NFIP requirements.
Compliance History	
Is the community in good standing with the NFIP?	Unknown
Are there any outstanding compliance issues (i.e., current violations)?	None that we are aware of at this time.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	The last CAV was August 13, 2014.
Is a CAV or CAC scheduled or needed?	The County has not been notified of the need to schedule a CAV or CAC.

Regulation	
When did the community enter the NFIP?	Unknown
Are the FIRMs digital or paper?	Digital – FEMA provides an interactive mapping service which is accessible from the County's website: http://gem.edcgov.us/ugotnet/ [Layer List, select FEMA NFHL, NFHL Availability, FIRM Panels]; also available on the FEMA website; paper is limited to non-digitized historical maps
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet FEMA and the State's minimum requirements.
Provide an explanation of the permitting process.	When a parcel is flagged for SFHA/Flood Zone review, the first test of flood review is to determine whether a parcel is actually in a SFHA/Flood Zone. If insufficient information is available to remove the proposed project from the SFHA/Flood Zone, a FEC is generally required. If the FEC confirms the project is in a SFHA/Flood Zone, mitigations are required to be shown in the building permit application. If a FEC is required, as part of mitigations or to demonstrate the project being outside the SFHA/Flood Zone, one must be received prior to building permit issuance & prior to finaling. Inspections are done by building inspectors in the field as determined by the flood review mitigations from the building permit application's approval.

Community Rating System	
Does the community participate in CRS?	No
What is the community's CRS Class Ranking?	Not Applicable
What categories and activities provide CRS points and how can the class be improved?	Not Applicable
Does the plan include CRS planning requirements?	Not Applicable

Source: FEMA/El Dorado County

Goals and Objectives

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Up to this point in the planning process, the HMPC has organized resources, assessed hazards and risks, and documented mitigation capabilities. The resulting goals, objectives, and mitigation actions were developed based on these tasks.

During the initial goal-setting meeting, the HMPC reviewed the results of the hazard identification, vulnerability assessment, and capability assessment. This analysis of the risk assessment identified areas where improvements could be made and provided the framework for the HMPC to formulate planning goals and objectives and to develop the mitigation strategy for the El Dorado County Planning Area.

Goals were defined for the purpose of this mitigation plan as broad-based public policy statements that:

- Represent basic desires of the community;
- Encompass all aspects of community, public and private;
- Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
- Are future-oriented, in that they are achievable in the future; and
- A time-independent, in that they are not scheduled events.

Goals are stated without regard to implementation. Implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. Goal statements form the basis for objectives and actions that will be used as means to achieve the goals. Objectives define strategies to attain the goals and are more specific and measurable.

HMPC members were provided with the list of goals from the 2012 plan as well as a list of other sample goals to consider. New goals from the HMPC were discussed until the team came to consensus. Some of the statements were determined to be better suited as objectives or actual mitigation actions and were set aside for later use. Next, the HMPC developed objectives that summarized strategies to achieve each goal.

Based on the risk assessment review and goal setting process, the HMPC identified the following goals and objectives, which provide the direction for reducing future hazard-related losses within the El Dorado County Planning Area.

Goal 1: Minimize risk and vulnerability of El Dorado County to the impacts of natural hazards; protect lives, public health and safety; and, reduce damages and losses to property, economy, and the environment.

- Minimize economic and resource impacts and promote long-term viability and sustainability of County resources
- Minimize impacts to both existing and future development from all hazards (through well-planned communities)
- Minimize impacts to natural and cultural resources
- Minimize impacts from climate change
- Minimize impacts to watersheds/Promote watershed health
- Reduce wildland fire risk and related losses
- Reduce flood risk and related damages, with a focus on repetitive loss structures and infrastructure

Goal 2: Provide protection for critical facilities, infrastructure, utilities and services from hazard impacts.

- Provide protection for critical infrastructure from the wildland fires, floods, and severe storms/weather (e.g., repeaters, cell towers, waters tanks, utilities)
- Improve infrastructure/system reliability for critical lifeline utilities, including storm water systems, roadways (evacuation routes, emergency services and supplies); rail lines, and pipelines
- Minimize risk of loss of life and injury to At-risk Populations

Goal 3: Improve public awareness, education, and preparedness for all hazards.

- Enhance public outreach, education, and preparedness program to include all hazards of concern (e.g. fire restrictions, water conservation measures, hazardous vegetation, air and water quality issues)
- Increase public knowledge of the risk and vulnerability to identified hazards and their

recommended responses to disaster events to reduce losses

- Educate general public on evacuation planning and sheltering options for all hazard types and to encompass all groups (e.g., residents, visitors, second homeowners, vulnerable populations, animals)
- Increase community awareness and participation in hazard mitigation activities to include defensible space, hazardous vegetation abatement projects, and forest management projects and practices to reduce flood risk on private property
- Utilize multiple public outreach avenues such as schools, new technologies, and social media
- Coordination with other regional jurisdictions to facilitate (consistent/coordinated) public information function prior to, during and after an event (e.g., facebook, twitter, web, tv, radio)

Goal 4: Increase communities' capabilities to mitigate losses and to be prepared for, respond to, and recover from a disaster event.

- Continued enhancements to Emergency Services capabilities integrating new technologies to reduce losses and save lives
- Improve interagency (local, state, federal) emergency coordination, planning, training, exercising, and communication to ensure effective community preparedness, response and recovery
- Improve interagency coordination with respect to implementation of mitigation activities such as fuels reduction and other multi-jurisdictional wildland fire projects
- Enhance the use of shared resources/Develop a strong mutual aid support system
- Maintain current service levels/provide for enhanced service levels
- Increase first responders awareness of vulnerable populations and other priority needs during a hazard event;(use of technology to pre-identify and communicate)
- Utilize lessons learned (debriefing) to improve response capabilities
- Promote efficient recovery from incidents to minimize impacts to lives, environment, and economy

Goal 5: Maintain FEMA Eligibility/Position the communities for grant funding.

- Continued compliance with the NFIP/enhancement of floodplain management program through participation in the NFIP's Community Rating System (CRS) where feasible.

Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In order to identify and select mitigation actions to support the mitigation goals, each hazard identified was evaluated. Only those hazards that were determined to be a priority hazard were considered further in the development of hazard-specific mitigation actions.

These priority hazards (in alphabetical order) are:

- Avalanche
- Dam Failure
- Debris Flow
- Drought
- Earthquake
- Erosion
- Flood: 100/500 year
- Flood: Localized Stormwater Flooding
- Seiche (Lake Tsunami)
- Severe Weather
- Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning/Wind/Tornadoes)
- Wildfire

It is important to note, however, that all the hazards addressed in this plan are included in the countywide multi-hazard public awareness mitigation action as well as in other multi-hazard, emergency management actions.

The HMPC was provided with examples of potential mitigation actions for each of the above categories. The HMPC was also instructed to consider both future and existing buildings in considering possible mitigation actions. Also utilized in the review of possible mitigation measures is FEMA's publication on Mitigation Ideas, by hazard type. Prevention type mitigation alternatives were discussed for each of the priority hazards. This was followed by a brainstorming session that

generated a list of preferred mitigation actions by hazard.

Prioritization Process

Once the mitigation actions were identified, the HMPC was provided with several decision-making tools, including FEMA's recommended prioritization criteria, STAPLEE sustainable disaster recovery criteria; Smart Growth principles; and others, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLEE stands for the following:

- **Social**: Does the measure treat people fairly? (e.g., different groups, different generations)
- **Technical**: Is the action technically feasible? Does it solve the problem?
- **Administrative**: Are there adequate staffing, funding, and other capabilities to implement the project?
- **Political**: Who are the stakeholders? Will there be adequate political and public support for the project?
- **Legal**: Does the jurisdiction have the legal authority to implement the action? Is it legal?
- **Economic**: Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- **Environmental**: Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining action priority. Other criteria used to assist in evaluating the benefit-cost of a mitigation action includes:

- Contribution of the action to save life or property
- Availability of funding and perceived cost-effectiveness
- Available resources for implementation
- Ability of the action to address the problem

In addition to reviewing and incorporating the actions from the 2012 plan, the committee also considered and defined several new actions.

Benefit-cost was also considered in greater detail in the development of the Mitigation Action Plan detailed below. The cost-effectiveness of any mitigation alternative will be considered in greater

detail through performing benefit-cost project analyses when seeking FEMA mitigation grant funding for eligible actions associated with this plan.

Recognizing the limitations in prioritizing actions from multiple jurisdictions and departments and the regulatory requirement to prioritize by benefit-cost to ensure cost-effectiveness, the HMPC decided to pursue actions that contributed to saving lives and property as first and foremost, with additional consideration given to the benefit-cost aspect of a project. This process drove the development of a determination of a high, medium, or low priority for each mitigation action, and a comprehensive prioritized action plan for the El Dorado County Planning Area.

Mitigation Action Plan

Requirement §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This action plan was developed to present the recommendations developed by the HMPC for how the El Dorado County Planning Area can reduce the risk and vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Emphasis was placed on both future and existing development. The action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action summary also includes a discussion of the benefit-cost review conducted to meet the regulatory requirements of the Disaster Mitigation Act.

Table 4-1 identifies the mitigation actions and lead jurisdiction for each action. In general, those actions where the County is the lead jurisdiction are detailed further in this section. Actions specific to other participants, or where other participants are taking the lead, are detailed in each respective participants' annex to this plan.

The action plan detailed below contains both new action items developed for this Plan Update as well as old actions that were yet to be completed from the 2012 plan. Table 4-1 indicates whether the action is new or from the 2012 plan.

It is important to note that El Dorado County and the participants have numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents, such as community wildfire protection plans/fire plans, storm water plans and capital improvement budgets and reports. These actions are considered to be part of this plan, and the details, to avoid duplication, should be referenced in their original source document. The HMPC also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this plan.

Further, it should be clarified that the actions included in this mitigation strategy are subject to

further review and refinement; alternatives analyses; and reprioritization due to funding availability and/or other criteria. The participants are not obligated by this document to implement any or all of these projects. Rather this mitigation strategy represents the desires of the community to mitigate the risks and vulnerabilities from identified hazards. The actual selection, prioritization, and implementation of these actions will also be further evaluated in accordance with the

It should be noted that the projects submitted by each jurisdiction in Table 4-1 benefit all participants whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority.

Table 4-1 El Dorado County Planning Area's Mitigation Actions

El Dorado County Multi-Hazard Actions						
Action Title	Lead Jurisdiction	New Action/ 2012 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Multi-Hazard Actions						
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	El Dorado County	New action	X	X		Prevention Public Information
Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	El Dorado County and all jurisdictions	New Action	X	X	X	Public Information
Debris Management Plan	El Dorado County	2012 Action	X	X	X	Prevention Emergency Services
Avalanche Actions						
Map Community Risk	El Dorado County	New action	X	X		Property Protection Natural Resource Protection
Dam Actions						
Map Community Risk	El Dorado County	2012 action	X	X	X	Property Protection Natural Resource Protection
Drought Actions						
Retrofit of High Water Use Landscape & Irrigation	El Dorado County	New action	X	X		Property Protection Natural Resource Protection
Drought Public Education and Outreach	El Dorado County	New action	X	X		Public Information

Action Title	Lead Jurisdiction	New Action/ 2012 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Earthquake Actions						
Incorporate Earthquake Mitigation into Local Planning	El Dorado County	2012 Action	X	X		Prevention Property Protection
Erosion Actions						
Stabilize Erosion Hazard Areas (e.g. Highway 50, Happy Valley, Rock Creek Road, etc.)	El Dorado County	New action	X	X	X	Property Protection Natural Resource Protection
Flood Actions						
Enhance Flood Mitigation through Local Planning	El Dorado County	2012 Action	X	X	X	Property Protection Natural Resource Protection
Limit or Restrict Development in Flood Plain Areas	El Dorado County	New action	X	X	X	Property Protection Natural Resource Protection

Action Title	Lead Jurisdiction	New Action/ 2012 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Seiche						
Map and Assess Vulnerability to Seiche	El Dorado County	2012 Action	X	X		Prevention Property Protection Natural Resource Protection
Severe Weather/Extreme Temperatures						
Increase Awareness of Extreme Temperature Risk and Safety	El Dorado County	2012 Action	X	X		Public Information
Severe Weather/Thunderstorms						
Protect Critical Facilities and Equipment	El Dorado County	2012 Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	Lead Jurisdiction	New Action/ 2012 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Wildfire Actions						
Wildfire Public Education	El Dorado County	2012 Action	X	X		Public Information
Defensible Space Programs	El Dorado County	2012 Action	X	X		Prevention Property Protection
Large Strategic Fuel Breaks	El Dorado County	2012 Action	X	X		Prevention Property Protection Natural Resource Protection
Fuel Breaks in the Wildland Urban Interface (WUI)	El Dorado County	2012 Action	X	X		Prevention Property Protection Natural Resource Protection
Subsidence Actions						
Map and Assess Vulnerability to Subsidence	El Dorado County	New	X	X		Prevention Property Protection Natural Resource Protection

Multi-Hazard Actions

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan. To remain in compliance with AB 2140, the LHMP will be integrated into El Dorado County's General Plan. Meetings and planning sessions with the Planning Department will occur to ensure compliance.

Hazards Addressed: All hazards

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: El Dorado County Planning Department, Board of Supervisors

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Priority (H, M, L): High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local budgets

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Schedule: As soon as possible

Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

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Hazards Addressed: All hazards with hazard-specific actions

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: El Dorado County, its incorporated jurisdictions, and special districts are participating jurisdictions to the El Dorado County Local Hazard Mitigation Plan Update. Each jurisdiction plays a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The County, cities, and special districts will work with other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will consider:

- Using a variety of information outlets, including social media, websites, local radio stations, news media, schools, and local, public sponsored events;
- Developing public-private partnerships and incentives to support public education activities.

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing County, City, and other special district outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office: El Dorado County, Cities, and all other participating jurisdictions

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Priority (H, M, L): High

Cost Estimate: Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding: Local budgets, grant funds

Schedule: Ongoing/Annual public awareness campaign

Action 3. Debris Management Plan. El Dorado County has a debris management plan that will be revised based on information learned from recent fires and disasters.

Hazards Addressed: Multi Hazard

Goals Addressed: 3, 4, 5

Issue/Background: El Dorado County has experienced wildfires and flooding in which debris is an issue that needs to be addressed.

Other Alternatives: None.

Existing Planning Mechanism(s) through which Action Will Be Implemented: El Dorado County has a disaster debris management plan from the Angora, Sand and King fires.

Responsible Office/Partners: El Dorado County, Environmental Management, HazMat

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Project Priority: High

Cost Estimate: $125,000

Benefits (Losses Avoided): Decrease emergency response time in public open space areas. Educate trail users in hazard avoidance and readiness planning.

Potential Funding: Local Budgets, Grants, Development Fees, other

Timeline: 2020 through 2022

Avalanche Actions

Action 4. Assess Critical Infrastructure Risk. El Dorado County will work with Cal Trans and County Departments to assess and map avalanche vulnerabilities along the Highway 50 corridor.

Hazards Addressed: Avalanche

Goals Addressed: 1, 2, 3, 5

Issue/Background: Avalanche hazards do exist each winter in the upper elevations of eastern El Dorado County. The majority of the El Dorado Irrigation District's (EID) water and wastewater treatment facilities, pump station, storage tanks, and reservoirs are all in the lower elevation on flatter terrain where the potential of avalanche damage is negligible to non-existent. However, EID's hydro-water conveyance system, for consumptive water, firefighting and power generation purposes, includes 17,000 linear feet of above grade wooden and concrete flumes, much of which is located on steep slopes in the higher elevations of the Sierras and susceptible to avalanche hazards and damage. 13 sections of flume along with a section of above grade pipeline located below Echo Lake have been identified as susceptible to hazard.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: EID Capital Improvement Plan

Responsible Office/Partners: El Dorado County Irrigation District

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Project Priority: High

Cost Estimate: $136,000,000.00

Benefits (Losses Avoided):

Potential Funding: Pre-Disaster Mitigation Grant Program, Hazard Mitigation Grant Program, Emergency Management Performance Grant Program, El Dorado Irrigation District.

Timeline: Ongoing.

Dam Actions
Action 5a. Map Community Risk

Hazards Addressed: Dam Inundation

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: Damn inundation hazards have been identified as a low frequency event that can have both a low and a high impact potential.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Continue to incorporate into the County's General Plan Enforcement of Objective 6.4.2 Dam Inundation to identify and mitigate hazards, and utilize the Code Red System technology to warn vulnerable populations.

Responsible Office/Partners: El Dorado County, SMUD, and EID

Project Priority: Low to medium

Cost Estimate: Staff time to identify hazards and plan for mitigation strategies. The cost of the Code Red System is approximately ten thousand dollars per year.

Benefits (Losses Avoided): Protect underground utilities and public road.

Potential Funding: County, Special Districts Budgets, public and private owners of dams. Some of these costs may be eligible for reimbursement through the Emergency Management Performance Grants.

Timeline: Ongoing

Drought Actions
Action 5b. Retrofit of High Water Use Landscape & Irrigation

Hazards Addressed: Drought, Fire Risk

Goals Addressed: 1, 2, 4

Issue/Background: El Dorado County maintains acres of landscaped grounds in addition to playable turf areas. Much of that acreage consists of ornamental lawn and other high water use plantings or outdated inefficient irrigation. Retrofit of these areas will be prioritized and completed on a site by site basis as funding becomes available. Other local agencies and districts within El Dorado County face a similar water usage situation.

Other Alternatives: Continue unsightly 'brown-out' conditions of existing landscape (leading to increased fire risk) during drought conditions. Currently implementing low water landscape standards for all new development.

Existing Planning Mechanism(s) through which Action Will Be Implemented: A selection process for an irrigation and landscape retrofit development team has been completed.

Responsible Office/Partners: El Dorado County Department Facilities and Parks, Incorporated Cities, Special Districts who maintain landscape areas

Project Priority: Medium

Cost Estimate: $15,000,000

Benefits (Losses Avoided): Decreased water usage. Fire risk reduction during drought.

Potential Funding: Grants, General Funds, Assessments, other

Timeline: Ongoing

Action 6. Drought Public Education and Outreach (Public Information)

Hazard Addressed: Drought

Goals Addressed: 1, 3, 4, 5

Issue/Background: The project involves public outreach and education the small community of Outingdale, CA served by wells and has experienced water shortages. The ongoing drought has had numerous impacts on the County. In addition, the state was in a State of Emergency due to the drought. One key method to conserve groundwater is to reduce water uses in homes and landscaping.

Other Alternatives: No outreached or education to water customers on how to conserve.

Responsible Office: El Dorado County, Cities, EID, and SMUD.

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Priority (High, Medium, Low): Medium

Cost Estimate: $5,000 – 10,000 annually during drought years

Benefits (avoided Losses): Reduces the environmental and economic impacts of drought.

Potential funding: Local budgets, potential grant funding.

Schedule: Annually during drought years.

Earthquake Actions

Action 7. Incorporate Earthquake Mitigation into Local Planning. El Dorado County will adopt and enforce updated building code provisions to reduce earthquake damage.

Hazards Addressed: Earthquake

Goals Addressed: 1, 2, 4, 5

Issue/Background: Seismic and geologic hazards have been identified as a low frequency event that can have both a low and high impact potential.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Continue to incorporate into local hazard mitigation planning and the County's General Plan enforcement of Objective 6.3.1 Building and Site Standards and enforce regulations that protect against seismic (through Code Enforcement, as necessary) and geologic hazards.

Responsible Office/Partners: El Dorado County, cities, fire districts, community service districts, public/private partners in public safety.

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Project Priority: Low

Cost Estimate: Staff time

Benefits (Losses Avoided): Potentially lifesaving given the preventive nature of the planning and enforcement actions taken.

Potential Funding: Competitive federal and grant funding

Timeline: Ongoing

Erosion Actions
Action 8. Stabilize Erosion Hazard Areas

Hazards Addressed: Erosion

Goals Addressed: 1, 2, 4, 5

Issue/Background: Many existing El Dorado County roads, culverts, hillsides, etc. are susceptible to erosion – the wearing away of land - that can destroy buildings and infrastructure.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing condition assessments.

Responsible Office/Partners: El Dorado County, Cities, DOT, CalTrans

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Project Priority: High

Cost Estimate: Determined by project.

Benefits (Losses Avoided): Critical infrastructure is able to be used in an emergency.

Potential Funding: Local budgets, Unidentified.

Timeline: 1-10 years

Flood Actions (100/500 Year and Localized)
Action 9. Enhance Flood Mitigation through Local Planning

Hazards Addressed: Flooding (100/500 year and Localized)

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: The County's General Plan sets the foundation for recognizing flood disaster potential and establishing through regulations, ordinances and building codes a strategy for protecting populations, new and existing development and economic sustainability.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Continue to incorporate into local hazard mitigation planning and the County's General Plan enforcement (through Code Enforcement) of Objective 7.3.1 Water Resource Protection to protect watersheds, riparian zones and aquifers, Objective 2.2.5 Future Rezoning, and Objective 5.4.1 Drainage and Flood Management Program.

Responsible Office/Partners: El Dorado County, cities, community service districts, public/private partners in water resource protection.

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Project Priority: Medium

Cost Estimate: Staff time

Benefits (Losses Avoided): Reduce and/or eliminate the impacts of flooding on existing structures to safeguard life and property.

Potential Funding: County, cities and special districts budgets

Timeline: Ongoing

Seiche Actions
Action 10. Map and Assess Vulnerability to Seiche

Hazards Addressed: Seiche

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: A seiche is a standing wave in an enclosed or partially enclosed body of water. Lake Tahoe has been identified as an area susceptible to seiche activity. There would be substantial damage to infrastructure such as county roads and two state highways that run through El Dorado County (highway 50 and Highway 89).

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: As funding allows, map and assess vulnerability to seiche.

Responsible Office/Partners: El Dorado County, GIS, University Nevada at Reno

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Project Priority: Low

Cost Estimate: Staff time

Benefits (Losses Avoided): Minimize flood damage to public roads and private property.

Potential Funding: Local budgets, potential grant funds

Timeline: Ongoing

Severe Weather/Extreme Temperatures

Action 11. Increase Awareness of Extreme Temperature Risk and Safety. Through public education campaigns, El Dorado County will work with agencies that serve vulnerable populations to prepare for extreme temperatures.

Hazards Addressed: Severe Weather/Extreme Temperature

Goals Addressed: 1, 2, 3, 4

Issue/Background: Continue to raise awareness and planning regarding extreme temperatures and addressing needs of vulnerable populations.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Funding through public health preparedness grants.

Responsible Office/Partners: El Dorado County, healthcare facilities

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Project Priority: Medium

Cost Estimate: Staff time, grant funds

Benefits (Losses Avoided): Reduce impact to health and safety of residents and vulnerable populations due to extreme temperatures

Potential Funding: Grant Programs

Timeline: Ongoing

Severe Weather/Thunderstorms

Action 12. Protect Critical Facilities and Equipment. El Dorado County will work with public and private partners to harden critical facilities and equipment. One way this will occur is through tree clearing along power lines and roadways.

Hazards Addressed: Severe Weather/Thunderstorms

Goals Addressed: 1, 2, 4, 5

Issue/Background: Severe winter storms can down trees, cause widespread power outages, flooding, damage property and cause fatalities and injuries.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Emergency Operations Plan

Responsible Office/Partners: El Dorado County, cities, DOT, CalTrans, community service districts, fire agencies, utility companies

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Project Priority: High

Cost Estimate: Determined by event

Benefits (Losses Avoided): Minimize critical infrastructure damage and loss

Potential Funding: Local budget, General Fund

Timeline: Ongoing

Wildfire Actions
Action 13. Public Education

Hazards Addressed: Wildfire

Goals Addressed: 1, 3

Issue/Background: Public education through community outreach is a must in El Dorado County. This is an ongoing strategy and included in all mitigation efforts. El Dorado County, fire agencies, Animal Services, FireSafe councils and other stakeholders work with as many residents as possible to provide information on defensible space and living with fire.

Other Alternatives: Each property owner or land manager needs to manage properties and infrastructure within their responsibility. While public service messages and media helps tell the public of their responsibility for defensible space and fire mitigation, specific and direct communications and training information increases the chance of reaching the public.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with the current property owner or land manager to implement fuels management and fire prevention projects identified in the Western Slope CWPP WUI area. Apply for local, State, or Federal funding to implement these plans.

Project Priority: High

Responsible Office: El Dorado County, fire agencies, animal services, cities, fire safe councils, special districts, community service districts, public/private partners in fire safety.

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Cost Estimate: Staff time

Benefits (Losses Avoided): Provide the tools and resources to develop, purchase, and maintain needed public education material to educate El Dorado County residents on wildfire prevention and Firewise Community techniques.

Potential Funding: County, State, and Federal funding.

Schedule: Ongoing

Action 14. Defensible Space Programs

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: These projects address the ongoing need to manage fuels in and around privately owned homes, businesses and communities, freeways and roadways, and "Assets at Risk" in El Dorado County. Small communities, individual property owners and infrastructure assets can be impacted by roadside fire starts and fire starts moving into or out of private property.

When complete, these projects will protect Assets at Risk and projects the communities have identified in the CWPP.

The El Dorado County Fire Safe Councils have worked with County, State, and individual property owners to identify areas within their jurisdictions to provide fuels management projects to reduce the risk of wildfire starts and spread along roadways and into or out of individual properties.

Other Alternatives: Each property owner or land manager needs to manage properties and infrastructure within their responsibility. Spread from fire starts within their property can only be prevented or contained by the fire prevention and fuel management work done by the owner.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with the current property owner or land manager to implement fuels management and fire prevention projects identified in the Western Slope CWPP WUI area. Apply for local, State, or Federal funding to implement these plans.

Project Priority: High

Responsible Office: El Dorado County, fire agencies, cities, fire safe councils, special districts, community service districts, public/private partners in fire safety.

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Cost Estimate: Dependent on project.

Benefits (Losses Avoided): Reduced risk of loss of life and property from catastrophic wildfire in developed communities, towns, and city's within the County. Loss of assets at risk can have significant impact on those outside of the County. Communication links and interstate transportation can be significantly impact by wildfire along the Highway 50 corridor.

Potential Funding: County, State, and Federal funding

Schedule: Ongoing

Action 15. Large Strategic Fuel Break

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4

Issue/Background: Large Strategic Fuel Break projects will provide landscape scale community protection in our area. When complete, these projects will help protect the communities identified as "Communities at Risk from Wildfire" listed in the National Fire Plan.

This practice applies to all communities where protection from wildfire is needed. These Strategic Fuel breaks are planned and located on the landscape as part of a conservation management system for a land unit where there is a need to control the risk of the spread of fire into our communities as well as to protect watersheds, critical infrastructure, and commerce traveling on our freeways and railways. Typically, they break up large, continuous tracts of dense natural fuels, thus limiting uncontrolled spread of fire, and are commonly associated with firebreaks (permanent or temporary strips of bare or vegetated land planned to retard fire). For our purposes, a strategic fuel break is typically placed to protect the communities identified in the Western Slope CWPP for that specific Fire Safe Council area.

