Chapter 8: Cal Water - Oroville

Figure 1: Cal Water Oroville is located at 1905 High Street, Oroville, CA 95965. Photo courtesty of Google maps

This Chapter presents a municipal service review for Cal Water Oroville with details regarding the service area, business structure, population and land use, disadvantaged communities, and the provision of water services and facilities. Based on the information included in this report, written determinations are suggested.

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8.1 Company Profile & Overview

8.1.1: Company Profile

Type of Organization:	Private investor-owned utility serving the public and regulated by the California Public Utilities Commission
Principal Act:	Although there is no Principal Act, CalWater is operated consistent with the California Constitution, Article 12, Section 3; California Public Utilities Code, Section 216(a).
Functions/Services:	Water treatment and distribution for residential, commercial, and other domestic purposes.

Local Office:	1905 High Street, Oroville, CA 95965
Administrative Contact:	1720 North First Street, San Jose, CA 95112
Phone No.:	(530) 533-4034
Web Site:	www.calwater.com; or visit https://www.facebook.com/calwater, https://www.instagram.com/calwater/, or https://twitter.com/calwater
General Manager:	Loni Lind, Operations Manager
Alternate Contact:	Dan Armendariz, Director of Field Operations

Meeting Schedule: None
Meeting Location: None
Date of Formation: 1927

Area Served: Cal Water serves 3,463 acres (5.41 square miles) located in the Oroville community in Butte County.

Population	11,022 persons
Number of water connections	3,547
Principal LAFCO:	Butte LAFCO
Other LAFCO:	none

8.1.2 Organization Overview

California Water Service (Cal Water) is a public utility[1] regulated by the California Public Utilities Commission (CPUC) and owned by private investors as a company. Cal Water provides water service to communities across California, from Chico in the north to the Palos Verdes peninsula in the south. Cal Water's parent company, California Water Service Group, also has operations in Washington, new Mexico, and Hawaii (Cal Water, Skarb, 2023). Cal Water's Oroville service area (Cal Water – Oroville) operates a water system serving an estimated 11,022 residents with 3,547 municipal connections that use approximately 2,753 acre-feet of water annually (Cal Water UWMP, 2021 and Cal Water, Lind, 2023). The system includes two storage tanks, six booster pumps, and 59 miles of pipeline (West Yost, 2017). Water is sourced from the west branch of the Feather River and one active groundwater well. In addition, when undergoing maintenance or during an emergency, Cal Water – Oroville can take advantage of a mutual intertie agreement with the Thermalito Irrigation District, which provides access to supplemental water. Cal Water – Oroville provides water services to residential, commercial, industrial, and governmental customers. Taking account of the 8 percent of water lost during distribution, residential customers account for 34 percent of water usage, and non-residential customers account for 58 percent of water use (Cal Water, UWMP, 2021).

8.2 Organization Formation and Service area

8.2.1 Formation

California Water Service (Cal Water) is a public utility regulated by the California Public Utilities Commission (CPUC) and owned by private investors as a company. Cal Water established its service area in Oroville in 1927. Cal Water - Oroville supplies water that derives from the west branch of the Feather River and the local groundwater. Cal Water was formed for the purpose of providing water service to its customers.

8.2.2 Service Area Boundary and SOI

Cal Water Oroville is the principal water purveyor within the city limits of Oroville. Cal Water serves the portion of the City of Oroville urban area that is not served by either the South Feather Water and Power Agency (SFWPA) or Thermalito Water and Sewer District (TWSD). Cal Water - Oroville generally serves that portion of the City located east of and south of the Feather River and a small unincorporated corridor along Hwy 70. The Cal Water Service Area is generally located approximately 60 miles north of Sacramento and is linked by Golden State Highway (S.R.

[1] CalWater's J. Skarb notes that Article 12, Section 3 of the California Constitution and Section 216(a) of the Public Utilities Code identifies Cal Water as a public utility.

99), State Highway 70, State Route 162, and the Union Pacific Railroad. Hydrologically, the Cal Water Oroville service area is located in the Feather River floodplain and watershed, described in Appendix C. Cal Water – Oroville's service area boundaries are set by the CPUC. The service area's most recently approved CPUC service area boundaries are shown in Figure 8-1. This new Service Area for Cal Water Oroville encompasses 3,463 acres. Cal Water's Service Area covers approximately 39 percent of the City of Oroville boundaries[2].

In its 2006 MSR and SOI document, LAFCO showed a spatial configuration of the Cal Water service area boundaries and SOI, as shown in Figure 8-2. LAFCO's designated boundary and SOI depicted in 2006 are congruent, indicating that LAFCo did not intend to expand the service area. There are other service providers in the area who can potentially provide water services to unserved areas. Figure 8-2 is helpful to understand the local community's intention with regard to the service area.

In 2022, the estimated population within the Cal Water Service Area boundary was 11,022 (Cal Water, Lind, 2023). Cal Water Oroville is bounded by SFWPA to the north, and TWSD, to the west. To the south of the Cal Water - Oroville service area is a rural area that relies upon water wells.

There is a geographic overlap in water service between Cal Water – Oroville's service area and that of SFWPA and TWSD. This overlap is shown in two separate geographic data sources. Figure 8-3 below is a map from the State Water Resources Control Board, and it depicts the geographic overlap between SFWPA and Cal Water-Oroville. The second geographic dataset was provided by Cal Water in the form of a shapefile in January 2023, as shown in Figure 8-4. This map shows more detail in Cal Water's overlapping service area with TWSD and SFWPA. Cal Water's and LAFCO's GIS data was utilized to calculate geographic factoids for the overlapped areas as follows:

- SFWPA parcels in CalWater: 343 parcels (APNs) and 228.5 acres (assessor's acreage)
- TWSD parcels in CalWater: 17 parcels (APNs) and 19.7 acres (assessor's acreage)

The CPUC's rules regarding overlapping service areas have not been researched as part of this MSR process. Also, Cal Water has explained that their Company was not aware of any overlap between its service area and neighboring service providers (Cal Water, J. Skarb, 2023). It is recommend that LAFCO study this issue in more detail when the next MSR or SOI is prepared for the area. Additionally, LAFCO should formally notify CPUC of the overlapping service areas.

[2] Please note that the tail end City's Industrial Unit area lies outside Cal Water's service area. Much of this land is zoned by the City for future industrial use, but currently contains active farmland. These parcels do not currently receive potable water service and likely rely upon wells.

Figure 8-1: Cal Water Service Area Oroville - Service Area Boundary Approved by CPUC (2022)

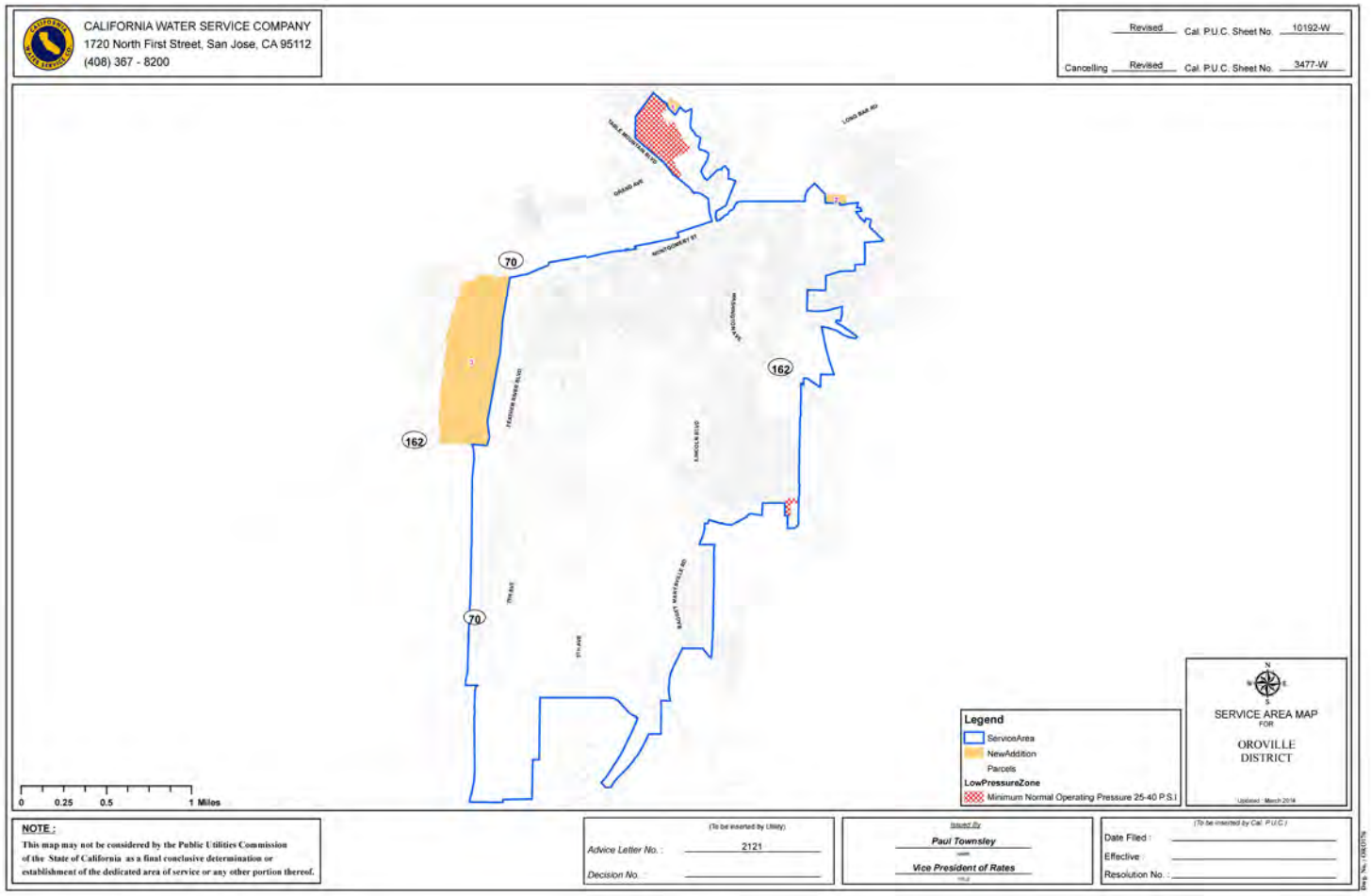


Figure 8-2: 2006 Location and Service Area Boundary as Approved by LAFCO

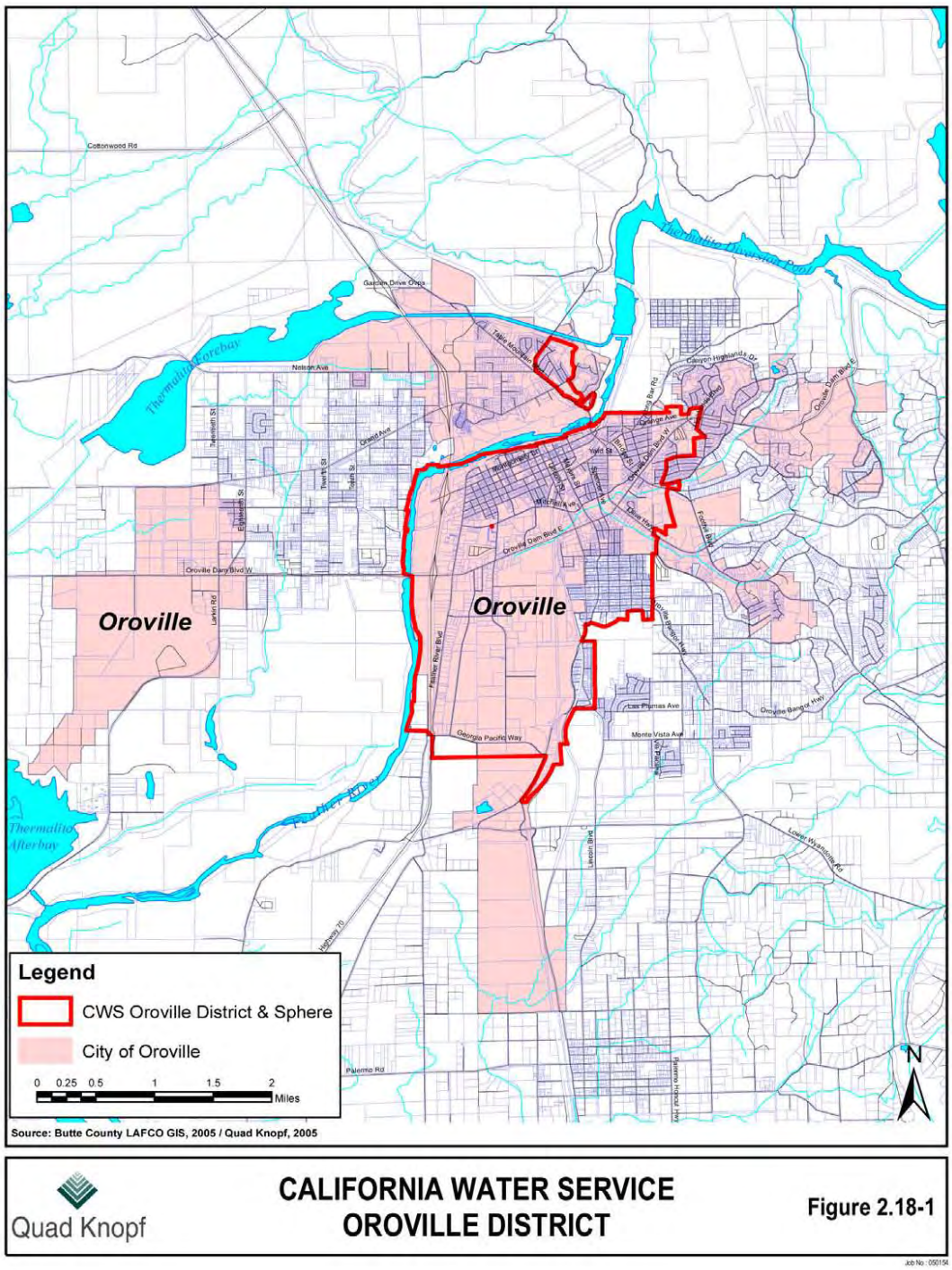
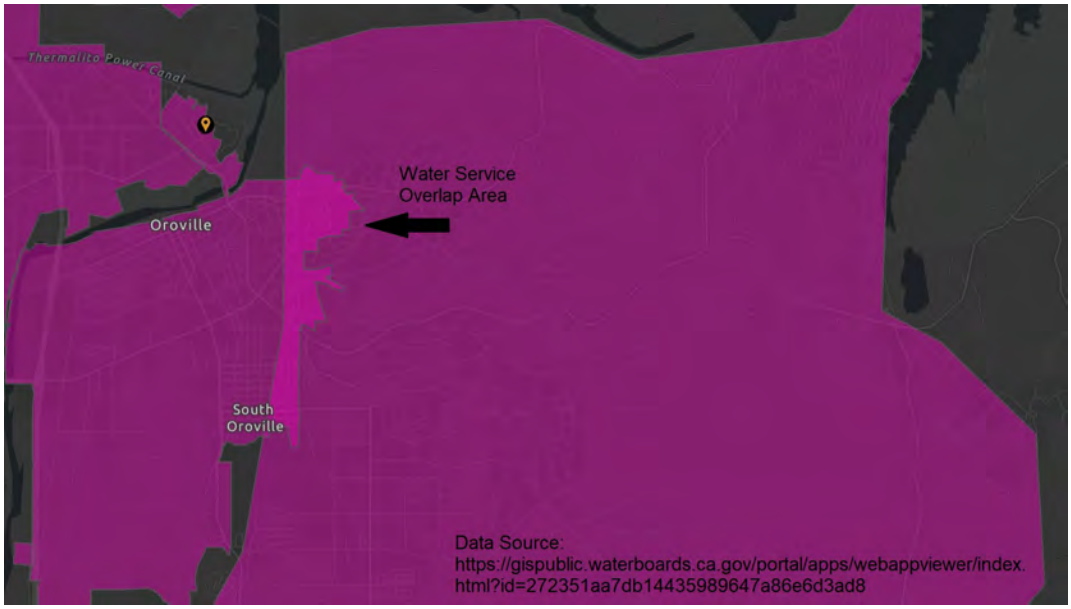


Figure 8-3: Overlapping Service Areas Between SFWPA and Cal Water



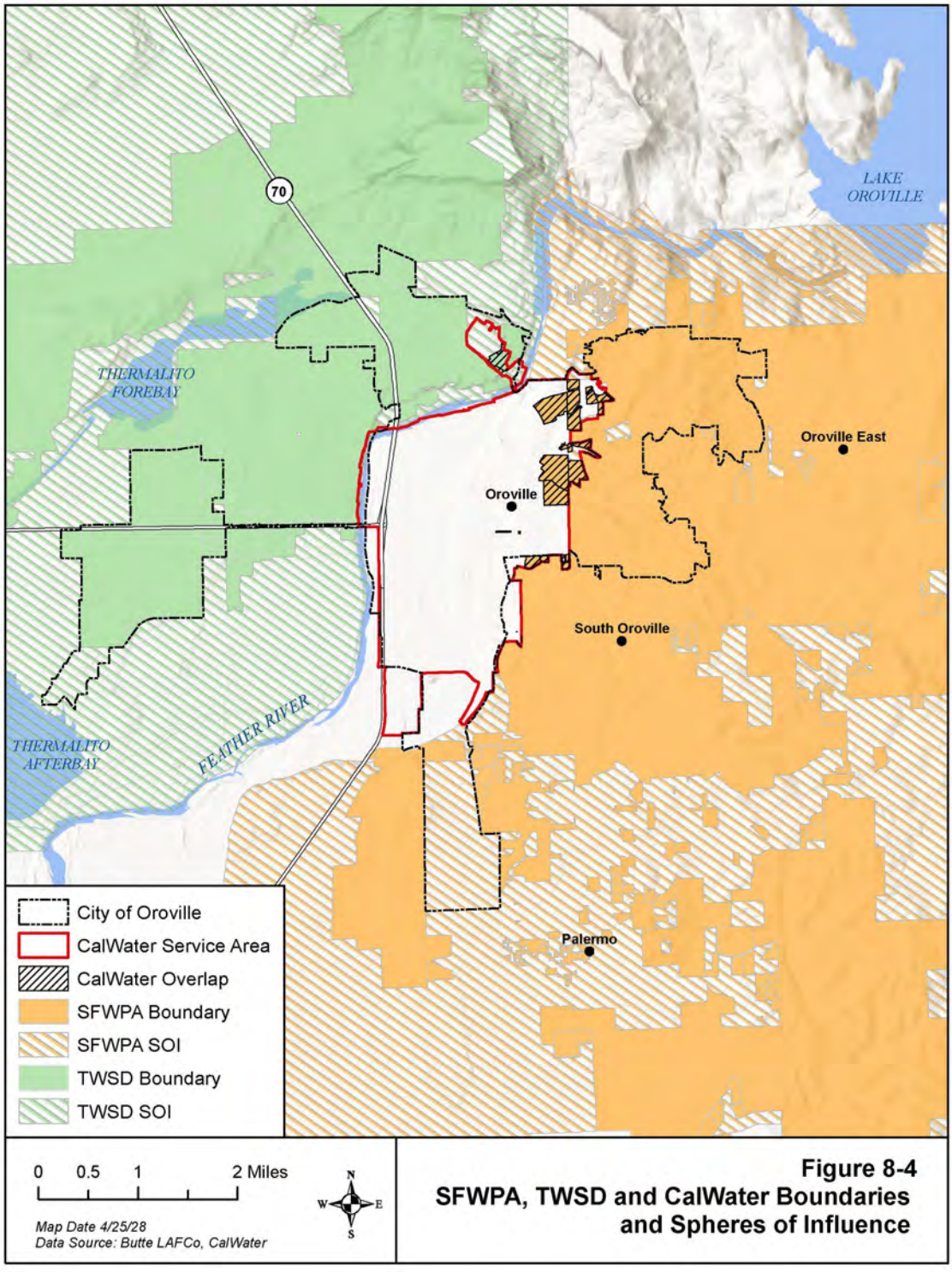


Figure 8-4
SFWPA, TWSD and CalWater Boundaries and Spheres of Influence

Consolidation

In 2022 Cal Water Company made a request to the CPUC to consolidate their Chico and Oroville districts in its General Rate Case (GRC) proceeding. In April 2022, the Public Advocate Office staff, Mr. Brian Yu, offered recommendations to the CPUC regarding Cal Water Service GRC A.21-07-002. The Public Advocates found that although the Oroville and Chico districts are not physically connected, the consolidation would create operational economies of scale, improve engineering and systems resilience, and there would be ratepayer benefits without unfair cross-subsidies or unreasonable cost (Public Advocate Office, 2022).

8.2.4 Extra-Territorial Services

Cal Water Oroville does not provide extra-territorial services outside its Company service area. According to the 2020 UWMP, "Cal Water is not pursuing water transfers involving the Oroville Service Area of Cal Water and other entities at this time" (Cal Water, 2021). Cal Water has two water purchase agreements to support its operations in Oroville and nearby Chico (Chico is outside the existing service area). One purchase agreement is with the Pacific Gas and Electric Company (PG&E) to transfer up to 3,000 acre-feet of water per year (AFY). The other is an agreement with Butte County for 150 AFY of surface water. Additional details are described in "Facilities Sharing," Section 8.9.

8.3: Company Governance and Accountability

This Section describes how performance, accountability, transparency, and public engagement relate to the public's trust in local government. Because Cal Water is a private investor-owned company, as regulated by the CPUC, its governance structure is somewhat different from other organizations described in this MSR. However, the same performance measures are utilized for consistency to compare Cal Water to the other water service providers studied in this MSR using the determinations prescribed by CKH Act.

8.3.1 Government Structure

The Cal Water - Oroville is structured as an investor-owned utility regulated by the California Public Utilities Commission (CPUC). Corporate headquarters is located in San Jose, CA, and water bill payments are sent to Whittier, CA. Since this privately owned utility provides water service to the public, it has been defined as a “public” utility by the California Constitution (Article 12, Section 3) and the California Public Utilities Code (Section 216(a)). Cal Water – Oroville is one of more than 20 service areas the Company has in California. The CPUC[3] approves the

[3] The CPUC is an independent agency with five Commissioners who serve six-year terms. The Commissioners are appointed by the Governor and must be confirmed by the California Senate. The current Commissioners and their appointment dates are listed below. As a state agency, the CPUC is required to comply with the Bagley-Keene Act, set forth in Government Code sections 11120-11132. The CPUC holds voting meetings every third Thursday and the

budgets and rates for each Cal Water district every three years in a General Rate Case (GRC) proceeding. The CPUC uses a rate-setting process that an Administrative Law Judge oversees. During the GRC proceeding, the CPUC receives testimony and evidence from Cal Water and others who become formal parties to the proceeding in order to present testimony and evidence. In order to adjust its rates, Cal Water - Oroville's conservation programs and expenditures are part of the General Rate Case proceeding. The last General Rate Case covered the three-year period 2020-22; a new GRC covering 2023-25 is presently underway (Cal Water 2020 UWMP, 2021).