The El Dorado County Fire Safe Councils have worked with County, State, and Federal agencies to identify areas within their jurisdictions to develop large strategic fuel breaks to protect specific communities and watersheds within the County.

Other Alternatives: Rely on the individual property owner or land managers to develop strategic fuel breaks to protect resources and assets that may be outside of their ownership or responsibility.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with the current property owner or land manager to implement strategic fuel breaks identified in the Western Slope CWPP. Apply for local, State, or Federal funding to implement these plans.

Project Priority: High

Responsible Office: El Dorado County, fire agencies, cities, fire safe councils, special districts, community service districts, public/private partners in fire safety.

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Cost Estimate: Dependent on project.

Benefits (Losses Avoided): Reduced risk of loss of life and property from catastrophic wildfire in developed communities, towns, and city's within the County.

Potential Funding: County, State, and Federal funding

Schedule: Ongoing.

Action 16. Fuel Breaks in the Wildland Urban Interface (WUI)

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4,

Issue/Background: The purpose of a Shaded Fuel Break within the WUI is to minimize destruction to communities from wildfire and to protect and enhance natural resources, watershed and habitat of western El Dorado County. When complete, these projects will help protect the community's identified as "Communities at Risk from Wildfire" and identified as communities with the WUI, listed in the CWPP.

This practice applies to all communities within the WUI where protection from wildfire is needed. These Shaded Fuel breaks are planned thinning of dense vegetation in an area approximately 300 feet wide where fire does not easily move from the ground into the overhead tree canopy and to allow fire resources to utilize such a location to increase probability of success during fire suppression activities. Fuel break width will be dependent upon the fuels and topography in any given area.

For our purposes, a strategic fuel break is typically placed to protect the communities identified in the Western Slope CWPP WUI, for that specific Fire Safe Council.

The El Dorado County Fire Safe Councils have worked with County, State, and Federal agencies to identify areas within their jurisdictions to develop shaded fuel breaks to protect specific communities and watersheds within the WUI.

Other Alternatives: Rely on the individual property owner or land managers within the WUI to develop fuel breaks to protect resources and assets from fire that may spread from the wildland into urban areas.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with the current property owner or land manager to implement shaded fuel breaks identified in the Western Slope CWPP WUI area. Apply for local, State, or Federal funding to implement these plans.

Project Priority: High

Responsible Office: El Dorado County, fire agencies, cities, fire safe councils, special districts, community service districts, public/private partners in fire safety.

Cost Estimate: Dependent on project.

Benefits (Losses Avoided): Reduced risk of loss of life and property from catastrophic wildfire in developed communities, towns, and city's within the County.

Potential Funding: County, State, and Federal funding

Schedule: Ongoing

Subsidence Actions
Action 17. Map and Assess Vulnerability to Subsidence

Hazards Addressed: Subsidence

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: Abandoned mines and culverts throughout the county, and primarily on the Western Slope, make El Dorado County vulnerable to subsidence.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: As funding allows, map and assess vulnerability to subsidence.

Responsible Office/Partners: El Dorado County, GIS

Partners: Cities of Placerville, El Dorado Irrigation District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Project Priority: Low

Cost Estimate: Staff time

Benefits (Losses Avoided): Minimize subsidence to public roads and private property.

Potential Funding: Local budgets, potential grant funds

Timeline: Ongoing

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Chapter 5 Plan Adoption

Requirement §201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally approved by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, county commissioner, Tribal Council).

The purpose of formally adopting this plan is to secure buy-in from El Dorado County and participating jurisdictions, raise awareness of the plan, and formalize the plan's implementation. The adoption of this plan establishes compliance with AB 2140 requiring adoption by reference or incorporation into the safety element of the general plan. The governing board for each participating jurisdiction has adopted this Local Hazard Mitigation Plan by passing a resolution. A copy of the generic resolution and the executed copies are included in Appendix D: Adoption Resolutions.

U.S. Department of Homeland Security
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052

FEMA

April 26, 2019

Lieutenant James Byers
El Dorado County Sheriff's OES
300 Fair Lane
Placerville, CA 95668

Dear Lt. Byers:

We have completed our final review of the *El Dorado County Local Hazard Mitigation Plan*, officially adopted by El Dorado County on April 23, 2019, and found the plan to be in conformance with Title 44 Code of Federal Regulations (CFR) Part 201.6 *Local Mitigation Plans.*

The approval of this plan ensures El Dorado County's continued eligibility for project grants under FEMA's Hazard Mitigation Assistance programs, including the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program. All requests for funding, however, will be evaluated individually according to the specific eligibility, and other requirements of the particular program under which applications are submitted.

Also, approved hazard mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). Additional information regarding the CRS can be found at https://www.fema.gov/national-flood-insurance-program-community-rating-system or through your local floodplain manager.

FEMA's approval of the *El Dorado County Local Hazard Mitigation Plan* is for a period of five years, effective starting the date of this letter. Prior to April 26, 2024, El Dorado County is required to review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval in order to continue to be eligible for mitigation project grant funding. The enclosed plan review tool provides additional recommendations to incorporate into the plan when El Dorado County undertakes its identified plan maintenance process.

If you have any questions regarding the planning or review processes, please contact the FEMA Region IX Hazard Mitigation Planning Team at fema-r9-mitigation-planning@fema.dhs.gov.

Sincerely,

for Juliette Hayes
Director
Mitigation Division
FEMA, Region IX

Enclosure

cc: Adam Sutkus, Hazard Mitigation Planning Chief, California Governor's Office of Emergency Services
Jennifer Hogan, State Hazard Mitigation Officer, California Governor's Office of Emergency Services

RESOLUTION NO. 058-2019

OF THE BOARD OF SUPERVISORS OF THE COUNTY OF EL DORADO
ADOPTION RESOLUTION
EL DORADO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, Congress directed the Federal Emergency Management Agency (FEMA) to place more emphasis on the planning process to promote and support sustainable, disaster resistant communities; and,

WHEREAS, The Disaster Mitigation Act of 2000 ((DMA 2000) amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by adding a new section, 322-Mitigation Planning. Mitigation is defined as "sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects" and;

WHEREAS, effective November 1, 2004, a mitigation plan approved by FEMA and the State is required from any community that wishes to obtain federal mitigation grant funding to reduce or eliminate potential risk to people and their property from hazards and their effects;

WHEREAS, the County of El Dorado is desirous of increasing the safety of its citizens during natural hazard events, while reducing the risk of loss of life and property;

WHEREAS, the County of El Dorado seeks to secure all the benefits of mitigation planning, including the full allocation provided under Government Code Section 8685.9;

NOW THEREFORE, BE IT RESOLVED that the El Dorado County Board of Supervisors has reviewed the Multi-Jurisdictional Hazard Mitigation Plan approved by FEMA and hereby adopts the same, with all subsequent amendments required or approved by FEMA, as the El Dorado County Multi-Jurisdictional Hazard Mitigation Plan.

BE IT FURTHER RESOLVED that the El Dorado County Board of Supervisors adopts the FEMA approved El Dorado County Multi-Jurisdictional Hazard Mitigation Plan as part of the Safety Element of the General Plan adopted pursuant to subdivision (g) of Government Code Section 65302.

PASSED AND ADOPTED by the Board of Supervisors of the County of El Dorado at a regular meeting of said Board, held the 23rd day of April, 2019, by the following vote of said Board:

Ayes: Frentzen,Veerkamp,Hidahl,Parlin,Novasel
Noes: None
Absent: None

Attest:
James S. Mitrisin
Clerk of the Board of Supervisors

By: _____ Deputy Clerk

_____ Board of Supervisors

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Chapter 6 Plan Implementation and Maintenance

Requirement §201.6(c)(4): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This chapter provides an overview of the overall strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the plan. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

Chapter 2 Planning Process includes information on the implementation and maintenance process since the 2012 Plan was adopted. This section includes information on the implementation and maintenance process for this plan update.

Implementation

Once adopted, the plan faces the truest test of its worth: implementation. While this plan contains many worthwhile actions, the participants will need to decide which action(s) to undertake first. Two factors will help with making that decision: the priority assigned the actions in the planning process and funding availability. Low or no-cost actions most easily demonstrate progress toward successful plan implementation.

An important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other plans and mechanisms, such as the general plans and Community Wildfire Protection Plans (CWPPs) for El Dorado County and participants. The County and participants already implement policies and programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. Implementation will be accomplished by adhering to the schedules identified for each action and through constant, pervasive, and energetic efforts to network and

highlight the multi-objective, win-win benefits to each program and the El Dorado County community and its stakeholders. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing enforcement of existing policies and vigilant review of programs for coordination and multi- objective opportunities.

Simultaneous to these efforts, it is important to maintain a constant monitoring of funding opportunities that can be leveraged to implement some of the more costly recommended actions. This will include creating and maintaining a bank of ideas on how to meet local match or participation requirements. When funding does become available; the participants will be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, state and federal earmarked funds, benefit assessments, and other grant programs, including those that can serve or support multi-objective applications.

Responsibility for Implementation of Goals and Activities

The elected officials and officials appointed to head each department within the County are charged with implementation of various activities in the plan. During the annual reviews as described later in this section, an assessment of progress on each of the goals and activities in the plan will be determined and noted. At that time, recommendations can be made to modify timeframes for completion of activities, funding resources, and responsible entities. On an annual basis, the priority standing of various activities may also be changed. Some activities that are found not to be doable may be deleted from the plan entirely and activities addressing problems unforeseen during plan development may be added.

Role of Hazard Mitigation Planning Committee in Implementation and Maintenance

With adoption of this plan, the participants will be responsible for the plan implementation and maintenance. The HMPC Steering Committee identified in Appendix A (or a similar committee) will reconvene bi-annually each year to ensure mitigation strategies are being implemented. As such, El Dorado County and participants agree to continue its relationship with the HMPC Steering Committee and:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Ensure hazard mitigation remains a consideration for community decision makers;

- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Report on plan progress and recommended changes to the various governing boards or councils of all participants; and
- Inform and solicit input from the public.

The primary duty of the participants is to see the plan successfully carried out and to report to their community governing boards and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the County website (and others as appropriate).

Maintenance

Plan maintenance implies an ongoing effort to monitor and evaluate plan implementation and to update the plan as progress, roadblocks, or changing circumstances are recognized.

Maintenance Schedule

The El Dorado County Sheriff's OES is responsible for initiating plan reviews and consulting with the other participants. In order to monitor progress and update the mitigation strategies identified in the action plan, El Dorado County Sheriff's OES and the individual participants will revisit this plan annually and/or following a hazard event. The HMPC will meet bi-annually to review progress on plan implementation and will provide annual evaluation reports for each participants. The El Dorado County Sheriff's OES will also submit a five-year written update to the State and FEMA Region IX, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. With this plan update anticipated to be fully approved and adopted in 2018, the next plan update for the El Dorado County Planning Area will occur in 2023.

Maintenance Evaluation Process

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions; and/or
- Increased vulnerability as a result of new development (and/or annexation).

Updates to this plan will:

- Consider changes in vulnerability due to action implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate growth and development-related changes to infrastructure inventories; and
- Incorporate new action recommendations or changes in action prioritization.

Changes will be made to the plan to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or funding resources. All mitigation actions will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation.

Updating of the plan will be by written changes and submissions, as the El Dorado County Sheriff's OES deems appropriate and necessary, and as approved by the appropriate governing boards or councils of the other participating jurisdictions. In keeping with the five-year update process, the El Dorado County Sheriff's OES will convene public meetings to solicit public input on the plan and its routine maintenance and the final product will be adopted by the governing boards or councils.

Annual Plan Review Process

For the 2018 hazard mitigation plan update review process, the El Dorado County Sheriff's OES will be responsible for facilitating, coordinating, and scheduling reviews and maintenance of the plan. The review of the Hazard Mitigation Plan will normally occur on a bi-annual basis each year and will be conducted by the El Dorado County Sheriff's OES as follows:

- The El Dorado County Sheriff's OES will use social media, press release or similar public communication advising the public of the date, time, and place for the annual review of the plan and will be responsible for leading the meeting to review the plan.
- Notification will be sent to the members of the federal, state, and local agencies, non-profit groups, local planning agencies, and representatives of business interests, neighboring communities, and others advising them of the date, time, and place for the review.
- County/City/District officials will be noticed by email, telephone or personal visit and urged to participate.

- Prior to the review, department heads and others tasked with implementation of the various activities will be queried concerning progress on each activity in their area of responsibility and asked to present a report at the review meeting.
- After the review meeting, minutes of the meeting and an annual report will be prepared by the El Dorado County Sheriff's OES and made available upon request.
- The report will also be presented to the County/City/participating jurisdictions' governing boards for review, and a request will be made that the Board take action to recognize and adopt any changes resulting from the review.

Criteria for Annual Reviews

The criteria recommended in 44 CFR 201 and 206 will be utilized in reviewing and updating the plan. More specifically, the annual reviews will include the following information:

- Community growth or change in the past quarter.
- The number of substantially damaged or substantially improved structures by flood zone.
- The renovations to public infrastructure including water, sewer, drainage, roads, bridges, gas lines, and buildings.
- Natural hazard occurrences that required activation of the Emergency Operations Center (EOC) and whether or not the event resulted in a presidential disaster declaration.
- Natural hazard occurrences that were not of a magnitude to warrant activation of the EOC or a federal disaster declaration but were severe enough to cause damage in the community or closure of businesses, schools, or public services.
- The dates of hazard events descriptions.
- Documented damages due to the event.
- Closures of places of employment or schools and the number of days closed.
- Road or bridge closures due to the hazard and the length of time closed.
- Assessment of the number of private and public buildings damaged and whether the damage was minor, substantial, major, or if buildings were destroyed. The assessment will include residences, mobile homes, commercial structures, industrial structures, and public buildings, such as schools and public safety buildings.
- Review of any changes in federal, state, and local policies to determine the impact of these policies on the community and how and if the policy changes can or should be incorporated into the Hazard Mitigation Plan. Review of the status of implementation of projects (mitigation strategies) including projects completed will be noted. Projects behind schedule

will include a reason for delay of implementation.

Incorporation into Existing Planning Mechanisms

Another important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other County and City plans and mechanisms. Where possible, plan participants will use existing plans and/or programs to implement hazard mitigation actions. As previously stated in this plan, mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. The point is re-emphasized here. As described in this plan's capability assessment, the County and participating jurisdictions already implement policies and programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. These existing mechanisms include:

- County and City general and master plans
- County and City Emergency Operations Plans
- County and City ordinances
- Flood/master plans
- Community Wildfire Protection plans
- Capital improvement plans and budgets
- Other plans and policies outlined in the capability assessments in the participant annexes
- Other plans, regulations, and practices with a mitigation focus

The successful implementation of this mitigation strategy will require constant and vigilant review of existing plans and programs for coordination and multi-objective opportunities that promote a safe, sustainable community.

Examples of incorporation of the LHMP into existing planning mechanisms include:

As recommended by Assembly Bill 2140, each community should adopt (by reference or incorporation) this LHMP into the Safety Element of their General Plan(s). Evidence of such adoption (by formal, certified resolution) shall be provided to CAL OES and FEMA.

Integration of wildfire actions identified in this mitigation strategy with the actions and implementation priorities established in existing Community Wildfire Protection Plans (CWPPs).

This is already in process. Key people responsible for development of planning area CWPPs participated in the development of this LHMP. They identified key projects in the CWPPs and integrated them into the Mitigation Strategy of this LHMP. Likewise, actual implementation of these wildfire projects will likely occur through the CWPP implementation process through the efforts of the Fire Safe Councils. Use the risk assessment information to update the hazard analysis in the El Dorado County Emergency Operations Plan.

Efforts should continuously be made to monitor the progress of mitigation actions implemented through these other planning mechanisms and, where appropriate, their priority actions should be incorporated into updates of this hazard mitigation plan.

Continued Public Involvement

Continued public involvement is imperative to the overall success of the plan's implementation. The update process provides an opportunity to solicit participation from new and existing stakeholders and to publicize success stores from the plan implementation and seek additional public comment. The plan maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings and press releases.

Public Involvement Process for Bi-Annual Reviews

The public will be noticed by social media and/or press releases specifying the date and time for the review and inviting public participation. The El Dorado County Sheriff's OES, local, state, and regional agencies will be notified and invited to attend and participate.

Public Involvement for Five-year Update

When the El Dorado County Sheriff's OES reconvenes for the update, they will coordinate with all stakeholders participating in the planning process—including those that joined this process since the planning process began—to update and revise the plan. As part of this effort, public meetings will be held and public comments will be solicited on the plan update draft.

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A.1 El Dorado County Step 1: Organize to Update a Plan

(a). Involvement of Community Land Use and Comprehensive Planning

In addition to attending meetings, providing draft text for inclusion in the plan, reviewing plan documents, and coordinating input from other departments and stakeholders, El Dorado County planners also provided information on development since the last plan, mapping and details on future development areas, input on current mitigation capabilities, coordination with other planning mechanisms, and in-progress modifications to the General Plan and associated documents specific to El Dorado County.

El Dorado County Planner

- El Dorado County Sheriff's Office of Emergency Services - Todd Crawford, Leslie Schlag

Also in supporting roles are additional supporters and planners. Kristine Oase-Guth and Michelle Patterson - EDC Health and Human Services Agency, Steve Willis - El Dorado County Fire Safe Council, Mike Webb – CAL FIRE, Anne Novotny and Lillian MacLeod - EDC Community Development Agency Long Range Planning, and Greg Schwab - Georgetown Fire District.

(b). Staff of Community Departments on HMPC with Expertise on CRS Step 7 Activities

In order to promote the integration of CRS into this planning process, the representatives from the County were selected based on their areas of expertise relative to the CRS mitigation categories as detailed in Table A-1.

Table A-1 El Dorado County Staff Capability with Six Mitigation Categories

El Dorado County Departments/Staff	Prevention	Property Protection	Natural Resource Protection	Emergency Services	Structural Flood Control Projects	Public Information	Other
Community Development Agency /Planning and Building Department – Anne Novotny and Lillian MacLeod	X	X	X			X	X
Office of Emergency Services – Jim Byers, Moke Auwae, Todd Crawford, and Leslie Schlag	X	X	X	X	X	X	X

El Dorado County Departments/Staff	Prevention	Property Protection	Natural Resource Protection	Emergency Services	Structural Flood Control Projects	Public Information	Other
Community Development Agency - Public Works - John Edwards	X	X	X		X		X
El Dorado County GIS - Information Technology – Jose Crummett & Alex Gole	X					X	X

A.1.1. HMPC and Steering Committee Initial Invitation List

AGENCY / CSD	NAME	EMAIL	PHONE
EDC Office of Emergency Services	Jim Byers	byersj@edso.org	642-4707
EDC Office of Emergency Services	Todd Hammitt	hammitttt@edso.org	621-5170
EDC Office of Emergency Services	Todd Crawford	crawfordt@edso.org	621-7660
EDC Office of Emergency Services	Leslie Schlag	schlagl@edso.org	621-5131
EDC Dept of Transportation	Don Spear	speard@edcgov.us	642-4908
EDC Community Development Agency	Steve Pedretti	steve.pedretti@edcgov.us	621-5914
EDC Office of Education	Kathy Daniels	Kdaniels@edcoe.org	295-2205
EDC Mental Health	Robert Price	robert.price@edcgov.us	621-6357
EDC Public Health	Michelle Patterson	michelle.patterson@edcgov.us	621-7581
EDC Public Health	Kristine Guth	kristine.guth@edcgov.us	621-7582
EDC Environmental Management	Greg Stanton	greg.stanton@edcgov.us	621-6658
EDC GIS	Jose Crummett	jose.crummett@edcgov.us	621-6511
EDC Emergency Medical Services Agency	Rich Todd	richard.todd@edcgov.us	621-6505
EDC Agriculture Commision	Charlene Carveth	charlene.carveth@edcgov.us	621-5522
EDC Disaster Council	Scott Heller	sheller@cityofplacerville.org	642-5210
EDC Fire Safe Council	Pat Dwyer	board@edcfiresafe.org	647-1700
Cameron Park Fire District	Bob Counts	Bob.Counts@fire.ca.gov	677-6190
Diamond Springs / El Dorado Fire District	Bryan Ransdell	bransdell@diamondfire.org	626-3190
EDC Fire District	Mike Hardy	hardym@eldoradocountyfire.com	644-9630
El Dorado Hills Fire District	Mike Lilienthal	mlilienthal@edhfire.com	916-933-6623 x1029
Fallen Leaf Lake Fire District	Gary Gerren	ggerren@fllcsd.org	544-3300
Garden Valley Fire District	Clive Savacool	clivesavacool@gardenvalley.org	333-1240
Georgetown Fire District	Greg Schwab	gschwab@georgetownfiredepartment.com	333-4111
Lake Valley Fire District	Gareth Harris	harris@caltahoefire.net	577-3737
Meeks Bay Fire District	Tim Alameda	alameda@ntfire.net	525-7548
Mosquito Fire District	Mike Hazlett	info@mfpd.us	626-9017
Pioneer Fire District	Grant Ingram	gingram@pioneerfire.org	620-4444
Rescue Fire District	Tom Keating	chief@rescuefiredepartment.org	677-1868
CALFIRE AEU	Mike Kaslin	mike.kaslin@fire.ca.gov	644-2345
El Dorado Irrigation District	Jim Abercrombie	jabercrombie@eid.org	642-4055
Georgetown PUD	Wendell Wall	wwall@gd-pud.org	333-4356
South Tahoe PUD	Richard Solbrig	rsolbrig@stpud.dst.ca.us	544-6474

Tahoe City PUD	Cindy Gustafson	cgustafson@tcpud.org	580-6052
Sacramento Municipal Utility District	Jeff Briggs	jeff.briggs@smud.org	916-732-5708
Arroyo Vista CSD	Bill Welty	wmwelty@gmail.com	916-933-0530
Audubon Hills CSD	Gene Blackmun	geneblackmun@comcast.net	644-4153
Cameron Estates CSD	Angela Johnson	cecsd@att.net	677-5889
Cameron Park CSD	Mary Cahill	mcahill@cameronpark.org	350-4651
Connie Lane CSD	Beth Drago	bethbyer@yahoo.com	677-9060
Cosumnes River CSD	Jim LoFranco	CosumnesRiverCSD@gmail.com	334-6441
East China Hill CSD	Stuart Macy	none listed	626-7751 BAD#
El Dorado Hills CSD	Kevin Loewen	kloewen@edhcsd.org	916-614-3237
Fallen Leaf Lake CSD	Gary Gerren	ggerren@fllcsd.org	544-3300
Garden Valley Ranch CSD	Jerry Griffin	kdg90dee@hotmail.com	916-990-2510
Golden West CSD	Edwin White	oneenigma@att.net	620-6844
Greenstone Country CSD	George Amo	greenstoncomm@att.net	622-6120
Grizzly Flats CSD	Jodi Lauther	bod@grizzlyflatscsd.com	622-9626
Hickok Road CSD	Janna Buwalda	jsbuwalda@sbcglobal.net	916-933-8891
Hillwood CSD	Ron Kuch	hcsdboard@hillwodocsd.org	677-3850
Holiday Lake CSD	Paul Cowdery	holidaylakecsd@yahoo.com	677-9458
Knolls Property Owners CSD	Kate Campbell-Craven	kcampbellcraven@gmail.com	642-0908
Lakeview CSD	John Larsen	none listed	676-9593
Marble Mountain CSD	Mattias Bergman	mvbergman@gmail.com	916-651-3282
Mortara Circle CSD	Phyllis Wild	pabatewild@golyon.com	409-5878
Nashville Trail CSD	Randy Hackbarth	trlryder@pacbell.net	626-0571
Rising Hill Road CSD	Ginny Borkowski	ginny.rhrcsd@gmail.com	308-4225
Rolling Hills CSD	Chaney Hicks	chaney@rollinghillscsd.org	916-220-2737
Showcase CSD	Lee Hodge	hodgeleea@yahoo.com	409-4929
Sierra Oaks CSD	Jack Tillman	none listed	642-9947
West El Largo CSD	Don Uelmen	tspdon@cwo.com	642-8385
Tahoe Paradise Resort Improvement Dist	Steve Dunn	none listed	577-9881
Cameron Park Airport District	Gary Millsaps	manager@cameronparkairport.com	676-8316
Georgetown Divide Recreation	Carl Clark	cclark@gdrg.org	823-9090

El Dorado County Resource Conservation Di	Mark Egbert	mark.egbert@ca.usds.gov	295-5630
Georgetown Divide Resource Conservation	Mark Egbert	mark.egbert@ca.usds.gov	295-5630
Tahoe Resource Conservation District	Tori Walton	twalton@tahoercd.org	543-1501x117
City of Placerville	Scott Heller	sheller@cityofplacerville.org	642-5210
City of South Lake Tahoe	Brian Uhler	buhler@cityofslt.us	542-6100
Marshall Hospital	Candace Revaz	crevaz@marshallmedical.org	903-6309
Barton Hospital	Doug Dame	ddame@bartonhealth.org	307-0939
Ca OES	Kim Nielsen	kim.nielsen@caloes.ca.gov	916-657-9372
Shingle Springs Rancheria	Ernest Vargas	evargas@ssband.org	387-4970
United States Forest Service	Laurence Crabtree	lcrabtree@fs.fed.us	622-5061
Lois Rios College El Dorado Center	Dale van Dam	vandamd@flc.losrios.edu	642-5615
Lake Tahoe Community College	Lisa Shafer	shaferl@ltcc.edu	541-4660 x210
PG&E	Richard Rodriquez	RCRU@pge.com	916-386-5361
PG&E	Pam Perdue	psp6@pge.com	916-764-7546

Kickoff Meeting Agenda

EL DORADO COUNTY SHERIFF'S OFFICE

OFFICE OF EMERGENCY SERVICES

2016 Hazard Mitigation Plan Update Meeting

EID Headquarters

10/25/16, 1000-1200 hrs

AGENDA

1. Introductions

2. Hazard Mitigation & Disaster Mitigation Act Planning Requirements
    a. Stakeholder Plan Review & Update, Public Mtg's, Adoption of Plan

3. Role of the Hazard Mitigation Planning Committee/Steering Committee
    a. Review Hazards & Rankings (add Cyber, Tree Mortality, Climate & Drought, Sustained Power Disruption)
    b. Planned Developments?? Locations? Hazards?