Cal Water - Oroville is an urban retail water supplier defined by CWC §10608.12 (t) and §10617. Cal Water Oroville is not a wholesale water supplier. This urban water supplier provides potable water to 3,547 customers, including 778+ commercial accounts and 2,756+ residential accounts (Cal Water UWMP, 2021 and California Drinking Water Watch, 2021). Cal Water recently prepared its Urban Water Management Plan (UWMP) and its water shortage contingency plan consistent with state water law and also shared the UWMP with the CPUC. This UWMP was utilized as a source of information for this MSR.

8.3.2 Company Leadership and Board

Cal Water - Oroville operates under the direction of its parent company, the California Water Service Group. The California Water Service Group is the third-largest publicly traded water utility in the United States, and its corporate stock is traded on the New York Stock Exchange (NYSE:CWT). The California Water Service Group provides high-quality water and wastewater services to over two million people in over 100 communities. The parent company, the California Water Service Group, is overseen by a 12-member Board of Directors whom company stockholders elect. The current Board of Directors members and their term start date are listed below.

- Gregory E. Aliff, Director Since 2015
- Terry P. Bayer, Director Since March 2014
- Shelly M. Esque, Director Since June 2018
- Martin A. Kropelnicki, Director Since 2013
- Thomas M. Krummel, Director Since 2010
- Richard P. Magnuson, Director Since 1996
- Yvonne (Bonnie) A. Maldonado, Director Since 2021
- Scott L. Morris, Director Since 2019
- Peter C. Nelson, Director Since 1996
- Carol M. Pottenger, Director Since 2017
- Lester A. Snow, Director Since March 2011
- Patricia K. Wagner, Director Since 2019

public may participate in those meetings, either in-person or remotely. The public may participate remotely by phone (1-800-857-1917; 9899501#) or webcast (*http://www.adminmonitor.com/ca/cpuc*).

Readers are invited to learn more about each Corporate Board of Directors member on their website at: <*https://www.calwatergroup.com/about-us/*>. This website also allows one to sign up for email alerts and to review investor relations materials.

Since Cal Water – Oroville is a private company, it is not required to comply with the Brown Act (or its counterpart, Bagley Keene Act), and Assembly Bill 1234 (Salinas, 2005), which requires ethics training. Since Cal Water – Oroville is a private company, it is not required to hold regularly scheduled public meetings with its Board of Directors. Residents of Oroville are not necessarily notified about meetings of its Board of Directors. Payments and stipends paid to the Board of Directors are not required to be posted to public websites such as <*https://transparentcalifornia.com/agencies/salaries/special-Companys/#water*>. Typically, local government agencies have an elected Board of Directors, and several state laws, such as the Brown Act, Political Reform Act, etc., are directly binding on the Board of Directors. However, Cal Water's Board of Directors is not subject to these same specific laws. Instead, a different suite of rules applies to Cal Water as an organization rather than focusing on its Board of Directors. The water system does comply with other laws and regulations, as detailed in this chapter and on Cal Water's website. A few key rules and regulations that guide Cal Water – Oroville are summarized in the next section, "Accountability and Transparency".

8.3.3 Accountability and Transparency

LAFCO's 2006 Final MSR on Domestic Water and Wastewater Service Providers specified the following about governance and accountability for Cal Water – Oroville:

> Cal Water Oroville has a service area but is not subject to LAFCo oversight in terms of expansion of its boundaries. Given that SFWPA's rates are significantly less than those charged by Cal Water Oroville, that Cal Water Oroville's service area immediately abuts SFWPA's service area, and that the providers' pipes actually overlap in a few isolated locations, something should be done to resolve these discrepancies and inefficiencies in service provision. Similarly, given that TID's rates are significantly less than those charged by Cal Water Oroville, that Cal Water Oroville's service area immediately abuts TID's service area, and that within TID's service area, a small residential area east of Table Mountain Boulevard known as Rancho Golden is provided water by Cal Water Oroville, something should be done to resolve these discrepancies and inefficiencies in service provision (LAFCO, 2006).

Any political engagement by Cal Water is strictly governed by the Political Reform Act. Government Code sections 12940-12957 requires all employers with five or more employees, such as Cal Water, to provide training and education regarding the prevention of sexual harassment (Cal Water, Skarb, 2023).

Corporate Philosophy

Cal Water's operating model enables operations and maintenance control at the local level, supported by centralized services for company-wide functions, including Engineering; Water quality testing and laboratory service; Customer service; Information technology; Finance; Communications; Human resources; and Purchasing.

Public Communication

Cal Water – Oroville aims to keep local customers informed of important information regarding water services. Cal Water utilizes various social media platforms to provide its customers with pertinent information regarding their service. The Company has a presence on Facebook, Instagram, Twitter, LinkedIn, and YouTube. Cal Water also has a website at <*www.calwater.com*>. Additionally, Cal Water has previously held meetings for its customers in Oroville on various topics, including water supply planning, water quality, and drought response (Cal Water, Skarb, 2023).

The Special District Transparency Act (SB 929 or California Government Code, §6270.6 and 53087.8) is a state law specifying that websites managed by government water service providers, such as SFWPA and TWSD, must meet specific standards. However, Cal Water – Oroville's website is not required to comply with this state law. Nevertheless, Cal Water – Oroville's website at: <*https://www.calwater.com/community/oroville/*> contains information useful to its customers. For example, the website allows water customers to pay their bills easily online. Water leaks and water waste can be reported. Information about droughts and water conservation is easily accessible on its website. Cal Water's website also allows customers to start and stop service; sign up for email alerts; find information about rates and upcoming infrastructure improvements; and learn about water quality. Specific information about Cal Water – Oroville can be found at: <*https://www.calwater.com/district-information/?dist=oro*>.

Additionally, Cal Water's customers are afforded protections offered in the 2018 Legislature-enacted California Consumer Privacy Act, which gives consumers more control over the collection of their personal information online and establishes new online privacy rights for consumers. However, the protections provided by California Consumer Privacy Act does not extend to government agencies like SWFPA and TWSD (Cal Water, Skarb, 2023).

General Accountability

As a corporation, Cal Water must meet certain standards or address the regulatory requirements of its business activities and should assume responsibility for the consequences of its actions. Therefore, Cal Water - Oroville is accountable to the California Public Utility Commission, the California State Water Resources Control Board (SWRCB), and its water customers. Drinking water regulations are described in Appendix D. The Company generally works towards compliance with these regulations. Additionally, Cal Water is accountable to its parent company and its stockholders.

Government-managed water providers in California are subject to periodic grand jury[4] investigations. However, private companies, such as Cal Water – Oroville, are typically not subject to grand jury investigations as described on the California Civil Grand Jury website: <*https://www.courts.ca.gov/civilgrandjury.htm* >.

8.3.4: Regulation by the California Public Utilities Commission

Cal Water – Oroville is regulated by the California Public Utilities Commission (CPUC). The CPUC is a state agency that regulates privately owned public utilities, including electric power, telecommunications, natural gas, and water companies. The CPUC has headquarters in the Civic Center district of San Francisco and field offices in Los Angeles and Sacramento. Additional information about the CPUC can be found on its website at: <*https://www.cpuc.ca.gov/*>.

As a state agency, the CPUC complies with the Bagley-Keene Act, as set forth in Government Code sections 11120-11132. The Bagley-Keene Act is the state-level equivalent of the Brown Act and requires state agencies to publicly notice their meetings, prepare agendas, conduct meetings publicly, and allow for public testimony at those meetings. The CPUC holds voting meetings every third Thursday, and the public may participate in those meetings, either in-person or remotely (Cal Water, Skarb, 2023). In addition to the CPUC's regularly scheduled voting meetings, the CPUC hosts local Public Participation Hearings during proceedings in which the costs paid by customers are set by the CPUC. These hearings are held specifically to receive the testimony of customers during the rate-setting process. The most recent public participation hearing for Cal Water – Oroville occurred on April 4, 2022 (Cal Water, Skarb, 2023).

As a public utility regulated by the CPUC, Cal Water – Oroville is subject to different laws and regulations than the other water suppliers covered in this MSR (Cal Water, Skarb, 2023). For instance, CPUC General Order 77-M requires public utilities such as Cal Water to furnish the CPUC an annual report that documents the names titles and duties of all Executive Officers and the compensation received by each; the names, titles, and duties of all employees who received compensation at the rate of $85,000 or more per annum, and the compensation received by each; the amount of the expense account, any contingent fees or other moneys directly or indirectly paid to each such officer and employee named; the names entities receiving dues, donations, subscriptions, and contributions paid by the utility; and the amount of, and for each such payment. These annual reports are posted on the CPUC's website (Cal Water, Skarb, 2023). Similarly, CPUC General Order 104-A requires public utilities under the jurisdiction of the CPUC to file an annual report of its operations. These annual reports include information very similar to the information provided in the audited financial statements prepared by the other utilities covered by this MSR (Cal Water, Skarb, 2023).

CPUC's rate-setting process aims to allow a process such that customers could potentially influence the rates. For example, individuals may become parties to the CPUC's rate-setting

[4] The responsibilities of a Grand Jury are detailed on this website: *https://www.courts.ca.gov/civilgrandjury.htm*.

proceedings. The CPUC may award compensation to qualified intervenors who demonstrate they contributed substantially to the proceeding (Cal Water, Skarb, 2023).

The California Public Advocates Office (PAO) is a separate entity, statutorily charged with the responsibility for advocating on behalf of customers before the CPUC. During the rate-setting process, Cal Water Oroville's customers are represented by a consumer advocate from the PAO's office.

Complaint Process:
Cal Water's customers may choose to participate in the CPUC's informal and formal complaint processes, through which the CPUC can order corrective action, including adjustments to customers' bills (Cal Water, Skarb, 2023).

8.3.5 Management Efficiencies

Efficiently managed organizations typically implement benchmarking and monitor performance to improve service delivery, planning efforts, and emergency planning. Management efficiency commonly relates to the ability of an organization to implement plans, improve service delivery, contain costs, eliminate duplications of effort, maintain qualified employees, and build and maintain adequate contingency reserves. This MSR uses a standard methodology to assess management efficiency for public service providers. Cal Water's operations, budgets, and management are reviewed independently every three years by the CPUC (Cal Water, Skarb, 2023). This process is prescribed by CPUC's rules, and it includes a designated challenger. Please see section 8.3.4 above for additional details about the CPUC.

8.3.6 Staffing and Training

As of July 30, 2021, Cal Water's Oroville District had seven employees with a combined 53 years of combined service and 13 professional certifications (CalWater, Lind and Skarb, 2023). Staff includes administration, customer service, and operations (Means Consulting, 2017). Operations staff is available for in-person customer service and can go door-to-door as needed when customers call or email to request service) (CalWater, Lind, 2023). Staff size seems to have shrunk by two positions since the Means Consulting 2017 report was published. An organizational chart of Cal Water's Oroville employees is depicted below in Figure 8-5.

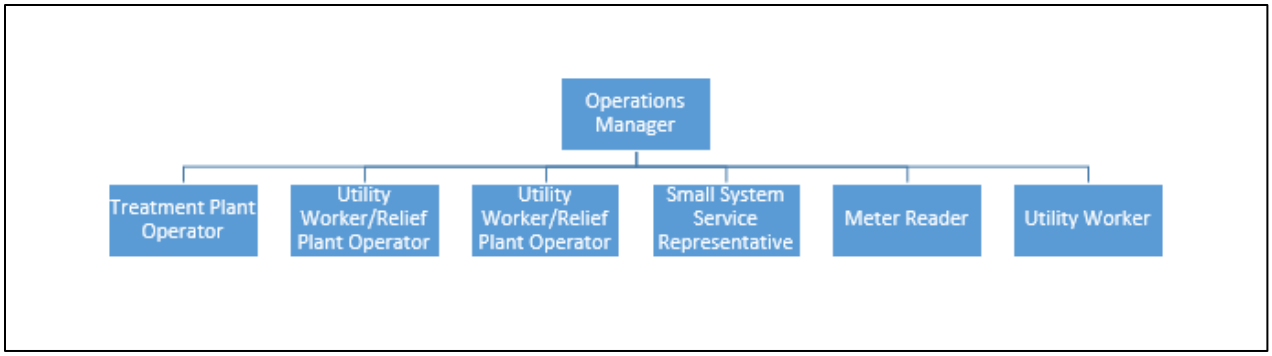


Figure 8-5 Cal Water Organization Chart (above)

LAFCO's 2006 MSR noted, "The ratio of managers to workers is appropriate; the Oroville District is not top heavy in managers. Cal Water Oroville has various policies and procedures related to personnel, provision of services, customer relations, operations and maintenance, and the like" (LAFCo, 2006). This statement remains accurate given the updated information shown in the Organization Chart, Figure 8-5. Additionally, Cal Water's staff-to-customer ratio is comparable to that of TWSD.

8.3.7 Accountability Determinations

Table 8-1: MSR DETERMINATIONS: ACCOUNTABILITY FOR COMMUNITY SERVICE NEEDS, INCLUDING GOVERNMENT STRUCTURE AND OPERATIONAL EFFICIENCIES

Number	Indicator	Determination
CWS-Acc-1	Government/Organizational Structure	As a private company, California Water Service does not have a government structure. Cal Water's Board of Directors does not hold public meetings and is not subject to compliance with the Brown Act. Limited information regarding the Company is readily available to members of the public. LAFCO's 2006 MSR determined that consideration should be given to resolving inefficiencies in service provision in relation to SFWPA and TID [TWSD] and this determination remains valid. However, as a utility that serves the public and is regulated by the California Public Utilities Commission (CPUC), Cal Water – Oroville must comply with different laws and regulations than government-owned utilities. The laws and regulations to which Cal Water – Oroville is subject allow opportunities for public involvement, oversight, and accountability. However, those opportunities are somewhat more limited and geographically separated as compared to local special districts.

CWS-Acc-2	A website provides public information and some level of transparency	Cal Water Oroville does currently maintain a website at: <*https://www.calwater.com/*>.
CWS-Acc-3	Accountability to Oroville Customers	Cal Water - Oroville is regulated by the California Public Utility Commission (CPUC), which regularly holds public meetings in Sacramento and San Francisco. During rate-setting proceedings, local public participation hearings may also be held. The public can participate in CPUC meetings remotely, via phone or web conference. Providing in-person public testimony to regulators may be difficult for Oroville residents due to driving distances and the reduced frequency of meetings compared to local special districts.
CWS-Acc-4	The ratio of management staff to worker staff in relation to the size of the operations	The number of employees (7) is appropriate, given the operation and size of the Oroville District. In addition to the ratio, Cal Water - Oroville staff have a high level of experience, expertise, and professional certifications, similar to the other service providers included in this MSR.

8.4: Growth & Population Forecasts

This Section provides information on the existing population and future growth projections for Cal Water Oroville. Historical and anticipated population growth is a factor that affects service demand. Appendices A and B provide detailed demographic and socio-economic information for The County of Butte and the City of Oroville. Information about the economy of The County of Butte is provided in Appendix H.

8.4.1 Existing Population

There are approximately 11,022 residents within the Cal Water service area boundaries, as shown in Table 8-2 below. The Company's 2020 UWMP estimated population by utilizing census tracts to calculate the population. Although census tracts do not directly correspond with service area boundaries, the data provides a close approximation of the existing population. More recently, in 2022, Cal Water Oroville reported on water conservation to the State Water Board, and as part of this, the Company estimated[5] it served a population of 11,022, an increase above its 2020 estimate. Given the dynamic variation in population in Oroville, the consultants recommend that when LAFCO next updates an MSR/SOI for services near Oroville, the

[5] The Company's population estimate of 11,022 was calculated using census data as well as % of multi-family vs single-family units, and the average size of those units, etc. Cal Water believes this more recent estimate is most accurate (Cal Water, Lind, 2023).

population within Cal Water's service area be re-evaluated compared to the service capacity. To be consistent with the population estimates of the other agencies in this MSR, both the 2020 data and the 2022 date are shown in Table 8-2 below. Cal Water provides service to 38+ percent of the geographic area of the City of Oroville and 54+ percent of the City's residents.

Table 8-2: Existing Permanent Population, Cal Water Oroville 2020

Name of Company	**Population Service area**
Cal Water Oroville Service Area[1] in 2020	10,849
Cal Water Oroville Service Area in 2022	11,022
City of Oroville[2]	18,888

Source: [1]Cal Water 2020 UWMP
[2]: California Department of Finance. May 2021. E-1 Population Estimates for Cities, Counties, and the State, January 1, 2020 and 2021. Sacramento, California.

8.4.3 Projected Population Growth

Projecting the future population for the Cal Water Service Area is complicated due to varying annexation rates and census tracts that do not match with the Service Area. For this MSR, data from the California Department of Finance (DOF) was used to project population growth, as shown in Table 8-3 below. The population projections for the City of Oroville are presented in Chapter 3, and these data were utilized to extrapolate population growth rates for the Cal Water Oroville Service Area. By the year 2045, it is estimated that Cal Water Oroville's existing service area will encompass a population of 11,194 persons. This represents an average annual growth rate of 0.13% percent between the years 2020 to 2045.

The addition of 345 or up to 1,068 people to Cal Water Oroville by 2045 is possible as the service area contains underdeveloped areas within existing boundaries that could potentially be available for more intensive residential development.

Table 8-3: Total Estimated & Projected Population (2020 – 2045)									
	2020	**2025**	**2030**	**2035**	**2040**	**2045**	**Percent Increase 2020 to 2045**	**Numeric Increase 2020 to 2045**	**CAGR 2020 to 2045**
County of Butte[1]	206,362	230,691	236,874	242,240	246,453	249,457	20.9%	43,095	0.76%
City of Oroville (Moderate)[2]	18,888	21,113	21,679	22,170	22,555	22,830	20.9%	3,942	0.76%
Low Scenario - Cal Water Oroville[3]	10,849	10,918	10,987	11,056	11,125	11,194	3.2%	345	0.13%
High Scenario – Cal Water[4]	10,849	11,022	11,316	11,573	11,774	11,917	9.80%	1,068	0.38%

Sources:
1: California Department of Finance. Demographic Research Unit. Report P-2A: Total Population Projections, California Counties, 2010-2060 (Baseline 2019 Population Projections; Vintage 2020 Release). Sacramento: California. July 2021.
2: Population projection for COOR calculated as 9.15 percent of The County of Butte's population.
3: Cal Water Oroville population projection is from the Cal Water 2020 UWMP (Cal Water, 2021)
*4: Estimated based on City of Oroville's population * 0.522. 11,022 used as starting value per Cal Water, Lind, 2023.*

8.4.4 Existing Land Use

Land use is a factor that affects population growth and, therefore, demand for public services. However, Cal Water Oroville is not a land use authority. Land use within the City of Oroville is described in Chapter 3 of this MSR.

Open Space & Agriculture

Butte LAFCO aims to protect open space and agriculture. Since Cal Water provides service to the City of Oroville, the geographic distribution of open space and agriculture is described in Chapter 3 of this MSR.

City General Plan

The Company's service area is subject to the land use policies and regulations of the City of Oroville. Most land-use decisions initiated by private property owners over the last decade are secured via entitlements and land-use permits from the City of Oroville and other agencies. The City plans for its future growth through its General Plan, which is a long-term comprehensive framework to guide physical, social, and economic development within the community's planning area. Planning designations, the Land-Use Element, the Housing Element, and other aspects of the City of Oroville's General Plan are described in Chapter 3.

8.4.5 Potential Future Development

Future population growth within the City of Oroville depends on General Plan policies, zoning, and associated land-use designations in the region. The City General Plan provides a series of goals, policies, standards, and implementation programs to guide land use, development, and environmental quality. Chapter 3 provides tables listing the new major projects in the City's planning and development stages. Additionally, a map of proposed/approved infill development projects within the City boundary is provided in Chapter 3 of this MSR. As described in Chapter 3, there is considerable room within the City boundary for infill development.

8.4.6 Local Hazard Mitigation Plan

Butte County collaborated with five incorporated communities, thirteen special independent government Districts, and one private organization to prepare the November 2019 Local Hazard Mitigation Plan (LHMP) described in Chapters 3 to 7 in this MSR. However, neither Cal Water Oroville nor Cal Water Chico were invited or offered the opportunity to participate in the 2019 LHMP process.

Natural hazard mitigation planning is important because the rising costs associated with disaster response and recovery have become more difficult to pay for. Therefore, prevention, in the form of planning and implementing mitigation measures, is essential to reducing the fiscal and social impact of natural hazard events. For example, natural hazard events can trigger emergency response and recovery costs, loss of life, personal injury, and property damage. Most people who reside in Butte County have been affected by natural hazards and remain vulnerable to drought, wildfire, floods, dam failure, heat waves, and other severe weather events. The government agencies that participated in the LHMP benefited from this planning process because the Plan:

- Updated the list of hazards
- Assessed the likely impacts of natural hazards to the people and physical assets
- Established updated goals
- Prioritized projects to reduce the impacts of future disasters on critical facilities and infrastructure.

Although Cal Water Oroville was not invited to participate in the 2019 LHMP process, the Company has previously studied potential natural hazards in other planning documents, as listed below:

- Urban Water Management Plan,
- Emergency Response Plan and
- America's Water Infrastructure Act (AWIA) analysis, report, and action plan the company executed in 2019-2020. The AWIA analysis identifies hazards and possible long-term risks to infrastructure and reliability of the water system over time, given different projected scenarios.
- (Source: Cal Water, Lind, 2023)

It is recommended that Cal Water Oroville contact the Butte County Office of Emergency Services and ask to be invited to participate in the next update to the LHMP, along with the other municipal water service providers.

8.4.6 Growth and Population Determinations

Table 8-4: MSR DETERMINATION: GROWTH AND POPULATION PROJECTIONS FOR THE AFFECTED AREA

Number	Indicator	Determination
CWS-Pop-1	Existing Service area boundary	Cal Water Oroville's 3,463-acre service area is located in the City of Oroville.
CWS-Pop-2	Existing Sphere of Influence	LAFCO's 2006 MSR/SOI depicts the Cal Water Oroville Sphere as congruent with its boundary.
CWS-Pop-3	Extra-territorial Services/Operations	Cal Water Oroville does not provide extra-territorial services outside its Company service area. To supply its operations, Cal Water Oroville has a purchase agreement with the Pacific Gas and Electric Company to purchase up to 3,000 acre-feet per year of water. In addition, it has an agreement with Butte County to purchase 150 AFY of surface water.

Table 8-4: MSR DETERMINATION: GROWTH AND POPULATION PROJECTIONS FOR THE AFFECTED AREA		
Number	**Indicator**	**Determination**
CWS Pop-4	Projected population in years 2020 to 2045.	There are approximately 11,022 residents within the Cal Water service area boundaries as of 2022. From 2020 to 2045, it is anticipated that an additional 345 to 1,068 persons are expected to reside within Cal Water Oroville boundaries. This represents an overall 3.2% percent increase in the projected future population.
CWS-Pop-5	Service area boundaries contain a sufficient land area to accommodate projected growth.	Currently, the Company's service area supports an average of 3 persons per acre, which is considered low population density. Therefore, the existing service area boundaries contain a sufficient land area to accommodate projected growth.
CWS-Pop-6	Effect that the Company's service provision will have on open space and agricultural lands.	The City of Oroville's boundary and SOI do contain agricultural lands, as described in Chapter 3. However, Cal Water Oroville is a private company with no jurisdiction over land use and no influence over agricultural or open space lands. Therefore, the provision of water services generally has minimal effects on agricultural land and open space. Open space, agriculture, and urban areas are all part of the modern landscape, and associated local hazards such as earthquakes, fires, and floods are also ephemeral features that can significantly impact water service operations. Butte County adopted the Local Hazard Mitigation Plan (LHMP) in November 2019. At that time, an invitation to participate in the LHMP process was not given to Cal Water. It is recommended that Cal Water Oroville contact the Butte County Office of Emergency Services and ask to be invited to the next update of the LHMP.

8.5 Disadvantaged Unincorporated Communities

LAFCO is required to make determinations regarding "Disadvantaged Unincorporated Communities" (DUCs). Disadvantaged Unincorporated Communities are defined as an inhabited territory that constitutes all or a portion of a community with an annual median household income that is less than 80 percent of the statewide annual household income (MHI). The requirement for LAFCO to consider DUCs results from Senate Bill 244, legislation passed in 2011 and incorporated into the CKH Act. Cal Water – Oroville's service area mostly extends to areas within the City of Oroville's boundary. However, there are two small unincorporated areas within Cal

Water's boundary. As shown in Figure 6-7 one of the unincorporated areas may be a DUC. When LAFCo prepares the next MSR update for Cal Water, it is recommended that a higher-resolution map be prepared. In the meantime, the DUC discussion in Chapter 6 (SFWPA) is also applicable to Cal Water.

Chapter 3 also describes Disadvantaged Communities (DACs) within the City limits. A DAC is a census tract where the annual median household income (MHI) is less than 80 percent of the statewide MHI. 12 census tracts lie within the City of Oroville's boundary and sphere of influence, as listed in Table 3-13. Eleven of the 12 census tracts have a median household income below $60,188, classifying them as disadvantaged communities.

Water affordability relates to the monthly fee for domestic water compared to the ability of lower-income communities to pay. Since the City of Oroville is located in proximity to DACs and DUCs, water affordability will remain an on-going concern which is discussed in more detail in the Finance section of this Appendix.

Table 8-5: MSR DETERMINATION: LOCATION AND CHARACTERISTICS OF ANY DISADVANTAGED UNINCORPORATED COMMUNITIES WITHIN OR CONTIGUOUS TO THE SPHERE OF INFLUENCE

Number	Indicator	Determination
CWS-DUC-1	The median household income is identified. The DUC threshold MHI (80 percent of the statewide MHI) is clearly stated. The MHI in the Organization's service area is described.	The statewide annual median household income (MHI) in California for 2019 was $75,235 (U.S. Census, 2021). Eighty percent of the statewide MHI (2019) equals $60,188.00, the threshold used to determine which geographic areas qualify for classification as disadvantaged communities. The year 2019 is utilized as the baseline year because it corresponds to the CALAFCO map.
CWS-DUC-2	Potential DUCs are considered. The provision of adequate water, wastewater, and structural fire protection services to DUCs is considered.	The Cal Water Service area extends mostly to areas within the City of Oroville. Several DACs have been identified within the City, as described in chapter 3. However, based on new GIS data provided by Cal Water, there seems to be one unincorporated area that could qualify as a DUC within the Cal Water Oroville Service Area. The provision of adequate water, wastewater, and structural fire protection services to DUCs is considered in Chapter 3. No public health or safety issues have been identified. Water affordability for disadvantaged communities is an issue that deserves further consideration by LAFCO and its partners.

8.6: Water Services

8.6.1.1: Existing Water Supply, Conservation, and Treatment

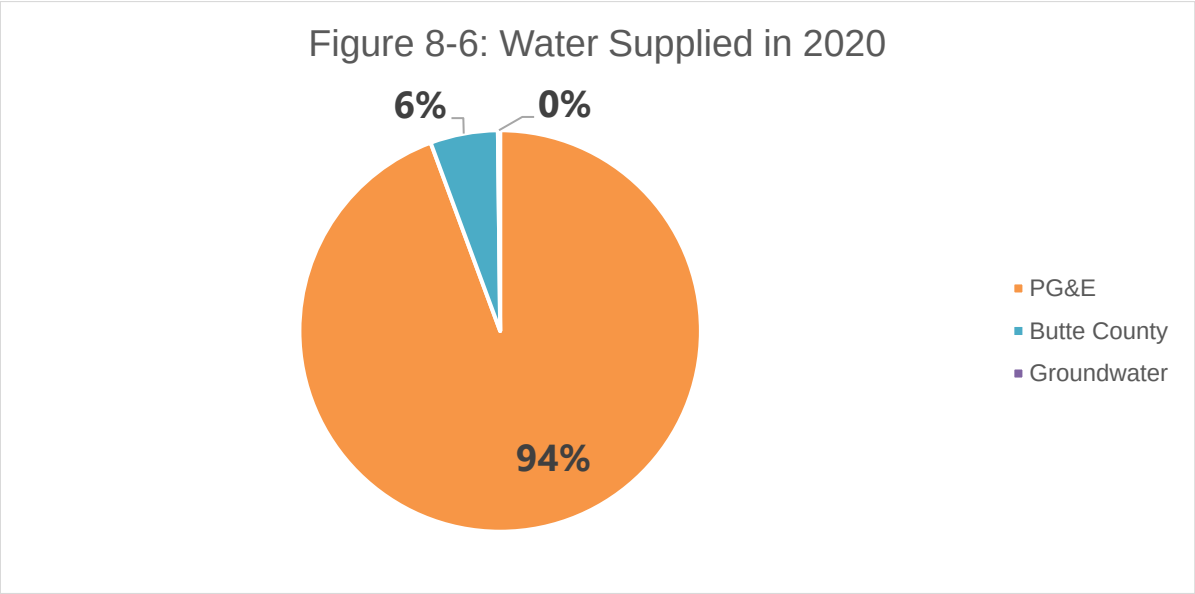
This Chapter evaluates the efficiency of services provided by Cal Water Oroville. Infrastructure needs and deficiencies are evaluated in terms of supply, capacity, condition of facilities, and service quality with correlations to operational, capital improvement, and finance plans. This Chapter addresses the provision of the services directly provided by Cal Water Oroville, including water supply, conservation, and treatment.

Cal Water Oroville supplies water to 38.9 percent of the City of Oroville's geographic boundary, including that portion located south of the Feather River, the Historic Downtown, the closest portion of the eastern foothills, and South Oroville. Cal Water Oroville estimates the number of customers served is 3,547 connections, as listed in Table 8-6 below. Cal Water Oroville operates Water System Number CA0410005.

Table 8-6: Number of Customers for Key Municipal Services	
Service	**Number of Customers in 2020**
Water	3,547 connections
Data Source: Cal Water, 2020 UWMP (2021)	

Water Supply

Cal Water's 2020 Urban Water Management Plan (UWMP) indicates that the Oroville District derives its water supply from a combination of purchased surface water and groundwater. In 2020 Cal Water supplied a total of 2,753 acre-feet of water to its customers. 94 percent of the water utilized in 2020 was purchased from PG&E, six percent was purchased from Butte County, and less than one percent was derived from Cal Water's groundwater well(s), as shown in Figure 8-6 below.



Data source for Figure 8-6: Cal Water, 2020 UWMP, 2021

PG&E Water

Water is purchased from Pacific Gas and Electric Company (PG&E) through an agreement that allows the transfer of up to 3,000 acre-feet per year (AFY) to Cal Water - Oroville. The purchased PG&E water originates from the Coal Canyon Power Plant (COOR, 2015). The Coal Canyon Powerhouse was retired due to the 2002 rupture of its penstock and has never been repaired due to a lack of cost-effectiveness. Some powerhouse equipment was left in place. However, the powerhouse cannot generate electricity without a working penstock (Butte County BOS, 2021). The purchased water from PG&E is conveyed from the west branch of the Feather River into Lake Oroville and delivered to Cal Water's Treatment Plant via the Thermalito Power Canal at Station 14. This supply was previously delivered via the Upper Miocene Canal, but due to fire damage, the canal is not currently operational (Cal Water, 2020 UWMP, 2021). The Butte County Board of Supervisors has considered several alternatives to protect the water supply associated with PG&E's and Cal Water's use of the Miocene Canal, as described in the staff report provided in Appendix N (Butte County BOS, 2021). In 2020, Cal Water purchased 2,598 AF of water from PG&E, which represents 94 percent of its total water utilized, as shown in Figure 8-6 above and Table 8-7 below. PG&E holds pre-1914 water rights for this water (Application ID S001251), as shown in Table 8-8 (on page 8-21). Additional information about water rights is provided in Appendix D. PG&E's water rights have an assigned "Place of Use," a geographic area. Cal Water staff indicate that this water supply is highly reliable in normal and dry years (Cal Water, K. Jenkins, 2023).

Butte County Water Purchase

Cal Water has a contract with Butte County for 150 AFY of Table A surface water supply from the California State Water Project (SWP) (Cal Water 2020 UWMP, 2021). This represents six percent of the water utilized by Cal water Oroville during the year 2020, as shown in Figure 8-6 above. Additionally, Cal Water can request an increase in SWP supply from Butte County up to 3,000 AFY if necessary. Cal Water considers this a potential "back-up" source of supply that may be utilized in the event of unforeseen supply interruptions or increased demands (Cal Water 2020 UWMP, 2021). Typically, contracts with the SWP include a disclaimer that acknowledges that if there is not enough natural precipitation to create a water supply, there is a risk that contracted water might not be delivered or delivered on a reduced basis.

Table 8-7: Cal Water Oroville Water Supplies Per UWMP[6]

Table 6-8. Water Supplies – Actual (DWR Table 6-8)

Water Supply	Additional Detail on Water Supply	2020		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Groundwater (not desalinated)	Wyandotte Creek Subbasin (b)	5	Drinking Water	
Purchased or Imported Water	Pacific Gas and Electric Company and/or Butte County (c)	2,747	Drinking Water	3,150
Total		2,753		

NOTES:
(a) Volumes are in units of AF.
(b) The Wyandotte Creek Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.
(c) The "Total Right or Safe Yield" of purchased water for the District is equal to the sum of its two contractual agreement volumes, 3,000 AFY from PG&E and 150 AFY from Butte County. However, the District has the ability to request to increase its purchase quantity from Butte County up to 3,000 AFY.

Data Source for Table 8-7: Cal Water, 2020 UWMP, 2021

[6] The Water supply data provided in Table 8-7, which is also called Table 6-8 in the UWMP, includes several disclaimers described by the UWMP as follows: Data do not represent the total amount of purchased water and groundwater supply that may be available to the District in a given year, but rather reflect the fact that the combination of available purchased water and groundwater supply sources has always been sufficient to meet demands in normal years, and is projected to continue to be sufficient to meet demands in the future. It should also be noted that the Wyandotte Creek Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.

Table 8-8: Pacific Gas and Electric - List of Water Rights Associated with the Miocene Hydroelectric Projects

Statement of Water Diversion and Use #	Priority date	FERC Project #	River System	Direct Diversion Amount (cfs)	Description (Facility)	Point of Diversion	Primary Place of Use	Water Right Class
892	1865	NA	West Branch Feather	75	Upper Miocene Canal	West Branch Feather River	Lime Saddle & Coal Canyon Powerhouses	Pre-1914
916	1865	NA	West Branch Feather	3	Upper Miocene Canal feeder	At Station 285 + 73	Lime Saddle & Coal Canyon Powerhouses	Pre-1914

Data Source: Pacific Gas and Electric (PG&E) website at: <*https://www.pge.com/pge_global/common/pdfs/safety/electrical-safety/safety-initiatives/desabla/Summary-of-Butte-Water-Rights.pdf*>. Provided by PG&E for informational purposes only. PG&E makes no representations as to the completeness or accuracy of the information provided herein.

Groundwater

Cal Water - Oroville supplements its surface water supply with local groundwater. The groundwater used by the Oroville District is extracted from the underlying Wyandotte Creek Subbasin ((DWR Basin No. 5-021.69). The service area has a total of one active and two stand-by wells, as listed in Table 8-9 below (Cal Water 2020 UWMP, 2021). As shown in Table 8-7 above, in 2020, groundwater comprised only 0.18 percent of the total water supplied by Cal Water Oroville. Before 2020, groundwater was a slightly larger percentage of water supplied.

Well #2 and Well #5 are out of service due to per- and polyfluoroalkyl substances (PFAS) impacts (Cal Water 2020 UWMP, 2021). PFAS are commonly known as "forever chemicals" because they are long-lasting chemicals that break down very slowly over time and persist in the environment (EPA, n/d). A new well is proposed to replace Well #2. The proposal for the new well is contingent upon approval by the CPUC of a rate increase as part of the 2021 GRC. Until the new well comes online, the Company will increase purchased surface water supplies to make up the difference (Cal Water 2020 UWMP, 2021). A proposed total budget of $218,912 for the Oroville Service area was requested as part of the Well Infrastructure Renewal Program. Additional funds were requested for the design of a new well (CPUC, 2022).

In July 2001, the California Water Service Company submitted a report entitled "Drinking Water Source Assessment," which identified protection Zones for Well 05-01 and Well 10-01. The Protection Zone has three tiers, A, B, and C, based on the travel time of water to the well calculated as a distance (Cal Water, 2001). The Protection Zone is intended to protect water quality in the wells. There does not appear to be any direct management or enforcement of the identified Protection Zones by a state agency.

Table 8-9: Cal Water Oroville Groundwater Wells and WTP

Name	Type Code	2019 State Status	2020 UWMP Status	2023 Notes from Cal Water[3]
Oroville Treatment Plant - Raw XCLD	IN	Active[1]	Active[2]	None
Well 05-01	WL	Active[1]	Active [2]	Well 5-01 is currently Standby (inactive, except in case of fire emergency). DDW can verify - a permit was issued in December.
Well 10-01	WL	Active[1]	Standby[2]	Well 10-01 was brought back to Active status in 2022 with the addition and commissioning of Granular Activated Carbon filtration on site to remove PFAS.
Well 02-01 - Stand-by	WL	Inactive[1]	Standby[2]	Well 2-01 is currently Standby (inactive, except in case of fire emergency).
West Pacific Well	WL	Inactive[1]	Inactive[1]	The Western Pacific Well was Inactive and has since been destroyed by its owners (it had been leased).

1. Data Source: SWRCB, CA Drinking Water Watch, *https://sdwis.waterboards.ca.gov/PDWW/JSP/WaterSystemDetail.jsp?tinwsys_is_number=97&tinwsys_st_code=CA&wsnumber=CA0410005*
2. Data Source: Cal Water 2020 UWMP, 2021
3. Cal Water, Lind, 2023

Emergency Water Supply

Cal Water and Thermalito Irrigation District maintain an emergency intertie, which allows them to access supplemental water during emergencies (i.e., the emergency intertie could provide a temporary alternative water source). Aside from replacing the well listed in Table 8-9, Cal Water does not have new water supply sources currently planned in their UWMP (Cal Water 2020 UWMP, 2021). However, Cal Water does regularly study the potential for new water supplies as part of its Infrastructure Improvement Plans (Cal Water. Jenkins, 2023).

Water Conservation

The Water Conservation Act of 2009 (Senate Bill X7-7) was enacted in November 2009 and requires the state of California to achieve a 20 percent reduction in urban per capita water use by December 31, 2020. To achieve this, each urban retail water supplier was required to establish water use targets for 2015 and 2020 using methodologies established by DWR (Cal Water 2020 UWMP, 2021). LAFCo's 2006 MSR noted that "Cal Water Oroville has implemented several conservation measures. These include retrofitting plumbing, public education, toilet rebates, and more. Cal Water Oroville also has an aggressive program to reduce unaccounted water within its systems" (LAFCO, 2006).

The Oroville District met its 2020 water use target of 261 gallons per capita per day (GPCD) since water use was reduced in 2020 to 227 GPCD. Cal Water Oroville participates in a "Regional Alliance" for purposes of SB X7-7 compliance. The 227 GPCD in 2020 represents a decrease of 39% when compared to the 372 GPCD in 2000. The Regional Alliance's 2020 water use is 178 GPCD, less than (i.e., better than) its 2020 target of 226 GPCD. (Cal Water 2020 UWMP, 2021). Excluding commercial and industrial water use, the residential-only per-capita water use in May 2022 was 88 (gpcd) (SWRCB, 2022). The California Water Service Company Oroville posts updated conservation data regularly to the California State Water Resources Control Board Water Conservation Reports at: <*https://www.waterboards.ca.gov/conservation/conservation_reporting.html*> (SWRCB, 2022).

Conservation Master Plan*:* Cal Water prepared a Conservation Master Plan as part of its 2020 Urban Water Management Plan (UWMP). The Conservation Master Plan helps to ensure that Cal Water is providing the right mix of conservation programs in the most cost-effective manner possible. The Conservation Master Plan guides the Company's staff and stakeholders by informing annual conservation activities, such as program levels, staffing, and budget needs. Additionally, the Conservation Master Plan summarizes the mix of conservation measures that Cal Water plans to implement, including the estimated water savings, costs, and effects on water demand (Means Consulting, 2017). Additional information on water conservation can be found in the 2020 Urban Water Management Plan available on CA DWR's website at: <*https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans>.* A summary of the customer assistance, plumbing fixture replacement, irrigation equipment replacement, and landscape upgrade elements that Cal Water offers in the Oroville District is provided in the Means

Consulting Report (2017) available online at:
<*https://www.calwater.com/community/oroville/docs/*>.

8.6.2.2: Water Supply Planning

Protecting water quality and maintaining an adequate water supply are critical for the future of the Oroville region. Given this importance, Cal Water Oroville (along with other regional and statewide agencies) prepare a range of water resource management plans as described in the following paragraphs.

Urban Water Management Plan
California's urban water suppliers prepare urban Water Management Plans (UWMPs) to support their long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. The Urban Water Management Planning Act (C6WC §10610 – 10656 supplemented by CWC §10608 et seq) specifies the requirements for UWMPs. Cal Water Oroville adopted a 2020 Urban Water Management Plan in June 2021. This UWMP describes Cal Water Oroville's existing water facilities, system water use, baselines, water system supplies, contingency plan, and water demand management measures. Their UWMP is 312 pages in length and can be viewed on the following website: <*https://www.calwater.com/docs/uwmp2020/ORO_2020_UWMP_FINAL.pdf*>. This UWMP is an update to the previous 2015 UWMP and discloses information that remains relevant (Cal Water, 2021). Cal Water utilizes the UWMP as a long-range planning document for water supply and system planning; and as a source for data on population, housing, water demands, water supplies, and capital improvement projects. Cal Water's final UWMP was formally adopted by Cal Water's Vice President, Customer Service and Chief Citizenship Officer on June 20, 2021, and was submitted to the California Department of Water Resources (DWR) within 30 days of approval.

Water Supply and Facilities Master Plan and Water Supply Reliability Study
Cal Water - Oroville is developing a Water Supply Reliability Study (WSRS) and updating the existing Water Supply & Facilities Master Plan (WSFMP) for Cal Water Oroville in 2023 and 2024. The WSRS is evaluating the reliability of existing water supplies and assessing supply and demand options to enhance future reliability. The Study will consider water supply project recommendations for the facilities' master planning process. The WSFMP is informed by the WSRS and forecasts potential infrastructure needs to support long-term operational reliability (Cal Water, Jenkins, 2023).

Integrated Regional Water Management Plan
Cal Water participated in the development of the Northern Sacramento Integrated Regional Water Plan (NSV-IRWMP), which covers Butte County plus five other counties in the Northern Sacramento Valley. The Northern Sacramento IRWMP partners worked together for many years to lay the foundation for an integrated regional water management plan to address water-related issues such as economic health and vitality; water supply reliability; flood, stormwater, flood management; water quality improvements; and ecosystem protection and enhancement. The

NSV-IRWMP aims to address water-related issues and offer solutions that can provide multiple benefits to the region. The Northern Sacramento Valley IRMWP was originally approved by the California Department of Water Resources on July 24, 2014. The Plan was subsequently updated on March 2, 2020, to comply with new DWR requirements as detailed on their website at: *https://nsvwaterplan.org/.* Cal Water played a supporting role in developing and providing information for the IRWMP. In addition, Cal Water has been diligent in supporting and pursuing a number of the goals and objectives outlined in the IRWMP (Means Consulting, 2017).

Sustainable Groundwater Management Act

Cal Water - Oroville participates in the California Sustainable Groundwater Management Act (SGMA) by collaborating with its partners to prepare a management plan in conjunction with the Wyandotte Creek Groundwater Sustainability Agency (WCGSA), as detailed on their website at: <*www.wyandottecreekgsa.com*>. A Cal Water Oroville employee actively participates in meetings for the WCGSA. The GSA meets all the current milestones, and a Draft Groundwater Sustainability Plan is available for public review per the SGMA regulations. The Wyandotte Creek Groundwater is hydrologically connected to the Sacramento Valley groundwater Basin. Cal Water Oroville utilizes a well(s) to extract groundwater from the Wyandotte Creek Basin. This Basin is not adjudicated. DWR's recent evaluation of California groundwater basins determined that the Basin is not in a critical overdraft condition. DWR has prioritized the Basin as "medium" (Cal Water 2020 UWMP, 2021).

Other Water Planning Efforts

Cal Water coordinates plans with the Butte County Department of Water and Resource Conservation.

Future Water Supplies

Table 8-10 below shows that Cal Water has projected its future water supplies. Between the years 2025 to 2045, the "Reasonably Available Volume" of water is expected to decrease by 68 acre-feet per year. Hopefully, this decrease will be offset by water conservation and improvements made at the water treatment plant. This MSR considers whether future supplies will be sufficient to meet future demand on the following pages. It is also noted that Cal Water staff indicate that available supplies are expected to be able to serve demands in all year types through 2045 (Cal Water, Jenkins, 2023).