4. Coordinating with Other Agencies
    a. Outside County / Adjacent Counties & State

5. Hazard Identification

6. Mitigation Strategy

7. Data Needs

8. Schedule
    a. 12/5-9/16 (Final Draft)
    b. Placerville & Tahoe Mtg's

9. Questions and Answers

Kickoff Meeting Sign-in Sheets

El Dorado County Sheriff's Office of Emergency Services
LHMP Update Stakeholders Meeting

AGENCY / GROUP / CSD	LAST NAME	FIRST	EMAIL
~~El Dorado~~ Fire CSD	FAWKES	GORDON	gfawkes@me.com
~~Kim Nielsen~~ - Cal OES	Nielsen	Kim	Kim.Nielsen@caloes.ca.gov
El Dorado County Fire C.	~~Steven~~ Willis	Steve	swillis@comcast.net
EID Parks & Rec Mgr	HAWKINS	GREG	ghawkins@eid.org
EDSO / OES	Schley	Leslie	Schley/cd edso.org
SMUD	Sackman	Kim	Kim.Sackman@smud.org
El Dorado Co. DOT	EDWARDS	JOHN	phn.edwards@edcgov.us
El Dorado Co. Office of Ed	Daniels	Kelly	kdaniels@edcoe.org
EDSO/OES	BYERS	JAMES	byersj@edso.org
EDC Ag Dep	Carveth	Charlene	charlene.carveth@edcgov.us
DSD-Planning Service	MacLeod	Lillian	lillian.macleod@edcgov.us
EDC HHSA	Patterson	Michelle	michelle.patterson@edcgov.us
EDC HHSA	Guth	Kristine	kristine.guth@edcgov.us
EDC GIS	GOLT	Alex	Alex.golt@EDCGOV.US
EDC GIS	CRUMMETT	JOSE	JOSE.CRUMMETT@EDCGOV.US
South Tahoe PUD	Cotulla	Shannon	SCOTULLA@STPUD.DST.CA.US
Grizzly Flats CSD	Lauther	Jodi	gfbill@sbcglobal.net

EID 10/25/2016 1000-1200 hrs

Email Group Updated 10/31/16

El Dorado County Sheriff's Office of Emergency Services

LHMP Update Stakeholders Meeting

AGENCY / GROUP / CSD	LAST NAME	FIRST	EMAIL
El Dorado Hills Fire	Lilienthal	Michael	mlilienthal@edhfire.com
"	Merino	Dave	dmerino@edhfire.com
ROLLING HILLS CSD	HICKS	CHANEY	CHANEY@ROLLINGHILLSCSD.ORG
EID	Kilburg	Ron	ron. rkilburg@eid.org
Pioneer Fire Dist	Ingram	Grant	gingram@pioneerfire.org
Nizolek Consulting / EID	Nizolek	Don	Dnizolek@aol.com
EDC COR	MOSS	MARK	MARK.MOSS@EDCGOV.US
EDC Community Dev Agency Long Range Planning	NOVOTNY	ANNE	anne.novotny@edcgov.us
Los Rios PD / El Dorado Center	Cox	Valerie	Valerie.Cox@losrios.edu
GEORGETOWN FIRE	Schwarz	Greg	GSCHWARZ@GEORGETOWNFIREDEPARTMENT.COM
Nashville Trail CSD	Hackbarth	Randy	trlryder@pacbell.net
~~Richard C. Rodriguez~~ PG&E - Gas Safety	Rodriguez	Richard	rcru@pge.com
Charlene Ambrose for Katrina Jackson	Jackson	Katrina	Kjackson@edhcsd.org
EDC SHERIFF OES	CRAWFORD	TODD	CRAWFORT@EDSO.ORG

EID 10/25/2016 1000-1200 hrs

EMAIL Ltr ASAP UPDATED 10/26/16

EL DORADO COUNTY SHERIFF'S OFFICE

OFFICE OF EMERGENCY SERVICES

2017 Hazard Mitigation Plan Update Meeting

EID Headquarters

12/7/16, 0900-1100 hrs

AGENDA

1. Introductions

2. Review, Updates, & Comments on Plan
    a. Overall Plan
    b. Section II - Hazard Identification & Analysis
        i. Any Hazards not Identified
            1. Energy Shortage/Resilience
            2. Cyber Threats
            3. Tree Mortality
    c. Section III – Community Vulnerability Assessment
        i. Hazard Risks (Section III-23)
        ii. Hazard Risk Ratings (Section III-24)
    d. Section IV – Hazard Mitigation Goals & Policies
        i. Goals (Section IV-6)
        ii. Specific Hazards & Mitigation Measure Review by Disciplines (Sec IV-12)
        iii. Planned Developments?? Locations? Hazards?
3. Public Meetings
    a. Tahoe & Placerville

4. Questions?

El Dorado County Sheriff's Office of Emergency Services

LHMP Update Stakeholders Meeting

AGENCY / GROUP / CSD	LAST NAME	FIRST	EMAIL
EID	Kilborg	Ron	rkilborg@eid.org
Cal OES	Nielsen	Kim	Kim.Nielsen@caloes.ca.gov
SMUD	SACKMAN	KIM	Kim sackman @smud.org
EDC Fire Safe Council	Willis	Steve	scwillis@comcast.net
EDC COR EMP	MOSS	MARK	MARK.MOSS@EDCGOV.US
El Dorado Co Office of Ed.	Daniels	Kelli	kdaniels@edcoe.org
Don Nizolek EID	Nizolek	DON	Dnizolek@aol.com
EID	HAWKINS	GREG	ghawkins@eid.org
El Dorado County Community Development Agency, Long Range Planning	NOVOTNY	ANNE	anne.novotny@edcgov.us
EDHCSD	Jackson	Katrina	Kjackson@edhcsd.org
GEORGETOWN FIRE	SCHWARB	GREG	GSCHWARB@GEORGETOWNFIREDEPARTMENT.COM
CAMERON PARK CSD	COUNTS	ROB	bob.counts@fire.ca.gov

EID 12/7/2016 0900-1100 hrs

El Dorado County Sheriff's Office of Emergency Services

LHMP Update Stakeholders Meeting

AGENCY / GROUP / CSD	LAST NAME	FIRST	EMAIL
EL DOCO DOT	EDWARDS	JOHN	john.edwards@EDCgov.us
CDA- Dev Services	MacLeod	Lillian	lillian.macleod@edcgov.US
CALFIRE	WEBB	MIKE	
EDC SO OES	CRAWFORD	TODD	

EID 12/7/2016 0900-1100 hrs

HMPC Meeting (Public Meeting/West Slope) 01-26-17

Post Details

Reported stats may be delayed from what appears on posts

El Dorado County Sheriff's Office Like Page
January 16 at 11:38am ·

PUBLIC MEETING NOTICE

The El Dorado County Sheriff's Office, Office of Emergency Services is in the process of updating the El Dorado County Local Hazard Mitigation Plan. We will be holding two public meetings to gather input from our residents on the draft version of the updated plan.
Please share the following information and we hope to see you at one of the meetings:

South Lake Tahoe area
Ca. Conservation Corps, Tahoe Center
Multi Purpose Room
1949 Apache Ave.
S. Lake Tahoe, Ca. 96150
1/24/17 @ 6 PM

Placerville area
EDC Community Development Agency
Planning Commision Meeting Room
2850 Fair Lane Crt.
Placerville, Ca. 95667
1/26/17 @ 6 PM

Please Share
L429

Get More Likes, Comments and Shares
Boost this post for $5 to reach up to 1,400 people.

5,790 people reached Boost Post

Hans Grabau, Michelle Kezer and 25 others 6 Comments 21 Shares

Like Comment Share Chronological

Ben Reynolds Sharing
Like · Reply · Message · January 16 at 11:50am

El Dorado County Sheriff's Office Thanks Ben! L429
Like · Reply · 1 · January 16 at 12:43pm

Randy Carpadus what type of hazards?
Like · Reply · Message · January 16 at 12:25pm

El Dorado County Sheriff's Office Good question Randy. We strive for "all hazards", and have quite the extensive list. There are the obvious fire and flood, but we also address drought, climate change, tree mortality, and more. Come to a meeting and see what we have. L429
Like · Reply · 4 · January 16 at 12:42pm

Scott Moore Tourist motor hazard? Is it possible to put a motorized vehicle "capacity" within city limits? That is my solution to reduce emissions, "keep tahoe blue", and reduce "tourist motor hazard".
Like · Reply · Message · 2 · January 16 at 1:13pm · Edited
1 Reply

Jeremy Lorenzo Laura Lorenzo we should go to this
Like · Reply · Message · January 16 at 11:02pm
1 Reply

Jonathan Carstensen I look forward to joining.

5,790 People Reached

78 Reactions, Comments & Shares

42 Like	27 On Post	15 On Shares
1 Wow	0 On Post	1 On Shares
1 Sad	0 On Post	1 On Shares
11 Comments	9 On Post	2 On Shares
23 Shares	21 On Post	2 On Shares

629 Post Clicks

4 Photo Views	0 Link Clicks	625 Other Clicks

NEGATIVE FEEDBACK

7 Hide Post	2 Hide All Posts
0 Report as Spam	0 Unlike Page

El Dorado County Sheriff's Office of Emergency Services

LHMP Placerville Area Public Meeting

FIRST NAME	LAST NAME	ADDRESS
Rick	Ferriera	3780 COTTONTAIL RD PLV. CA
Susan	Frederick	Disaster Council Dist 3 rep.
Ernest	Hartley	PO Box 1167, El Dorado, CA 95623
Don	Nizolek	875 Phillip Ct. El Dorado Hills CA 95762
Kristine	Guth	4214 Canyon Valley Rd, Diamond Springs 95619
Lesley	COOVELIS	2900 FAIRLANE CT., PLACERVILLE CA
[illegible]	Seaward	GEORGETOWN FIRE, P.O.Box 470, 95634
Amanda	Williams	3846 Terrizano placerville 95667
Todd	Crawford	EDSO OES

EDC Planning Commission Room 1/26/17 1800hrs

HMPC Meeting (Public Meeting/East Slope) 01-24-17

El Dorado County Sheriff's Office of Emergency Services

LHMP SLT Area Public Meeting

FIRST NAME	LAST NAME	ADDRESS
BRAD	ZERMICK	LAKE VALLEY FIRE 2211 KEETAK ST SLT, CA 95150
TIM	Alameda	LAKE Valley FPD - (530) 577-3737
JAMES	BYERS	EDSO OES
TODD	CRAWFORD	EDSO OES
GREG ALMOS	ALMOS	EDSO SLT OES

Ca CCC MP Room 1/24/17 1800hrs

El Dorado County: Involve the Public

Efforts were made to engage the public during the creation of this plan to communicate and invite participation in the LHMP update project. A key element of public participation is including members of the public and other public-type stakeholders on the Hazard Mitigation Planning Committee as part of the Steering Committee to the HMPC.

a) List of Steering Committee Members

Community/Representative	Department/Organization	Citizen	Stakeholder
El Dorado County			
Leslie Schlag	Office of Emergency Services		X
Todd Crawford	Office of Emergency Services		X
Mike Webb	Cal Fire		X
Greg Schwab	Georgetown Fire		X
Anne Novotny	Community Development Agency-Planning		X
Bob Counts	Cameron Park CSD / CAL FIRE		X
Steve Wills	El Dorado County Fire Safe		X
Lillian MacLeod	Community Development Agency-Planning		X
Kristine Oase-Guth	Health and Human Services		X
Michelle Patterson	Health and Human Services		X
City of South Lake Tahoe			
Brian Uhler	Police Chief		X
Jeff Meston	Fire Chief		X
City of Placerville			
Scott Heller	Police Chief		X

b) and c) Public Meetings

Meeting Topic	Meeting Date	Meeting Locations
1) Intro to DMA and mitigation planning 2) LHMP plan overview and public comments	01-26-2017	El Dorado County Planning Commission Room West Slope.
1) Intro to DMA and mitigation planning 2) LHMP plan overview and public comments	01-24-2017	CCC Meeting Room, East Slope, Meyers.

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Appendix B References

Assessment Roll Values, El Dorado County Assessor's Office

CAL FIRE, Amador / El Dorado Unit

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California Department of Finance

California Department of Fish and Game

California Department of Forestry and Fire Protection

California Department of Parks and Recreation Office of Historic Preservation

California Department of Public Health

California Department of Water Resources

California Office of Emergency Services

California Employment Development Department

California Environmental Quality Act

California Geological Survey

California Highway Patrol

California Historical Landmarks

California Natural Diversity Database

California Points of Historical Interest

California Register of Historic Places

California Volcanoes and Volcanics, U.S. Geological Survey, Cascades Volcano

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El Dorado County Environmental Management

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El Dorado County Flood Insurance Study

El Dorado County General Plan Amendments, 2006 – 2018

El Dorado County General Plan. 2004

El Dorado County Geographic Information System

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El Dorado County Housing Element, 2013-2021, El Dorado

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Georgetown Divide Conservation

Georgetown Divide Recreation

Georgetown Fire District

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Integrating Manmade Hazards into Mitigation Planning, Federal Emergency Management Agency, FEMA 386-7. 2003

Introduction to Hazard Mitigation, Federal Emergency Management Agency, FEMA IS-393.A 2006

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Lake Tahoe Community College

Lake Valley Fire District

Los Rios Community College

Meeks Bay Fire District

Mosquito Fire District

Multi-Hazard Identification and Risk Assessment, Federal Emergency Management Agency,

1997 National Climatic Data Center Storm Events Database

National Environmental Policy Act

National Flood Insurance Program, Federal Emergency Management Agency

National Institute of Building Science, Multi-Hazard Mitigation Council

National Inventory of Dams

National Oceanic and Atmospheric Administration

National Climatic Data Center

National Register Information System

National Register of Historic Places

National Resource Conservation Service

National Response Center

National Weather Service

Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities. National Institute of Building Science Multi-Hazard Mitigation Council, 2005

Original Fujita Scale, National Oceanic and Atmospheric Administration Storm Prediction

Center

Pacific Gas & Electric

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Population, Housing Units, Area, and Density: 2010 (GCT-PH1), U.S. Census Bureau, 2010

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SHELDUS, Hazards Research Lab, University of South

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U.S. Bureau of Reclamation. Press Release: "Reclamation Commissioner Connor Announces Contract for Dam Safety Work of Folsom Reservoir's Dikes 4 and 6." August 19, 2009.

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Understanding Your Risks: Identifying Hazards and Estimating Losses, Federal Emergency Management Agency, FEMA 386-2. 2001

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University of Nevada, Reno

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Appendix C Adoption Resolution

Note to Reviewers: When this plan has been reviewed and approved pending adoption by FEMA Region IX, the adoption resolutions will be signed by the participating jurisdictions and added to this appendix. A model resolution is provided below.

RESOLUTION NO.

OF THE BOARD OF SUPERVISORS OF THE COUNTY OF EL DORADO
ADOPTION RESOLUTION
EL DORADO COUNTY LOCAL HAZARD MITIGATION PLAN

WHEREAS, El Dorado County recognizes the threat that natural hazards pose to people and property withing our community; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

WHEREAS, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

WHEREAS, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments;

WHEREAS, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, El Dorado County fully participated in the FEMA-prescribed mitigation planning process to prepare this local hazard mitigation plan; and

WHEREAS, the California Office of Emergency Services and Federal Emergency Management Agency, Region IX officials have reviewed the El Dorado County Local Hazard Mitigation Plan and approved it contingent upon this official adoption of the participating governing body;

WHEREAS, the El Dorado County Board of Supervisors desires to comply with requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the El Dorado County Local Hazard Mitigation Plan;

WHEREAS, adoption by the governing body for El Dorado County demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this Local Hazard Mitigation Plan.

WHEREAS, adoption of this legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

NOW, THEREFORE, BE IT RESOLVED that the El Dorado County Board of Supervisors adopts the El Dorado County Local Hazard Mitigation Plan as an official plan; and

BE IT RESOLVED, that the El Dorado County Board of Supervisors adopts the El Dorado County Local Hazard Mitigation Plan by reference into the safety element of their general plan in accordance with the requirements of AB 2140, and

BE IT FURTHER RESOLVED, El Dorado County will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000 and to establish conformance with requiremnts of AB 2140.

PASSED AND ADOPTED by the Board of Supervisors of the County of El Dorado at a regular meeting of said Board, held the _____ day of _____, 20__, by the following vote of said Board:

Attest:
_____
Clerk of the Board of Supervisors

Ayes:
Noes:
Absent:

By: _____ _____
Deputy Clerk Chair, Board of Supervisors

APPENDIX L

2020 URBAN MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN RESOLUTION

RESOLUTION NO. 2017-30

A RESOLUTION OF THE BOARD OF DIRECTORS OF GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT ADOPTING NEW RATES FOR TREATED WATER AND IRRIGATION WATER SERVICES

WHEREAS, Georgetown Divide Public Utility District ("District") provides irrigation and treated water services to residents and businesses of the District; and

WHEREAS, a Water Rate Study, dated October 24, 2017, prepared by RCAC ("Water Rate Study"), establishes various rates proposed therein, which the District Board finds are reasonably related to the cost of service for the District; and

WHEREAS, in preparing the Water Rate Study, staff and RCAC held several workshops and recommended a range of alternatives that the District could adopt regarding the revised water rates, which the District Board has reviewed; and

WHEREAS, on December 12, 2017, pursuant to Proposition 218 (Cal. Const., Art. XIIID, Sec. 6) the District Board heard and considered all oral testimony, written materials, and written protests concerning the rate increase; and

WHEREAS, the District has verified and counted the protests and determined that the District may proceed with the proposed water rates.

NOW, THEREFORE, BE IT RESOLVED THAT THE GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT, DOES HEREBY ACCEPT AND CLOSE the Proposition 218 proceedings in connection with the District's proposed water rates, with receipt of less than a majority protest vote as declared by the District Secretary. The District Board may adopt multi-year rate increases for water rates, in accordance with the Water Rate Study, in compliance with Proposition 218.

NOW, THEREFORE, BE IT and it is hereby RESOLVED by the Board of Directors of the Georgetown Divide Public Utility District as follows:

Beginning on January 1, 2018, the monthly charges (billed bi-monthly) for treated water customers are established as follows:

	Monthly Base Charge					
Meter Size	**Current**	**Jan 1, 2018**	**Jan 1, 2019**	**Jan 1, 2020**	**Jan 1, 2021**	**Jan 1, 2022**
5/8, 3/4, 1"	$ 23.57	$ 29.41	$ 30.88	$ 32.42	$ 34.04	$ 35.74
1.5"	$ 23.57	$ 98.02	$ 102.92	$ 108.07	$ 113.47	$ 119.15
2"	$ 23.57	$ 156.83	$ 164.67	$ 172.91	$ 181.55	$ 190.63
3"	$ 23.57	$ 313.66	$ 329.34	$ 345.81	$ 363.10	$ 381.25
4"	$ 25.16	$ 490.09	$ 514.60	$ 540.33	$ 567.34	$ 595.71

An ALT treatment plant supplemental charge of $15.08 per month is also added to the above listed base charge for all treated water customers.

	Usage Rate (per CF)					
Tier	**Current**	**Jan 1, 2018**	**Jan 1, 2019**	**Jan 1, 2020**	**Jan 1, 2021**	**Jan 1, 2022**
<1000 CF	--	$ 0.0255	$ 0.0268	$ 0.0281	$ 0.0295	$ 0.0310
1000-2000	$ 0.0138	$ 0.0255	$ 0.0268	$ 0.0281	$ 0.0295	$ 0.0310
2001-3000	$ 0.0165	$ 0.0255	$ 0.0268	$ 0.0281	$ 0.0295	$ 0.0310
3001-4000	$ 0.0193	$ 0.0255	$ 0.0268	$ 0.0281	$ 0.0295	$ 0.0310
>4001 CF	$ 0.0221	$ 0.0255	$ 0.0268	$ 0.0281	$ 0.0295	$ 0.0310

NOW, THEREFORE, BE IT and it is hereby RESOLVED by the Board of Directors of the Georgetown Divide Public Utility District as follows:

Beginning on January 1, 2018, the monthly charges for irrigation water customers are established as follows:

	Monthly Base Charge (Irrigation Season Only)					
Meter Size	**Current**	**Jan 1, 2018**	**Jan 1, 2019**	**Jan 1, 2020**	**Jan 1, 2021**	**Jan 1, 2022**
½"	$ 47.00	$ 77.00	$ 84.80	$ 93.20	$ 102.60	$ 112.80
Per each 1"	$ 72.74	$ 154.20	$ 169.60	$ 186.60	$ 205.20	$ 225.80

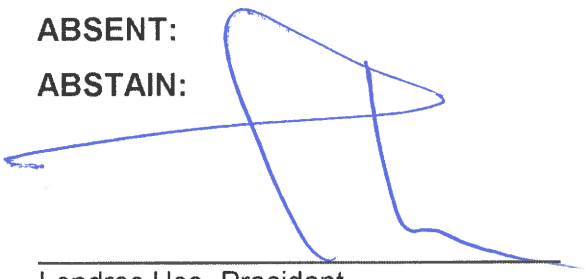
PASSED, APPROVED, AND ADOPTED by the Georgetown Divide Public Utility District District at a special meeting held on the 12th day of December 2017; motioned by Director Hanschild, seconded by Director Wadle, and upon roll call was carried by the following vote of:

AYES: Halpin, Hanschild, Uso, Wadle

NAYS:

ABSENT:

ABSTAIN:



Londres Uso, President
Board of Directors
GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

ATTEST:

Steven Palmer, Clerk and Ex officio
Secretary, Board of Directors
GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

CERTIFICATION

I hereby certify that the foregoing is a full, true and correct copy of Resolution 2017-30 duly and regularly adopted by the Board of Directors of the Georgetown Divide Public Utility District, County of El Dorado, State of California, on the 12th day of December 2017.

Steven Palmer, Clerk and Ex officio
Secretary, Board of Directors
GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

RESOLUTION NO. 2023–18

OF THE BOARD OF DIRECTORS OF THE GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT ADOPTING THE URBAN WATER MANGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN REVISIONS

WHEREAS, the Georgetown Divide Public Utility (District) in compliance with the Urban Water Management Planning Act (Act), as amended (California Water Code, Division 6, Part 2.6; §10610, et. seq. established by Assembly Bill 797, 1983). Urban water suppliers are required to prepare and/or update their Urban Water Management Plan (UWMP) and submit a complete plan to the Department of Water Resources (DWR) every five years.; and

WHEREAS, all urban water suppliers defined in Section 10617; 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 (ac-ft) annually are required to prepare an UWMP water suppliers are required to prepare and/or update their Urban Water Management Plan (UWMP) and submit a complete plan to the Department of Water Resources (DWR) every five years; and

WHEREAS, on May 11, 2021, the Board of Directors adopted the 2020 UWMP after proper public notification and public hearing which was subsequently submitted to DWR prior to the July 1, 2021, deadline; and

WHEREAS, on May 18, 2022, the District received comments from DWR to correct sections of the UWMP; and

WHEREAS, events that transpired during 2022, including drought conditions, completion of the 2020 census and Mosquito Fire, allowed the District to further evaluate the needs of the District and revise the 2020 UWMP; and

WHEREAS, recommended revisions were discussed in the January 10, 2023, Board meeting; and

WHEREAS, a Public Hearing was held at the March 14, 2023;

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT THAT THE REVISIONS TO THE URBAN WATER MANAGEMENT PLAN TO SUBMIT TO THE DEPARTMENT OF WATER RESOURCES WITHIN 30 DAYS OF ADOPTION BE APPROVED.

PASSED AND ADOPTED by the Board of Directors of the Georgetown Divide Public Utility District at a meeting of said Board held on the 14th day of March 2023, by the following vote:

AYES:
NOES:
ABSENT/ABSTAIN:

Mitch MacDonald

Mitch MacDonald, President, Board of Directors
GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

Attest:

Nicholas Schneider, Clerk and Ex officio
Secretary, Board of Directors
GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

CERTIFICATION

I hereby certify that the foregoing is a full, true and correct copy of Resolution 2023-18 duly and regularly adopted by the Board of Directors of the Georgetown Divide Public Utility District, County of El Dorado, State of California, on this 14th day of March 2023.

Nicholas Schneider, Clerk and Ex officio
Secretary, Board of Directors
GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

APPENDIX M

RURAL COMMUNITY ASSISTANCE CORPORATION – COST OF SERVICE STUDY

Georgetown Divide PUD
Water Financial Analysis

Requested by: California State Water Resources Control Board

Prepared by: John Van den Bergh

Rural Community
Assistance Corporation
3120 Freeboard Drive, Suite 201
West Sacramento, CA 95691

October 2017

This document was prepared using funds under Agreement 15-017-550 with the California State Water Resources Control Board; the total Agreement is for $3,971,379 and will produce multiple documents.

November 12, 2017

Elvira Reyes
State Water Resources Control City Council - Division of Financial Assistance

1001 I St. 16th Floor
PO Box 944212
Sacramento, CA 95814

Subject: Georgetown Divide Water Rate Study
SRF TA 4418

Dear Elvira:

Enclosed please find the printed final report of the Georgetown Divide Public Utility District. It was one of the more difficult studies as it involved almost 4,000 connections, $160 million in assets, and two customer classes.

The report was presented and approved by the GDPUD Board on October 24, 2017. RCAC will now assist the PUD with the Prop 218 process, which will be completed on December 12, 2017.

If you have any additional questions, feel free to contact me at 916/447-9832, Ext 1032 or John Van den Bergh at 916/917-4284.

Sincerely,

Ari Neumann

Ari Neumann
RCAC, Assistant Director
Community & Environmental Services

Enclosure: Georgetown Divide PUD 2017 Wastewater Rate Study

CC: Steve Palmer, General Manager, GDPUD, 6425 Main St., Georgetown, CA 95634

Contents

1. Georgetown Divide PUD

Community

Georgetown is an unincorporated community in El Dorado County, CA. It is the northeastern-most town in the California Mother Lode. The population was 2,367 at the 2010 census, up from 1962 in 2000. The town is registered as California Historical Landmark #484.

The official Median Household Income (MHI) for Georgetown is estimated by the American Community Survey (2014) to be $46,136, +/- $17,670 variance. The MHI for the service area is estimated at $66,359.

Georgetown is about 20 miles and 30 minutes east of Auburn, CA.

The Georgetown Divide is located between the Middle and South Forks of the American River, nestled in the heart of the Sierra Nevada Foothills and Northern California's Gold Country. Access is through Hwy 50 and Hwy 80, making it in close proximity to either metropolitan cities or recreational activities of Lake Tahoe.

District

The Georgetown Divide Public Utility District, as we know it today, was formed on June 4, 1946. However, the origins of District facilities can be traced back to 1852 and the El Dorado, Pilot and Rock Creek Canal Companies, one of the first established water purveyors in the State of California – a not inconsequential result of James Marshall's discovery of gold in nearby Coloma. Following the decline in gold production, agriculture and lumbering became the staple industries on the Divide for many years.

In recent decades, several vineyards have increased the demand for irrigation water.

The focus of the District water supply system is the Stumpy Meadows Reservoir, a 20,000 acre - foot impoundment on Pilot Creek, at the eastern edge of the District.

The District provides treated water, irrigation water and sewer services to the community. Not all three services are provided in all areas.