Table 8-10: Future Water Supplies Projected to Year 2045

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
		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)
Groundwater (not desalinated)	Wyandotte Creek Subbasin (b)	106		104		104		103		103	
Purchased or Imported Water	Pacific Gas and Electric Company and/or Butte County (c)	2,548	3,150	2,495	3,150	2,490	3,150	2,484	3,150	2,483	3,150
Total		2,654		2,599		2,594		2,587		2,586	

NOTES:
(a) Volumes are in units of AF.
(b) The Wyandotte Creek Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.
(c) The "Total Right or Safe Yield" of purchased water for the District is equal to the sum of its two contractual agreement volumes, 3,000 AFY from PG&E and 150 AFY from Butte County. However, the District has the ability to request to increase its purchase quantity from Butte County up to 3,000 AFY.

Source for Table 8-10 above: Cal Water 2020 UWMP, 2021

Water Demand

Existing Water Demand

Cal Water's 2020 UWMP indicates that the Company delivers water to residential, commercial, industrial, and governmental customers at the percentages listed in Table 8-11 below.

Table 8-11: Existing Water Demand by Customer Type	
Type	**Percent of Overall Water Demand**
Residential customers	34 percent
Industrial customers	21 percent
Other Non-residential water uses	37 percent
Distribution system losses	8 percent
Data Source: Cal Water 2020 UWMP, 2021	

In 2006, LAFCO's MSR noted that the maximum day demand in the Oroville service area of 6.3 MGD." (LAFCO, 2006). In addition, water demand within the Oroville service area was 2,436 acre-feet per year (AFY) on average between 2016 and 2020 (Cal Water 2020 UWMP, 2021).

Existing Groundwater Demand

Groundwater use is important to Cal Water Oroville because the groundwater well water is pumped to storage structures during non-peak demand periods. The stored groundwater is then drawn down to provide peak day demand. With the proposed replacement well installation previously discussed, Cal Water Oroville indicates it can maintain sufficient production capacity to supply all of the current annual average day and maximum day demand (Cal Water 2020 UWMP, 2021). The amount of groundwater utilized by Cal Water Oroville in past years is shown in Table 8-12 below.

Demand Related to Fire Suppression & Impacts

In the recent past, Butte County areas experienced the devastating Camp and North Complex Fires, which destroyed nearly 17,000 structures, including more than 14,000 homes, and displaced many more residents. Therefore, the importance of functional fire hydrants is understood. In 2006, LAFCO's MSR noted, "The El Medio Fire Protection District has apparently reported that turning on a hydrant too quickly is sufficient to blow a water line" (LAFCO, 2006). In the past, the El Medio Fire Protection District (EMFPD) provided services to the mostly urbanized unincorporated territory immediately south of and adjacent to the City of Oroville. El Medio once served a population of approximately 6,000 persons within a geographic area of approximately 1,500 acres. EMFPD has experienced staff shortages and budget shortfalls over the last decade, resulting in its ultimate closure in December 2020. Since then, Oroville Fire Department and CAL FIRE have taken over coverage for their respective territory. The MSR consultants do not have data indicating which agency is responsible for maintaining fire hydrants throughout the City. Sufficient water pressure is needed to support emergency fire suppression needs. However, Cal Water's staff did indicate that in recent years Cal Water has completed water pipeline replacement

projects in South Oroville to address pressure issues (Cal Water, Skarb, 2023). Insufficient information was available in a timely manner to inform an analysis of Cal Water's supply/demand situation in relation to fire suppression needs. Therefore, it is recommended that when a MSR for Cal Water is next updated in approximately five years, LAFCO should ask Cal Water's engineers to verify sufficient water supply for fire-fighting purposes.

A related but slightly different situation exists concerning potential future impacts associated with a wildland fire in Cal Water's surface water source watershed. The risks that wildland fires could pose to the water source from PG&E and to Cal Water Oroville's overall system are not well documented. However, Cal Water's 2022 Watershed Sanitary Survey Report acknowledges that "a fire in the watershed could contribute large loads of suspended solids and organic matter to the water supply during and immediately after a fire and for some time until the fire area is stabilized" (Cal Water, 2022). This took place, in fact, following the North Complex and Dixie Fires in 2020. The storm event in October 2021 washed large amounts of ash and debris into the water. Cal Water's local treatment operators were able to successfully treat water that was more than twice as turbid as any water they had previously been required to treat at the plant. Lessons were learned from that instance, and new procedures and equipment were put in place to help address similar scenarios in the future (Cal Water, Lind, 2023).

Table 8-12: Groundwater Utilized by Cal Water Oroville in Past Years

	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	Wyandotte Creek Subbasin	134	432	126	145	5
	TOTAL	134	432	126	145	5

NOTES:
(a) Volumes are in units of AF.
(b) The Wyandotte Creek Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.

Source for Table 8-12 above: Cal Water 2020 UWMP, 2021

Future Water Demand (Projected)

Considering historical water use, expected population increase and other growth, regular climatic variability, and other assumptions, water demand is projected to be 2,654 AFY in 2025 and decrease to 2,586 AFY by 2045, a change of 6 percent compared to the 2016-2020 average. Water demands are expected to be somewhat higher in dry-year periods, potentially up to 2,833 AFY by 2025, during an extended five-year drought (Cal Water, 2020 UWMP, 2021).

Cal Water's 2020 UWMP indicates that based on historical data and projected demands, and the planned construction of a new well in 2021, it is assumed that groundwater will comprise approximately four percent of future supplies (Cal Water, 2020 UWMP, 2021). Cal Water's 2020 UWMP indicates that the available supply is expected to be sufficient to meet the projected future demands of the service area in normal and multiple dry-year periods through 2045. It should be noted that the Wyandotte Creek Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit, or represent Cal Water's water rights or maximum pumping volumes (Cal Water, 2020 UWMP, 2021).

There are no planned future water supply projects or programs that are expected to provide a quantifiable increase to the Oroville District's water supply (Cal Water, 2020 UWMP, 2021). New supplies are regularly assessed as part of the Cal Water Oroville Infrastructure Improvement Plans (Cal Water, Jenkins, 2023).

Water Recycling

The SC-OR Wastewater Treatment Plant receives domestic wastewater derived from showers, dishwater, toilets, kitchen sinks, and storm runoff. SC-OR's wastewater treatment plant utilizes a complex process to provide advanced secondary treatment, as described in Chapter 5. Recycled water is the concept of utilizing treated wastewater for a beneficial purpose, such as irrigating local landscapes. Cal Water Oroville's 2020 UWMP indicates that implementing a recycled water program at the treatment plant would require upgrades for tertiary treatment and a new distribution infrastructure between the treatment plant and potential District customers. Based on these conditions, a recycled water system in the area is not planned at this time (Cal Water, 2020 UWMP, 2021). Additionally, Cal Water Oroville does not expect to meet future demand with recycled water (Cal Water, 2020 UWMP, 2021).

Summary Comparison of Water Supply and Demand

LAFCO's 2006 MSR determined that "Cal Water Oroville can provide adequate water supplies to meet the demand in the Oroville District. The Oroville District's water supply is sufficient to accommodate the projected growth. Cal Water Oroville should continue utilizing conservation measures and should continue its program to reduce unaccounted water" (LAFCO, 2006). However, since 2006, new information has become available, including Cal Water Oroville's 2020 UWMP, the Means Consulting Report, the Butte County Board of Supervisors' October 26, 2021 report on the Miocene Canal, and various other reports and databases. These reports have been briefly analyzed in this MSR and listed in the Bibliography.

Typically, when comparing water supply to water demand, the ideal situation is to have water supply far exceed demand such that the excess supply provides a buffer that can serve in case of unforeseen events or hazards. Cal Water's UWMP and Table 8-7 on page 8-27 show that currently, in typical water years, the available water supply (2,753 AFY) matches the existing water demand (2,753) (Cal Water, 2020 UWMP, 2021). However, as previously noted, Cal Water

could have the ability to purchase additional surface water supplies from Butte County (up to 3,000 AFY) or increase the pumping of groundwater. Cal Water Staff would like readers to note that the Company's "Total Right or Safe Yield" of purchased water for the District is equal to 3,150 AFY, which is the sum of its two contractual agreement volumes, 3,000 AFY from PG&E and 150 AFY from Butte County as listed in Table 8-7 above (Cal Water, 2020 UWMP, 2021).

In the future, the UWMP indicates that demand for water will potentially decrease from 2,753 AF in 2020 and 2,654 AF in 2025 to 2,586 AF in 2045 (Cal Water, 2020 UWMP, 2021). Additionally, the UWMP describes water conservation measures that will facilitate this projected decrease in demand. The Plan indicates that water conservation measures will likely improve in the future, thereby securing a balance in the year 2045 with a supply of 2,586 AFY, meeting the demand of 2,586 AFY (Cal Water, 2020 UWMP, 2021). However, in dry-year periods, water demands are expected to be somewhat higher, potentially up to 2,833 AFY by 2025, during an extended five-year drought (Cal Water, 2020 UWMP, 2021). The drought demand of 2,833 AFY exceeds projected 2045 supply (2,586 AFY) (Cal Water, 2020 UWMP, 2021). However, Cal Water's staff has noted that the drought demand is projected to be less than the 3,150 AFY of "Total Right or Safe Yield."

The UWMP's projected future water demand calculations do not consider the effect of climate change on water demand (Cal Water, 2020 UWMP, 2021). Specifically, the effect of climate change on Cal Water-Oroville's primary water source, PG&E supply from the Feather River, is not described in the UWMP. However, the UWMP does note that Cal Water is studying climate change. Also, the UWMP's future projected water demand does not consider the effect that the expansion of the water service area recently approved by the CPUC could have on future water demand. The population in Oroville and the associated water demand will likely rise in the future. It is recommended that the next MSR or SOI update prepared by LAFCO for Cal Water study this issue of projected future water demand for the Cal Water Oroville service area in more detail, given the data gaps identified in this paragraph. This long-term water demand question would ideally be hydrologically modeled by a hydrologist.

Drinking Water Quality

This Section focuses on one aspect of water quality: drinking water quality. When drinking a glass of water, it is essential for customers to understand whether this water is safe for consumption and free from pollution to protect their health and safety and promote overall wellness. Cal Water Oroville's water quality monitoring program includes taking raw and treated water samples throughout the year.

LAFCO's 2006 MSR found the following: "The water delivered to Cal Water Oroville's customers currently meets all federal and state water quality regulations. According to Cal Water Oroville's 2004 water quality report, the samples tested were well below the MCL (maximum contaminant level) for all contaminants. The arsenic levels detected ranged from none to 2 ppb (parts per billion). The new MCL for this constituent that went into effect on January 23, 2006, is 10 ppb.

Therefore, the Oroville District is below the new arsenic MCL. In addition, both surface water and groundwater are treated with chlorine and fluoride prior to distribution" (LAFCO, 2006).

In 2017 Means Consulting prepared a report entitled "Report on California Water Service's Oroville District an Evaluation of Service Offerings" (listed in the Bibliography), which found the following points about the quality of water provided by Cal Water Oroville:

- In Cal Water's case, its Oroville service area has not had any water quality violations in at least the last decade (i.e., from 2007 to 2017).
- The water Cal Water provided to its customers in Oroville in 2016 met every primary and secondary state and federal water quality standard, and it achieved similar results in 2013, 2014, and 2015 (Means Consulting, 2017).

Cal Water Oroville's 2020 UWMP noted that Groundwater Well #2 had been closed due to the presence of per- and polyfluoroalkyl substances (PFAS) (Cal Water, 2020 UWMP, 2021). The U. S. EPA reports that PFAS persist in the environment and can also be found in the blood of people and animals worldwide. PFAS are found in water, air, fish, and soil at locations across the nation and the globe. Scientific studies have shown that exposure to some PFAS in the environment may be linked to harmful health effects in humans and animals (EPA, n/d). Therefore, the closure of Well #2 by Cal Water Oroville was an important step in reducing exposure to PFAS. Well #5 has also been removed from service due to detection of PFAS. Well #10 has had Granular Activated Carbon treatment added to the wellhead to remove PFAS before sending to customers. (Cal Water, Lind, 2023)

California Drinking Water Watch

Cal Water Oroville's water system was queried on the C.A. Drinking Water Watch (Safe Drinking Water) online database. Over the past twenty-six years, Cal Water Oroville has received only two water quality violations for the Water Treatment Plant (Water System No. CA0410005). The most recent violation occurred in January 2022, when lab results showed an issue related to the Revised Total Coliform Rule (California Drinking Water Watch, 2022). The treatment plant's compliance with the Rule was documented in March 2022. Details are listed in Table 8-13 below.

Table 8-13: Summary of General Information from Drinking Water Division

Water System Number	System Name	Type	Mx Treatment Class	Primary Source Water Type
CA0410005	Cal Water Service Company	C	T4	Surface Water

Data Source: C.A. Water Board Drinking Water Division Database Query Result

Table 8-14: Water Quality Violations Listed in Database for Cal Water - Oroville

Violation No.	Status	Violation Type	Violation Name	Analyte Code	Analyte Name
2022-9621002	V	3A	MONITORING, ROUTINE, MAJOR (RTCR)	8000	REVISED TOTAL COLIFORM RULE (RTCR)
1996-9621001	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)

Data Source: C.A. Drinking Water Watch. *https://sdwis.waterboards.ca.gov/PDWW/JSP/Violations.jsp?tinwsys_is_number=97&tinwsys_st_code=CA*

8.7: Infrastructure

Existing Infrastructure

Cal Water Oroville currently operates two storage tanks, six booster pumps, and 59 miles of pipeline to deliver roughly 2.5 million gallons of water daily (West Yost, 2017 and Cal Water, 2020 UWMP, 2021). Back in 2006, LAFCO's MSR noted that "Cal Water Oroville's infrastructure consists of four wells," and the wells are properly maintained and monitored through a telemetry system" (LAFCO, 2006). However, three of the wells have been taken out of operation since then. Cal Water currently has one operational groundwater well (Cal Water Consumer Confidence Rpt, 2021). The water pipes in the Cal Water Oroville District are constructed of wrought iron, cast iron, steel, concrete, and PVC. Cal Water currently has an aggressive pipe replacement program through which over 1,000 feet of distribution pipelines are replaced every year. When unaccounted water in the system reaches a level of 10% or higher, a full-scale system audit is performed, and repairs are made where necessary. The pipeline infrastructure within the Oroville District is generally well-maintained. In 2006, LAFCO's MSR found that some areas of pipeline were old and deteriorated (LAFCO, 2006). However, more recently, in 2021, the State Water Resources Control Board Division of Drinking Water completed an Inspection Report which found that the Cal Water Oroville "water system is in general compliance with regulatory requirements and is professionally operated and maintained. Minor deficiencies were found during the inspection" (SWRCB, 2021). Cal Water Oroville may also utilize a connection with Thermalito Irrigation District during emergencies or treatment plant maintenance (Cal Water Consumer Confidence Report, 2021).

Recent improvements to infrastructure include, but are not limited to:

- Installation of a 20-inch pipe from the Cherokee Reservoir in place of the former raw water ditch,
- Installation of a new hydropneumatic tank for the Ranch Golden Zone (replaced an old tank), and
- Removal/destruction of Well 901 during the summer of 2020.
- The diversion at Gold Run Creek was rebuilt
- Plant Control system was replaced with a programmable logic controller to facilitate automating the filter backwash recycling system.
- A particle counter was installed that can monitor either raw or treated water
- Two 50-pound-per-day (PPD) chlorine generators were replaced with two 100 ppd generators
- (Data Source: SWRCB, 2021 and Cal Water, 2022)

Water Treatment Plant

The raw surface water purchased from PG&E and from Butte County is processed through a 7 MGD conventional water treatment plant (LAFCO, 2006). The treatment process includes coagulation-sedimentation, fluoridation, filtration, and disinfection (SWRCB, 2021). The rapid mix and flocculation processes are not strictly conventional as they lack an engineered rapid max chamber (high shear rate) and flocculation paddle wheels (low energy addition). However, the treatment plant does receive credits for the removal of Giardia and the inactivation of viruses.

Cal Water's Oroville Treatment Plant currently operates with approximately 10 percent losses (i.e., if 100 AFY is treated at the plant, 90 AFY is produced) (Cal Water 2020 UWMP, 2021). The water treatment plant is located near the Thermalito Power Canal. Cal Water Oroville has not reported any plans to expand its water treatment plant (LAFCO, 2006). Recent improvements to the water treatment plant include the installation of three electrical panels (SWRCB, 2021).

A January 2003 report by Cal Water entitled "Drinking Water Source Assessment, Cal-Water Service Co-Oroville in Butte County regarding the Oroville Treatment Plant – RAW" recommended a "Protection Zone" around the water treatment plant intake with a 2,500-foot radius called "Zone B." The Assessment also recommends a Protection Zone "A" of 400 feet from a reservoir or primary stream boundaries and 200 feet from tributaries (Cal Water, 2003).

Water Storage

Cherokee Reservoir stores raw water. Oroville Reservoir functions as a sedimentation basin. A Clearwell Tank and a High Duty Reservoir are also utilized (SWRCB, 2021).

8.7.1. Infrastructure Needs and Deficiencies

Cal Water's website states: "*Every three years, Cal Water submits an Infrastructure Improvement Plan to an independent state agency and separate state watchdog, the Office of Ratepayer Advocates, for review and approval. This process helps to ensure that we are able to continue*

providing a reliable supply of high-quality water for customers' everyday needs and sufficient resources for firefighters. Our most recent Infrastructure Improvement Plan for years 2019-2021 was submitted on July 2, 2018, kicking off a typically 18-month review process. With a delay due in part to the coronavirus pandemic, final approval was given near the end of 2020 and included revised budgets that reflect the actual cost of operating, maintaining, and upgrading our water system. Customers' February 2021 bills will reflect these new rates" (Cal Water, n.d.).

The SWRCB 2021 Inspection Report noted that several stations are scheduled for future improvements. However, planned and needed improvements that were not addressed in Cal Water's approved 2018 infrastructure improvement plan are still subject to as-yet unrealized approval by the CPUC. Proposed future improvements may include work along the following stations:

- Station 1: will be removed, and the existing structure will be used for storage only.
- Station 2: currently on stand-by and will possibly be destroyed due to PFOA/PFOS contamination.
- Station 3: New booster pumps, new electrical, and a backup generator will be installed.
- Station 10: Well is active (as of 2022) with GAC filtration, a new backup generator, and an 800 gpm well.
- (Data Sources: SWQCB, 2021 and Cal Water, Lind, 2023)

The Oroville service area currently has several pressure zones supported by associated booster/lift stations (SWQCB, 2021). Overall, Cal Water provides sufficient water pressure in the pipelines to serve routine customer needs. Cal Water has identified the neighborhoods where the minimum water pressure is available, as shown in Figure 8-7. Water pressure sufficiency for local fire hydrants was not studied in this MSR. Cal Water does not have any current plans for major system upgrades or expansions (COOR, 2022). However, Cal Water's 2021 GRC was still under review by the CPUC at the time this report was compiled. Cal Water will submit a new infrastructure improvement plan to the CPUC in 2024 and every three years subsequently (Cal Water, K. McCusker, 2023).

Figure 8-7: Neighborhoods with Minimum Water Pressure

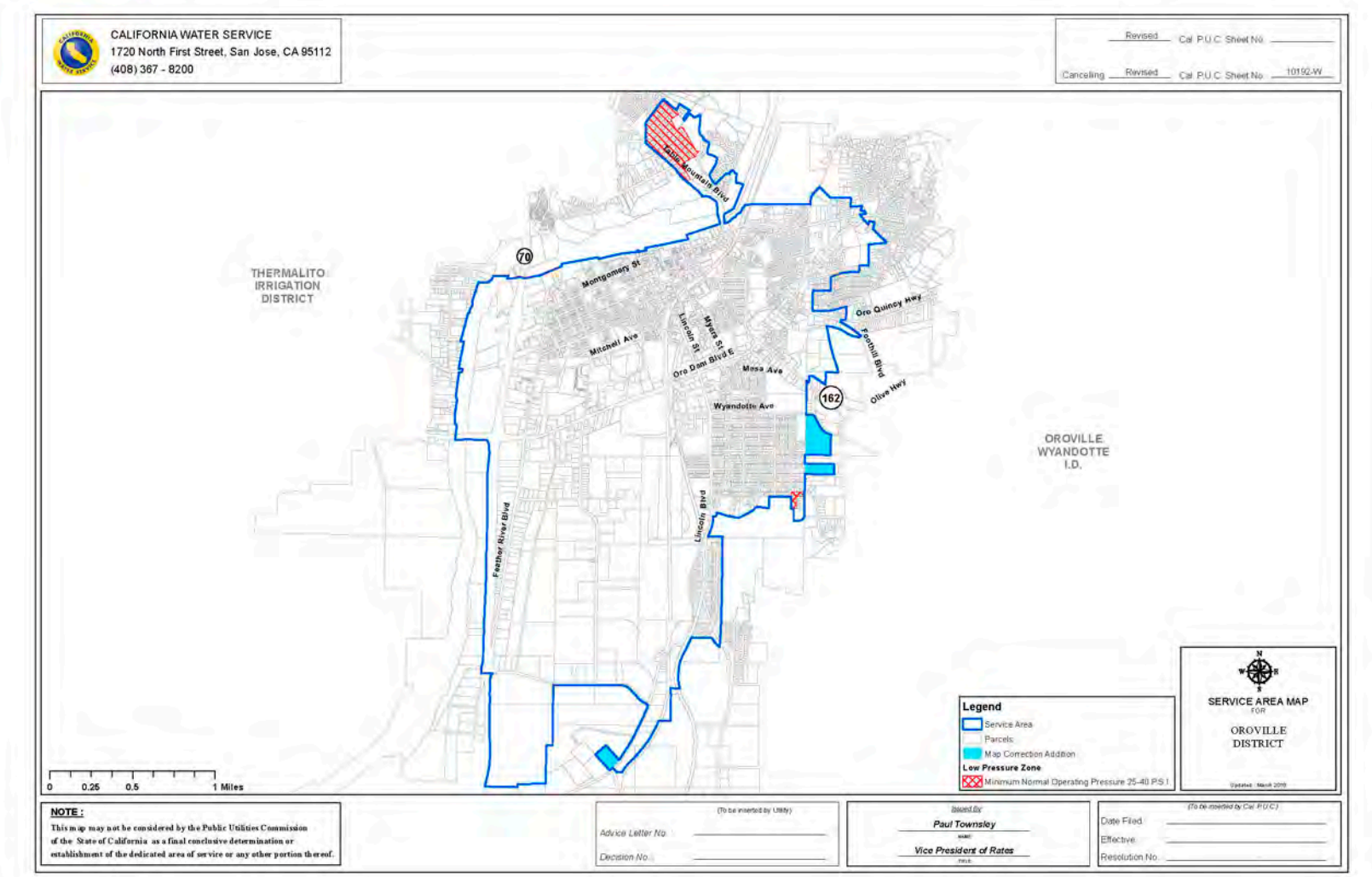


Table 8-15: MSR DETERMINATION: PRESENT AND PLANNED CAPACITY OF PUBLIC FACILITIES AND ADEQUACY OF PUBLIC SERVICES, INCLUDING INFRASTRUCTURE NEEDS OR DEFICIENCIES		
Number	**Indicator**	**Determination**
CWS PUB-1	Has the Organization been diligent in developing plans to accommodate current and future constituents' infrastructure and service needs? Regularly reviews and updates its service plans to help ensure that infrastructure needs and deficiencies are addressed in a timely manner.	Regarding water quality, Cal Water Oroville meets current state and federal requirements. Cal Water Oroville submits regular reports to Calif. Public Utilities Commission. Water demands are expected to be somewhat higher in dry-year periods, potentially up to 2,833 AFY by 2025, during an extended five-year drought. The drought demand of 2,833 AFY exceeds the projected 2045 supply (2,586 AFY). However, Cal Water's staff has noted that the future drought demand is projected to be less than the 3,150 AFY of "Total Right or Safe Yield." The UWMP's projected future water demand calculations do not consider the effect of climate change on water demand. However, the UWMP does note that Cal Water is studying this issue. Also, the UWMP's future projected water demand does not consider the effect that expansion of the water service area recently approved by the CPUC could have on future water demand. The population in Oroville and the associated water demand will likely rise in the future. Given the identified data gaps, it is recommended that the next MSR or SOI update prepared by LAFCO for Cal Water study this issue of projected future water demand for the Cal Water Oroville service area in more detail. This long-term water demand question would ideally be hydrologically modeled by a hydrologist.
CWS PUB-4	The Company meets infrastructure needs for the provision of water service.	In 2021, the State Water Resources Control Board Division of Drinking Water completed an Inspection Report which found that the Cal Water Oroville's water system is in general compliance with regulatory requirements and is professionally operated and maintained. Minor deficiencies were found during the inspection.