Services extend as far west as Cool and as far south as Pilot Hill. (See map.)

This District has an elected five-member Board, which sets policy and oversees a General Manager (GM). Board members do not, and should not, actively participate in the management of the District.

The Board meets monthly.

The District last reviewed and updated its treated water and irrigation rates in 2008. As a result, operational costs and replacement costs for capital facilities are exceeding annual revenue, and additional capital improvement needs are being deferred. It is considered best practice to evaluate water rates every three to five years.

Customers

The District has 3,774 treated water customers who are billed bi-monthly.

Meter Size	Number of Meters
A	C
5/8"	3117
3/4"	421
1"	198
1.5"	28
2"	10
3"	0
4"	4
6"	0
Total	3774

In addition, there are 408 irrigation customers.

Current Rates

Base Rate for treated water is the same for all meter sizes, with the exception of the four 4" meters.

Meter Size	Existing Base Rate
5/8"	$47.14
3/4"	$47.14
1"	$47.14
1.5"	$47.14
2"	$47.14
3"	$47.14
4"	$50.32
6"	$50.32

Usage Charges are currently tiered and vary from $1.28 to $2.21 per 100 CF. 2000 CF is included in the Base Rate.

Irrigation customers pay $363.70 per miner's inch, per season.

The District's rate schedule includes connection fees, transfer fees, late charges, etc. This rate study does not include an analysis of these charges.

Funding of this report

This rate study covers both the treated water and the irrigation water services and is made available at no charge to the District. This report was prepared using funds under Agreement 13-409-550 between RCAC and the California State Water Resources Control Board.

Disclaimer

The recommendations contained in this rate study are based on financial information provided to RCAC by the District. Although every effort was made to assure the reliability of this information, no warranty is expressed or implied as to the correctness, accuracy or completeness of the information contained herein.

Any opinions, findings, and conclusions or recommendations expressed in this material are solely the responsibility of the authors and do not necessarily represent the official views of the California State Water Resources Control Board.

For accounting advice, a CPA should be consulted. For legal advice, the District should seek the advice of an attorney.

2. Guiding Principles of this Rate Study

RCAC's rate studies comply with AWWA guidelines, unless California regulations, mainly Prop 218, require a deviation from national standards.

Sustainability

Rates should cover the costs to the system to allow it to provide services now, and in the foreseeable future. It is the responsibility of the Board to set rates to a level where the system is sustainable.

Fair

Rates should be fair to all rate payers. No single rate payer or group of rate payers should be singled out for different rates. Therefore, the proposed treated water rates do not make any distinction between domestic, commercial, industrial or agricultural users. The rates are the same for all types of customers.

The District should not charge more for treated water than the cost to provide the service. However, the costs should include: operations, repairs, interest, loan principal, and all other costs related to the collection, treatment and distribution, now and in the foreseeable future.

Unreasonably low rates for current customers will require unreasonably high rates for future customers, which should be avoided.

To avoid any possibility of treated water customers subsidizing irrigation customers, or vice versa, RCAC has split the assets, budgets, reserves and debts between treated water and irrigation customers.

Justifiable

Water rates must be based on actual needs of the District. Revenue generated from treated water rates can't be used for anything else but to pay for the costs of collecting, treating and distribution of water within its service area, plus administrative costs.

Similarly, revenue generated from irrigation water rates can't be used for anything else, but to pay for the cost associated with that service.

However, subsidies to either, treated or irrigation water, not funded by rate payers, but from outside sources (i.e. property taxes, hydro revenue, etc.), can be allocated to either class of service at the discretion of the board.

Prop 218[1] requires the justification of the tier level and the amount charged for each tier. This rate study does not provide the cost justification for any tiered Usage Charges, and proposes the elimination of a tiered Usage Rate. As a result, volumetric charges per cubic foot of treated water will be the same per cubic foot, regardless of usage.

[1] Article XIII D, Section 6 of the California Constitution

Purpose of this study

The purposes of this study are:

- Ensure the financial strength of the district well into the future
- Expose the need to set reserves aside for future replacement of failing components
- Allocate shared costs between treated water and irrigation water customers
- Identify any other financial deficiencies of the district

The Model

RCAC uses an Excel rate setting model developed over many years of practice. It has been used in more than 60 rate studies throughout the western United States. It is geared towards RCAC's clients, which are communities of less than 10,000 people.

The origins lay in CIP and Budget forms published by the California State Water Resources Control Board, Office of Financial Assistance. The forms were integrated and enhanced to comply with AWWA standards, regulation and recent legal cases.

Board Decision

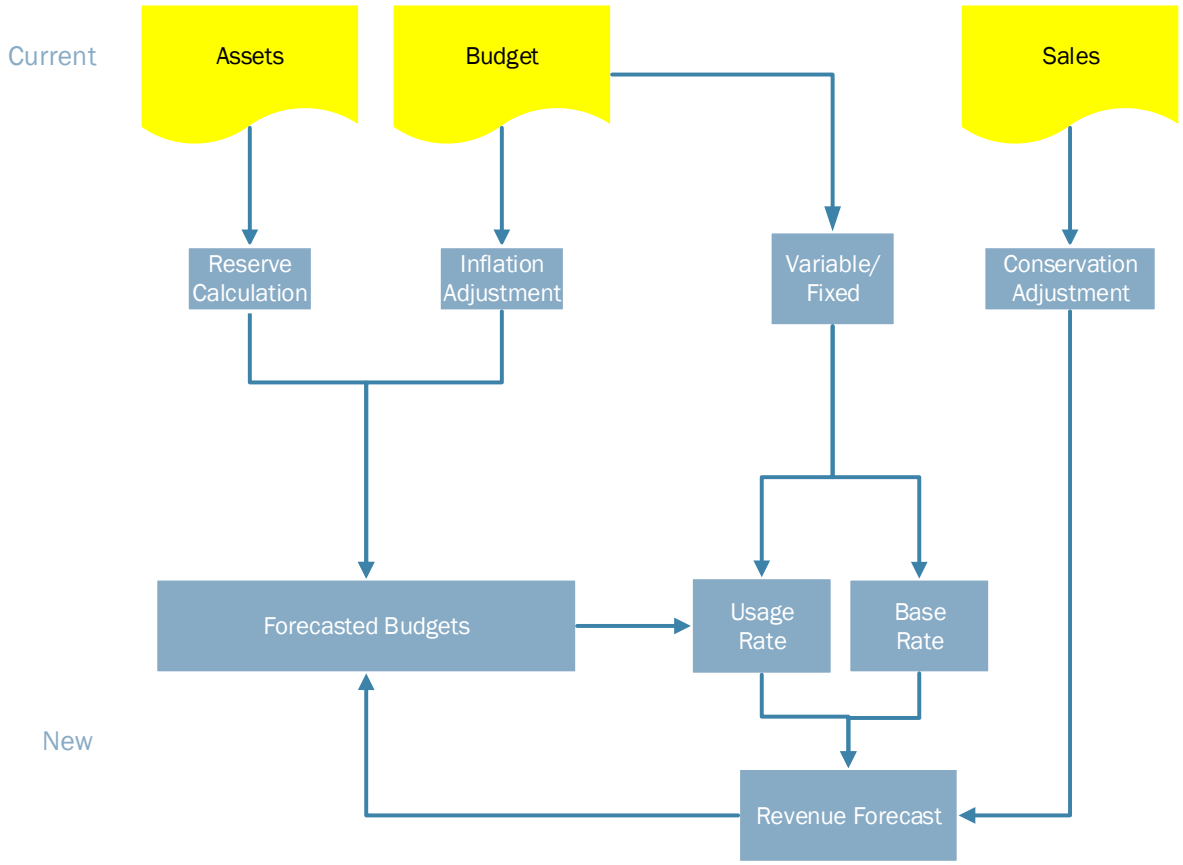
While this document recommends certain rates, the ultimate decision rests with the district's Board. However, the Board has a fiduciary responsibility to set the rates at such a level that the District will be able to continue to operate in the future, including providing funds to replace all parts of the system as they wear out.

At a special board meeting on October 18, 2017, the board reviewed and adjusted the proposed rates, to arrive at the rates presented in this report. The final rates may only be adopted after a 45-day notice of the proposed rate increase is provided, in accordance with Prop 218, and a successful Prop 218 public hearing is conducted, as provided in the notice.

3. Rate Study Process

The figure[2] below explains the process of setting rates. This process is based on AWWA standards as described in *"Principles of Water Rates, Fees and Charges (M1), AWWA, Sixth Edition, 2012"*. In *Griffith v. Pajaro Valley Water Management Agency*, the court clarified that the AWWA standards, described in their M1 manual comply with the proportionality requirements of Article XIII D, Section 6(b) of the California Constitution (referred to on the previous page of this report).

We begin with the list of all capitalized assets, the budget and the current number of customers, as provided by the GM.



From the list of assets, the required reserves are calculated (Section 4 of this report) and fed into a 5-year Budget projection (Section 5)

The Budget is adjusted for 2.0% inflation.

The expenses are then split between fixed and variable expenses.

[2] In this report all yellow cells contain data obtained outside the model. All blue cells are calculated.

The fixed expenses are then allocated among the different customers according to their hydrological potential, as determined by their meter size, and gives us a recommended Base Rate.

The Usage Charge is calculated based on the variable expenses.

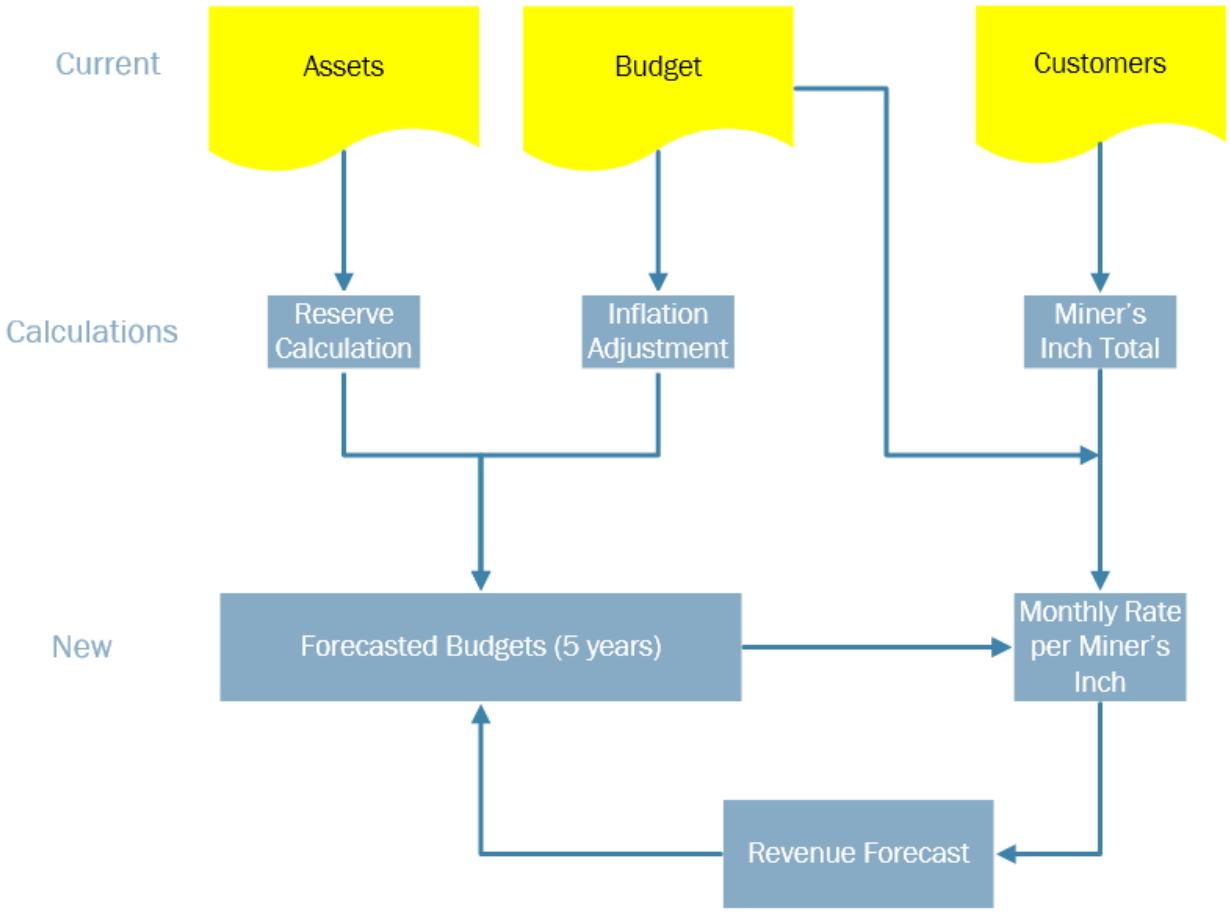
The Sales Forecast (in CF or gallons) is adjusted for future growth and water conservation, and is then applied against the Base Rate and Usage Charge, to arrive at a Revenue Forecast.

This Revenue Forecast is then inserted in the forecasted Budget.

If the Budget does not balance with the selected Base Rate and Usage Charge, they are adjusted until they balance the Budget.

To lessen the impact on District customers, rate increases could be spread over five years.

The same principle works for the irrigation rates, except that the rate, per miner's inch, is calculated by dividing the total expenses by the total miner's inches.



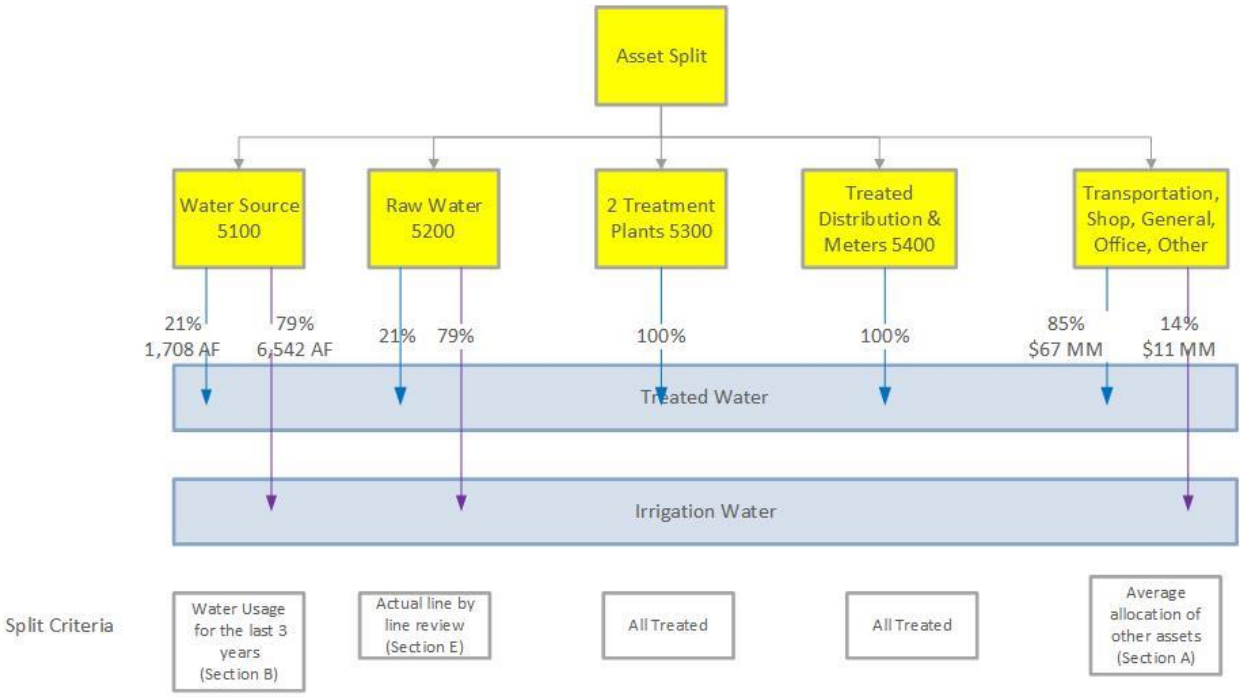
4. Capital Replacement Program

Source of the Data

The data in the Capital Replacement Program (CRP) comes from the data supplied by the District's General Manager and AWWA standards. It is attached as Exhibit 1T[3] and Exhibit 1I.

The list of the components, their installation date and their original costs were all supplied by the General Manager (GM) and thoroughly reviewed by the operations manager.

Since this list contained assets used for Treated Water, Irrigation Water and some assets were used by both, the assets needed to be split between the two classes of service. The graphic below shows how the assets were split between Treated Water, Irrigation Water and Waste Water.

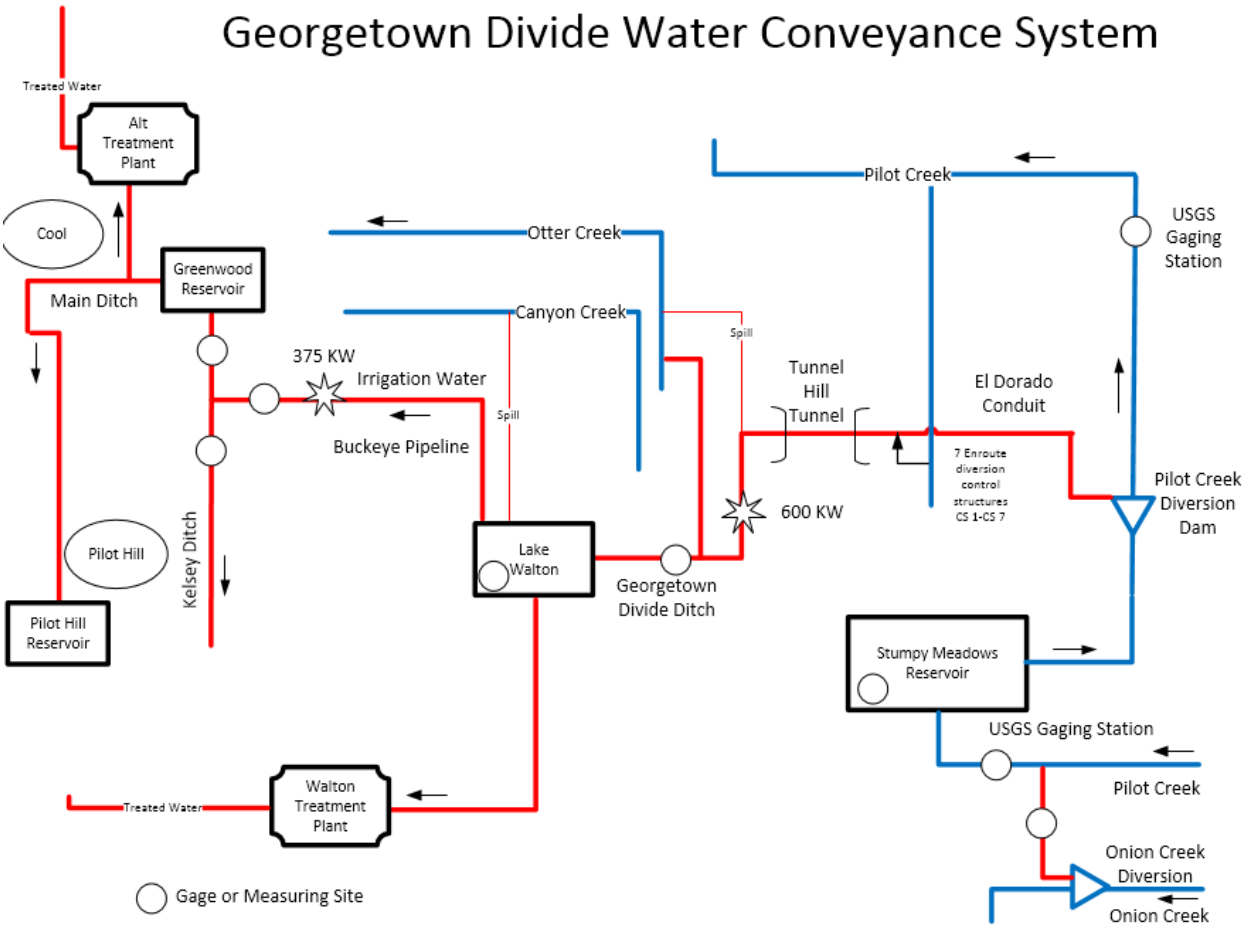


Split Criteria of Assets

Assets were split between treated and irrigation water according to the use of the asset by either treated or irrigation customers. Assets pertaining to the sewer system were excluded also. Since many assets are used by both irrigation and treated water, assets were split according to certain rules explained below.

[3] The suffix of the exhibits refers to T for "treated" and I for "irrigation".

In the graphic below, all red lines and black blocks are owned by the district and need to be split between treated and irrigation. The graphic shows the shared assets between irrigation and treated water assets.



Assets listed in accounting account series 5100 (Water Source) were split according to the volume of water (acre feet) flowing through the "water source" assets.

The table below shows the water usage split between treated and irrigation water of 21% and 79% respectively. Water volume during the drought years of 2014 and 2015 were not included.

	2012	2013	2016	Average
Drinking Sales	1,591	1,671	1,262	1,508
Drinking Loss	200	200	200	200
Total	1,791	1,871	1,462	1,708
Irrigation Sales	4,681	4,692	4,654	4,676
Irrigation Loss	2,000	1,800	1,800	1,867
Total	6,681	6,492	6,454	6,542
			% Treated	21%
			% Irrigation	79%

Source: Water Supply & Demand Summary 2012, 2013 and 2016

Assets listed in accounting account series 5200 (Raw Water) were more difficult to split. Staff went through the list of assets and determined the use of each asset. When an asset was used by both treated and irrigation water, it was split by volume.

Since most raw water assets are used by both irrigation and treated water, the raw water (5200) asset split between treated and irrigation water turned out to be the same as the water source (5100) split: 21% and 79% respectively for treated and irrigation water.

Assets associated with the treatment plant (5300) and the distribution system (5400) were all allocated to treated water.

Assets associated with Customer Service (5500) were split according to the number of customers.

The table below shows the customer service assets split between treated and irrigation water of 71% and 8% respectively.

Number of Customers		
Drinking Water	3,774	71%
Irrigation Water	408	8%
Waste Water	1,099	21%
Total	5,281	100%

Assets associated with everything else (transportation, shop, office, etc.) were split according to the percentages of all the other assets.

The table below shows the other assets split between treated and irrigation water of 85% and 14% respectively.

	$ IW Current Value	$ TW Current Value	$ Septic Current Value
SOURCE OF SUPPLY PLANT #5100	$8,429,083.56	$2,240,642.47	
LAKE WALTON PLANT #5300	$0.00	$4,354,198.53	
AUBURN LAKE TRAILS PLANT	$0.00	$3,339,546.34	
T&D RAW WATER #5200	$2,143,708.19	$8,045,221.12	
T & D METERS & METER BOXES	$35,811.43	$316,860.95	
T & D TREATED WATER #5400	$0.00	$48,487,228.12	
TRANSPORTATION EQUIPMENT			
SHOP & FIELD EQUIPMENT			
GENERAL PLANT			
OFFICE EQUIPMENT			
SEPTIC COLLECTION PLANT			$1,035,877
TRANSPORTATION EQUIPMENT & OTHER			
	$10,608,603.18	$66,783,697.53	$1,035,876.51
	14%	85%	1%

Exhibit 1 shows the list of all the assets and their cost, split according to the above split criteria. For example, a water source asset of an original cost of $1,000,000 is split between treated and irrigation water, according to 79%-21%. Therefore, $790,000 is listed in Exhibit 1T and the same asset is listed as $290,000 in Exhibit 1I.

Life Expectancy of Assets

The Normal Estimated Life of all assets listed in Exhibit 1 is based on AWWA standards and adjusted for actual conditions.

The Estimated Remaining Life in Exhibit 1 is based on the best judgement of the GM, the Operator and RCAC, after a visual inspection of the condition of the component.

Sources of Funding

Funding of the replacement of components can only come from cash saved by the District, a grant obtained or a loan.

The Board has made a policy for funding of capital assets as shown in the table below:

Assets Cost between	**and**	Cash	Grant	Loan
$0	$50,000	100%	0%	0%
$50,001	$100,000	75%	0%	25%
$100,001	$500,000	50%	20%	30%
$500,001	$9,999,999	25%	20%	55%

For example, a capital replacement project costing $200,000, would ideally be funded by 50% cash, 20% grant and 30% loan.

While the possibility of receiving substantial grants to replace certain components of the system is good at this time, these possibilities will diminish over time as government funding capabilities will diminish.

The current Median Household Income (MHI) of $46,700 ("Disadvantaged", but not "Severely Disadvantaged") makes it difficult for Georgetown to rely heavily on grants.

Staff and RCAC went through the list of all assets and determined the realistic split between cash, grant and loan funding of projects. In aggregate, 26% will be funded with cash, 1% with grants and 73% with loans.

This study assumes the average interest rate on the loans will be 2.5% APR.

Existing Reserves

Existing funds in all accounts were manually allocated to treated and irrigation water.

The District has about $6,753,000 in cash and liquid assets allocated to the treated water system and $322,564 to irrigation water. Of these liquid assets, $5,142,000 is available as reserves for future replacement of deteriorating components of the treated water system and $166,432 is available for the irrigation system replacement.

These amounts were calculated based on the January 2017 Cash & Investment balances in the district's accounts (Exhibit 4). Funds that pertained to both Irrigation and Treated water were split according to past revenue percentages of each service category.

Description of Exhibit 1T and 1I

The CRP provides us with a detail of the reserves needed to replace the capital assets.

The total line of the CRP table (Exhibit 1T $1,544,026 and Exhibit 1I $250,172) are the amount the District must put aside each year to be able to fund the replacement of equipment for the treated water or irrigation system.

Alternative

If the District decides not to fund the annual capital reserve requirement, the District will have to come up with these amounts from other sources, or from steeper rate increases in future years. The District can't count on the future generosity of the state or other government sources to provide any sizable grants.

It will require a substantial effort of the District's staff to obtain these grants and loans. The amount of grants obtained for future projects has a large impact on the rates. Therefore, this study recommends a new rate study when new loans or grants are obtained.

5. Budget

Board Member Analysis Request (Board Scenario)[4]

At the October 18, 2017 Board Meeting, the Board asked staff to analyze a scenario that funds general and administrative (G&A) expenses (Department 6500 with tax revenue for the first year.

- Estimated Available Tax Revenue: $1,569,000
- G&E Expenses for the first year are: $1,198,350
- The remaining $371,000 was proposed to be allocated to:
    - Ditch maintenance and water meter replacement programs
    - $35,000 for water bill relief for low-income household subsidies
    - $336,000 up to bring down irrigation costs

Analysis of the Board Scenario

For purposes of calculating the rates, we can apply tax revenues to the G&A expenses. However, this will have to be assumed for all future years, not just the first year.

The ditch maintenance and water meter replacement programs are already included in the CIP section of the rate setting calculation, and hence need not be funded separately.

The funding for a low-income household water bill subsidy program can be added to the budget used for the rate calculations.

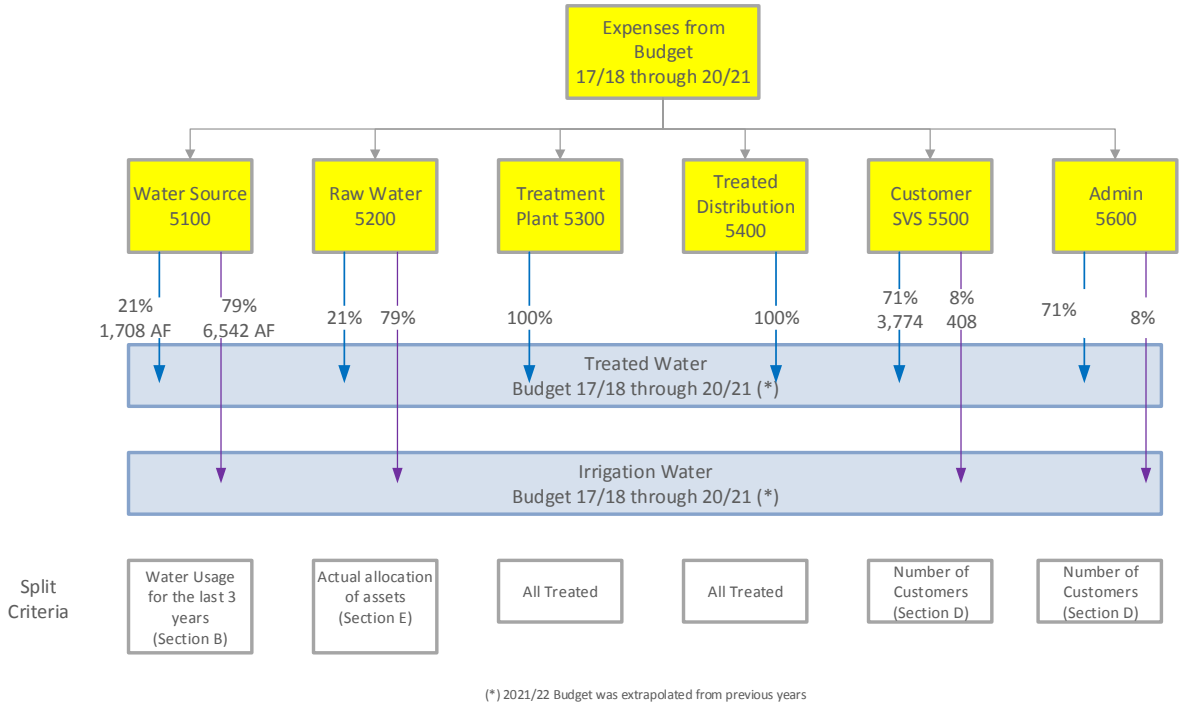
The impact of this scenario on the rates is discussed at the end of this report.

Source of Data[5]

All expenses shown in Exhibit 2 (5-Year Budget sheet) are based on the budget provided by the District for 2016-17 to 2020-21. The forecasted budget for the 2021/22 year was extrapolated. This budget assumed full staffing.

This Budget was then split between treated water and irrigation water, as explained in the graphic below.

[4] We shall call this the "Board Scenario". The alternative scenario, we shall call "recommended scenario."
[5] Unless indicated otherwise, the Board Scenario and the Recommended Scenario" are the same.



(*) 2021/22 Budget was extrapolated from previous years

Source: 2016-2017 Working Budget + Split

The split of the budget between Treated and Irrigation water of accounts 5100, 5200, 5300, 5400 and 5500 were discussed in the section about the split of the assets on page 10. The split of the General and Administration expenses (5600) is split according to the number of customers served by the District.

Reserve Funding

Exhibit 4 shows all the funds in the District's accounts, as of January 2017. These funds were split between treated and irrigation water.

These funds were further split in the four types of reserves the District should consider, according to AWWA standards: Debt Reserve, Operating Reserve, Emergency Reserve and Capital Reserve.

Treated Water

Existing Reserves	Amount	
Debt Reserve	$335,511	As per lending agreement(s)
Operating Reserve	$876,629	
Emergency Reserve	$778,569	
Capital Reserve	$4,762,189	
Total	$6,752,898	

Reserve Targets	Amount	Annual Reserve Addition	Excess funds to be transfer to CRP
Debt Reserve	$335,511	$0	$0
Operating Reserve	$856,341	$0	$20,288
Emergency Reserve	$443,000	$0	$335,569
Capital Reserve	$5,118,046	This is the total amount currently available for CIP. Transferred to CIP sheet.	

We compare the existing reserves against the target reserves. Any excess in Debt, Operating or Emergency Reserves is allocated to Capital Reserves. Any shortfall in Debt, Operating or Emergency Reserves is added to the budget in five installments, so the shortfall is eliminated in five years.

1. Debt Reserve: Your lenders require that you keep $335,511 in a Debt Reserve Account for your treated water loans (or the drinking water portion of joint loans). The District is in compliance with that provision, hence, we need not include funds in the Budget to fund this type of reserve.

2. Operating Reserve: Operating reserves are established to provide the District with the ability to withstand short term cash-flow fluctuations. A 45-day operating reserve is a frequently used industry norm which computes to $856,341 in Operating Reserves. As of July 2017, you have this in the bank, hence, we need not include additional Operating Reserves in our Budget. In fact, you have $20,288 more than that. It is recommended that you transfer this amount into your Capital Reserve account.

3. Emergency Reserve: Emergency reserves are intended to help utilities deal with short-term emergencies, such as main breaks or pump failures. An emergency reserve is intended to fund the immediate replacement or reconstruction of the system's single most critical asset. We estimate that $443,000 would be sufficient for emergency reserves for the treated water. As of July 2017, you have $778,569 in the bank for treated water. It is recommended that you transfer the excess of $335,569 from Emergency Reserves to Capital Reserves.

4. Capital Replacement Reserve: This reserve is strictly to be used to fund the District portion of any replacement of capital assets that are worn out. We assume that the balance of the liquid assets can be used for Capital Reserves. You currently have $4,762,189 in Capital reserves dedicated to the treated water system. Add to that the $20,288 in excess Operating Reserves and $335,569 in excess Emergency Reserves, for a current Capital Reserve of $5,118,046.

Irrigation Water

Existing Reserves	Amount	Goal
Debt Reserve	$0	As per lending agreement(s)
Operating Reserve	$106,131	45 days of expenses
Emergency Reserve	$94,259	Critical equipment replacement cost
Capital Reserve	$122,173	Funds available to replace existing assets

Total	$322,564

Reserve Targets	Amount	Annual Reserve Addition	Excess funds to be transfer to CIP
Debt Reserve	$0	$0	$0
Operating Reserve	$122,595	$3,293	$0
Emergency Reserve	$50,000	$0	$44,259
Capital Reserve	$166,432	This is the total amount currently available for CIP. Transferred to CIP sheet.	

We compare the existing reserves against the target reserves. Any excess in Debt, Operating or Emergency Reserves is allocated to Capital Reserves. Any shortfall in Debt, Operating or Emergency Reserves is added to the budget in five installments, so the shortfall is eliminated in five years.

Four type of reserves:

1. Debt Reserve: None of the debt associated with the irrigation system requires any debt reserve.

2. Operating Reserve: Operating reserves are established to provide the District with the ability to withstand short term cash-flow fluctuations. A 45-day operating reserve is a frequently used industry norm which computes to $122,595 in Operating Reserves. As of July 2017, you only have $106,131 in the bank, hence we need to budget an extra $3,293 for the next 5 years to bring this amount up to the target. This amount of $3,293 is added to the Budget.

3. Emergency Reserve: Emergency reserves are intended to help utilities deal with short-term emergencies, such as main breaks or pump failures. An emergency is intended to fund the immediate replacement or reconstruction of the system's single most critical asset. We estimate that $50,000 would be sufficient for emergency reserves for the irrigation water. As of July 2017, you have $94,259 in the bank for irrigation water emergencies. It is recommended that you transfer the excess of $44,259 from Emergency Reserves to Capital Reserves.

4. Capital Replacement Reserve: This reserve is strictly to be used to fund the District portion of any replacement of capital assets that are worn out. We assume that the balance of the liquid assets can be used for Capital Reserves. You currently have $122,173 in Capital Reserves dedicated to the irrigation water system. Add to that the $44,259 in excess Emergency Reserves this gives us a current Capital Reserve of $166,432.

Allocation of Property Taxes

The District has about $1,569,000 in annual property tax revenue. The board has full discretion on how to spend these funds for any District-related purpose.

Board Scenario

At the October 18, 2017 Board meeting, it was suggested that the tax revenue be split as follows:

- To cover G&A expenses (Department 5600): $1,198,000
- Water bill subsidies for low-income families: $35,000
- Allocation to irrigation services: $336,000

Recommended Scenario

Since the Board has discretion to allocate these outside funds, we would ask the Board to allocate $1,006,000 (64%) to treated water and 563,000 (36%) to irrigation. These numbers are necessary to avoid a negative cash flow for the irrigation service, without having to increase the rates for customers with 1 miner's inch of usage, by more than 100% in the first year.

Reserve Accounting and Investment Opportunities

The District has multiple checking and savings accounts that do not correspond to AWWA standards for reserve accounts. It is recommended that the District have:

1. One Operating account
2. Debt reserve accounts for each loan
3. At least one Emergency account for each class of service: treated, irrigation, waste water
4. At least one Capital reserve account for each class of service

The names of these accounts should correspond with the four reserves recommended by the AWWA.

The District should also have policies in place regarding:

1. who can access these accounts
2. for what purposes funds can be withdrawn
3. how often the reserve accounts are funded from the operating account

By design, cash will accumulate in the Operating account. Periodically any excess funds above the target set on page 18 should be transferred to the Capital Reserve accounts.

Operating cash should remain in the checking account.

Debt Reserve funds can be invested for a long time, preferably maturing at the same time as the associated debt.

Emergency Reserves should be kept in a savings account for immediate liquidity.

Capital Reserves could be invested in a series of maturities that correspond with the Capital Improvement plan horizon.

By following the above principles, you can maximize your return on your reserves.

6. Rate Calculation

The District is planning to change all 5/8" meters with 3/4" meters in the next two years. New homes will probably be required to install fire suppression sprinklers, which require 1" meters. An analysis of the usage data indicates that customers with 5/8", 3/4" or 1" use about the same quantity of water and the extra capacity of their meter is only needed for emergencies. Therefore we recommend that the rates for the bottom three sizes of meters be the same.

AWWA recommends that expenses be split between fixed and variable expenses. Fixed expenses are expenses that don't change when the volume of water changes. (Example: insurance) Variable expenses are those that change with the volume of water sold. (Example: utilities)

In theory, fixed expenses need to be funded with Base Charges and variable expenses determine the Usage Charge.

The fixed expenses are allocated to the different meter sizes according to their hydrological potential draw.

The "Theoretical Base Rate by Meter Size per 2M" in the tables below was calculated using this method. California courts have determined that this national standard, is compliant with Prop 218.

A. Board Scenario

Treated Water

Base Rate Calculation for Treated Water

Meter Size	Theoretical Base Rate by Meter Size, per 2M	Base Rate as % of Theoretical Rate	Existing Base Rate	Proposed Base Charge for Year 1	Year 2	Year 3	Year 4	Year 5
	Future Increases →				5.0%	5.0%	5.0%	5.0%
5/8"	$91.25	75%	$47.14	$ 68.43	$71.85	$75.44	$79.21	$83.17
3/4"	$136.87	50%	$47.14	$ 68.43	$71.86	$75.45	$79.22	$83.18
1"	$228.12	30%	$47.14	$ 68.43	$71.85	$75.44	$79.21	$83.17
1.5"	$456.23	50%	$47.14	$ 228.12	$239.52	$251.50	$264.08	$277.28
2"	$729.97	50%	$47.14	$ 364.98	$383.23	$402.39	$422.51	$443.64
3"	$1,459.94	50%	$47.14	$ 729.97	$766.47	$804.79	$845.03	$887.28
4"	$2,281.15	50%	$50.32	$ 1,140.58	$1,197.61	$1,257.49	$1,320.36	$1,386.38

Usage Rate Calulation

Tier	Bottom of Tier	Top of Tier	Year 1, per 100 CF	Year 2	Year 3	Year 4	Year 5
	Future Increases →			5.0%	5.0%	5.0%	5.0%
1	-	999,999	$2.2500	$2.36	$2.48	$2.60	$2.73
Net Gain/Loss (incl. reserve contrib.			-648,067	-565,030	-397,733	-316,016	-194,610
Are contributions to res. enough?			No	No	No	No	No
Contribution to Reserves (Cashflow)			884,536	963,324	961,788	1,043,506	1,164,911
Affordability Index MH	46,700.00		1.45%	1.53%	1.62%	1.71%	1.80%
Project funding $30.16/2 months			0.39%	0.39%	0.39%	0.39%	0.39%
Afforability of total rate			1.84%	1.92%	2.01%	2.10%	2.18%

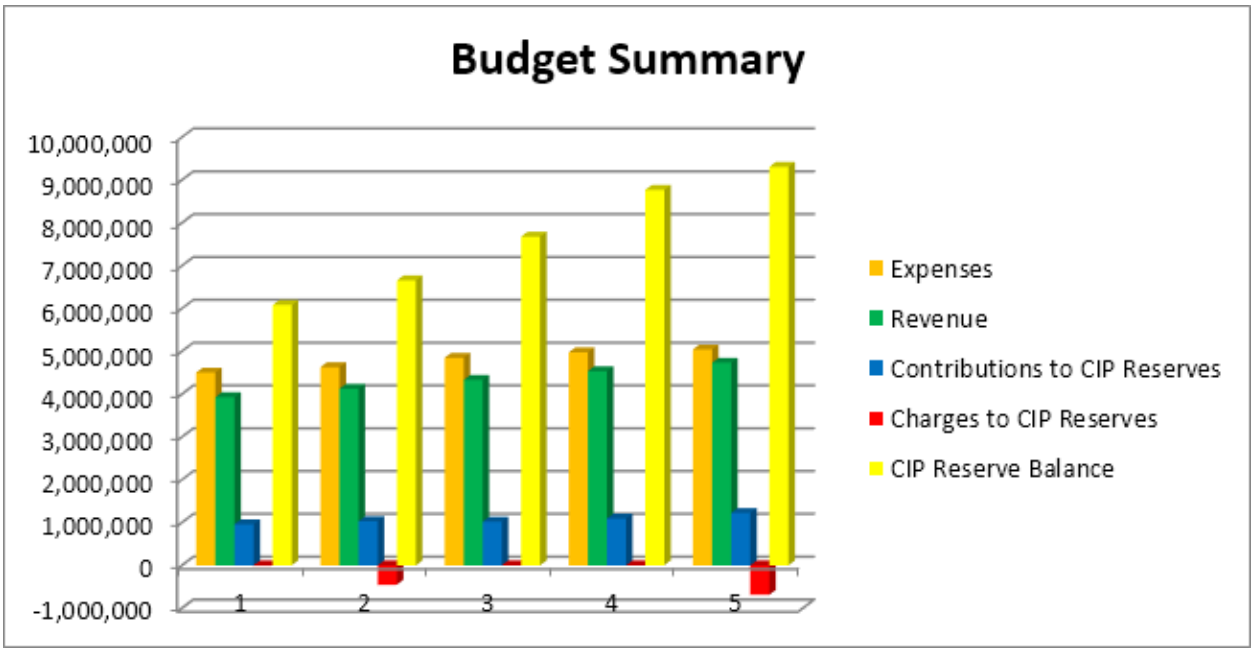
Using the rates in the yellow cells and a 5% rate increase for the next 5 years has the following consequences:

- Treated water customers will see a rate increase of 66% over 5 years.
- The average homeowner will pay about $139.82 every two months, in the fifth year.
- Reserves are funded in a substantial way, but still 14% short of the target in the fifth year.
- A 15 year projection (not shown) estimates that reserve funds will be exhausted, unless rates are increased after the fifth year of this study.

The graph below shows the trends:

- Expenses (orange bar) grow at the rate of inflation
- Revenue (green bar) grows at 5% per year
- Contributions to reserves (blue bar) are enough to cover the planned capital replacements in year 5 and beyond.
- Charges to Reserves (red bar) are the replacement costs of certain assets, according to the CRP

- The Reserve Balance[6] (yellow bar) is the total amount of all reserves, which is growing as expected.



[6] Total Reserves (Capital Replacement Reserves, Emergency Reserves, Debt Reserves, etc.)

Irrigation Water

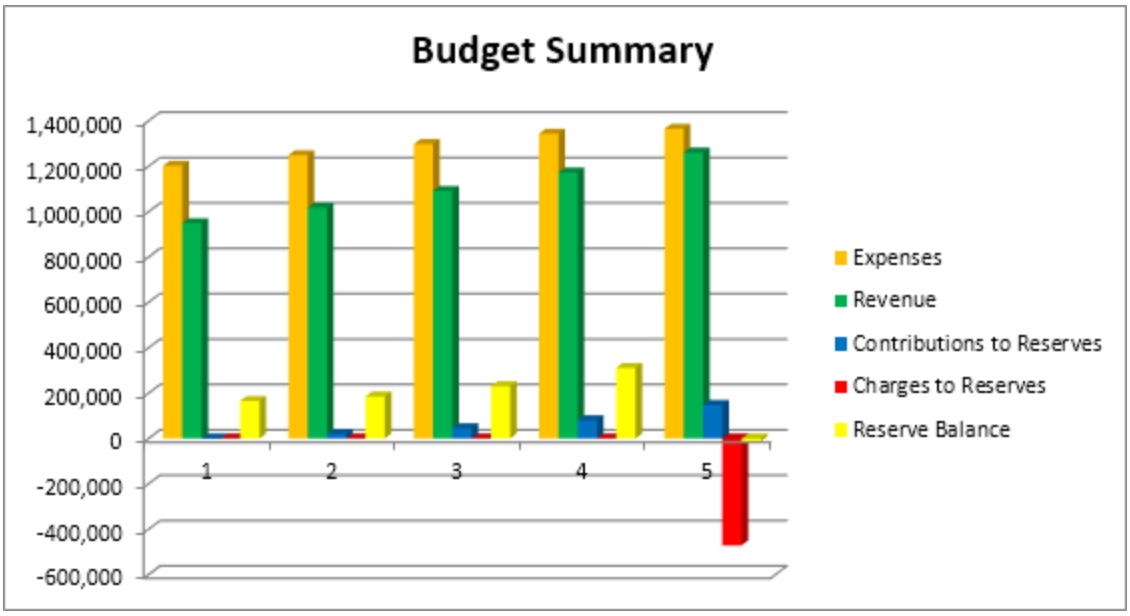
New Irrigation Rates

Meter Size (MI)	Meter Size (metric)	Theoretical Seasonal Rate by MI	as % of Theoretical Rate	Proposed Base Charge for Year 1	Year 2	Year 3	Year 4	Year 5
		Future Increases →			10.0%	10.0%	10.0%	10.0%
1/2"	0.500	$966	51%	$493	$542	$596	$656	$721
1"	1.000	$1,932	51%	$986	$1,084	$1,192	$1,312	$1,443
1.5"	1.500	$2,899	51%	$1,478	$1,626	$1,789	$1,968	$2,164
2"	2.000	$3,865	51%	$1,971	$2,168	$2,385	$2,623	$2,886
2.5"	2.500	$4,831	51%	$2,464	$2,710	$2,981	$3,279	$3,607
3"	3.000	$5,797	51%	$2,957	$3,252	$3,577	$3,935	$4,329
3.5"	3.500	$6,763	51%	$3,449	$3,794	$4,174	$4,591	$5,050
4"	4.000	$7,730	51%	$3,942	$4,336	$4,770	$5,247	$5,772
5"	5.000	$9,662	51%	$4,928	$5,420	$5,962	$6,559	$7,214
6"	6.000	$11,594	51%	$5,913	$6,504	$7,155	$7,870	$8,657
7"	7.000	$13,527	51%	$6,899	$7,588	$8,347	$9,182	$10,100
8"	8.000	$15,459	51%	$7,884	$8,673	$9,540	$10,494	$11,543
9"	9.000	$17,391	51%	$8,870	$9,757	$10,732	$11,805	$12,986
10"	10.000	$19,324	51%	$9,855	$10,841	$11,925	$13,117	$14,429
12"	12.000	$23,189	51%	$11,826	$13,009	$14,310	$15,741	$17,315
15"	15.000	$28,986	51%	$14,783	$16,261	$17,887	$19,676	$21,643
16"	16.000	$30,918	51%	$15,768	$17,345	$19,080	$20,988	$23,086
18"	18.000	$34,783	51%	$17,739	$19,513	$21,464	$23,611	$25,972
20"	20.000	$38,648	51%	$19,710	$21,681	$23,849	$26,234	$28,858
25"	25.000	$48,309	51%	$24,638	$27,102	$29,812	$32,793	$36,072
30"	30.000	$57,971	51%	$29,565	$32,522	$35,774	$39,352	$43,287
40"	40.000	$77,295	51%	$39,421	$43,363	$47,699	$52,469	$57,716
43"	43.000	$83,092	51%	$42,377	$46,615	$51,276	$56,404	$62,044

Expenses from Budget	$ 1,201,940	$ 1,249,058	$ 1,298,202	$ 1,343,310	$ 1,365,138
Income Generated by the Selected Rate	$ 948,990	$ 1,017,009	$ 1,091,292	$ 1,172,455	$ 1,261,175
Net Gain or Loss (incl. reserve contributions)	-252,951	-232,049	-206,911	-170,855	-103,963
Are contributions to reserves enough?	No	No	No	No	No
Contributions to Reserve (Cashflow)	$ (1,026)	$ 19,876	$ 45,014	$ 81,070	$ 147,962
Target Contribution to Reserve	$ 251,925	$ 251,925	$ 251,925	$ 251,925	$ 251,925

Using the rates in the yellow cells and a 10% rate increase for the next 5 years has the following consequences:

- Rates increase for 1 Miner's inch by 172%.
- This increase ONLY covers operating expenses and NO reserves.
- Rates must be adjusted in year 5 to cover planned capital replacements, or the replacements cannot be funded after the 5th year.



The graph above shows the trends:

- Expenses (orange bar) grow at the rate of inflation
- Revenue (green bar) grows at 10% per year
- Contributions to reserves (blue bar) are barely enough to cover the planned capital replacements in year 5.
- Charges to Reserves (red bar) are the replacement costs of certain assets, according to the CRP
- The Reserve Balance[7] (yellow bar) is the total amount of all reserves, which will be completely exhausted by the fifth year.

B. Recommended Scenario

The differences between the Board Scenario and the Recommended Scenario are:

- Tax revenue is allocated based on need to keep irrigation customers' increase in the first year to around 109%, vs 197% for the Board Scenario.
- General and Administrative expenses are allocated between treated and irrigation customers, according to the number of customer in the recommended scenario, which is an acceptable "rule" for allocating expenses.

[7] Total Reserves (Capital Replacement Reserves, Emergency Reserves, Debt Reserves, etc.)

Treated Water

Base Rate Calculation for Treated Water

Meter Size	Theoretical Base Rate by Meter Size, per 2M	Base Rate as % of Theoretical Rate	Existing Base Rate	Proposed Base Charge for Year 1	Year 2	Year 3	Year 4	Year 5
	Future Increases →				5.0%	5.0%	5.0%	5.0%
5/8"	$112.02	52%	$47.14	$ 58.81	$61.75	$64.84	$68.08	$71.48
3/4"	$168.03	35%	$47.14	$ 58.81	$61.75	$64.84	$68.08	$71.48
1"	$280.05	21%	$47.14	$ 58.81	$61.75	$64.84	$68.08	$71.48
1.5"	$560.10	35%	$47.14	$ 196.04	$205.84	$216.13	$226.94	$238.29
2"	$896.17	35%	$47.14	$ 313.66	$329.34	$345.81	$363.10	$381.26
3"	$1,792.34	35%	$47.14	$ 627.32	$658.68	$691.61	$726.19	$762.50
4"	$2,800.52	35%	$50.32	$ 980.18	$1,029.19	$1,080.65	$1,134.68	$1,191.41

Usage Rate Calulation

Tier	Bottom of Tier	Top of Tier	Year 1, per 100 CF	Year 2	Year 3	Year 4	Year 5
	Future Increases →			5.0%	5.0%	5.0%	5.0%
1	-	999,999	$2.5500	$2.68	$2.81	$2.95	$3.10
Net Gain/Loss (incl. reserve contrib.			-575,577	-503,979	-513,331	-440,641	-309,025
Are contributions to res. enough?			No	No	No	No	No
Contribution to res. (Cashflow)			957,026	1,028,624	1,019,272	1,091,962	1,223,578
Affordability Index MH	46,700.00		1.40%	1.48%	1.57%	1.66%	1.74%
Project funding $30.16/2 months			0.39%	0.39%	0.39%	0.39%	0.39%
Afforability of total rate			1.79%	1.87%	1.96%	2.05%	2.13%

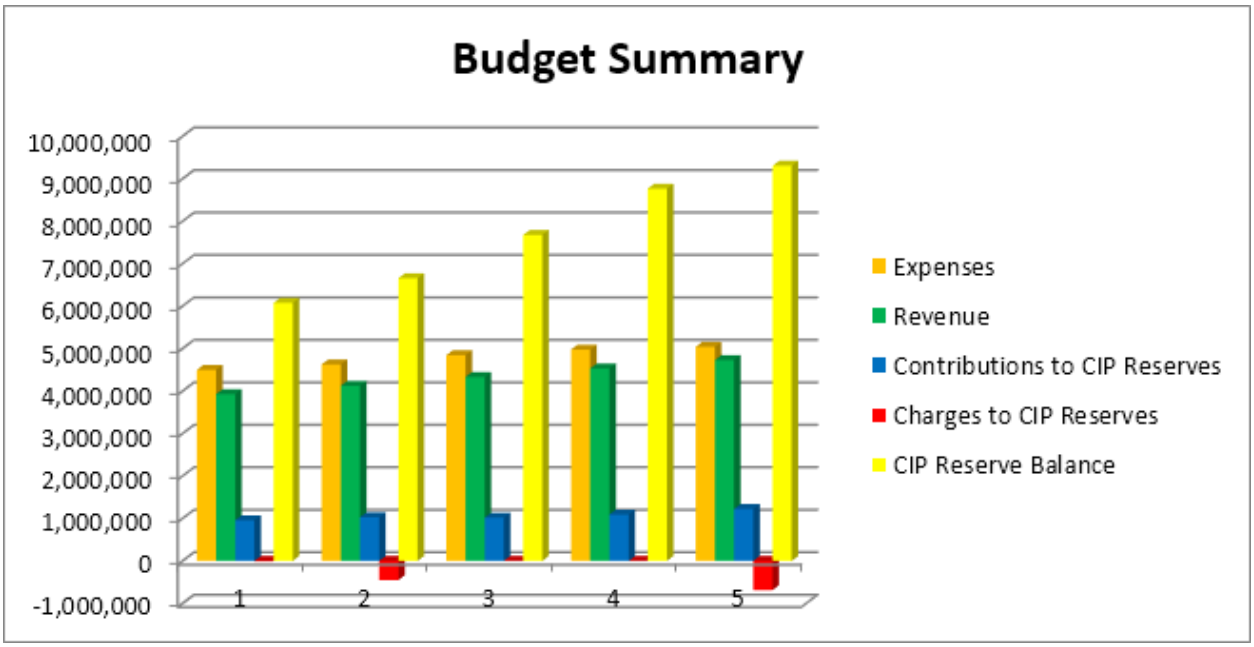
Using the rates in the yellow cells and a 5% rate increase for the next 5 years has the following consequences:

- Treated water customers will see a rate increase of 61% over 5 years. The average homeowner will pay about $135.67 every two months, in the fifth year.
- Reserves are funded in a substantial way, but still 20% short of the target in the fifth year.
- A 15 year projection (not shown) estimates that reserve funds will be close to exhausted, unless rates are increased after the tenth year of this study.