CWS PUB-5	Is there duplicate infrastructure by other agencies nearby?	Duplicate domestic water service infrastructure is located near the Cal Water Oroville service area. For example, four drinking water treatment plants are located in the Oroville/Bangor area. Additionally, areas of geographic overlap exist between Cal Water Oroville, SFWPA, and TWSD. Specifically, 228.5 acres are located in both SFWPA and Cal Water boundaries. 19.7 acres are located in both TWSD and Cal Water boundaries. It is recommended that LAFCO study this issue in more detail when the next MSR or SOI is prepared for the area. Additionally, LAFCO should formally notify CPUC of the overlapping service areas.
CWS PUB-6	The Organization has preventative maintenance measures and has planned for replacement of aging infrastructure.	Cal Water Oroville's staff indicate that they file an infrastructure improvement plan every three years with the CPUC. The CPUC determines if those infrastructure investments are prudent and necessary. The CPUC determines the revenue necessary to safely and reliably operate the water system; the infrastructure improvement plan is key in determining that revenue requirement. Rates are adjusted up or down to meet the revenue requirement for that three-year cycle.
CWS-PUB-7	Evaluation of the Organization's capacity to assist with and/or assume services provided by other agencies.	Cal Water Oroville has demonstrated an ability to collaborate professionally as follows: • Participated in the development of the Northern Sacramento Integrated Regional Water Plan (NSV-IRWMP), • Participates in the regional WAC/SGMA • Maintains water inter-tie infrastructure with TWSD. It is also noted that Cal Water's 2020 UWMP did not mention any additional infrastructure capacity or water supply capacity that could be made available to assist nearby water service providers.

8.8: Finances

Financial analysis for Cal Water Oroville is presented in this Section. Cal Water Oroville is part of a private company that serves the City of Oroville urban area that either SFWPA or TWSD does not serve. In 2006 LAFCO's MSR determined that "Cal Water Oroville's rates (metered and flat)

are significantly more than the corresponding rates charged by Cal Water Chico. Cal Water Oroville's rates are also significantly more than the rates charged by SFWPA and TID [TWSD]" (LAFCO, 2016). As a private company, California Water Service charges rates that allow it to cover the costs of providing water service and make a profit. Since the 2016 MSR, new information has been provided to the public concerning Cal Water Oroville's rates as follows:

- Analysis Group, Inc. January 2017. A Comparison of Residential Water Bills: Cal Water Oroville and South Feather Water & Power Agency. Contributions from David Sosa. Commissioned by Cal Water. 15-pages.
- West Yost Associates. May 2017. Oroville System Report. Prepared for California Water Service. 30-pages.
- Butte LAFCO. May 3, 2018. Oroville Region Water Service Study. 23-pages. Prepared by Northstar Engineering.

Water Rates

The 2018 Service Study by Northstar Engineering found that as a private corporation, Cal Water is not required to comply with Prop 218. Instead, the California Public Utilities Commission (CPUC) reviews applications from Cal Water for rate increases. The CPUC's general proceeding is a formal review process that considers how projects could affect utility ratepayers. The CPUC's general proceedings include a public participation hearing where local customers can provide written or oral input. Additionally, stakeholders may register as formal participants in the proceedings. Registered customers receive copies of all filings, legal briefs, formal testimonies, and other documents related to the general proceeding. (LAFCO, 2018). CPUC's review aims to ensure that necessary improvements are made to the water system, that the system is operated efficiently, that the rates are based upon "cost of service," and that the Company only earns a modest return on the funds it invests in water system infrastructure. This return on investment is typically paid out to stockholders in the form of an annual cash dividend. All large water companies regulated by the CPUC are required to file a General Rate Case every three years. The 2018 Service Study by Northstar Engineering contains detailed information on the six steps involved with the rate-case process (LAFCO, 2018).

In 2016, the average monthly water bill for a Cal Water Oroville District customer was $58.00 (Analysis Group, Inc., 2017). This rate increased slightly in 2018 to $62.07 average monthly, given that typical monthly residential usage of 10 CCF is for Cal Water per "Notice of California Water Service's Request to Increase Rates for the Cost of Capital Application (A.17-04-006) Oroville" where 1 CCF = 748 gallons (LAFCO, 2018). In 2023, Cal Water's K. McCusker shared unpublished rate data indicating that the median consumed amount of water in 2017 was 7 ccf, and the median bill was $43.73. In 2018, the median consumption was also 7 ccf, with a median bill of $50.07. And $52.12 in 2019, and $51.97 in 2020, which is the last year for which data was available at the time this report was compiled (Cal Water, K. McCusker, 2023).

The 2018 Service Study by Northstar Engineering noted the following financial details about Cal Water[7]:

- Distribution expenses account for 4.9% ($3.01) of a typical monthly water bill.
- Administration expenses account for 29.4%, $18.27 of a typical monthly water bill.
- Capital Spending expenses are a little harder to relate directly since they are a significantly different business model where depreciation and rate of return come into play. Capital Spending is estimated at 23.3%, $14.48 of a typical monthly water bill.
- Depreciation expenses account for 11.2%, $6.96 of a typical monthly water bill.
- Tax expenses account for 6.7%, 4.16 of a typical monthly water bill.
- Earnings expenses account for 10.8%, $6.69 of a typical monthly water bill.

Water sales income for Cal Water is heavily weighted toward the Quantity Charge for actual metered water sales, with roughly 2/3 of their water sales income from this source and 1/3 from the Monthly Meter Charge (LAFCO, 2018). Since Cal Water conforms most closely to an industry standard of 70% for water sales and 30% for the monthly service charge, they are most impacted by water conservation, which can result in reduced water sales (LAFCO, 2018).

Pursuant to Article 12 of the California Constitution, the CPUC regulates Cal Water's rates, operations, terms of service, budgets, financing, and water quality. Every three years, Cal Water must submit an application to the CPUC to have its rates, budgets, expenses, and proposed infrastructure improvements approved. Cal Water provides an application to the CPUC to prove that its expenses, operations, and proposed infrastructure improvement projects are just and reasonable (Means Consulting, 2017).

Requested Rate Increases

On July 1, 2022, Cal-Am submitted an application to the CPUC seeking approval to increase its revenues for water services in each of its districts statewide for 2024 through 2026. This application (A2207001 – Proceeding) is described on CPUC's website at: <*https://apps.cpuc.ca.gov/apex/f?p=401:56:0::NO:RP,57,RIR:P5_PROCEEDING_SELECT:A2207001*>. Here the CPUC states that "Cal-Am also seeks approval of 20 special requests, which include authorization for various fees, surcharges, programs, mechanisms, balancing and memorandum accounts, consolidations, and changes to reporting requirements. On January 27, 2023, Cal Water filed an updated application requesting approval of a water revenue adjustment mechanism. The application of California-American Water Company (U210W) for authorization to increase its revenues for water service by $55,771,300 or 18.71% in the year 2024, by $19,565,300 or 5.50% in the year 2025, and by $19,892,400 or 5.30% in the year 2026" (CPUC,

[7] In 2023 Cal Water's staff provided an alternative distribution of expenses as follows: Capital improvements comprise 44% of costs; Centralized services comprise 19% of costs; Personnel comprise 18% of costs; Water production comprises 9% of costs; Other O&M comprises 8% of costs; Conservation comprises 2% of costs (Cal Water, K. McCusker, 2023).

2023). Data was not readily available to indicate whether the CPUC approved this revenue request. Additionally, a revenue request sometimes does not directly translate into a rate increase for customers.

Table 8-16**:** Percentage Increase in Revenues Requested for Oroville District		
2024	**2025**	**2026**
18.71%	5.50%	5.30%
Data Source: CPUC, 2023		

Please note that in the past (2021), Cal Water Oroville filed a general rate case with the CPUC. As part of that filing, Cal Water Oroville proposed $6.4 million in infrastructure investment over the next three-year cycle. It also proposed a rate consolidation with Cal Water Chico (Cal Water, K. McCusker, 2023).

Water Affordability

Water affordability relates to the monthly fee for domestic water compared to the ability of lower-income communities to pay. Since the City of Oroville is located in proximity to DACs and DUCs, water affordability will remain an ongoing concern. The Public Policy Institute of California's (PPIC) website at: <*https://www.ppic.org/publication/water-affordability/*> describes water affordability throughout the state. Classifying water affordability is complicated because it is not yet precisely defined. However, the PPIC recommends using a threshold of 1.5 percent to determine whether residents experience affordable water rates for basic needs like cooking, washing, and drinking. This 1.5 percent threshold is utilized for an affordability calculation in Table 8-17 below.

The results in Table 8-17 below show that, on average, many community residents cannot afford to pay the current water rates in the Cal Water Service Area. This should not be interpreted to imply that the water rates are either too high or too low. The calculations only relate to the ability of customers to pay the charges based on what is known about the average household income in the area. Equations typically have at least two parts; in this case, the parts are: 1) prices and 2) ability to pay the price. The 2018 Water Service Study by Northstar Engineering found that "There are no indications of excessive costs or expenses that may be targeted for significant cost reduction" in relation to each of the three water service providers in the Oroville Area (LAFCO, 2018). The 2018 report indicates that water rates for Cal Water Oroville reflect the cost of providing the service. However, Table 8-17 shows that, on average, many community residents may struggle financially to pay the current water rates.

Table 8-17: Water Affordability by Census Tract				
Census Tract	**Median Household Income (2019)**	**1.5 Percent Calculation**	**Annual Average Water Rate (2018)**	**Affordable?**
25	$37,054	556	$744.84	no
27	49,029	735	744.84	no
28	27,031	405	744.84	no
29	48,897	733	744.84	no
30.01	29,235	439	744.84	no
30.02	41,377	621	744.84	no
32	40,318	605	744.84	no
37	Not in Cal Water boundary			
26.01	Not in Cal Water boundary			
26.02	48,090	721	744.84	no
31	52,258	784	744.84	yes
33	47,411	711	744.84	no

Source: U.S. Census, 2019 American Community Survey 5-Year Estimates and Chapter 3 of this MSR
Water rate data from LAFCO, 2018 calculated as 62.07*12 = 744.84.
*Note #1: Census Tracts correspond to the map provided in Chapter 3 for the City of Oroville DACs.
*Note #2: Cal Water has a Customer Assistance Program that could assist customers by making water service more affordable. The CAP rates are not reflected in this Table.

Addressing water affordability is an important issue that is being considered in California. For example, the state legislature[8] is working to address water affordability issues. Additionally, several organizations are studying water affordability (Pacific Institute, 2013). Cal Water's 2020 UWMP also describes household incomes within the customer base (Cal Water 2020 UWMP, 2021). More relevantly, Cal Water has a Customer Assistance Program (CAP) to help with water service affordability. CAP offers a $20 discount on the monthly service charge, an annualized reduction of $240. When LAFCO next prepares an MSR or SOI Update in the Oroville area, it is recommended that the MSR or SOI contain a more detailed analysis of this water affordability issue, including modeling different affordability scenarios, such as a two percent threshold or a two and one-half percent threshold. Additionally, an affordability scenario that includes both water and sewer rates might be informative. In the future, the City of Oroville and/or LAFCo may wish to share median household income data with the CPUC to explore whether water affordability by local residents is an issue that the CPUC could help address. A different option would be for LAFCO to continue to explore structural or efficiency measures or infrastructure features that could be studied over the long term.

[8] For example, Sen. Bill Dodd from Napa authored SB-222, a bill that hoped to facilitate the provision of some financial assistance to low-income water customers. Cal Water supported SB-222, stating that all Californians should have access to bill assistance like that available to their customers through their Customer Assistance Program (CAP). However, the bill was not signed by Governor Newsom.

Expenses

An average of the expenses over three fiscal years was calculated to be approximately $5.4 million, as shown in Table 8-18 below. Raw water supply costs Cal Water about $125 per acre-foot (LAFCO, 2018). Cal Water pays taxes, generates earnings, and invests in assets (LAFCO, 2018).

Table 8-18: Water Use and Costs – Cal Water – Oroville

District			Cal Water
Number of Customers			3600
Annual Water Use	Total Water Use (Acre-feet)		2300
	Water Use Per Customer	Acre-feet	0.64
		CCF	278.3
Expenses	Total Expenses		$ 5,415,136
	Per Unit Expenses	Per Customer	$ 1,504.20
		Per Acre-foot	$ 2,354.41
		Per CCF	$ 5.40
Revenue	Total Revenue		$ 4,441,777
	Per Unit Revenue	Per Customer	$ 1,233.83
		Per Acre-foot	$ 1,931.21
		Per CCF	$ 4.43

(Data Source for Table 8-18 above, LAFCO, 2018)

Capital Improvement Projects

Cal Water's staff has noted that since 2011, Cal Water - Oroville has invested more than $7.2 million in infrastructure improvements. Cal Water submits triennial Infrastructure Improvement Plans to the CPUC every three years to ensure the needs of its customers are met, and its rates reflect the actual cost of providing service. In 2021, Cal Water submitted its triennial Infrastructure Improvement Plan to the CPUC for review and approval. As part of its application, Cal Water has proposed completing more than $4,000,000 in improvements to the water system between 2023 and 2026 (Cal Water, J. Skarb, 2023). However, the CPUC has not yet made a decision on this request for funding (an associated rate increase) as of April 27, 2023.

Between the years 2009 to 2016, Cal Water Oroville made several significant capital expenditures to improve system facilities and pipelines, resulting in enhanced system capacity, improved reliability, and/or maintenance of infrastructure conditions (West Yost, 2017). These improvements are listed in Table 8-19 below.

Table 8-19: Capital Expenditure Summary for 2009 through 2016

Program Area	Capital Cost
Water Supply	$1,250,000
Water Treatment	$1,140,000
Wells	$230,000
Booster Pump Stations	$125,000
System Storage	$750,000
Distribution System Pipelines	$3,815,000
Other System Improvements	$393,000
Total	**$7,703,000**

Data Source for Table 8-19 above, West Yost, 2017

During the seven-year timeframe from 2009 to 2016, Cal Water invested a total of $7.7 million, which averages to approximately $1.1 million per year (West Yost, 2017). More recently, Cal Water plans to expend 34,328 on a water meter replacement program (CPUC, 2022)

In 2022 Cal Water Company requested that the CPUC allow rate increases to fund various capital improvement projects in the combined Oroville/Chico districts, including the following proposed projects:

1. Water Treatments – PFAS, Carbon Tetrachloride
2. Design Only Projects – Station rebuild, Storage
3. Capital Project Contingency (Removed)
4. Previously Funded Incomplete Project

It is not clear whether the CPUC allowed a rate increase to cover the costs of these capital improvement projects. However, by making these requests, Cal Water is demonstrating a willingness to invest in physical assets associated with water service provision.

Other Financial Details

Typically, MSRs study an organization's debt, outstanding litigation, risk management, and insurance. However, these issues are not studied herein due to information and time constraints.

Table 8-20 below lists the determinations for Cal Water - Oroville's financial policies and fiscal sustainability.

Table 8-20: MSR DETERMINATIONS FOR CAL WATER - OROVILLE FINANCIAL ABILITY TO PROVIDE SERVICES		
	Indicator	**Determinations**
CWS-FIN-1	Summary financial information presented in a standard format and simple language.	Pursuant to CPUC General Order 104-A, Cal Water submits to the CPUC an annual report that provides detailed financial information for Cal Water as a whole, as well as each individual service area, including Cal Water – Oroville. These reports are publicly available on the CPUC's website. The most recent report for the year ending December 31, 2021, was filed in May 2022 and is available here: *https://bit.ly/3IQ40Ah*. These reports are similar to the audited financial reports provided by government-owned utilities. Cal Water's most recent proposed Infrastructure Improvement Plan is available on its website at: <*https://www.calwater.com/rates/iip-2021/*>. Pursuant to federal securities laws, California Water Service Group, a subsidiary of Cal Water, prepares and submits comprehensive annual financial reports. These reports are publicly available on the organization's website at: https://ir.calwatergroup.com/financial-reports/annual-reports. Additional financial information has been shared with the public concerning Cal Water - Oroville's rates, finances, and operations in several recent reports, including: ▪ Analysis Group, Inc. January 2017. A Comparison of Residential Water Bills: Cal Water Oroville and South Feather Water & Power Agency. Contributions from David Sosa. Commissioned by Cal Water. 15-pages. ▪ Butte LAFCO. May 3, 2018. Oroville Region Water Service Study. 23-pages. Prepared by Northstar Engineering. ▪ West Yost Associates. May 2017. Oroville System Report. Prepared for California Water Service. 30-pages.
CWS-FIN-2	Other financing policies are clearly articulated.	The California Public Utilities Commission (CPUC) regulates the compensation offered to Cal water employees. Pursuant to CPUC General Order 77-M, Cal Water prepares and submits to the CPUC an annual report that documents the names, titles, and duties of all Executive Officers

		and the compensation received by each; and the names, titles, and duties of all employees who received compensation at the rate of $85,000 or more per annum, and the compensation received by each. These reports are available on the CPUC's website at: *https://bit.ly/3QJZ4i8*. However, Since Cal Water Oroville is a private company, they are not required to share or post information related to compensation reports and financial transaction reports to the State Controller's Office.
CWS-FIN-3	Rates are adopted consistent with requirements of the State of California.	The 2018 Service Study by Northstar Engineering found that as a private corporation, Cal Water is not required to comply with Prop 218. Instead, every three years, the CPUC reviews applications from Cal Water for rate increases. The CPUC's general proceeding is a formal review process that considers how projects could potentially affect utility ratepayers. The CPUC's general proceedings include a public participation hearing where local customers can provide written or oral input.
CWS-FIN-4	Water affordability factors in relation to disadvantaged communities are considered.	Water affordability relates to the monthly fee for domestic water in comparison to the ability of lower-income communities to pay. Since the City of Oroville is located in proximity to DACs and DUCs, water affordability will remain an ongoing concern. It is recommended that any future MSR or SOI for the Oroville Area contain a more detailed analysis of this water affordability issue, including modeling different affordability scenarios, such as a two percent threshold or a two-and-one-half percent threshold. Additionally, an affordability scenario that includes both water and sewer rates might be informative. In the future, the City of Oroville and/or LAFCo may wish to share median household income data with the CPUC to explore whether water affordability by local residents is an issue that the CPUC could help address. A different option would be for LAFCO to continue to explore structural or efficiency measures or infrastructure features that could be studied over the long term.
CWS-FIN-5	Capital Improvement Projects which serve to enhance system reliability are funded.	Between the years 2009 to 2016, Cal Water Oroville made several significant capital expenditures to improve system facilities and pipelines, resulting in enhanced system capacity, improved reliability, and/or maintenance of infrastructure conditions. In addition, Cal Water files a general rates case with the CPUC, including

		an infrastructure improvement plan, every three years. This triennial process determines the revenue required to safely and reliably operate the water system. Rates are adjusted up or down as appropriate to meet that revenue requirement.

8.9: Cost Avoidance & Facilities Sharing

LAFCO's 2006 MSR found that "Cal Water Oroville is part of a private company which serves the City of Oroville urban area that is not served by either SFWPA or TID [now TWSD]. Accordingly, specific cost avoidance and facilities sharing opportunities were not evaluated in the 2006 MSR.

Currently, Cal Water Oroville implements the following cost-saving actions:

- Communicates with nearby municipal service providers.
- Participates in regional planning efforts such as the IRWMP and SGMA.
- Has a connection with Thermalito Irrigation District, which can be used during emergencies or treatment plant maintenance (Cal Water 2020 UWMP, 2021).
- Is considering a future consolidation with Cal Water Chico (CPUC, 2022).

Additionally, Cal Water staff noted the following cost-avoidance activities:

- Cost-sharing with Cal Water's central services, including engineering services, water quality services, electrician services, customer services and bill paying, equipment purchase negotiation, IT, and human resources.
- Coordinates with other Cal Water districts.
- Shared staff (clerk) between Cal Water's Oroville District and its Chico district for doing the requisite contracting paperwork to install water at the new Dutch Bros and Hampton Inn as efficiently as possible.
- Moved the much of water pumping to off-peak hours, saving power costs and supporting the electric grid.
- Customer Assistance Program.
- Coordination with PG&E and Butte County regarding water in the canal.
- Shared information with other local service providers about where to find best-priced local materials, etc. (Cal Water, L. Lind, 2023)

it is important for Cal Water Oroville to seek out future cost-saving opportunities because the Company has recently requested water rate increases (CPUC, 2022) and because water affordability is an issue for local disadvantaged communities.

Reorganization:
To save money are avoid future overhead costs, it is sometimes beneficial for an organization to pursue structural and/or jurisdictional reorganizations. For example, Cal Water has proposed consolidating its Oroville and Chico Districts (CPUC, 2022).