The graph below shows the trends:

- Expenses (orange bar) grow at the rate of inflation
- Revenue (green bar) grows at 5% per year
- Contributions to reserves (blue bar) are enough to cover the planned capital replacements in year 5 and beyond.
- Charges to Reserves (red bar) are the replacement costs of certain assets, according to the CRP

- The Reserve Balance[8] (yellow bar) is the total amount of all reserves, which is growing as expected.



[8] Total Reserves (Capital Replacement Reserves, Emergency Reserves, Debt Reserves, etc.)

Irrigation Water

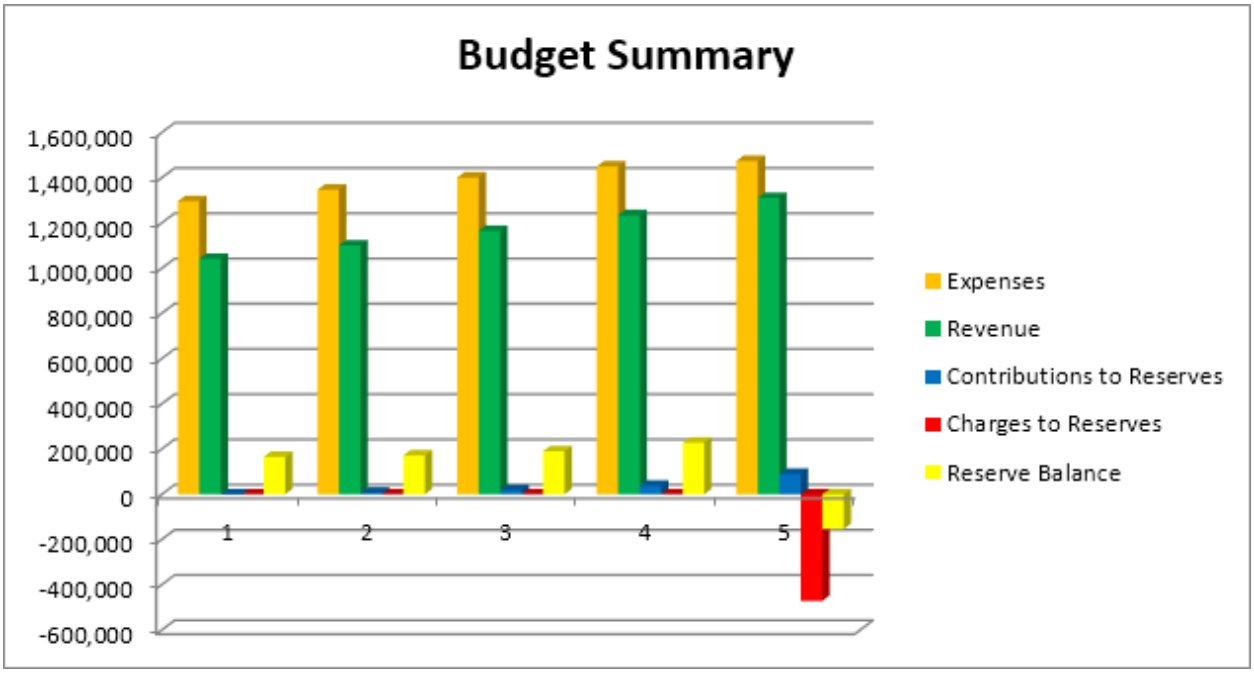
New Irrigation Rates

Meter Size (MI)	Meter Size (metric)	Theoretical Seasonal Rate by MI	% of Theoretical Rate	Proposed Base Charge for Year 1	Year 2	Year 3	Year 4	Year 5
		Future Increases →			10.0%	10.0%	10.0%	10.0%
1/2"	0.500	$1,042	37%	$385	$424	$466	$513	$564
1"	1.000	$2,084	37%	$771	$848	$933	$1,026	$1,129
1.5"	1.500	$3,126	37%	$1,156	$1,272	$1,399	$1,539	$1,693
2"	2.000	$4,167	37%	$1,542	$1,696	$1,866	$2,052	$2,258
2.5"	2.500	$5,209	37%	$1,927	$2,120	$2,332	$2,565	$2,822
3"	3.000	$6,251	37%	$2,313	$2,544	$2,799	$3,078	$3,386
3.5"	3.500	$7,293	37%	$2,698	$2,968	$3,265	$3,592	$3,951
4"	4.000	$8,335	37%	$3,084	$3,392	$3,731	$4,105	$4,515
5"	5.000	$10,419	37%	$3,855	$4,240	$4,664	$5,131	$5,644
6"	6.000	$12,502	37%	$4,626	$5,088	$5,597	$6,157	$6,773
7"	7.000	$14,586	37%	$5,397	$5,936	$6,530	$7,183	$7,901
8"	8.000	$16,670	37%	$6,168	$6,785	$7,463	$8,209	$9,030
9"	9.000	$18,753	37%	$6,939	$7,633	$8,396	$9,235	$10,159
10"	10.000	$20,837	37%	$7,710	$8,481	$9,329	$10,262	$11,288
12"	12.000	$25,004	37%	$9,252	$10,177	$11,194	$12,314	$13,545
15"	15.000	$31,256	37%	$11,565	$12,721	$13,993	$15,392	$16,932
16"	16.000	$33,339	37%	$12,336	$13,569	$14,926	$16,419	$18,060
18"	18.000	$37,507	37%	$13,877	$15,265	$16,792	$18,471	$20,318
20"	20.000	$41,674	37%	$15,419	$16,961	$18,657	$20,523	$22,576
25"	25.000	$52,093	37%	$19,274	$21,202	$23,322	$25,654	$28,219
30"	30.000	$62,511	37%	$23,129	$25,442	$27,986	$30,785	$33,863
40"	40.000	$83,348	37%	$30,839	$33,923	$37,315	$41,046	$45,151
43"	43.000	$89,599	37%	$33,152	$36,467	$40,114	$44,125	$48,537

Expenses from Budget	$ 1,296,062	$ 1,347,227	$ 1,400,629	$ 1,450,035	$ 1,473,966
Income Generated by the Selected Rate	$ 1,041,543	$ 1,100,737	$ 1,164,952	$ 1,234,671	$ 1,310,426
Net Gain or Loss (incl. reserve contributions)	-254,519	-246,490	-235,677	-215,364	-163,540
Are contributions to reserves enough?	No	No	No	No	No
Contributions to Reserve (Cashflow)	$ (1,054)	$ 6,975	$ 17,788	$ 38,101	$ 89,924
Target Contribution to Reserve	$ 253,465	$ 253,465	$ 253,465	$ 253,465	$ 253,465

Using the rates in the yellow cells and a 10% rate increase for the next 5 years has the following consequences:

- Rates increase for 1 Miner's inch by 109%, from $363.70 to $771.00 for the season.
- This increase ONLY covers operating expenses and NO reserves.
- Rates must be adjusted in year 5 to cover planned capital replacements, or the replacements cannot be funded after the 5th year.



The graph above shows the trends:

- Expenses (orange bar) grow at the rate of inflation
- Revenue (green bar) grows at 10% per year
- Contributions to reserves (blue bar) are not enough to cover the planned capital replacements in year 5.
- Charges to Reserves (red bar) are the replacement costs of certain assets, according to the CRP
- The Reserve Balance[9] (yellow bar) is the total amount of all reserves, which will be completely exhausted by the fifth year.

C. Discussion of Scenarios

We prefer the Recommended Scenario because:

- Tax revenue is allocated based on need to keep irrigation customers' increase in the first year to 109%, vs 197% for the Board Scenario.
- General and Administrative expenses are allocated between treated and irrigation customers, according to the number of customer in the recommended scenario, which is an acceptable "rule" for allocating expenses.
- In both cases, rates for irrigation customers will have to be reviewed in 4-5 years.
- The increase in rates for both treated and irrigation customers are lower under the recommended scenario.

The table below shows the differences in the rates for the first year.

[9] Total Reserves (Capital Replacement Reserves, Emergency Reserves, Debt Reserves, etc.)

Bi-Monthly Base Rate for Treated Water in first year						
		Board	Recommended			
	Current	F	G			
5/8"	$47.14	$68.43	$58.81			
3/4"	$47.14	$68.43	$58.81			
1"	$47.14	$68.43	$58.81			
1.5"	$47.14	$228.12	$196.04			
2"	$47.14	$364.98	$313.66			
3"	$47.14	$729.97	$627.32			
4"	$50.32	$1,140.58	$980.18			
Usage per 100CF of Treated Water in first year						
All	$1.38-$2.21	$2.25	$2.55			
Average Treated Water Bi-Monthly Bill for 5/8" meter in first year, for 2100 CF						
	84.18	112.7	108.98			
	% Increase	34%	29%			
Seasonal rate for 1 MI of Irrigation Water in first year						
1 MI	$363.70	$986.00	$771.00			
	% Increase	171%	112%			

7. Next Step

Start the process

The District must follow Proposition 218 (Exhibit 3) in implementing the water rates. The Board must have a hearing and pass a resolution that includes:

1. The selected rates
2. Approve of the wording of the Prop 218 Notice (Sample in Exhibit 6 and emailed to the GM for editing. Make sure the Public Notice reflects the rates, tiers and fees approved by the Board).
3. Set a date for the Notices to be mailed to all the property owners and renters within the District. (No need to send them registered mail. Send the Notices to all "property owners of record". Your County Tax Collector or Assessor can provide you with a list of addresses and address labels.)
4. Set a due date for the protest votes to be received, at least 45 days after the Notices are mailed.
5. At the second meeting, the Board must plan to take testimony. You may want to set multiple hearing dates or "educational meetings[10]" to explain the rate increases to the public.

[10] "Hearings" imply the presence of the Board and require an agenda and the appropriate notices. "Education Meetings" can be presented by staff, without the presence of Board members or an agenda.

6. Set an effective date for the proposed rates and fees.

Hearing

At the due date of the protest votes, tally the protest votes. If **more** than half of the parcel owners protest (one vote per parcel); then the Board cannot adopt the rates proposed in step 1, but must

- keep the rates unchanged
- or repeat the process starting with step 1

If **less** than half of the property owners protest, the Board can adopt the rates and fees. At that time in the process, the Board can only accept or reject the proposed rates and fees—they cannot change[11] them (unless steps 1-6 are repeated.)

Implementation

The rate structure proposed in this model can be implemented through the District's billing system.

Policies must be put in place to

- set up the appropriate reserve accounts: emergency and capital
- fund the reserves from revenue
- access the accounts
- define the circumstances under which funds can be withdrawn

The Board should also commit to a new rate study within 4 years, to extend rate increases beyond the 5 years, Prop 218 allows us to set rates for.

Finally, the Board should commit to create a subsidy program for low-income customers.

[11] Neither raise nor lower them.

8. Exhibits

Exhibit 1T: Capital Replacement Program Treated Water (Same for either scenario)

Exhibit 1I: Capital Replacement Program Irrigation Water (Same for either scenario)

Exhibit 2T: Budget Treated Water (Board)

Exhibit 2I: Budget Irrigation Water (Board)

Exhibit 3T: Budget Treated Water (Recommended)

Exhibit 3I: Budget Irrigation Water (recommended)

Exhibit 4: Cash & Investment Split (Same for either scenario)

Exhibit 5: Prop 218 Text

Exhibit 6: Notice Document

Capital Replacement Program **Exhibit 1T**

Georgetown Divide PUD TW

Date: 10/20/17

System Number: 910013

Service Connections: 3774

Qty	Component	Year Acquired	Unit Cost (Historic, Current or Future)	Cost Type (H, C, F)	Estimated Historic Cost	Normal Estimated Life	Current Age	Estimated Current Cost	Planned Remaining Life	Estimated Remaining Life	Estimated Future Cost	Fund with Cash	Fund with Grant	Fund with Loan	Existing Reserves	Annual Reserve Required
	Existing Capital Replacement Program															
	SOURCE OF SUPPLY PLANT #5100														$0	
1	Mark Edson Dam & Stumpy Meadows Res.	1962	$106,333	H	$106,333	100	55	$315,993	45	50	$850,524	10%	50%	40%	$12,389	$1,072
1	Tunnel Hill Tunnel	1962	$22,577	H	$22,577	100	55	$67,092	45	46	$166,831	25%	20%	55%	$6,076	$586
1	Kaiser Siphon Replacement (1)	1964	$83,961	C	$28,778	100	53	$83,961	47	46	$208,778	25%	20%	55%	$7,603	$734
1	Sand Trap Siphon (1)	1964	$34,125	C	$11,696	100	53	$34,125	47	48	$88,284	50%		50%	$6,430	$587
1	Up Country Ditch Imp (Pilot Ck Diversion to Tunnell Hill Inlet) (1)	1964	$424,830	C	$145,612	100	53	$424,830	47	56	$1,287,731	10%	50%	40%	$18,758	$1,392
															$0	
															$0	
	5200 SHARED														$0	
1	Cabin Waste Gate Replacement (1)	1972	$6,300	C	$2,538	40	45	$6,300	-5	20	$9,361	100%		0%	$1,364	$357
1	Bacon Creek Pipe (1)	1964	$53,576	C	$18,363	40	53	$53,576	-13	20	$79,611	50%		50%	$5,798	$1,518
1	Buckeye Conduit (1)	1964	$94,461	C	$32,377	40	53	$94,461	-13	20	$140,364	25%		75%	$5,112	$1,338
1	Up Country Ditch (Penn Stock Bypass to Shroeder Conduit) (1)	1964	$156,056	C	$53,489	40	53	$156,056	-13	5	$172,299	25%		75%	$6,275	$7,189
1	Main Ditch #1 Imp (1)	1964	$433,821	C	$148,694	40	53	$433,821	-13	5	$478,973	10%	50%	40%	$6,977	$7,994
1	Main Ditch #2 to ALT (1)	1964	$101,194	C	$34,685	40	53	$101,194	-13	5	$111,726	25%		75%	$4,069	$4,662
															$0	
															$0	
	5200 IRRIGATION ONLY (1)														$0	
1	Main Ditch #2 below ALT	1964	$0	C	$0	40	53	$0	-13	10		25%		75%	$0	
1	Pilot Hill Ditch (Main)	1964	$0	C	$0	40	53	$0	-13	10		50%		50%	$0	
1	Pilot Hill Ditch	1964	$0	C	$0	40	53	$0	-13	10		25%		75%	$0	
1	Kelsey Ditch #1	1964	$0	C	$0	40	53	$0	-13	10		25%		75%	$0	
1	Kelsey Ditch #2 Imp	1964	$0	C	$0	40	53	$0	-13	10		25%		75%	$0	
1	Spanish Dry Diggins Ditch	1964	$0	C	$0	40	53	$0	-13	10		100%		0%	$0	
1	Taylor Mine Ditch	1964	$0	C	$0	40	53	$0	-13	10		100%		0%	$0	
															$0	
															$0	
	5300 - Lake Walton WTP														$0	
1	Lake Walton Plant Replacement (4)	1992	$12,728,909	C	$7,681,448	50	25	$12,728,909	25	25	$20,883,124	25%		75%	$760,506	$154,431
1	Raw Water Bypass (1)	1974	$500,000	C	$209,745	40	43	$500,000	-3	19	$728,406	25%		75%	$26,527	$7,354
1	Lake Walton Outlet Works (1)	1974	$50,000	C	$20,974	40	43	$50,000	-3	19	$72,841	100%		0%	$10,611	$2,942
1	Lake Walton Dredging (1)	1974	$500,000	C	$301,732	40	25	$500,000	15	22	$772,990	25%		75%	$28,150	$6,617
							43		-43						$0	
	5300 - AUBURN LAKE TRAILS PLANT														$0	
1	ALT Water Treatment Plant (4)	2018	$12,728,909	C	$12,988,683	50	-1	$12,728,909	51	59	$40,945,042	25%		75%	$1,491,105	$102,887
															$0	
															$0	
	5400 T & D METERS & METER BOXES														$0	
1	Automated Meter Reading and Meter Replacement Project (5)	2018	$1,745,800	C	$1,781,429	20	-1	$1,745,800	21	2	$1,816,330	25%		75%	$66,146	$192,839
															$0	
	T & D TREATED WATER #5400 (2)														$0	
1	Angel Camp Tank (0.5 MG)	1974	$776,602	C	$325,777	40	43	$776,602	-3	10	$946,674	25%		75%	$34,475	$19,174
1	Deer Ravine Tank (0.25 MG)	1974	$388,301	C	$162,888	40	43	$388,301	-3	10	$473,337	50%		50%	$34,475	$19,174
1	Pilot Hill Tank (0.47 MG)	1974	$730,006	C	$306,230	40	43	$730,006	-3	10	$889,873	25%		75%	$32,407	$18,023
1	Black Ridge Road Tank (0.06 MG)	1974	$93,192	C	$39,093	40	43	$93,192	-3	10	$113,601	75%		25%	$12,411	$6,903
1	Hotchkiss Hill Tank (0.06 MG)	1974	$93,192	C	$39,093	40	43	$93,192	-3	10	$113,601	75%		25%	$12,411	$6,903
1	Spanish Dry Diggins Tank (0.2 MG)	1971	$310,641	C	$122,647	40	46	$310,641	-6	10	$378,670	50%		50%	$27,580	$15,339

1	Black Oak Mine Tank (0.3 MG)	1974	$465,961	C	$195,466	40	43	$465,961	-3	10	$568,004	25%		75%	$20,685	$11,504
1	Garden Park Tank (0.2 MG)	1974	$310,641	C	$130,311	40	43	$310,641	-3	10	$378,670	50%		50%	$27,580	$15,339
1	Kelsey Tank (0.21 MG)	1974	$332,386	C	$139,432	40	43	$332,386	-3	10	$405,177	50%		50%	$29,511	$16,413
1	Hotchkiss Hill Subtank (0.06 MG)	1974	$93,192	C	$39,093	40	43	$93,192	-3	10	$113,601	75%		25%	$12,411	$6,903
1	Black Ridge Road Pump Station	1974	$123,400	C	$51,765	40	43	$123,400	-3	5	$136,244	75%		25%	$14,885	$17,055
1	Chipmunk Trail Pump Station	1974	$123,400	C	$51,765	40	43	$123,400	-3	5	$136,244	75%		25%	$14,885	$17,055
1	Reservoir Road Pump Station	1974	$123,400	C	$51,765	40	43	$123,400	-3	5	$136,244	75%		25%	$14,885	$17,055
1	4-Inch Pipelines (42,130 AC, 50,771 PVC lf)	1974	$3,437,337	C	$1,441,927	60	43	$3,437,337	17	15	$4,626,203	25%		75%	$168,474	$60,618
1	6-Inch Pipelines (175,142 AC, 3,981 DI, 235,640 PVC lf)	1974	$19,908,624	C	$8,351,462	60	43	$19,908,624	17	15	$26,794,387	25%		75%	$975,778	$351,090
1	8-Inch Pipelines (42,068 AC, 85,394 PVC lf)	1974	$7,392,796	C	$3,101,201	60	43	$7,392,796	17	15	$9,949,730	25%		75%	$362,342	$130,373
1	10-Inch Pipelines (36,484 AC, 10,359 PVC lf)	1974	$2,951,109	C	$1,237,960	60	43	$2,951,109	17	15	$3,971,804	25%		75%	$144,642	$52,043
1	12-Inch Pipelines (42,346 AC lf)	1974	$3,388,480	C	$1,421,432	60	43	$3,388,480	17	15	$4,560,448	25%		75%	$166,079	$59,756
															$0	
															$0	
															$0	
															$0	
															$0	
	TRANSPORTATION EQUIPMENT (3)														$0	
1	Mobile Radios	1971	$4,056	H	$4,056	5	46	$10,085	-41	5	$11,134	100%		0%	$1,622	$1,858
1	Truck	2017	$38,250	C	$38,250	15	0	$38,250	15	15	$51,479	100%		0%	$7,499	$2,698
1	Excavator	2017	$55,250	c	$55,250	15	0	$55,250	15	15	$74,359	100%		0%	$10,832	$3,897
1	Trailer for excavator	2017	$10,625	C	$10,625	20	0	$10,625	20	20	$15,788	100%		0%	$2,300	$602
1	Trailer & Hookups	1991	$9,469	H	$9,469	5	26	$15,846	-21	10	$19,316	100%		0%	$2,814	$1,565
1	1998 Ford Pickup Truck	1998	$10,340	H	$10,340	5	19	$15,064	-14	10	$18,363	100%		0%	$2,675	$1,488
1	1999 Ford F150 Pickup	1999	$10,304	H	$10,304	5	18	$14,717	-13	10	$17,940	100%		0%	$2,613	$1,453
1	2002 Ford F-150 4x4	2001	$11,448	H	$11,448	5	16	$15,715	-11	10	$19,157	100%		0%	$2,791	$1,552
1	Chevy Truck - 1500	2003	$11,298	H	$11,298	5	14	$14,908	-9	10	$18,173	100%		0%	$2,647	$1,472
1	2004 Chevy 1500 Pickup	2004	$11,265	H	$11,265	5	13	$14,573	-8	10	$17,764	100%		0%	$2,588	$1,439
1	2004 Chevy 4 WD Pickup	2004	$18,421	H	$18,421	5	13	$23,829	-8	10	$29,047	100%		0%	$4,231	$2,353
1	2005 Chevy ID#1GBHK24U95E333348	2005	$17,911	H	$17,911	5	12	$22,715	-7	10	$27,690	100%		0%	$4,034	$2,243
1	2006 Chevy Colorado	2006	$12,068	H	$12,068	5	11	$15,005	-6	10	$18,291	100%		0%	$2,664	$1,482
1	2007 Chevy CK2500 Regular Cab	2007	$18,097	H	$18,097	5	10	$22,061	-5	10	$26,892	100%		0%	$3,917	$2,179
1	2008 Chevy 1500	2008	$14,480	H	$14,480	5	9	$17,305	-4	10	$21,095	100%		0%	$3,073	$1,709
1	Sundowner Trailer	2010	$4,588	H	$4,588	5	7	$5,270	-2	10	$6,425	100%		0%	$936	$520
1	Re-manufactured Long block Unit #32	2013	$3,489	H	$3,489	20	4	$3,777	16	17	$5,288	100%		0%	$770	$242
1	2016 Ford F-150	2016	$14,158	H	$14,158	10	1	$14,441	9	10	$17,604	100%		0%	$2,564	$1,426
															$0	
	SHOP & FIELD EQUIPMENT (3)														$0	
1	Fully Depreciated	1965	$1,082	H	$1,082	10	52	$3,030	-42	5		100%		0%	$0	
1	Tool Set	2017	$5,550	C	$5,550	10	0	$5,550	10	10	$6,765	100%		0%	$985	$548
1	New Radio System	1989	$7,192	H	$7,192	10	28	$12,521	-18	5	$13,825	100%		0%	$2,014	$2,307
1	Steam Cleaner (Pressure Washer)	1989	$1,886	H	$1,886	10	28	$3,284	-18	5		100%		0%	$0	
1	Welder	1991	$1,515	H	$1,515	10	26	$2,535	-16	5		100%		0%	$0	
1	Backhoe	1991	$27,385	H	$27,385	20	26	$45,827	-6	5	$50,597	75%		25%	$5,528	$6,334
1	Dump Truck	1991	$26,610	H	$26,610	20	26	$44,530	-6	5	$49,164	75%		25%	$5,371	$6,154
1	Tilt-bed Trailer	1992	$4,775	H	$4,775	10	25	$7,833	-15	5	$8,648	100%		0%	$1,260	$1,443
1	Dozer	1996	$13,655	H	$13,655	5	21	$20,697	-16	5	$22,851	100%		0%	$3,329	$3,814
1	Mini Excavator	2000	$22,535	H	$22,535	20	17	$31,555	3	5	$34,839	100%		0%	$5,075	$5,815
1	IR Portable Air Compressor	2003	$7,308	H	$7,308	20	14	$9,643	6	7	$11,077	100%		0%	$1,614	$1,305
1	2008 Chevy Truck 3500 1 ton Dump Truck	2008	$26,551	H	$26,551	10	9	$31,731	1	5	$35,033	100%		0%	$5,103	$5,847
1	Clark Equip.-excavator	2010	$23,678	H	$23,678	20	7	$27,198	13	14	$35,887	100%		0%	$5,228	$2,028
1	Meters	2014	$6,687	H	$6,687	20	3	$7,096	17	18	$10,135	100%		0%	$1,476	$435
1	Ditch Witch FX30 Vac Trailer	2015	$30,886	H	$30,886	20	2	$32,134	18	19	$46,813	75%		25%	$5,114	$1,418
1	Rammer Small Compactor	2016	$4,105	H	$4,105	20	1	$4,187	19	20	$6,221	100%		0%	$906	$237
															$0	

	GENERAL PLANT (3)														$0	
1	Office Building	1976	$137,335	H	$137,335	40	41	$309,307	-1	15	$416,286	25%		75%	$15,160	$5,455
1	Chip, Seal Parking Lot	1985	$2,953	H	$2,953	10	32	$5,565	-22	1	$5,677	100%		0%	$827	$4,850
1	Yard Fence	1986	$3,088	H	$3,088	10	31	$5,704	-21	5	$6,298	100%		0%	$917	$1,051
1	Generator & Electrical	1986	$2,210	H	$2,210	20	31	$4,084	-11	5		100%		0%	$0	
1	Gas Heat/Air System	1987	$1,650	H	$1,650	20	30	$2,989	-10	5		100%		0%	$0	
1	Rheem Cooling & Heating Unit	1989	$1,751	H	$1,751	20	28	$3,048	-8	5		100%		0%	$0	
1	Metal Building	1990	$5,811	H	$5,811	20	27	$9,918	-7	5	$10,950	100%		0%	$1,595	$1,828
1	Office & Shop Privacy Fence	2004	$6,080	H	$6,080	10	13	$7,865	-3	5	$8,683	100%		0%	$1,265	$1,449
1	Hangtown Fence - Add'l Ground Fencing	2006	$4,895	H	$4,895	10	11	$6,086	-1	5	$6,720	100%		0%	$979	$1,122
1	Carpet Replacement	2007	$3,724	H	$3,724	7	10	$4,540	-3	5	$5,012	100%		0%	$730	$837
1	Partial Re-roof of Main Maintenance Building	2016	$3,088	H	$3,088	30	1	$3,149	29	30	$5,704	100%		0%	$831	$136
															$0	
	OFFICE EQUIPMENT (3)														$0	
1	Computer Network	2001	$3,254	H	$3,254	10	16	$4,468	-6	5		100%		0%	$0	
1	Canon Copier	2002	$4,795	H	$4,795	10	15	$6,454	-5	5	$7,125	100%		0%	$1,038	$1,189
1	Phone System (Equip&Software)	2002	$4,744	H	$4,744	3	15	$6,385	-12	5	$7,049	100%		0%	$1,027	$1,177
1	Dell Server &software	2005	$2,185	H	$2,185	3	12	$2,771	-9	5		100%		0%	$0	
1	5 DELL Computers	2007	$4,637	H	$4,637	5	10	$5,652	-5	5	$6,240	100%		0%	$909	$1,042
															$0	
	DISTRIBUTION (3)														$0	
38	Pressure Reducing Valves	1987	$2,455	H	$93,278	40	30	$168,960	10	10	$205,961	50%		50%	$15,001	$8,343
172	Air Relief Valves	1987	$709	H	$121,970	40	30	$220,932	10	10	$269,315	50%		50%	$19,615	$10,909
422	Isolation Valves	1987	$2,291	H	$966,816	40	30	$1,751,254	10	10	$2,134,769	25%		75%	$77,742	$43,237
247	Other Valves	1987	$2,018	H	$498,518	40	30	$902,997	10	10	$1,100,748	25%		75%	$40,086	$22,294
581	Firehydrants	1987	$3,273	H	$1,901,558	60	30	$3,444,410	30	35	$6,888,439	25%		75%	$250,858	$34,170
20	Pressure Reducing Valves	2017	$5,000	C	$100,000	40	0	$100,000	40	40	$220,804	50%		50%	$16,082	$1,856
															$0	
	Subtotal Existing Capital Assets				$45,159,718			$78,663,010			$135,559,165	26%	1%	73%	$5,118,046	$1,544,026

Capital Replacement Program **Exhibit 1I**

Georgetown Divide PUD IW

Date: 10/20/17

System Number: 910013

Service Connections: 408

Qty	Component	Year Acquired	Unit Cost (Historic, Current or Future)	Cost Type (H, C, F)	Estimated Historic Cost	Normal Estimated Life	Current Age	Estimated Current Cost	Planned Remaining Life	Estimated Remaining Life	Estimated Future Cost	Fund with Cash	Fund with Grant	Fund with Loan	Existing Reserves	Annual Reserve Required
	Existing Capital Replacement Program															
	SOURCE OF SUPPLY PLANT #5100														$0	
1	Mark Edson Dam & Stumpy Meadows Res.	1962	$400,015	H	$400,015	100	55	$1,188,737	45	50	$3,199,589	10%	50%	40%	$14,980	$4,664
1	Tunnel Hill Tunnel	1962	$84,931	H	$84,931	100	55	$252,393	45	46	$627,604	25%	20%	55%	$7,346	$2,543
1	Kaiser Siphon Replacement (1)	1964	$315,852	C	$108,259	100	53	$315,852	47	46	$785,402	25%	20%	55%	$9,193	$3,183
1	Sand Trap Siphon (1)	1964	$128,375	C	$44,001	100	53	$128,375	47	48	$332,115	50%		50%	$7,775	$2,550
1	Up Country Ditch Imp (Pilot Ck Diversion to Tunnell Hill Inlet) (1)	1964	$1,598,171	C	$547,779	100	53	$1,598,171	47	56	$4,844,320	10%	50%	40%	$22,681	$6,090
															$0	
															$0	
	5200 SHARED														$0	
1	Cabin Waste Gate Replacement (1)	1972	$23,700	C	$9,548	40	45	$23,700	-5	20	$35,217	100%		0%	$1,649	$1,517
1	Bacon Creek Pipe (1)	1964	$201,549	C	$69,082	40	53	$201,549	-13	20	$299,491	50%		50%	$7,011	$6,450
1	Buckeye Conduit (1)	1964	$355,352	C	$121,798	40	53	$355,352	-13	20	$528,035	25%		75%	$6,180	$5,686
1	Up Country Ditch (Penn Stock Bypass to Shroeder Conduit) (1)	1964	$587,070	C	$201,220	40	53	$587,070	-13	5	$648,172	25%		75%	$7,587	$30,250
1	Main Ditch #1 Imp (1)	1964	$1,631,992	C	$559,371	40	53	$1,631,992	-13	5	$1,801,851	10%	50%	40%	$8,436	$33,636
1	Main Ditch #2 to ALT (1)	1964	$380,682	C	$130,480	40	53	$380,682	-13	5	$420,304	25%		75%	$4,920	$19,615
															$0	
															$0	
	5200 IRRIGATION ONLY (1)														$0	
1	Main Ditch #2 below ALT	1964	$663,376	C	$227,375	40	53	$663,376	-13	10	$808,652	25%		75%	$9,465	$18,377
1	Pilot Hill Ditch (Main)	1964	$429,126	C	$147,084	40	53	$429,126	-13	10	$523,102	50%		50%	$12,246	$23,775
1	Pilot Hill Ditch	1964	$1,070,876	C	$367,047	40	53	$1,070,876	-13	10	$1,305,392	25%		75%	$15,279	$29,665
1	Kelsey Ditch #1	1964	$571,625	C	$195,927	40	53	$571,625	-13	10	$696,808	25%		75%	$8,156	$15,835
1	Kelsey Ditch #2 Imp	1964	$1,112,565	C	$381,336	40	53	$1,112,565	-13	10	$1,356,211	25%		75%	$15,874	$30,820
1	Spanish Dry Diggins Ditch	1964	$37,375	C	$12,810	40	53	$37,375	-13	10	$45,560	100%		0%	$2,133	$4,141
1	Taylor Mine Ditch	1964	$36,563	C	$12,532	40	53	$36,563	-13	10	$44,570	100%		0%	$2,087	$4,051
															$0	
															$0	
	5300 - Lake Walton WTP														$0	
0	Lake Walton Plant Replacement (4)	1992	$0	C	$0	50	25	$0	25	25		25%		75%	$0	
0	Raw Water Bypass (1)	1974	$0	C	$0	40	43	$0	-3	19		25%		75%	$0	
0	Lake Walton Outlet Works (1)	1974	$0	C	$0	40	43	$0	-3	19		100%		0%	$0	
0	Lake Walton Dredging (1)	1974	$0	C	$0	40	25	$0	15	22		25%		75%	$0	
							43		-43						$0	
	5300 - AUBURN LAKE TRAILS PLANT														$0	
0	ALT Water Treatment Plant (4)	2018	$0	C	$0	50	-1	$0	51	59		25%		75%	$0	
															$0	
															$0	
	5400 T & D METERS & METER BOXES														$0	
0	Automated Meter Reading and Meter Replacement Project (5)	2018	$0	C	$0	20	-1	$0	21	2		25%		75%	$0	
															$0	
	T & D TREATED WATER #5400 (2)														$0	
0	Angel Camp Tank (0.5 MG)	1974	$0	C	$0	40	43	$0	-3	10		25%		75%	$0	
0	Deer Ravine Tank (0.25 MG)	1974	$0	C	$0	40	43	$0	-3	10		50%		50%	$0	
0	Pilot Hill Tank (0.47 MG)	1974	$0	C	$0	40	43	$0	-3	10		25%		75%	$0	
0	Black Ridge Road Tank (0.06 MG)	1974	$0	C	$0	40	43	$0	-3	10		75%		25%	$0	
0	Hotchkiss Hill Tank (0.06 MG)	1974	$0	C	$0	40	43	$0	-3	10		75%		25%	$0	

0	Spanish Dry Diggins Tank (0.2 MG)	1971	$0	C	$0	40	46	$0	-6	10		50%		50%	$0	
0	Black Oak Mine Tank (0.3 MG)	1974	$0	C	$0	40	43	$0	-3	10		25%		75%	$0	
0	Garden Park Tank (0.2 MG)	1974	$0	C	$0	40	43	$0	-3	10		50%		50%	$0	
0	Kelsey Tank (0.21 MG)	1974	$0	C	$0	40	43	$0	-3	10		50%		50%	$0	
0	Hotchkiss Hill Subtank (0.06 MG)	1974	$0	C	$0	40	43	$0	-3	10		75%		25%	$0	
0	Black Ridge Road Pump Station	1974	$0	C	$0	40	43	$0	-3	5		75%		25%	$0	
0	Chipmunk Trail Pump Station	1974	$0	C	$0	40	43	$0	-3	5		75%		25%	$0	
0	Reservoir Road Pump Station	1974	$0	C	$0	40	43	$0	-3	5		75%		25%	$0	
0	4-Inch Pipelines (42,130 AC, 50,771 PVC lf)	1974	$0	C	$0	60	43	$0	17	15		10%		90%	$0	
0	6-Inch Pipelines (175,142 AC, 3,981 DI, 235,640 PVC lf)	1974	$0	C	$0	60	43	$0	17	15		10%		90%	$0	
0	8-Inch Pipelines (42,068 AC, 85,394 PVC lf)	1974	$0	C	$0	60	43	$0	17	15		10%		90%	$0	
0	10-Inch Pipelines (36,484 AC, 10,359 PVC lf)	1974	$0	C	$0	60	43	$0	17	15		10%		90%	$0	
0	12-Inch Pipelines (42,346 AC lf)	1974	$0	C	$0	60	43	$0	17	15		10%		90%	$0	
															$0	
0	Highway 193/Sliger Mine Main Relocation (2)	1974	$0	C	$0	60	43	$0	17	5		50%		50%	$0	
0	Tank Telemetry Enhancements (2)	2020	$0	C	$0	15	-3	$0	18	5		100%		0%	$0	
															$0	
															$0	
	TRANSPORTATION EQUIPMENT (3)														$0	
1	Mobile Radios	1971	$668	H	$668	5	46	$1,661	-41	5		100%		0%	$0	
1	Truck	2017	$6,300	C	$6,300	15	0	$6,300	15	15	$8,479	100%		0%	$397	$500
1	Excavator	2017	$9,100	c	$9,100	15	0	$9,100	15	15	$12,247	100%		0%	$573	$723
1	Trailer for excavator	2017	$1,750	C	$1,750	20	0	$1,750	20	20		100%		0%	$0	
1	Trailer & Hookups	1991	$1,560	H	$1,560	15	26	$2,610	-11	10		100%		0%	$0	
1	1998 Ford Pickup Truck	1998	$1,703	H	$1,703	15	19	$2,481	-4	10		100%		0%	$0	
1	1999 Ford F150 Pickup	1999	$1,697	H	$1,697	15	18	$2,424	-3	10		100%		0%	$0	
1	2002 Ford F-150 4x4	2001	$1,886	H	$1,886	15	16	$2,588	-1	10		100%		0%	$0	
1	Chevy Truck - 1500	2003	$1,861	H	$1,861	15	14	$2,455	1	10		100%		0%	$0	
1	2004 Chevy 1500 Pickup	2004	$1,855	H	$1,855	15	13	$2,400	2	10		100%		0%	$0	
1	2004 Chevy 4 WD Pickup	2004	$3,034	H	$3,034	15	13	$3,925	2	10		100%		0%	$0	
1	2005 Chevy ID#1GBHK24U95E333348	2005	$2,950	H	$2,950	15	12	$3,741	3	10		100%		0%	$0	
1	2006 Chevy Colorado	2006	$1,988	H	$1,988	15	11	$2,471	4	10		100%		0%	$0	
1	2007 Chevy CK2500 Regular Cab	2007	$2,981	H	$2,981	15	10	$3,633	5	10		100%		0%	$0	
1	2008 Chevy 1500	2008	$2,385	H	$2,385	15	9	$2,850	6	10		100%		0%	$0	
1	Sundowner Trailer	2010	$756	H	$756	15	7	$868	8	10		100%		0%	$0	
1	Re-manufactured Long block Unit #32	2013	$575	H	$575	20	4	$622	16	17		100%		0%	$0	
1	2016 Ford F-150	2016	$2,332	H	$2,332	15	1	$2,379	14	10		100%		0%	$0	
															$0	
	SHOP & FIELD EQUIPMENT (3)														$0	
			~~$178~~							~~5~~		~~100%~~		0%	$0	
1	Tool Set	2017	$914	C	$914	10	0	$914	10	10		100%		0%	$0	
1	New Radio System	1989	$1,185	H	$1,185	10	28	$2,062	-18	5		100%		0%	$0	
1	Steam Cleaner (Pressure Washer)	1989	$311	H	$311	10	28	$541	-18	5		100%		0%	$0	
1	Welder	1991	$249	H	$249	10	26	$418	-16	5		100%		0%	$0	
1	Backhoe	1991	$4,511	H	$4,511	20	26	$7,548	-6	5	$8,334	75%		25%	$293	$1,167
1	Dump Truck	1991	$4,383	H	$4,383	20	26	$7,334	-6	5	$8,098	75%		25%	$284	$1,134
1	Tilt-bed Trailer	1992	$786	H	$786	15	25	$1,290	-10	5		100%		0%	$0	
1	Dozer	1996	$2,249	H	$2,249	20	21	$3,409	-1	5		100%		0%	$0	
1	Mini Excavator	2000	$3,712	H	$3,712	20	17	$5,197	3	5	$5,738	100%		0%	$269	$1,071
1	IR Portable Air Compressor	2003	$1,204	H	$1,204	20	14	$1,588	6	7		100%		0%	$0	
1	2008 Chevy Truck 3500 1 ton Dump Truck	2008	$4,373	H	$4,373	15	9	$5,226	6	5	$5,770	100%		0%	$270	$1,077
1	Clark Equip.-excavator	2010	$3,900	H	$3,900	20	7	$4,480	13	14	$5,911	100%		0%	$277	$376
1	Meters	2014	$1,101	H	$1,101	20	3	$1,169	17	18		100%		0%	$0	
1	Ditch Witch FX30 Vac Trailer	2015	$5,087	H	$5,087	20	2	$5,293	18	19	$7,710	75%		25%	$271	$264
1	Rammer Small Compactor	2016	$676	H	$676	20	1	$690	19	20		100%		0%	$0	

															$0	
	GENERAL PLANT (3)														$0	
1	Office Building	1976	$22,620	H	$22,620	40	41	$50,945	-1	15	$68,565	25%		75%	$803	$1,011
1	Chip, Seal Parking Lot	1985	$486	H	$486	10	32	$917	-22	1		100%		0%	$0	
1	Yard Fence	1986	$509	H	$509	10	31	$940	-21	5		100%		0%	$0	
1	Generator & Electrical	1986	$364	H	$364	20	31	$673	-11	5		100%		0%	$0	
1	Gas Heat/Air System	1987	$272	H	$272	20	30	$492	-10	5		100%		0%	$0	
1	Rheem Cooling & Heating Unit	1989	$288	H	$288	20	28	$502	-8	5		100%		0%	$0	
1	Metal Building	1990	$957	H	$957	20	27	$1,634	-7	5		100%		0%	$0	
1	Office & Shop Privacy Fence	2004	$1,001	H	$1,001	10	13	$1,295	-3	5		100%		0%	$0	
1	Hangtown Fence - Add'l Ground Fencing	2006	$806	H	$806	10	11	$1,002	-1	5		100%		0%	$0	
1	Carpet Replacement	2007	$613	H	$613	7	10	$748	-3	5		100%		0%	$0	
1	Partial Re-roof of Main Maintenance Building	2016	$509	H	$509	30	1	$519	29	30		100%		0%	$0	
															$0	
	OFFICE EQUIPMENT (3)														$0	
0	Computer Network	2001	$536	H	$0	10	16	$0	-6	5		100%		0%	$0	
1	Canon Copier	2002	$790	H	$790	10	15	$1,063	-5	5		100%		0%	$0	
1	Phone System (Equip&Software)	2002	$781	H	$781	3	15	$1,052	-12	5		100%		0%	$0	
			$360							5		100%		0%	$0	
1	5 DELL Computers	2007	$764	H	$764	5	10	$931	-5	5		100%		0%	$0	
															$0	
															$0	
	Existing Capital Replacement Program				$3,731,376			$10,749,508			$18,433,245				$166,432	$250,172

Five Year Forecasted Budget

Georgetown Divide PUD TW

No Admin

Date: 10/20/17

Inflation Factor (%): 2.00

System Number: 910013

Exhibit 2T

EXPENSES AND SOURCES OF FUNDS	2017	2018	2019	2020	2021
OPERATIONS & MAINTENANCE EXPENSES					
Personnel Related	1,532,146.01	1,596,007.14	1,663,530.07	1,727,504.03	1,762,054.11
Materials and Supplies	147,315.56	154,681.34	162,415.40	170,536.17	173,946.90
Rental/Durable	9,191.05	9,650.60	10,133.13	10,639.79	10,852.58
Staff Development	5,655.44	5,938.21	6,235.12	6,546.88	6,677.82
Travel--Conference	2,000.00	2,100.00	2,205.00	2,315.25	2,361.56
Utilities	167,485.44	175,859.71	184,652.69	193,885.33	197,763.03
Vehicle & Equipment Maintenance	2,627.81	2,759.20	2,897.16	3,042.02	3,102.86
Vehicle Operations	20,484.03	21,508.23	22,583.64	23,712.82	24,187.08
Building Maintenance	1,000.00	1,050.00	1,102.50	1,157.63	1,180.78
Govt. Reg./Lab Fees	53,700.85	56,385.90	59,205.19	62,165.45	63,408.76
Outside Service/Consultants	22,721.92	23,858.01	25,050.91	26,303.46	26,829.53
		0.00	0.00	0.00	0.00
Total Operation and Maintenance Expenses:	1,964,328.11	2,049,798.34	2,140,010.83	2,227,808.82	2,272,365.00
GENERAL & ADMINISTRATIVE EXPENSES					
Low Income Subsidy	35,000.00	35,700.00	36,414.00	37,142.28	37,885.13
Debt Reserve	0.00	0.00	0.00	0.00	0.00
Operating Reserve	0.00	0.00	0.00	0.00	0.00
Emergency Reserve	0.00	0.00	0.00	0.00	0.00
Existing Capital Replacement Program	1,532,603.28	1,528,353.70	1,359,521.48	1,359,521.48	1,359,521.48
Funded Project Replacement Program	0.00	0.00	0.00	0.00	0.00
Future Capital Improvement Program	0.00	0.00	0.00	0.00	0.00
Debt Payments (Principle + Interest)	59,348.26	59,348.26	144,112.12	144,112.12	144,112.12
Legal, Audit, Insurance,	35,558.69	37,336.62	39,203.45	41,163.63	41,986.90
Other General & Administrative	17,985.74	18,885.02	19,829.27	20,820.74	21,237.15
Total General and Administrative Expenses:	1,680,495.97	1,679,623.61	1,599,080.33	1,602,760.25	1,604,742.78
TOTAL EXPENSES	3,644,824.07	3,729,421.95	3,739,091.16	3,830,569.07	3,877,107.78
SOURCE OF FUNDS / REVENUES RECEIVED					
Water Revenue	2,753,457.25	2,916,226.12	3,088,228.77	3,256,361.53	3,419,141.54
Property Tax	0.00	0.00	0.00	0.00	0.00
SMUD, Hydro, Leases, Interest, etc	293,300.00	299,166.00	305,149.32	311,252.31	317,477.35
Hydro	-60,000.00	-61,200.00	-62,424.00	-63,672.48	-64,945.93
Capital Facility Charges	10,000.00	10,200.00	10,404.00	10,612.08	10,824.32
		0.00	0.00	0.00	0.00
TOTAL REVENUE (Lines 29 through 37):	2,996,757.25	3,164,392.12	3,341,358.09	3,514,553.43	3,682,497.29
NET LOSS OR GAIN:	-648,066.82	-565,029.83	-397,733.07	-316,015.64	-194,610.49
NET CASH FLOW (Contribution to Reserves)	884,536.46	963,323.87	961,788.40	1,043,505.84	1,164,910.98

Cash Budget

Georgetown Divide PUD IW

Date: 10/20/17

Exhibit 2I

Inflation Factor (%): 2.00

System Number: 910013

EXPENSES AND SOURCES OF FUNDS	2017	2018	2019	2020	2021
OPERATIONS & MAINTENANCE EXPENSES					
Personnel Related	790,287.84	829,470.96	871,328.64	907,688.96	925,842.74
Materials and Supplies	28,784.44	30,223.66	31,734.85	33,321.59	33,988.02
Rental/Durable	15,808.95	16,599.40	17,429.37	18,300.84	18,666.86
Staff Development	1,932.64	2,029.27	2,130.73	2,237.27	2,282.02
Travel--Conference	0.00	0.00	0.00	0.00	0.00
Utilities	8,191.32	8,600.88	9,030.92	9,482.47	9,672.12
Vehicle & Equipment Maintenance	2,372.19	2,490.80	2,615.34	2,746.10	2,801.02
Vehicle Operations	15,015.97	15,766.77	16,555.11	17,382.87	17,730.53
Building Maintenance	0.00	0.00	0.00	0.00	0.00
Govt. Reg./Lab Fees	27,199.15	28,559.10	29,987.06	31,486.41	32,116.14
Outside Service/Consultants	29,578.08	31,056.99	32,609.84	34,240.33	34,925.13
		0.00	0.00	0.00	0.00
Total Operation and Maintenance Expenses:	919,170.58	964,797.84	1,013,421.86	1,056,886.84	1,078,024.58
GENERAL & ADMINISTRATIVE EXPENSES					
					0.00
Debt Reserve	0.00	0.00	0.00	0.00	0.00
Operating Reserve	1,753.04	1,753.04	1,753.04	1,753.04	1,753.04
Emergency Reserve	0.00	0.00	0.00	0.00	0.00
Existing Capital Replacement Program	250,172.04	250,172.04	250,172.04	250,172.04	250,172.04
Funded Project Replacement Program	0.00	0.00	0.00	0.00	0.00
Future Capital Improvement Program	0.00	0.00	0.00	0.00	0.00
Debt Payments (Principle + Interest)	1,043.74	1,043.74	0.00	0.00	0.00
Legal, Audit, Insurance,	15,726.75	16,513.09	17,338.74	18,205.68	18,569.79
Other General & Administrative	14,074.21	14,777.92	15,516.82	16,292.66	16,618.51
Total General and Administrative Expenses:	282,769.78	284,259.82	284,780.63	286,423.41	287,113.38
TOTAL EXPENSES	1,201,940.36	1,249,057.66	1,298,202.50	1,343,310.26	1,365,137.96
SOURCE OF FUNDS / REVENUES RECEIVED					
Water Revenue	612,989.58	674,288.54	741,717.39	815,889.13	897,478.05
Property Tax	336,000.00	342,720.00	349,574.40	356,565.89	363,697.21
		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 REVENUE (Lines 29 through 37):	948,989.58	1,017,008.54	1,091,291.79	1,172,455.02	1,261,175.25
NET LOSS OR GAIN:	-252,950.77	-232,049.12	-206,910.70	-170,855.23	-103,962.71
NET CASH FLOW (Contribution to Reserves)	-1,025.70	19,875.95	45,014.37	81,069.84	147,962.37

Cash Budget

Georgetown Divide PUD TW

Date: 10/20/17

Exhibit 3T

Inflation Factor (%): 2.00

System Number: 910013

EXPENSES AND SOURCES OF FUNDS	2017	2018	2019	2020	2021
OPERATIONS & MAINTENANCE EXPENSES					
Personnel Related	2,032,357.05	2,115,849.60	2,204,051.75	2,288,147.45	2,333,910.39
Materials and Supplies	147,315.56	154,681.34	162,415.40	170,536.17	173,946.90
Rental/Durable	9,191.05	9,650.60	10,133.13	10,639.79	10,852.58
Staff Development	8,614.04	9,044.74	9,496.98	9,971.83	10,171.26
Travel--Conference	8,163.75	8,571.93	9,000.53	9,450.56	9,639.57
Utilities	181,660.27	190,743.28	200,280.45	210,294.47	214,500.36
Vehicle & Equipment Maintenance	2,627.81	2,759.20	2,897.16	3,042.02	3,102.86
Vehicle Operations	20,484.03	21,508.23	22,583.64	23,712.82	24,187.08
Building Maintenance	7,074.42	7,428.14	7,799.55	8,189.52	8,353.31
Govt. Reg./Lab Fees	56,059.16	58,862.11	61,805.22	64,895.48	66,193.39
Outside Service/Consultants	60,474.78	63,498.52	66,673.45	70,007.12	71,407.26
Low Income Fund	35,000.00	35,000.00	35,000.00	35,000.00	35,000.00
Total Operation and Maintenance Expenses:	2,569,021.91	2,677,597.69	2,792,137.25	2,903,887.22	2,961,264.97
GENERAL & ADMINISTRATIVE EXPENSES					
Retiree Health Premium	97,190.68	102,050.22	107,152.73	112,510.37	114,760.57
Debt Reserve	0.00	0.00	0.00	0.00	0.00
Operating Reserve	0.00	0.00	0.00	0.00	0.00
Emergency Reserve	0.00	0.00	0.00	0.00	0.00
Existing Capital Replacement Program	1,532,603.00	1,532,603.00	1,532,603.00	1,532,603.00	1,532,603.00
Funded Project Replacement Program	0.00	0.00	0.00	0.00	0.00
Future Capital Improvement Program	0.00	0.00	0.00	0.00	0.00
Debt Payments (Principle + Interest)	59,348.26	59,348.26	144,112.12	144,112.12	144,112.12
Legal, Audit, Insurance,	131,891.81	138,486.40	145,410.72	152,681.25	155,734.88
Other General & Administrative	111,153.73	116,711.41	122,546.98	128,674.33	131,247.82
Total General and Administrative Expenses:	1,932,187.48	1,949,199.29	2,051,825.55	2,070,581.08	2,078,458.39
TOTAL EXPENSES	4,501,209.39	4,626,796.98	4,843,962.80	4,974,468.30	5,039,723.36
SOURCE OF FUNDS / REVENUES RECEIVED					
Water Revenue	2,676,332.82	2,838,471.64	3,010,237.50	3,176,352.03	3,335,080.67
Property Tax	1,006,000.00	1,036,180.00	1,067,265.40	1,099,283.36	1,132,261.86
SMUD, Hydro, Leases, Interest, etc	293,300.00	299,166.00	305,149.32	311,252.31	317,477.35
Hydro	-60,000.00	-61,200.00	-62,424.00	-63,672.48	-64,945.93
Capital Facilities Charge	10,000.00	10,200.00	10,404.00	10,612.08	10,824.32
		0.00	0.00	0.00	0.00
TOTAL REVENUE (Lines 29 through 37):	3,925,632.82	4,122,817.64	4,330,632.22	4,533,827.30	4,730,698.28
NET LOSS OR GAIN:	-575,576.56	-503,979.34	-513,330.59	-440,641.00	-309,025.08
NET CASH FLOW (Contribution to Reserves)	957,026.44	1,028,623.66	1,019,272.41	1,091,962.00	1,223,577.92