This Chapter contains several recommendations for hydrologic and socio-economic studies, and the results of those studies may yield potential future reorganization ideas. Additionally, as the Oroville region sees new development and population growth in the future, it is possible that water infrastructure constraints or water affordability may need to be evaluated in more detail. Also, Butte County's Board of Supervisors continues to study the Miocene Canal Acquisition issue. The County also supplies raw water to Cal Water Oroville. Therefore, it is possible that the County's input or study results may include recommendations for reorganization of the local water resource infrastructure or service areas. In the future, specific recommendations for reorganization may become necessary to address the issues of geographic overlap between service areas, boundaries, and SOIs.

Table 8-21: MSR DETERMINATION: STATUS OF, AND OPPORTUNITIES FOR, SHARED FACILITIES

Number	Indicator	Determination
CWS-SHA-1	The Organization collaborates with multiple other agencies for the delivery of services within its service area.	Cal-Water Oroville collaborates with multiple other agencies for the delivery of services within its service area. Specifically, Cal Water Oroville: • Sustains a level of communication with nearby municipal service providers. • Participates in regional planning efforts such as the IRWMP and SGMA. • Maintains a physical infrastructure connection with Thermalito Irrigation District, which can be used during emergencies or treatment plant maintenance. • Is considering a future consolidation with Cal Water Chico.
CWS SHA-2	Agreements for mutual aid or any other appropriate agreement (i.e., Tax Sharing Agreement) are periodically reviewed to ensure fiscal neutrality.	Cal Water Oroville has a physical infrastructure connection with Thermalito Irrigation District, which can be used during emergencies or treatment plant maintenance.

CWS SHA-3	Other practices and opportunities that may help to reduce or eliminate unnecessary costs are examined by the Company periodically. Ideally, there is a balance between cost efficiency and risk reduction strategies.	Currently, Cal Water Oroville implements several cost-saving actions, including the four examples listed below: • Sustains a level of communication with nearby municipal service providers. • Participates in regional planning efforts such as the IRWMP and SGMA. • Has a connection with Thermalito Irrigation District, which can be used during emergencies or treatment plant maintenance. • Customer Assistance Program It is important for Cal Water Oroville to seek out future cost-saving opportunities because the Company has recently requested water rate increases (CPUC, 2022) and because water affordability is an issue for local disadvantaged communities.

8.10: BIBLIOGRAPHY

Butte County Board of Supervisors. October 26, 2021. Agenda Transmittal. Miocene Canal Acquisition Follow-Up Discussion. County Counsel and County Administration. Agenda Item 4.07. 20-pages. Available online.

Butte County Office of Emergency Management (OEM). November 5, 2019. Butte County Local Hazard Mitigation Plan. Contributions from Foster Morrison. Retrieved on September 3, 2021, from: <*http://www.buttecounty.net/oem/mitigationplans*>.

Butte Local Agency Formation Commission (LAFCO). June 2006. Final Municipal Service Review for Domestic Water and Wastewater Service Providers. Chapter 2.18 California Water Service Company – Oroville District. Contributions from Quad Knopf. Adopted by Resolution No. 55-M 2005/06. Retrieved on August 25, 2022 from <*https://www.buttelafco.org/domestic-water-wastewater* >.

Butte LAFCO. May 3, 2018. Oroville Region Water Service Study. 23-pages. Prepared by Northstar Engineering.

C.A. State Water Resources Control Board (SWRCB. 2022. Water Conservation and Production Reports. Retrieved September 1, 2020 from: <*https://www.waterboards.ca.gov/conservation/conservation_reporting.html*>.

California Public Utilities Commission (CPUC) Public Advocates Office. February 4, 2022. Prepared Testimony in Response to California Water Service 2023 General Rate Case Application 21-07-002. .pdf format. 1831-pages. San Francisco, California.

CPUC Public Advocate Office staff, Mr. Brian Yu. April 2022. PowerPoint Presentation Cal Water Service GRC A.21-07-002. 7 slides.

California Public Utilities Commission (CPUC). 2023. Webpage entitled Public Forum on California-American Water Company (Cal-Am) Rate Requests. Proceeding A.22-07-001. Retrieved on April 21, 2023 from CPUC's website at: <*https://apps.cpuc.ca.gov/apex/f?p=401:56:0::NO:RP,57,RIR:P5_PROCEEDING_SELECT:A2207001*>.

California Water Service Company (Cal Water). July 2001. Drinking Water Source Assessment for the Cal-Water Service Co.-Oroville Butte County Water System, Well 05-01, Well 10-01. 26-pages. Submitted to California Department of Health Services Drinking Water Field Operations Branch. Available upon request from Reese B. Crenshaw, PE, Sr. Sanitary Engineer, Valley District (#21), SWRCB – Division of Drinking Water.

California Water Service (Cal Water). January 2003. Drinking Water Source Assessment, CAL-WATER SERVICE CO-OROVILLE in Butte County regarding the Oroville Treatment Plant – RAW. Submitted to California Department of Health Services Drinking Water Field Operations Branch. 12-pages. Available upon request from Reese B. Crenshaw, PE, Sr. Sanitary Engineer, Valley District (#21), SWRCB – Division of Drinking Water.

California Water Service Company (Cal Water). June 2021. *2020 Urban Water Management Plan: Oroville District*. 321-pages. Contributions from EKI Environment & Water, Inc., M.Cubed, and Gary Fiske and Associates. Retrieved on July 14, 2022, from: <*https://www.calwater.com/docs/uwmp2020/ORO_2020_UWMP_FINAL.pdf*> and from <*https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans* >.

California Water Service (Cal Water). 2021. Water Quality Report. 17-pages. Available online.

California Water Service (Cal Water). May 24, 2022. California Water Service Oroville (#0410005) Watershed Sanitary Survey. 46-pages. Available upon request from Reese B. Crenshaw, PE, Sr. Sanitary Engineer, Valley District (#21), SWRCB – Division of Drinking Water.

California Water Service (Cal Water). January 27, 2023. Comments on Administrative Draft MSR submitted by Cal Water Staff including Ms. Loni Lind, Mr. Justin Skarb, and K. McCusker. 63 pages.

City of Oroville (COOR). January 30, 2015. Oroville Sustainability Updates, Draft Supplemental EIR. Contributions from Placeworks Consultants. 274-pages. Retrieved August 28, 2022. <*https://www.cityoforoville.org/services/planning-development-services-department/planning-division/planning-documents*>

City of Oroville. July 19, 2022. Adopted 2022-2030 Housing Element. 291-pages. Retrieved August 30, 2022, from: <*https://www.orovillehousingelement.com/_files/ugd/5c8158_041024f4c66544918855ffd6cc4a1cbc.pdf*>.

Means Consulting. August 2017. Report on California Water Service's Oroville District an Evaluation of Service Offerings. 57-pages. Retrieved September 1, 2022, from <*https://www.calwater.com/community/oroville/docs/*>.

Pacific Institute. August 2013. Assessing Water Affordability: A Pilot Study in Two Regions of California. Authors: Juliet Christian-Smith, Carolina Balazs, Matthew Heberger, and Karl Longley. Pages: 26. Retrieved September 1, 2022, from <*https://pacinst.org/publication/assessing-water-affordability/* >.

State Water Resources Control Board (SWRCB), Division of Drinking Water. April 26, 2021. Inspection Report. Signed by Reese B. Crenshaw, Valley District Engineer. 16-pages.

U.S. Environmental Protection Agency (EPA). n/d. Webpage entitled "PFAS Explained." Retrieved on September 10, 2022, from: <*https://www.epa.gov/pfas/pfas-explained*>.

West Yost Associates. May 2017. Oroville System Report. Prepared for California Water Service. 30-pages.

Chapter 9: Adopted Resolution

The Commission will consider adopting a resolution regarding the provision of water and wastewater services in the Oroville Area. Once adopted, this resolution will be available in this chapter and incorporated into this MSR.

Chapter 10: Comments Received

Public comment regarding this Draft MSR is solicited. Once public comment is received, it will be addressed in this chapter.

CHAPTER 11: GLOSSARY

Acre-foot: The volume of water required to cover one acre of land to a depth of one foot. This is equal to 325.851 gallons or 1,233 cubic meters. An "acre-foot" of water usually supplies enough water to support two urban households for one year.

Appropriation Doctrine: In the western US, the doctrine of Prior Appropriation was in common use as early settlers and miners began to develop the land. The prior appropriation doctrine is based on the concept of "first in time, first in right"; meaning that the first person to use a quantity of water and put it to Beneficial Use has a higher priority of water right than a subsequent user. In drought conditions, high priority users are allocated water before junior users receive water. Appropriative rights can be lost through nonuse or transferred apart from the land.

Appropriative rights: Water rights based on the "Appropriation Doctrine". Not related to riparian land ownership. In California and since 1914, a state-issued permit or license is required to establish appropriative rights.

Aqueduct: A conduit, pipe, or channel designed to transport water from a remote source, usually by gravity.

Aquifer: A below-ground geologic formation that bears water, stores water, and/or transmits water, such as to wells and springs.

Annexation: The annexation, inclusion, attachment, or addition of territory to a city or district.

Area of origin statutes: Statutes designed to protect counties and watersheds where the water originates, in the form of rain or snow, from the export of water outside the regions.

Average base flow (ABF): Flow in the sanitary sewer during dry-weather months, measured when no appreciable rain is falling. Base flow consists of sanitary flow plus groundwater infiltration.

Average dry-weather flow (ADWF): The 30-day rolling average wastewater flow from May through October.

Beneficial use: Includes irrigation, municipal, domestic, industrial, recreational use, and protection of fish wildlife and their habitat, and aesthetic enjoyment. The California Constitution (Article X, Section 2) requires that all water resources must be put to beneficial use, without waste or unreasonable use.

Best Management Practices: Best management practices are defined as methods or techniques found to be the most effective and practical means in achieving an objective (such as minimizing pollution) while making the optimum use of the District's resources.

Board of Directors: The legislative body or governing board of a district.

Board of Supervisors: The elected board of supervisors of a county.

Bond: An interest-bearing promise to pay a stipulated sum of money, with the principal amount due on a specific date. Funds raised through the sale of bonds can be used for various public purposes.

Buildout: The maximum development potential when all lands within an area have been converted to the maximum density allowed under the General Plan.

CFS: Abbreviation for cubic feet per second. Used to describe a rate of the flow in streams and rivers. One "cfs" is equivalent to 7.48 gallons of water flowing each second. Also, equal to a volume of water one foot high and one foot wide flowing a distance of one foot in one second.

City: Any charter or general law city.

Consumptive use: Any use of water that permanently removes water from the natural stream system. 2. Water that has been evaporated, transpired, incorporated into products, plant tissue, or animal tissue and is not available for immediate reuse.

Conveyance loss: *Loss* of water from a channel or pipe during *conveyance*, including *losses* due to seepage, leakage, evaporation and transpiration by plants growing nearby.

Consolidation: The uniting or joining of two or more districts into a single new successor district. In the case of consolidation of special districts, all of those districts shall have been formed pursuant to the same principal act.

Contiguous: In the case of annexation, territory adjacent to an agency to which annexation is proposed. Territory is not contiguous if the only contiguity is based upon a strip of land more than 300 feet long and less than 200 feet wide.

Cost avoidance: Actions to eliminate unnecessary costs derived from, but not limited to, duplication of service efforts, higher than necessary administration/operation cost ratios, use of outdated or deteriorating infrastructure and equipment, underutilized equipment or buildings or facilities, overlapping/inefficient service boundaries, inefficient purchasing or budgeting practices, and lack of economies of scale.

Crown (of the sewer): The upper portion of the sewer pipes.

Design flow: The selected flow condition for wastewater collection system design, determined by adding corresponding peak sanitary flow and peak groundwater infiltration. This is also referred to as peak dry-weather flow.

Detachment: The detachment, deannexation, exclusion, deletion, or removal from a city or district of any portion of the territory of that city or district.

Development Fee: A fee charged to the developer of a project by a county, or other public agency as compensation for otherwise-unmitigated impacts the project will produce. California Government Code Section 66000, et seq., specifies that development fees shall not exceed the estimated reasonable cost of providing the service for which the fee is charged. To lawfully impose a development fee, the public agency must verify its method of calculation and document proper restrictions on use of the fund.

Discharge: The volume of water that passes a given location within a given period of time. Usually measured in cfs.

Drainage basin: A watershed (land area) where precipitation runs off into streams, rivers, lakes, and reservoirs. A drainage basin may be identified by tracing a line along the highest elevations between two areas on a map, often along a ridgeline.

Dissolution: The dissolution, disincorporation, extinguishment, and termination of the existence of a district and the cessation of all its corporate powers, except for the purpose of winding up the affairs of the district.

District or special District: An agency of the state, formed pursuant to general law or special act, for the local performance of governmental or proprietary functions within limited boundaries. "District" or "special district" includes a county service area.

District of limited Powers: An airport district, community services district, municipal utility district, public utilities district, fire protection district, harbor district, port district, recreational harbor district, small craft harbor district, resort improvement district, library district, local hospital district, local health district, municipal improvement district formed pursuant to any special act, municipal water district, police protection district, recreation and park district, garbage disposal district, garbage and refuse disposal district, sanitary district, or county sanitation district.

Dry-weather flow: Wastewater flow monitored during the dry season, occurring May through October. Consists of sanitary flow and groundwater infiltration.

Excessive infiltration and inflow: The quantities of infiltration/ inflow that can be economically eliminated from a wastewater collection system by rehabilitation, as determined by a cost-effective analysis.

Evaporation: A physical process such that liquid water transforms to water vapor, including vaporization from water surfaces, land surfaces, and fields.

Evapotranspiration: Combination of evaporation from free water surfaces and transpiration of water from plant surfaces to the atmosphere.

Formation: The formation, incorporation, organization, or creation of a district.

Function: Any power granted by law to a local agency or a county to provide designated governmental or proprietary services or facilities for the use, benefit, or protection of all persons or property.

Functional revenues: Revenues generated from direct services or associated with specific services, such as a grant or statute, and expenditures.

FY: Fiscal year.

General plan: A document containing a statement of development policies including a diagram and text setting forth the objectives of the plan. In California, the general plan for a city or a county must include certain state mandated elements related to land use, circulation, housing, conservation, open-space, noise, and safety.

General revenues: Revenues not associated with specific services or retained in an enterprise fund.

Groundwater: Water under the earth's surface, often confined to aquifers capable of supplying wells and springs.

Incorporation: The incorporation, formation, creation, and establishment of a city with corporate powers. Any area proposed for incorporation as a new city must have at least 500 registered voters residing within the affected area at the time commission proceedings are initiated.

Independent Special District: Any special district having a legislative body all of whose members are elected by registered voters or landowners within the district, or whose members are appointed to fixed terms, and excludes any special district having a legislative body consisting, in whole or in part, of ex officio members who are officers of a county or another local agency or who are appointees of those officers other than those who are appointed to fixed terms. "Independent special district" does not include any district excluded from the definition of district contained in §56036.

Infiltration and inflow (I&I): The collective term used to describe the extraneous flow in a wastewater collection system from both rainfall-dependent infiltration and inflow or groundwater infiltration.

Infrastructure: Public services and facilities, such as pipes, canals, levees, water-supply systems, other utility, systems, and roads.

LAFCO: Local Agency Formation Commission.

Local Accountability And Governance: A style of public agency decision making, operation and management that includes an accessible staff, elected or appointed decision-making body and decision making process, advertisement of, and public participation in, elections, publicly disclosed budgets, programs, and plans, solicited public participation in the consideration of work and infrastructure plans; and regularly evaluated or measured outcomes of plans, programs or operations and disclosure of results to the public.

Local Agency: A city, county, or special district or other public entity, which provides public services.

Management Efficiency: The organized provision of the highest quality public services with the lowest necessary expenditure of public funds. An efficiently managed entity (1) promotes and demonstrates implementation of continuous improvement plans and strategies for budgeting, managing costs, training and utilizing personnel, and customer service and involvement, (2) has the ability to provide service over the short and long term, (3) has the resources (fiscal, manpower, equipment, adopted service or work plans) to provide adequate service, (4) meets or exceeds environmental and industry service standards, as feasible considering local conditions or circumstances, (5) and maintains adequate contingency reserves.

Municipal Services: The full range of services that a public agency provides, or is authorized to provide, except general county government functions such as courts, special services and tax collection. As understood under the CKH Act, this includes all services provided by Special Districts under California law.

Municipal Service Review (MSR): A study designed to determine the adequacy of governmental services being provided in the region or sub-region. Performing service reviews for each city and special district within the county may be used by LAFCO, other

governmental agencies, and the public to better understand and improve service conditions.

Ordinance: A law or regulation set forth and adopted by a governmental authority.

Peak flow: Maximum measured daily flow. Commonly measured in cubic feet per second (cfs). Typically occurs during wet-weather events and can also be referred to as peak wet-weather flow.

Peak dry-weather flow (PDWF): Peak daily sanitary flow plus groundwater infiltration.

Peak wet-weather flow (PWWF): Peak daily wet-weather flow plus peak rainfall-dependent infiltration and inflow from rainfall events.

Peaking Factor: The ratio of peak hourly wet-weather flow to base flow

Per Capita Water Use: The water produced by or introduced into the system of a water supplier divided by the total residential population; normally expressed in gallons per capita per day (gpcd).

pH: A measure of the relative acidity or alkalinity of water. Water with a pH of 7 is neutral; lower pH levels indicate increasing acidity, while pH levels higher than 7 indicate increasingly basic solutions.

Plan of reorganization: A plan or program for effecting reorganization and which contains a description of all changes of organization included in the reorganization and setting forth all terms, conditions, and matters necessary or incidental to the effectuation of that reorganization.

Potable Water: Water of a quality suitable for drinking.

Prior appropriation doctrine: In dealing with water rights, the *prior appropriation doctrine* states that water rights are determined by priority of beneficial use. This means that the first person to use water or divert water for a beneficial use or purpose can acquire individual rights to the water. The rights can be lost through nonuse; they can also be sold or transferred apart from the land.

Principal act: In the case of a district, the law under which the district was formed and, in the case of a city, the general laws or a charter, as the case may be.

Principal LAFCO for municipal service review: The LAFCO with the lead responsibility for a municipal service review. Lead responsibility can be determined pursuant to the CKH Act definition of a Principal LAFCO as it applies to government organization or reorganization actions, by negotiation, or by agreement among two or more LAFCOs.

Proceeding: A course of action. Procedures.

Public agency: The state or any state agency, board, or commission, any city, county, city and county, special district, or other political subdivision, or any agency, board, or commission of the city, county, city and county, special district, or other political subdivision.

Public trust: The public's rights to many natural resources, including running water, the sea, and the shore. The Public Trust Doctrine traditionally applied to commerce and fishing in

navigable waters and has been expanded to include fish, wildlife, habitat, and recreation, and the preservation of natural resources and ecosystems.

Rainfall-dependent infiltration and inflow (RDI/I): Rainfall runoff from both infiltration and inflow sources that enter the wastewater collection system during and shortly after a rain event. RDI/I consists of stormwater inflow and rainfall-dependent infiltration.

Rate restructuring: Rate restructuring does not refer to the setting or development of specific rates or rate structures. During a municipal service review, LAFCO may compile and review certain rate related data, and other information that may affect rates, as that data applies to the intent of the CKH Act (§56000, §56001, §56301), factors to be considered (§56668), SOI determinations (§56425) and all required municipal service review determinations (§56430). The objective is to identify opportunities to positively impact rates without adversely affecting service quality or other factors to be considered.

Reorganization: Two or more changes of organization initiated in a single proposal.

Reserve: (1) For governmental type funds, an account used to earmark a portion of fund balance, which is legally or contractually restricted for a specific use or not appropriable for expenditure. (2) For proprietary type/enterprise funds, the portion of retained earnings set aside for specific purposes. Unnecessary reserves are those set aside for purposes that are not well defined or adopted or retained earnings that are not reasonably proportional to annual gross revenues.

Responsible LAFCO: The LAFCO of a county other than the Principal County that may be impacted by recommendations, determinations or subsequent proposals elicited during a municipal service review being initiated or considered by the Lead LAFCO.

Retained earnings: The accumulated earnings of an enterprise or intragovernmental service fund which have been retained in the fund and are not reserved for any specific purpose (debts, planned improvements, and contingency/emergency).

Riparian water right: The legal right held by an owner of land contiguous to or bordering on a natural stream or lake, to take water from the source for use on the contiguous land. The doctrine of riparian rights is an old one, having its origins in English common law. Riparian rights cannot be sold or transferred for use on non-riparian land.

RWQCB: Regional Water Quality Control Board.

SCADA: Acronym for Supervisory Control and Data Acquisition; a software application program used for process control and to gather real time data from remote locations. The SCADA System consists of hardware and software components. The hardware collects and feeds data into a computer with SCADA software installed. The function of SCADA is recording and logging all events in a file that is stored in a hard disk or sending them to a printer. If conditions become hazardous, SCADA sounds warning alarm.

Service lateral: A sewer connecting a building or house to the mainline sewer.

Service review: A study and evaluation of municipal service(s) by specific area, subregion or region culminating in written determinations regarding seven specific evaluation categories.

Sewage: The wastewater released by residences, businesses and industries in a community is commonly referred to as sewage. It is 99.94 percent water, with only 0.06 percent of the

wastewater dissolved and suspended solid material. The cloudiness of sewage is caused by suspended particles, which in untreated sewage ranges from 100 to 350 mg/l.

Sewer Information Maintenance and Management System (SIMMS): A computer program that provides a means of tracking and organizing sewer maintenance schedules.

Special Reorganization: A reorganization that includes the detachment of territory from a city or city and county and the incorporation of that entire detached territory as a city.

Specific plan: A policy statement and implementation tool that is used to address a single project or planning problem. Specific plans contain concrete standards and development criteria that supplement those of the general plan.

Sphere of influence (SOI): A plan for the probable physical boundaries and service area of a local agency, as determined by the LAFCO.

Sphere of influence determinations: In establishing a sphere of influence, the Commission must consider and prepare written determinations related to present and planned land uses, need and capacity of public facilities, and existence of social and economic communities of interest.

Stream: A body of flowing water or natural watercourse containing water at least part of the year. In hydrology, it is generally applied to the water flowing in a natural channel as distinct from a canal.

Streamflow: The water discharge that occurs in a natural channel. A more general term than runoff, streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Stormwater runoff: Rainwater which does not infiltrate into the soil and runs off the land.

SWRCB: State Water Resources Control Board.

Total Dissolved Solids (TDS): A quantitative measure of the residual minerals dissolved in water that remains after evaporation of a solution. Usually expressed in milligrams per liter.

Treated water: Raw water which has been treated for human consumption through secondary or tertiary processes at a water treatment plan (WTP).

Watershed: An area of land that drains water, sediment and dissolved materials to a common receiving body or outlet. The term is not restricted to surface water runoff and includes interactions with subsurface water. Watersheds vary from the largest river basins to just acres or less in size. In urban watershed management, a watershed is seen as all the land which contributes runoff to a particular water body.

Zoning: The primary instrument for implementing the general plan. Zoning divides a community into districts or "zones" that specify the permitted/prohibited land uses.

CHAPTER 12: ACKNOWLEDGEMENTS

Several people contributed information that was utilized in this Municipal Service Review.

Butte LAFCo Staff	Stephen Lucas, Executive Officer Shannon Costa, LAFCO Analyst
City of Oroville	Dawn Nevers Assistant Community Development Director
Lake Oroville Area PUD	David Goyer, General Manager: Scott McCutcheon, Former GM Kelly Hamblin and Darin Kahalekulu, Keith Knibb, Sauers Engineering
Sewerage Commission – Oroville Region	Glen E. Sturdevant, General Manager Mikah Salsi, Plant Supervisor.
South Feather Water and Power Agency	Rath Moseley, General Manager Jaymie Perrin, Analyst
Thermalito Water and Power Agency	Jayme Boucher, General Manager Chris Heindell, Engineer
Cal Water Company	Loni Lind, Cal Water Ken Jenkins, Cal Water Chief Water Operations Justin Skarb, Cal Water VP of Community Affairs Kevin McCuster, Cal Water Community Affairs

Report Preparers

A team of consultants authored this MSR and provided an independent analysis.

SWALE Inc.	Kateri Harrison, Project Manager, Author Laylonni Laster, Planning Technician Arsal Khan – Summer Planning Intern Ashley Ocampo – Summer Planning Intern Justin DiGennaro – Summer Planning Intern Shira Sanghvi – Summer Planning Intern
Baracco & Associates	Bruce Baracco, Project Advisor
Fremont Environmental Consulting	Matt Fremont, GIS Maps
J. Stolen, Small Business	Judy Stolen, GIS Maps

Land Acknowledgment

The Butte County area is the ancestral lands of the Maidu tribes. The authors of this report recognize and respect Indigenous Peoples as traditional stewards of this land and the enduring relationship that exists between Indigenous Peoples and their traditional territories.

Closing Quote

“When in the course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the laws of nature and of nature's god entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation. We hold these truths to be self-evident, that all men are created equal, that they are endowed by their creator with certain unalienable rights, that among these are life, liberty and the pursuit of happiness. That to secure these rights, governments are instituted among men, deriving their just powers from the consent of the governed, --That whenever any form of government becomes destructive of these ends, it is the right of the people to alter or to abolish it, and to institute new government, laying its foundation on such principles and organizing its powers in such form, as to them shall seem most likely to effect their safety and happiness. Prudence, indeed, will dictate that governments long established should not be changed for light and transient causes…... To prove this, let Facts be submitted to a candid world.”

Signed by Francis Hopkinson of New Jersey (and many others) and ratified on July 4, 1776

APPENDICES

A. Demographic Report – County of Butte
B. Socio-Economic Report – City of Oroville
C. SOI Options for Service Providers (including alternatives, reorganization or formation of new agencies, private sector opportunities)
D. Municipal Drinking Water Regulations
E. Public Water Systems in Butte County
F. EPA Drinking Water Standards
G. Wastewater Regulations
H. Economy of Butte County - Summary
I. Feather River Watershed Description
J. Flood Risk Oroville
K. American Society of Civil Engineers, Region 9, California's Aging Drinking Water Infrastructure
L. Housing in Butte County
M. Miocene Canal Staff Report to Board of Supervisors

Appendix A

Demographics for Butte County

QuickFacts

Butte County, California

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

Table

All Topics	Butte County, California
Population Estimates, July 1 2021, (V2021)	**208,309**
PEOPLE	
Population	
Population Estimates, July 1 2021, (V2021)	**208,309**
Population estimates base, April 1, 2020, (V2021)	211,632
Population, percent change - April 1, 2020 (estimates base) to July 1, 2021, (V2021)	-1.6%
Population, Census, April 1, 2020	211,632
Population, Census, April 1, 2010	220,000
Age and Sex	
Persons under 5 years, percent	5.3%
Persons under 18 years, percent	20.4%
Persons 65 years and over, percent	18.2%
Female persons, percent	50.3%
Race and Hispanic Origin	
White alone, percent	84.8%
Black or African American alone, percent (a)	2.0%
American Indian and Alaska Native alone, percent (a)	2.7%
Asian alone, percent (a)	5.3%
Native Hawaiian and Other Pacific Islander alone, percent (a)	0.3%
Two or More Races, percent	4.9%
Hispanic or Latino, percent (b)	18.4%
White alone, not Hispanic or Latino, percent	69.2%
Population Characteristics	
Veterans, 2016-2020	14,202
Foreign born persons, percent, 2016-2020	7.5%
Housing	
Housing units, July 1, 2021, (V2021)	90,314
Owner-occupied housing unit rate, 2016-2020	59.5%
Median value of owner-occupied housing units, 2016-2020	$304,700
Median selected monthly owner costs -with a mortgage, 2016-2020	$1,736
Median selected monthly owner costs -without a mortgage, 2016-2020	$509
Median gross rent, 2016-2020	$1,087
Building permits, 2021	2,050
Families & Living Arrangements	
Households, 2016-2020	83,879
Persons per household, 2016-2020	2.59
Living in same house 1 year ago, percent of persons age 1 year+, 2016-2020	82.1%
Language other than English spoken at home, percent of persons age 5 years+, 2016-2020	15.5%
Computer and Internet Use	
Households with a computer, percent, 2016-2020	94.0%
Households with a broadband Internet subscription, percent, 2016-2020	87.7%
Education	
High school graduate or higher, percent of persons age 25 years+, 2016-2020	89.7%
Bachelor's degree or higher, percent of persons age 25 years+, 2016-2020	28.3%
Health	
With a disability, under age 65 years, percent, 2016-2020	13.0%
Persons without health insurance, under age 65 years, percent	7.8%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2016-2020	56.5%
In civilian labor force, female, percent of population age 16 years+, 2016-2020	53.5%
Total accommodation and food services sales, 2017 ($1,000) (c)	498,283
Total health care and social assistance receipts/revenue, 2017 ($1,000) (c)	1,977,309
Total transportation and warehousing receipts/revenue, 2017 ($1,000) (c)	137,910
Total retail sales, 2017 ($1,000) (c)	3,137,533
Total retail sales per capita, 2017 (c)	$13,719
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2016-2020	21.3

Income & Poverty	
Median household income (in 2020 dollars), 2016-2020	$54,972
Per capita income in past 12 months (in 2020 dollars), 2016-2020	$30,700
Persons in poverty, percent	▲ 17.3%
BUSINESSES	
Businesses	
Total employer establishments, 2020	4,646
Total employment, 2020	64,614
Total annual payroll, 2020 ($1,000)	2,711,984
Total employment, percent change, 2019-2020	1.4%
Total nonemployer establishments, 2019	12,745
All employer firms, Reference year 2017	3,960
Men-owned employer firms, Reference year 2017	2,096
Women-owned employer firms, Reference year 2017	681
Minority-owned employer firms, Reference year 2017	501
Nonminority-owned employer firms, Reference year 2017	2,873
Veteran-owned employer firms, Reference year 2017	S
Nonveteran-owned employer firms, Reference year 2017	3,202
GEOGRAPHY	
Geography	
Population per square mile, 2020	129.3
Population per square mile, 2010	134.4
Land area in square miles, 2020	1,636.49
Land area in square miles, 2010	1,636.46
FIPS Code	06007

About datasets used in this table

Value Notes

Estimates are not comparable to other geographic levels due to methodology differences that may exist between different data sources.

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 the left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2021) refers to the final year of the series (2020 thru 2021). Different vintage years of estimates are not comparable.

Users should exercise caution when comparing 2016-2020 ACS 5-year estimates to other ACS estimates. For more information, please visit the 2020 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 interval of an 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

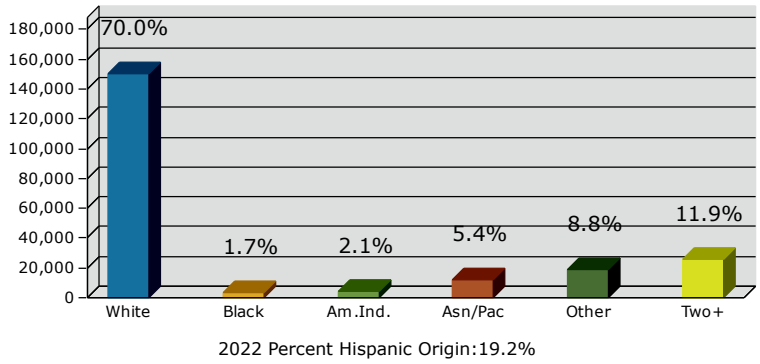
QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer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

Graphic Profile

Butte County, CA

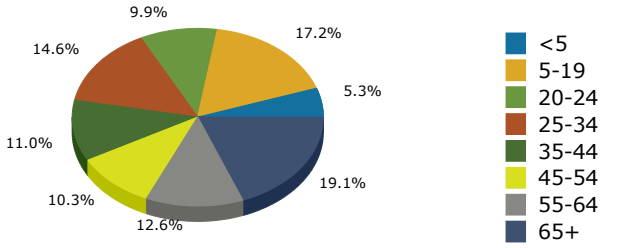
Geography: County

2022 Population by Race

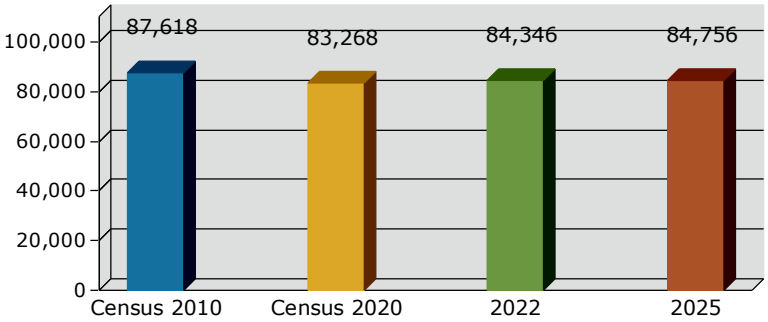


2022 Percent Hispanic Origin:19.2%

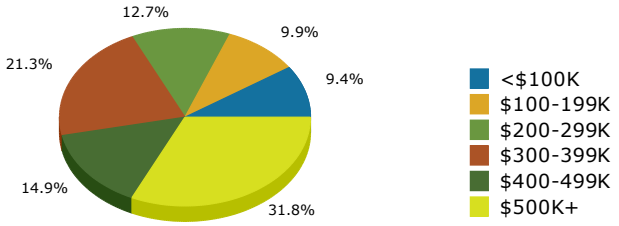
2022 Population by Age



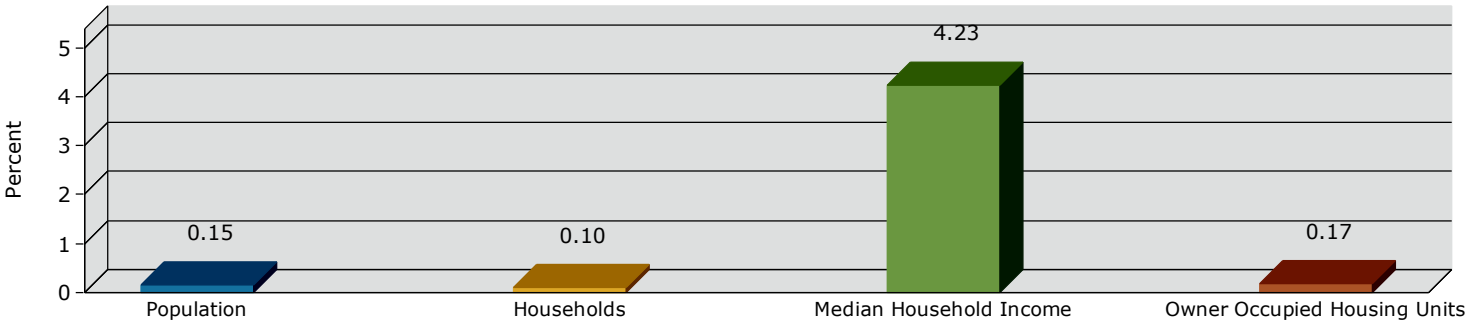
Households



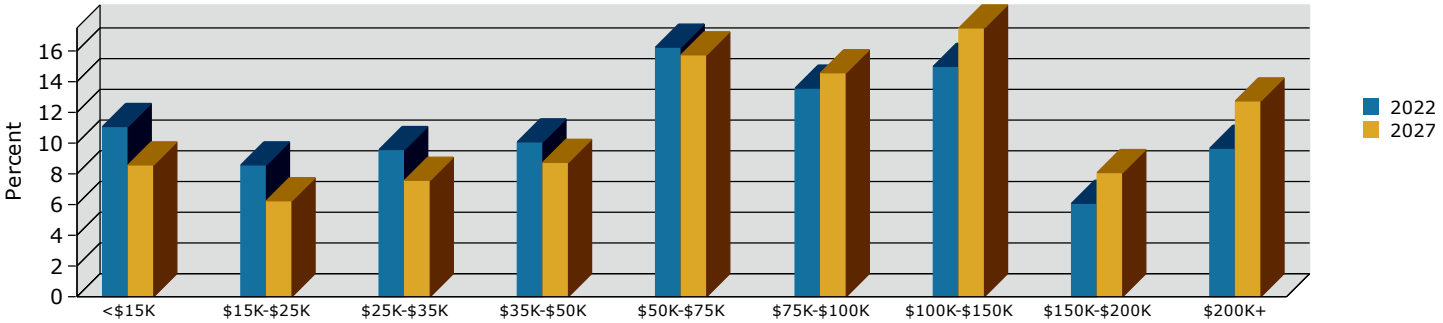
2022 Home Value



2022-2027 Annual Growth Rate



Household Income



Source: Esri forecasts for 2022 and 2027. U.S. Census Bureau 2010 decennial Census data converted by Esri into 2020 geography.

Appendix B

Demographics for the City of Oroville, CA

QuickFacts

Oroville city, California

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

Table

All Topics	Oroville, City of, California
Population, Census, April 1, 2020	**20,042**
PEOPLE	
Population	
Population Estimates, July 1 2021, (V2021)	19,893
Population estimates base, April 1, 2020, (V2021)	20,062
Population, percent change - April 1, 2020 (estimates base) to July 1, 2021, (V2021)	-0.8%
Population, Census, April 1, 2020	**20,042**
Population, Census, April 1, 2010	15,546
Age and Sex	
Persons under 5 years, percent	7.6%
Persons under 18 years, percent	23.8%
Persons 65 years and over, percent	14.4%
Female persons, percent	48.8%
Race and Hispanic Origin	
White alone, percent	66.7%
Black or African American alone, percent (a)	4.8%
American Indian and Alaska Native alone, percent (a)	1.9%
Asian alone, percent (a)	13.7%
Native Hawaiian and Other Pacific Islander alone, percent (a)	0.1%
Two or More Races, percent	9.1%
Hispanic or Latino, percent (b)	14.4%
White alone, not Hispanic or Latino, percent	60.0%
Population Characteristics	
Veterans, 2016-2020	1,020
Foreign born persons, percent, 2016-2020	7.8%
Housing	
Housing units, July 1, 2021, (V2021)	X
Owner-occupied housing unit rate, 2016-2020	46.4%
Median value of owner-occupied housing units, 2016-2020	$192,000
Median selected monthly owner costs -with a mortgage, 2016-2020	$1,297
Median selected monthly owner costs -without a mortgage, 2016-2020	$434
Median gross rent, 2016-2020	$887
Building permits, 2021	X
Families & Living Arrangements	
Households, 2016-2020	6,591
Persons per household, 2016-2020	2.73
Living in same house 1 year ago, percent of persons age 1 year+, 2016-2020	77.5%
Language other than English spoken at home, percent of persons age 5 years+, 2016-2020	18.3%
Computer and Internet Use	
Households with a computer, percent, 2016-2020	91.8%
Households with a broadband Internet subscription, percent, 2016-2020	80.8%
Education	
High school graduate or higher, percent of persons age 25 years+, 2016-2020	84.0%
Bachelor's degree or higher, percent of persons age 25 years+, 2016-2020	13.6%
Health	
With a disability, under age 65 years, percent, 2016-2020	18.6%
Persons without health insurance, under age 65 years, percent	6.6%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2016-2020	44.7%
In civilian labor force, female, percent of population age 16 years+, 2016-2020	45.1%
Total accommodation and food services sales, 2017 ($1,000) (c)	53,459
Total health care and social assistance receipts/revenue, 2017 ($1,000) (c)	351,845
Total transportation and warehousing receipts/revenue, 2017 ($1,000) (c)	7,741
Total retail sales, 2017 ($1,000) (c)	451,538
Total retail sales per capita, 2017 (c)	$23,617
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2016-2020	19.3

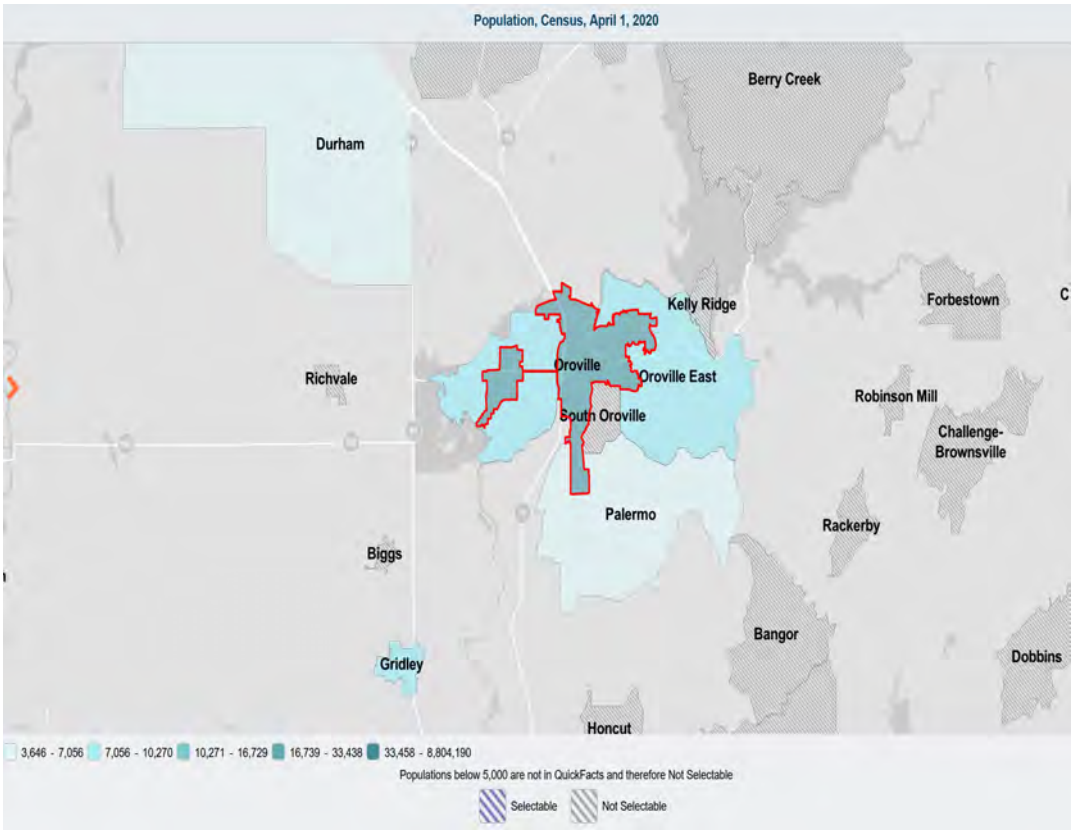
Income & Poverty	
Median household income (in 2020 dollars), 2016-2020	$34,371
Per capita income in past 12 months (in 2020 dollars), 2016-2020	$17,961
Persons in poverty, percent	▲ 25.8%

BUSINESSES

Businesses	
Total employer establishments, 2020	X
Total employment, 2020	X
Total annual payroll, 2020 ($1,000)	X
Total employment, percent change, 2019-2020	X
Total nonemployer establishments, 2019	X
All employer firms, Reference year 2017	392
Men-owned employer firms, Reference year 2017	192
Women-owned employer firms, Reference year 2017	S
Minority-owned employer firms, Reference year 2017	S
Nonminority-owned employer firms, Reference year 2017	265
Veteran-owned employer firms, Reference year 2017	S
Nonveteran-owned employer firms, Reference year 2017	305

GEOGRAPHY

Geography	
Population per square mile, 2020	1,448.7
Population per square mile, 2010	1,196.5
Land area in square miles, 2020	13.83
Land area in square miles, 2010	12.99
FIPS Code	0654386



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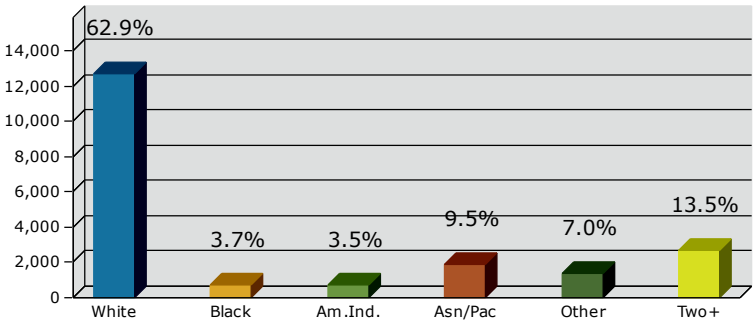
QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer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