Cash Budget

Georgetown Divide PUD IW

Date: 10/20/17

Exhibit 3I

Inflation Factor (%): 2.00

System Number: 910013

EXPENSES AND SOURCES OF FUNDS	2017	2018	2019	2020	2021
OPERATIONS & MAINTENANCE EXPENSES					
Personnel Related	844,364.71	885,670.15	929,763.42	968,299.06	987,665.04
Materials and Supplies	28,784.44	30,223.66	31,734.85	33,321.59	33,988.02
Rental/Durable	15,808.95	16,599.40	17,429.37	18,300.84	18,666.86
Staff Development	2,252.49	2,365.11	2,483.37	2,607.54	2,659.69
Travel--Conference	666.35	699.67	734.65	771.38	786.81
Utilities	9,723.73	10,209.92	10,720.41	11,256.43	11,481.56
Vehicle & Equipment Maintenance	2,372.19	2,490.80	2,615.34	2,746.10	2,801.02
Vehicle Operations	15,015.97	15,766.77	16,555.11	17,382.87	17,730.53
Building Maintenance	656.69	689.53	724.00	760.21	775.41
Govt. Reg./Lab Fees	27,454.10	28,826.80	30,268.14	31,781.55	32,417.18
Outside Service/Consultants	33,659.47	35,342.45	37,109.57	38,965.05	39,744.35
		0.00	0.00	0.00	0.00
Total Operation and Maintenance Expenses:	980,759.10	1,028,884.25	1,080,138.23	1,126,192.62	1,148,716.47
GENERAL & ADMINISTRATIVE EXPENSES					
Ritiree Health Premium	10,507.10	11,032.46	11,584.08	12,163.28	12,406.55
Debt Reserve	0.00	0.00	0.00	0.00	0.00
Operating Reserve	3,292.75	3,292.75	3,292.75	3,292.75	3,292.75
Emergency Reserve	0.00	0.00	0.00	0.00	0.00
Existing Capital Replacement Program	250,172.04	250,172.04	250,172.04	250,172.04	250,172.04
Funded Project Replacement Program	0.00	0.00	0.00	0.00	0.00
Future Capital Improvement Program	0.00	0.00	0.00	0.00	0.00
Debt Payments (Principle + Interest)	1,043.74	1,043.74	0.00	0.00	0.00
Legal, Audit, Insurance,	26,141.14	27,448.20	28,820.61	30,261.64	30,866.87
Other General & Administrative	24,146.43	25,353.75	26,621.44	27,952.51	28,511.56
Total General and Administrative Expenses:	315,303.20	318,342.93	320,490.91	323,842.22	325,249.76
TOTAL EXPENSES	1,296,062.30	1,347,227.18	1,400,629.14	1,450,034.83	1,473,966.23
SOURCE OF FUNDS / REVENUES RECEIVED					
Water Revenue	479,543.05	527,497.35	580,247.09	638,271.80	702,098.98
Property Tax	562,000.00	573,240.00	584,704.80	596,398.90	608,326.87
		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 REVENUE (Lines 29 through 37):	1,041,543.05	1,100,737.35	1,164,951.89	1,234,670.70	1,310,425.85
NET LOSS OR GAIN:	-254,519.25	-246,489.83	-235,677.25	-215,364.14	-163,540.38
NET CASH FLOW (Contribution to Reserves)	-1,054.46	6,974.96	17,787.54	38,100.65	89,924.41

Split of cash and investments between (4) Reserve Types and Treaded/Irrigation water **Exhibit 4**

			Reserves			
		Debt	Operating	Emergency	Capital	Other/WW
SMUD Fund	$ 324,069				$ 324,069	
CABY Grant	$ (29,222)				$ -	$ (29,222)
General Fund	$ 1,175,636		$1,175,636			
Insurance Reserve	$ -					$ -
Dental/Optical	$ -					$ -
Retiree	$ 538,071					$ 538,071
Stewart Mine	$ 28,825	$ 28,825				
Bayne Road & Other Assessment Districts	$ 65,804	$ 65,804				
Georgetown-Buckeye Water Improvement	$ -	$ -				
District	$ -	$ -				
Water Development	$ 399,753				$ 399,753	
Bond & Interest for Debt Service	$ -					
Buffalo Pipeline	$ -					
Sand Trap Siphon	$ -					
Stumpy Meadows Emergency	$ 1,044,130			$ 1,044,130		
Reserve Fund (SMERF)	$ -					
Capital Reserve Cash Clearing	$ 1,029,266				$ 1,029,266	
Pilot Hill North	$ (7,481)	$ (7,481)				
Pilot Hill South	$ 50,136	$ 50,136				
Kelsey North	$ 119,154	$ -				
Kelsey South	$ -	$ -				
State Revolving Fund	$ 7,499	$ 7,499				
Federal Emergency Management Agency	$ -					
Wrench/Valve Deposit Fund	$ -					
Small Hydro Fund	$ 592,262				$ 592,262	
Pipeline Extension Holding Fund to 26	$ -				$ -	
Environmental Protection Agency	$ 315,098				$ 315,098	
Garden Valley Water Improvement District	$ 71,574	$ 71,574				
Capital Facility Charges	$ 1,679,822				$ 1,679,822	
ALT - WTP Capital Reserve	$ 766,122				$ 766,122	
Auburn Lake Trails (ALT) Zone Fund	$ 963,527					$ 963,527
ALT Tank Replacement Loans & Repair Activity	$ 33,791					$ 33,791
ALT CDS Reserve Connection Fund	$ 181,840					$ 181,840
	$ 9,349,676					

Split of Reserves, based on average historic sales (Section C)

	Sales	%		Debt	Operating	Emergency	Capital
Treated Water	$ 1,613,052	75%		$ 216,357	$ 876,629	$ 778,569	$ 4,762,189
Irrigation Water	$ 195,288	9%			$ 106,131	$ 94,259	$ 122,173
Other	$ 354,905	16%					
	$ 2,163,245	100%					

Red=Treated water only Green=Treated + Irrigation to be split according to prior sales $ in Section C

Reserve	Definition	Target
Debt	Amount set aside per debt agreements	Per agreement with lender
Operating	Money in checking account	1.5 times revenue in a billing cycle (calculated from Buget)
Emergency	Immediately accessible funds for emergen	Largest asset that could fail
Capital	Funds to replace equipment when it wears	As calculated in the CIP

Exhibit 5

Proposition 218 Certification

CALIFORNIA CONSTITUTION
ARTICLE 13C (VOTER APPROVAL FOR LOCAL TAX LEVIES)

SECTION 1. Definitions. As used in this article:

(a) "General tax" means any tax imposed for general governmental purposes.

(b) "Local government" means any county, city, city and county, including a charter city or county, any special district, or any other local or regional governmental entity.

(c) "Special district" means an agency of the State, formed pursuant to general law or a special act, for the local performance of governmental or proprietary functions with limited geographic boundaries including, but not limited to, school districts and redevelopment agencies.

(d) "Special tax" means any tax imposed for specific purposes, including a tax imposed for specific purposes, which is placed into a general fund.

CALIFORNIA CONSTITUTION
ARTICLE 13C (VOTER APPROVAL FOR LOCAL TAX LEVIES)

SEC. 2. Local Government Tax Limitation. Notwithstanding any other provision of this Constitution:

(a) All taxes imposed by any local government shall be deemed to be either general taxes or special taxes. Special purpose districts or agencies, including school districts, shall have no power to levy general taxes.

(b) No local government may impose, extend, or increase any general tax unless and until that tax is submitted to the electorate and approved by a majority vote. A general tax shall not be deemed to have been increased if it is imposed at a rate not higher than the maximum rate so approved. The election required by this subdivision shall be consolidated with a regularly scheduled general election for members of the governing body of the local government, except in cases of emergency declared by a unanimous vote of the governing body.

(c) Any general tax imposed, extended, or increased, without voter approval, by any local government on or after January 1, 1995, and prior to the effective date of this article, shall continue to be imposed only if approved by a majority vote of the voters voting in an election on the issue of the imposition, which election shall be held within two years of the effective date of this article and in compliance with subdivision (b).

(d) No local government may impose, extend, or increase any special tax unless and until that tax is submitted to the electorate and approved by a two-thirds vote. A special tax shall not be deemed to have been increased if it is imposed at a rate not higher than the maximum rate so approved.

CALIFORNIA CONSTITUTION
ARTICLE 13C (VOTER APPROVAL FOR LOCAL TAX LEVIES)

SEC. 3. Initiative Power for Local Taxes, Assessments, Fees and Charges. Notwithstanding any other provision of this Constitution, including, but not limited to, Sections 8 and 9 of Article II, the initiative power shall not be prohibited or otherwise limited in matters of reducing or repealing any local tax, assessment, fee or charge. The power of initiative to affect local taxes, assessments, fees and charges shall be applicable to all local governments and neither the Legislature nor any local government charter

shall impose a signature requirement higher than that applicable to statewide statutory initiatives.

CALIFORNIA CONSTITUTION
ARTICLE 13D (ASSESSMENT AND PROPERTY-RELATED FEE REFORM)

SECTION 1. Application. Notwithstanding any other provision of law, the provisions of this article shall apply to all assessments, fees and charges, whether imposed pursuant to state statute or local government charter authority. Nothing in this article or Article XIIIC shall be construed to:

(a) Provide any new authority to any agency to impose a tax, assessment, fee, or charge.

(b) Affect existing laws relating to the imposition of fees or charges as a condition of property development.

(c) Affect existing laws relating to the imposition of timber yield taxes.

CALIFORNIA CONSTITUTION
ARTICLE 13D (ASSESSMENT AND PROPERTY-RELATED FEE REFORM)

SEC. 2. Definitions. As used in this article:

(a) "Agency" means any local government as defined in subdivision (b) of Section 1 of Article XIIIC.

(b) "Assessment" means any levy or charge upon real property by an agency for a special benefit conferred upon the real property. "Assessment" includes, but is not limited to, "special assessment," "benefit assessment," "maintenance assessment" and "special assessment tax."

(c) "Capital cost" means the cost of acquisition, installation, construction, reconstruction, or replacement of a permanent public improvement by an agency.

(d) "District" means an area determined by an agency to contain all parcels which will receive a special benefit from a proposed public improvement or property-related service.

(e) "Fee" or "charge" means any levy other than an ad valorem tax, a special tax, or an assessment, imposed by an agency upon a parcel or upon a person as an incident of property ownership, including a user fee or charge for a property related service.

(f) "Maintenance and operation expenses" means the cost of rent, repair, replacement, rehabilitation, fuel, power, electrical current, care, and supervision necessary to properly operate and maintain a permanent public improvement.

(g) "Property ownership" shall be deemed to include tenancies of real property where tenants are directly liable to pay the assessment, fee, or charge in question.

(h) "Property-related service" means a public service having a direct relationship to property ownership.

(i) "Special benefit" means a particular and distinct benefit over and above general benefits conferred on real property located in the district or to the public at large. General enhancement of property value does not constitute "special benefit."

CALIFORNIA CONSTITUTION
ARTICLE 13D (ASSESSMENT AND PROPERTY-RELATED FEE REFORM)

SEC. 3. Property Taxes, Assessments, Fees and Charges Limited. (a) No tax, assessment, fee, or charge shall be assessed by any agency upon any parcel of property or upon any person as an incident of property ownership except:

(1) The ad valorem property tax imposed pursuant to Article XIII and Article XIIIA.

(2) Any special tax receiving a two-thirds vote pursuant to Section 4 of Article XIIIA.

(3) Assessments as provided by this article.

(4) Fees or charges for property related services as provided by this article.

(b) For purposes of this article, fees for the provision of electrical or gas service shall not be deemed charges or fees imposed as an incident of property ownership.

CALIFORNIA CONSTITUTION
ARTICLE 13D (ASSESSMENT AND PROPERTY-RELATED FEE REFORM)

SEC. 4. Procedures and Requirements for All Assessments. (a) An agency which proposes to levy an assessment shall identify all parcels which will have a special benefit conferred upon them and upon which an assessment will be imposed. The proportionate special benefit derived by each identified parcel shall be determined in relationship to the entirety of the capital cost of a public improvement, the maintenance and operation expenses of a public improvement, or the cost of the property related service being provided. No assessment shall be imposed on any parcel which exceeds the reasonable cost of the proportional special benefit conferred on that parcel. Only special benefits are assessable, and an agency shall separate the general benefits from the special benefits conferred on a parcel. Parcels within a district that are owned or used by any agency, the State of California or the United States shall not be exempt from assessment unless the agency can demonstrate by clear and convincing evidence that those publicly owned parcels in fact receive no special benefit.

(b) All assessments shall be supported by a detailed engineer's report prepared by a registered professional engineer certified by the State of California.

(c) The amount of the proposed assessment for each identified parcel shall be calculated and the record owner of each parcel shall be given written notice by mail of the proposed assessment, the total amount thereof chargeable to the entire district, the amount chargeable to the owner's particular parcel, the duration of the payments, the reason for the assessment and the basis upon which the amount of the proposed assessment was calculated, together with the date, time, and location of a public hearing on the proposed assessment. Each notice shall also include, in a conspicuous place thereon, a summary of the procedures applicable to the completion, return, and tabulation of the ballots required pursuant to subdivision (d), including a disclosure statement that the existence of a majority protest, as defined in subdivision (e), will result in the assessment not being imposed.

(d) Each notice mailed to owners of identified parcels within the district pursuant to subdivision (c) shall contain a ballot which includes the agency's address for receipt of the ballot once completed by any owner receiving the notice whereby the owner may indicate his or her name, reasonable identification of the parcel, and his or her support or opposition to the proposed assessment.

(e) The agency shall conduct a public hearing upon the proposed assessment not less than 45 days after mailing the notice of the proposed assessment to record owners of each identified parcel. At the public hearing, the agency shall consider all protests against the proposed assessment and tabulate the

ballots. The agency shall not impose an assessment if there is a majority protest. A majority protest exists if, upon the conclusion of the hearing, ballots submitted in opposition to the assessment exceed the ballots submitted in favor of the assessment. In tabulating the ballots, the ballots shall be weighted according to the proportional financial obligation of the affected property.

(f) In any legal action contesting the validity of any assessment, the burden shall be on the agency to demonstrate that the property or properties in question receive a special benefit over and above the benefits conferred on the public at large and that the amount of any contested assessment is proportional to, and no greater than, the benefits conferred on the property or properties in question.

(g) Because only special benefits are assessable, electors residing within the district who do not own property within the district shall not be deemed under this Constitution to have been deprived of the right to vote for any assessment. If a court determines that the Constitution of the United States or other federal law requires otherwise, the assessment shall not be imposed unless approved by a two-thirds vote of the electorate in the district in addition to being approved by the property owners as required by subdivision (e).

CALIFORNIA CONSTITUTION
ARTICLE 13D (ASSESSMENT AND PROPERTY-RELATED FEE REFORM)

SEC. 5. Effective Date. Pursuant to subdivision (a) of Section 10 of Article II, the provisions of this article shall become effective the day after the election unless otherwise provided. Beginning July 1, 1997, all existing, new, or increased assessments shall comply with this article. Notwithstanding the foregoing, the following assessments existing on the effective date of this article shall be exempt from the procedures and approval process set forth in Section 4:

(a) Any assessment imposed exclusively to finance the capital costs or maintenance and operation expenses for sidewalks, streets, sewers, water, flood control, drainage systems or vector control. Subsequent increases in such assessments shall be subject to the procedures and approval process set forth in Section 4.

(b) Any assessment imposed pursuant to a petition signed by the persons owning all of the parcels subject to the assessment at the time the assessment is initially imposed. Subsequent increases in such assessments shall be subject to the procedures and approval process set forth in Section 4.

(c) Any assessment the proceeds of which are exclusively used to repay bonded indebtedness of which the failure to pay would violate the Contract Impairment Clause of the Constitution of the United States.

(d) Any assessment which previously received majority voter approval from the voters voting in an election on the issue of the assessment. Subsequent increases in those assessments shall be subject to the procedures and approval process set forth in Section 4.

CALIFORNIA CONSTITUTION
ARTICLE 13D (ASSESSMENT AND PROPERTY-RELATED FEE REFORM)

SEC. 6. Property Related Fees and Charges. (a) Procedures for New or Increased Fees and Charges. An agency shall follow the procedures pursuant to this section in imposing or increasing any fee or charge as defined pursuant to this article, including, but not limited to, the following:

(1) The parcels upon which a fee or charge is proposed for imposition shall be identified. The amount of the fee or charge proposed to be imposed upon each parcel shall be calculated. The agency shall provide written notice by mail of the proposed fee or charge to the record owner of each identified parcel upon which the fee or charge is proposed for imposition, the amount of the fee or charge proposed to be imposed upon each, the basis upon which the amount of the proposed fee or charge was calculated, the reason for the fee or charge, together with the date, time, and location of a public hearing on the proposed fee or charge.

(2) The agency shall conduct a public hearing upon the proposed fee or charge not less than 45 days after mailing the notice of the proposed fee or charge to the record owners of each identified parcel upon which the fee or charge is proposed for imposition. At the public hearing, the agency shall consider all protests against the proposed fee or charge. If written protests against the proposed fee or charge are presented by a majority of owners of the identified parcels, the agency shall not impose the fee or charge.

(b) Requirements for Existing, New or Increased Fees and Charges a fee or charge shall not be extended, imposed, or increased by any agency unless it meets all of the following requirements:

(1) Revenues derived from the fee or charge shall not exceed the funds required to provide the property related service.

(2) Revenues derived from the fee or charge shall not be used for any purpose other than that for which the fee or charge was imposed.

(3) The amount of a fee or charge imposed upon any parcel or person as an incident of property ownership shall not exceed the proportional cost of the service attributable to the parcel.

(4) No fee or charge may be imposed for a service unless that service is actually used by, or immediately available to, the owner of the property in question. Fees or charges based on potential or future use of a service are not permitted. Standby charges, whether characterized as charges or assessments, shall be classified as assessments and shall not be imposed without compliance with Section 4.

(5) No fee or charge may be imposed for general governmental services including, but not limited to, police, fire, ambulance or library services, where the service is available to the public at large in substantially the same manner as it is to property owners. Reliance by an agency on any parcel map, including, but not limited to, an assessor's parcel map, may be considered a significant factor in determining whether a fee or charge is imposed as an incident of property ownership for purposes of this article. In any legal action contesting the validity of a fee or charge, the burden shall be on the agency to demonstrate compliance with this article.

(c) Voter Approval for New or Increased Fees and Charges. Except for fees or charges for sewer, water, and refuse collection services, no property related fee or charge shall be imposed or increased unless and until that fee or charge is submitted and approved by a majority vote of the property owners of the property subject to the fee or charge or, at the option of the agency, by a two-thirds vote of the electorate residing in the affected area. The election shall be conducted not less than 45 days after the public hearing. An agency may adopt procedures similar to those for increases in assessments in the conduct of elections under this subdivision.

(d) Beginning July 1, 1997, all fees or charges shall comply with this section.

Proposition 218 Notification

NOTICE TO PROPERTY OWNERS OF PUBLIC HEARING ON PROPOSED INCREASE TO WATER RATES

Hearing Date:	**December 12, 2017**
Time:	**5:30 PM**
Location:	**Georgetown Elementary School** **6530 Wentworth Springs, Georgetown CA 95634**

Why are you receiving this notice? This notice is being furnished to you by the Georgetown Divide Public Utility District (District) pursuant to the California Constitution Article XIIID (also known as "Proposition 218"). Under Proposition 218, the District is required to notify property owners of proposed changes to property-related fees such as water and sewer service. This letter serves as notice that the District will hold a public hearing on December 12, 2017, to consider changes to its current treated water and irrigation water rates.

What do water rates fund? The District provides treated water service to approximately 3,774 customers (residential and commercial) and 408 irrigation water customers. The water system must be financially self-sufficient. Monthly rates paid by users of the system are the primary source of revenue. All revenue generated from your water bill is used to maintain and operate the water system. These revenues must meet costs such as system maintenance, licensing, electricity, chemicals, reserve funds for emergency repairs and replacement of aging pipes and other equipment, administrative costs, and salaries and benefits for staff. Revenue generated from these rates is also used to pay off debt used to rebuild aging components of the system.

Why is the rate change required? District's rates were last reviewed in 2011. The water system requires extensive investment, primarily in the replacement and repair of aging pipes and other equipment, in order to maintain a safe and reliable system. The District has insufficient reserve funds to pay for needed replacements and preventative maintenance; and rates are too low to qualify for loans and grants.

Additionally, the District was recently the subject of a Grand Jury Investigation which concluded that the District needed to initiate a rate increase.

Lastly, the District rates must be updated to comply with recent court decisions that require tiered water rates to accurately reflect the cost of service. The District is proposing a standardized system based on American Water Works Association standards to ensure that water rates are equivalent with providing that level of service.

How are rates calculated for treated water? The proposed rate structure for treated water service fees has two components: (1) a fixed monthly base charge; and (2) a variable (water consumption-based) usage rate. The first component is a fixed amount calculated to recover the District's fixed costs of operating and maintaining the water system and is based on the potential volume of water a customer could potential draw, as determined by the size of their water meter

The variable component of the rate structure is based on water consumption (usage).

How are rates calculated for irrigation water? Since irrigation water users are charged for a fixed volume of water, the proposed rate structure for irrigation water service fees consists only of a monthly base charge. The monthly base charge is based on the size of the service connection, in miner's inches.

Current and proposed treated water rates
Treated water rates will increase over a five-year period.

	Monthly Base Charge					
Meter Size	**Current**	**Jan 1, 2018**	**Jan 1, 2019**	**Jan 1, 2020**	**Jan 1, 2021**	**Jan 1, 2022**
5/8, 3/4, 1"	$ 23.57	$ 29.41	$ 30.88	$ 32.42	$ 34.04	$ 35.74
1.5"	$ 23.57	$ 98.02	$ 102.92	$ 108.07	$ 113.47	$ 119.15
2"	$ 23.57	$ 156.83	$ 164.67	$ 172.91	$ 181.55	$ 190.63
3"	$ 23.57	$ 313.66	$ 329.34	$ 345.81	$ 363.10	$ 381.25
4"	$ 25.16	$ 490.09	$ 514.60	$ 540.33	$ 567.34	$ 595.71

	Usage Rate (per CF)					
Tier	**Current**	**Jan 1, 2018**	**Jan 1, 2019**	**Jan 1, 2020**	**Jan 1, 2021**	**Jan 1, 2022**
<1000 CF	--	$ 0.0255	$ 0.0268	$ 0.0281	$ 0.0295	$ 0.0310
1000-2000	$ 0.0138	$ 0.0255	$ 0.0268	$ 0.0281	$ 0.0295	$ 0.0310
2001-3000	$ 0.0165	$ 0.0255	$ 0.0268	$ 0.0281	$ 0.0295	$ 0.0310
3001-4000	$ 0.0193	$ 0.0255	$ 0.0268	$ 0.0281	$ 0.0295	$ 0.0310
>4001 CF	$ 0.0221	$ 0.0255	$ 0.0268	$ 0.0281	$ 0.0295	$ 0.0310

Current and proposed irrigation water rates
Irrigation water rates will increase over a five-year period.

	Monthly Base Charge					
Meter Size	**Current**	**Jan 1, 2018**	**Jan 1, 2019**	**Jan 1, 2020**	**Jan 1, 2021**	**Jan 1, 2022**
½"	$ 47.00	$ 77.00	$ 84.80	$ 93.20	$ 102.60	$ 112.80
Per each 1"	$ 72.74	$ 154.20	$ 169.60	$ 186.60	$ 205.20	$ 225.80

You can be heard Water rates are subject to majority protest, which means if a majority of impacted property owners or tenants of a parcel submit ***written protests*** against the increase, the District cannot institute the new rates. For your protest to be counted, please include the following:

1. Your name;
2. The address of the impacted property (or APN number); and,
3. Your signature.

Written protests are accepted by mail or personal delivery to the *Clerk of the Board, Georgetown Divide Public Utility District, PO Box 4240, Georgetown, California 95634;* or in person at the public hearing on the date and time specified above, until the close of the public hearing. Protests submitted by fax or email will not be accepted.

Questions? Detailed information regarding the proposed changes in rates are available on the District website, www.gd-pud.org. If you have any questions, please call the District at (530) 333-4356.

APPENDIX N

NOTIFICATION LETTERS

GEORGETOWN DIVIDE
Public Utility District
P.O. BOX 4240
GEORGETOWN, CALIFORNIA 95634-4240
PHONE (530) 333-4356
FAX (530) 333-9442
gd-pud.org

January 9, 20223

Ms. Tiffany Schmid
Director, Development Services Division
2850 Fairlane Court
Placerville, CA 95667

Subject: **Georgetown Divide Public Utility District – 2020 Urban Water Management Plan Notice**

Dear Ms. Schmid:

The Georgetown Divide Public Utility District (the District) is reviewing its 2020 Urban Water Management Plan (UWMP). The UWMP is required to be submitted to the California Department of Water Resources (DWR) every five years per water code 10610-10657. The purpose of this letter is to notify El Dorado County Planning Division that the District is updating the UWMP for 2020. The District intends to present the findings at a public hearing scheduled for the March 14, 2023, board of directors meeting.

Sincerely,

Nicholas Schneider
Interim General Manager

GEORGETOWN DIVIDE
Public Utility District
P.O. BOX 4240
GEORGETOWN, CALIFORNIA 95634-4240
PHONE (530) 333-4356
FAX (530) 333-9442
gd-pud.org

January 9, 2023

Mr. Kenneth Payne
El Dorado County Water Agency
4330 Golden Center Drive, Suite C
Placerville, CA 95667

Subject: **Georgetown Divide Public Utility District – 2020 Urban Water Management Plan Notice**

Dear Mr. Payne:

The Georgetown Divide Public Utility District (the District) is reviewing its 2020 Urban Water Management Plan (UWMP). The UWMP is required to be submitted to the California Department of Water Resources (DWR) every five years per water code 10610-10657. The purpose of this letter is to notify El Dorado County Water Agency that the District is updating the UWMP for 2020. The District intends to present the findings at a public hearing scheduled for the March 14, 2023, board of directors meeting.

Sincerely,

Nicholas Schneider
General Manager

APPENDIX O

PUBLIC NOTIFICATION