Graphic Profile

Oroville, City of, CA

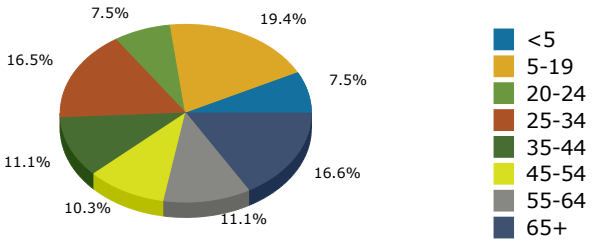
Geography: Place

2022 Population by Race

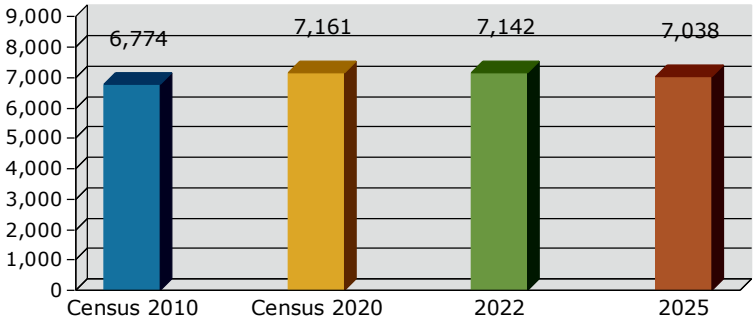


2022 Percent Hispanic Origin:16.6%

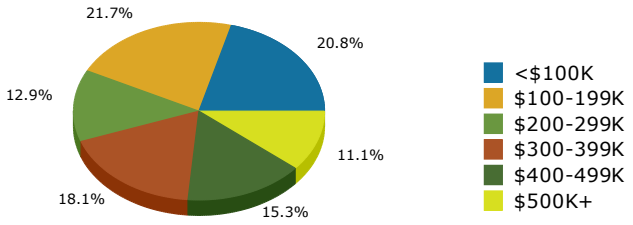
2022 Population by Age



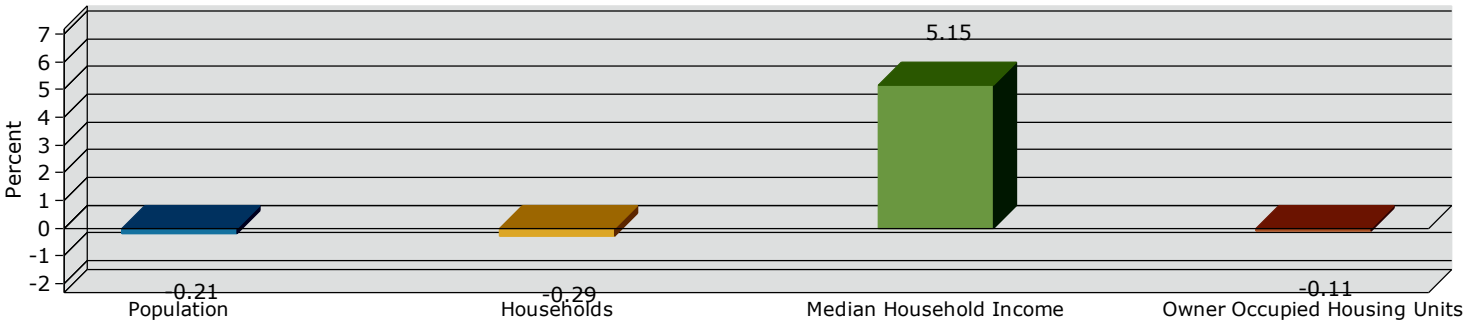
Households



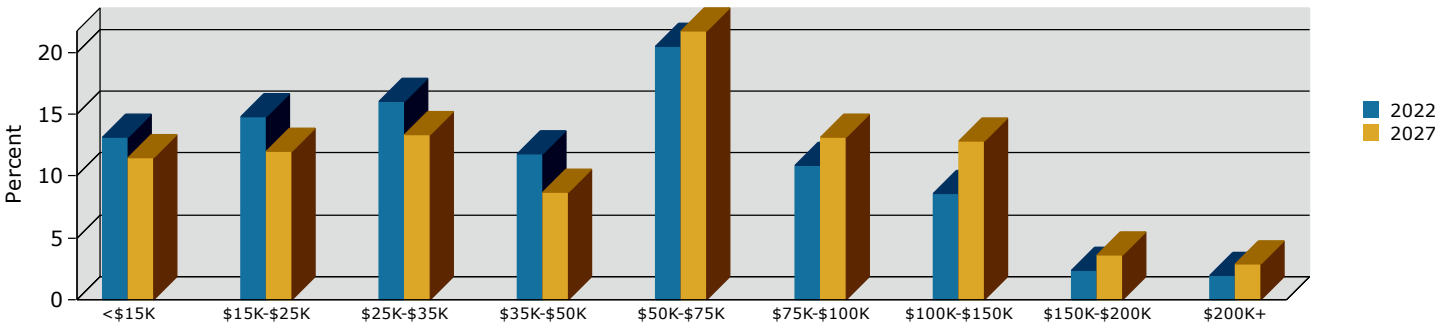
2022 Home Value



2022-2027 Annual Growth Rate



Household Income



Source: Esri forecasts for 2022 and 2027. U.S. Census Bureau 2010 decennial Census data converted by Esri into 2020 geography.

People

The total population of Oroville is 19,501. The median age is 32.88

City of Oroville

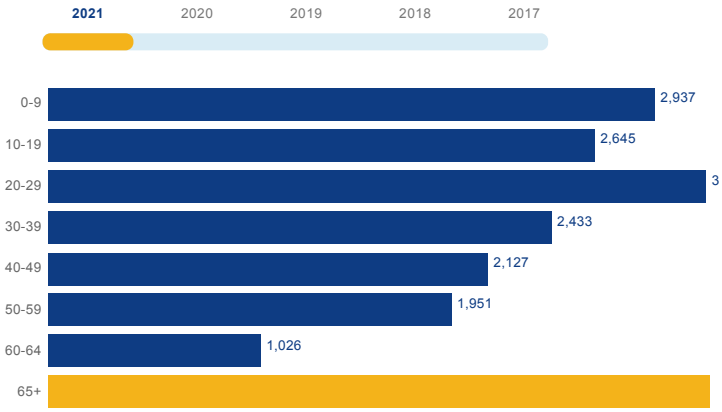
19,501

Total Population

48.8% Male

51.2% Female

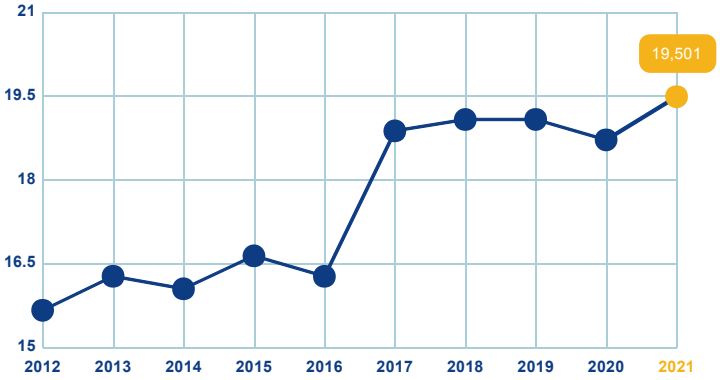
Age Distribution



Median Age

33

Population Growth (in thousands)



Educational Attainment

24.51% of the population in Oroville have an Associate's degree or higher. 56.34% have completed some college or higher.

< Grade 9	Grade 9-12	High School	Some College	Assoc Degree	Bach Degree	Grad Degree
3.71%	9.59%	30.36%	31.83%	10.02%	10.68%	3.81%

0 in the community

5 within 50 miles

Colleges

offer Associate's Degree or Certificate

0 in the community

7 within 50 miles

Universities

offer Bachelor's Degree or Higher

Labor Force

Oroville has a labor force of 6,218 people.

6,218

Labor Force

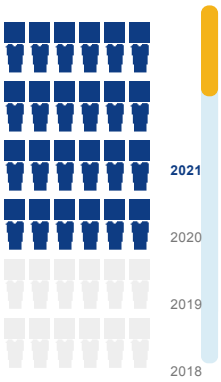
Talent

What are the largest job counts by occupation?

Office and Administrative support	Healthcare support	Health Diagnosing and Treating Practitioners	Executive, Managers, and Administrators	Sales
14.54%	**9.56%**	**9.27%**	**8.81%**	**8.47%**
1,908	1,254	1,216	1,156	1,111

Total Employees

13,124



The work distribution of total employees in Oroville is:

25%

Blue Collar

74%

White Collar

Total Establishments

947

Businesses and Jobs

Oroville has a total of 947 businesses. In 2021, the leading industries in Oroville were Health Care and Social Services, Public Administration, Retail, and Education.

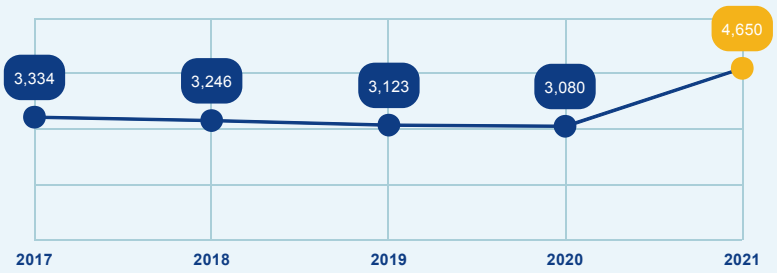
What are the top industries by jobs?

1 Health Care and Social Services

4,650 Jobs | 135 Establishments

2 Public Administration

1,960 Jobs | 29 Establishments



3 Retail

1,315 Jobs | 143 Establishments

4 Education

1,037 Jobs | 32 Establishments

How many employees do businesses in Oroville have?

1-4 Employees	63.36%
5-9 Employees	16.79%
10-19 Employees	9.4%
20-49 Employees	5.49%
50-99 Employees	2.64%
100+ Employees	2.33%

Income and Spending

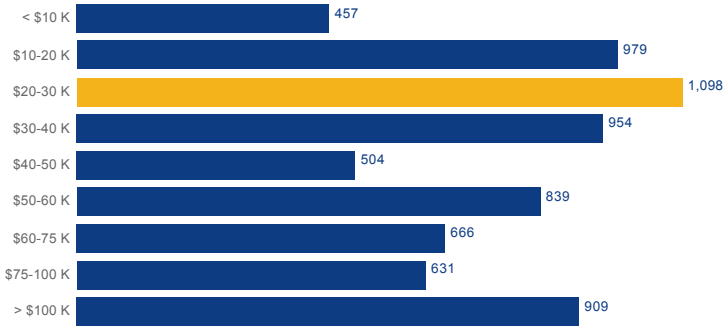
Households in Oroville earn a median yearly income of $40,689. 21.89% of the households earn more than the national average each year. Household expenditures average $45,319 per year. The majority of earnings get spent on Shelter, Transportation, Food and Beverages, Health Care, and Utilities.

$40,689

Median Household Income

30%	less than the county
50%	less than the state
40%	less than the nation

Income Distribution



How do people spend most of their money?

PER HOUSEHOLD

Shelter	Transportation	Food and Beverages	Health Care	Utilities
$9,700	$8,216	$6,782	$3,921	$3,528

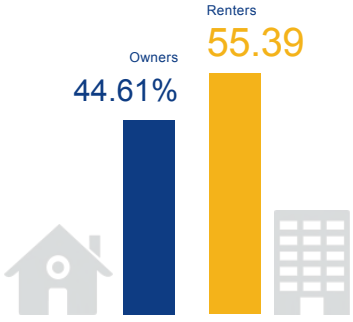
$45,319

Median Household Expenditure

Housing

There are 11% more households who rent their homes than there are homeowners.

Owners vs. Renters



Transportation

Residents spend an average of 18 minutes commuting to work. Oroville is served by 13 airports within 50 miles. Rail can be accessed within the community. Interstates can be accessed 21 miles away.

18 min

Commute Travel Time

1 + 13 (+50 miles)

Airports in Community

21 miles

Distance to Interstate

Freight Rail

In Community

Taxes

Top State Corporate Income Tax

8.84%

Top State Corporate Capital Gains Tax

8.84%

Top State Personal Income Tax

13.3%

Top State Personal Capital Gains Tax

13.3%

State Sales Tax

7.25%

Data Source: California Governor's Office of Business and Economic Development. (n.d.) The Community & Place Based Data Tool is an interactive web-mapping data tool containing up-to-date demographic, industry + business, education, consumer expenditure and occupation data for the cities, counties across California. Retrieved on August 27, 2022 from: < https://business.ca.gov/apps/ > OR <https://properties.zoomprospector.com/california/community?page=1&s%5BSortDirection%5D=false&s%5BCommunityType%5D=2&s%5BSortBy%5D=name>.

Appendix C

Sphere of Influence

Options for Future Updates

For

6 Water And Wastewater Service Providers

Appendix C: Sphere of Influence Options for Future Updates

Sphere of Influence Considerations

The Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 requires that LAFCo review and update the Sphere of Influence (SOI or Sphere) for each of the special districts and cities within the county. In determining the Sphere of Influence for an agency, LAFCo must consider and prepare written determinations with respect to four factors [Government Code §56425(e)]. These factors relate to the present and planned land uses including agricultural and open-space lands, the present and probable need for public facilities and services, the present capacity of public facilities and adequacy of public services, and the existence of any social or economic communities of interest in the area.

Generally, the intent of an SOI is to identify the most appropriate areas for an agency's service area in the *probable future.* Typically, LAFCo discourages inclusion of land in an agency's Sphere if a need for services provided by that agency cannot be demonstrated. Accordingly, territory included in an agency's Sphere is an indication that the probable need for services has been established, and that the subject agency has been determined by LAFCo to be the most logical service provider for the area.

Sphere of Influence Options

This Appendix presents several potential options for updating the spheres of influence (SOIs) in the future for the five water and wastewater public service providers in the Oroville Area. One private water service provider (CalWater) is also considered. The presented options are informational only, and may assist the Commission in considering future informational needs and next steps. When LAFCo moves to update an individual SOI at some future date, the Commission may also consider additional information beyond that presented herein. For example, the current status of any nearby Disadvantaged Unincorporated Communities (DUCs) will be recognized. LAFCo's process provides for a meeting/conference with each potentially affected District prior to updating a District's SOI. Additionally, the Commission will hold a public hearing and adopt written statements of fact regarding the SOI prior to adopting any updates.

<u>Summary of Significant Observations Identified in 2022 MSR</u>

- There are a total of six (6) service providers, providing water (3) and wastewater services (4) to a relatively small geographic area.
- The Oroville Area is served by three drinking water treatment plants. Additionally, a fourth, smaller, drinking water treatment plant is located in nearby Bangor.
- What reorganization options exist that are best suited to provide potable water over the long-term with the greatest efficiency and least cost?
- What reorganization options exist that are best suited to provide comprehensive sewer services over the long-term with the greatest efficiency and least cost?

- The Thermalito area has been identified as having a water affordability issue. Additionally, residents within the Cal Water Service area may face an affordability issue and future study of this factor is recommended.
- Inflow and infiltration (I&I) remains a problem for wastewater service providers.
- How do the affected sewer agencies effectively recapture/recycle the abundance of wastewater produced in the region?

Potential Future Options

Given the considerations addressed in this 2022 Water and Wastewater Services MSR for the Oroville Area, seven conceptual options have been identified on a regional basis as listed below. This section is provided for informational purposes only. When Butte LAFCo next updates a Sphere for the agencies, it may wish to consider these or other options.

1) **Retain the status quo**. The existing boundary and SOI for each agency would remain in their current configuration.

2) **One Agency**: Reorganize all public water and wastewater service systems under one agency. The City of Oroville, Lake Oroville Area PUD, South Feather Water and Power Agency, Sewage Commission – Oroville Region, and the Thermalito Water and Sewer District would be reorganized into one agency providing both water and wastewater services. Ideally, as a water service provider, CalWater-Oroville (private company) would reasonably be considered in any reorganization plan for consistency. However, as non-government agency, this component would require efforts that are not within the mission of LAFCo. Reorganization would result in the formation of a new entity which would function as an umbrella agency to oversee water and wastewater services for the entire Oroville Regional area.

3) **Two Agencies**:

   3a) Reorganize the five (or six) service providers into two agencies: a) wastewater and b) drinking water. TWSD would present an issue as it provides both services.

4) ***Only Wastewater Service Reorganization:***

The Oroville Area currently receives wastewater service from four agencies including COOR, LOAPUD, TWSD, and SC-OR. Under this option, the provision of wastewater services would be reorganized into one agency. For example, all retail wastewater collection, conveyance, treatment, and disposal could be handled by a 'modified' SC-OR JPA in the future. A modified SC-OR would ideally include the following features:

- SC-OR JPA reorganized to have a seven (7) member Board of Directors. Each of the seven Board Members would be a "voting" member. The three member entities (COOR, LOAPUD, TWSD) would each select two voting Board members from their respective City Council/Board of Directors. The 7th Board Member would be a "public" member selected by the other six Board Members (similar to LAFCo). SC-OR would continue as a JPA but the internal workings of Board would be refined and personnel would be reorganized to maximize all collective resources
- The SC-OR JPA's Area of Interest would be large, and it would cover the area that SC-OR intends to serve in the future. In the future, it would be possible to transition from a JPA arrangement to a full reorganization of all sewer services under SC-OR as an independent special district.
- 4b) variant: COOR sewage collection systems west and north of the Feather River would be reorganized under the TWSD and the sewage collection system south and east of the Feather River would be reorganized into the LAOPUD. This would simplify the collection system to only two providers.

5) Only Drinking Water service reorganization:

For drinking water services, under this hypothetical option, three existing water service providers would be reorganized to form one agency. It is suggested that LAFCo consider expanding the SOI of a public agency, such as SFWPA, to include the boundary area and SOI of the Thermalito Water and Sewer District and also the CalWater - Oroville service area. Ideally, as a water service provider, CalWater-Oroville (private company) would reasonably be considered in any reorganization plan for consistency. However, as non-government agency, this component would require efforts that are not within the mission of LAFCo. For this option, SFWPA is suggested as a focus because this Agency has a large modern water treatment plant that is up to date and the largest number of trained experienced employees. Over the long-term, SFWPA would be the primary water service provider in the area. SFWPA would also continue to provide hydroelectric and recreation services. Reorganizing the three providers together could result in more streamlined infrastructure and associated maintenance upkeep because only one potable water treatment plant would be needed (as compared to the current situation with three

potable water treatment plants). Improved efficiency could help alleviate the water affordability issue identified for residents of Thermalito and the City of Oroville.

6) ***Add Groundwater Basin Collaboration Area into SOI's or Area of Interest:*** This option addresses the three water service providers (TWSD, CalWater, and SFWPA). Under this option LAFCo would recognize that two water service providers (TWSD and CalWater) rely upon groundwater resources to serve their customers. LAFCo would utilize existing information about the groundwater basin's geographic extent to consider whether Thermalito Water and Sewer District and CalWater-Oroville share groundwater resources through hydrologic connections with each other or with other stakeholders. This geographic extent would inform whether an agency's SOI (or Area of Interest) should be expanded or contracted to provide a focus on those portions of a Groundwater Basin, where recharge areas should be protected and/or where several other water users share this resource. For example, information from the Groundwater Sustainability Agency (GSA) Wyandotte could be considered. LAFCO should also note that this option indirectly impacts local wastewater service providers who experience inflow and infiltration (I&I) issues because ideally storm water would be captured and utilized for groundwater recharge. In summary, this option will further study and consider details associated with the hydrology of groundwater connections and stormwater connections to determine whether any changes to a service provider's SOI or Area of Interest is necessary. A hydrological study would be recommended in association with this option.

7) **Update the SFWPA SOI to include "Place of Use"**. The State Water Board issued a water right to SFWPA and this water right is associated with a designated "Place of Use". LAFCO will map this "Place of Use" and then consider adjusting the boundaries or SOI of SFWPA to achieve consistency.

##

Appendix D:

Regulatory Requirements - Municipal Water

APPENDIX D: REGULATORY REQUIREMENTS MUNICIPAL WATER

Table of Contents

SURFACE WATER RULES

Federal Regulations

U.S. Clean Water Act (1972)

The Clean Water Act (CWA) is the primary federal statute governing the protection of water quality. The EPA's implementation of this law provides a comprehensive program to protect the nation's surface waters. Under CWA Section 304, states must ensure that potable water retailed to the public meets specific standards.

Section 303(d) of the CWA requires states to identify water bodies that do not meet water quality objectives and that do not support beneficial uses. The 303(d) list includes the Feather River, Lower (Lake Oroville Dam to Confluence with Sacramento River). This section of the Feather River, Lower, identified as State Waterbody ID: CAR5192200019980817161057, is impaired for several specific uses, including cold freshwater habitat, commercial and sport fishing, municipal and domestic supply, spawning, reproduction, and/or early development, warm freshwater habitat, and wildlife habitat as shown in Table D-2, below.

Table D-2: 303(d) List Feather River, Lower

State or Tribal Nation specific designated uses	**303(d) List Status**
Agricultural Supply	Good
Non-Contact Water Recreation	Good
Water Contact Recreation	Good

Cold Freshwater Habitat	Impaired
Commercial and Sport Fishing	Impaired
Municipal and Domestic Supply	Impaired
Spawning, Reproduction, And/or Early Development	Impaired
Warm Freshwater Habitat	Impaired
Wildlife Habitat	Impaired
Migration of Aquatic Organisms	Insufficient Information
Data Source: U.S. EPA. Waterbody Report. Downloaded August 27, 2022 from <*https://mywaterway.epa.gov/waterbody-report/CA_SWRCB/CAR5192200019980817161057/2022* >.	

U.S. Safe Drinking Water Act (1974)

Under the Safe Drinking Water Act (SDWA, 42 USC Sections 300f et seq.), the U.S. EPA regulates contaminants of concern to domestic water supply. The law requires action to protect drinking water and its sources, including lakes, reservoirs, rivers, springs, and groundwater wells. Contaminants of concern relevant to domestic water supply are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. EPA drinking water standards are developed as a maximum contaminant level (MCL) for each chemical or microbe. The California Department of Public Health (CDPH) has been granted primary enforcement responsibility for the SDWA. Title 22 of the California Administrative Code establishes CDPH authority and stipulates drinking water quality and monitoring standards. Additionally, the California State Water Resources Control Board (State Water Board) Division of Drinking Water (DDW) is the primary agency responsible for the administration and enforcement of the SDWA requirements in California. In addition to the federal standards, California also imposes an MCL standard for the fuel additive MTBE and for a rice herbicide breakdown product used in the Sacramento Valley. Health violations occur when the contaminant amount exceeds the safety standard (MCL) or when water is not treated properly. Monitoring violations typically involve failure to report the results of required monitoring in a timely fashion.

State Regulations

California Water Code

The California Water Code outlines the general state authority and responsibilities over water in California. Most of the state regulations described below are codified into the California Water Code. The entire Water Code is available online at: <*http://leginfo.legislature.ca.gov/faces/codes.xhtml*>. Other state codes applicable to drinking water include the Corporations Code, Education Code, Food and Agricultural Code, Government Code, Health and Safety Code, and the Public Resources Code.

California Porter-Cologne Water Quality Control Act (1969)

The Porter-Cologne Act provides the statutory authority for the protection of water quality in California. Consistent with the Porter-Cologne Act, the State adopts water quality policies, plans, and objectives to protect the State's waters. The Act outlines the obligations of the SWRCB and nine RWQCBs to adopt and periodically update basin plans.

Water Quality Control Plan

The State Water Resources Control Board and nine RWQCBs are responsible for ensuring implementation and compliance with the provisions of the CWA and the Porter-Cologne Act. In the Oroville Area water service providers service area, the Central Valley Region has a Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan), which is a 461-page planning document., The Basin Plan sets forth water quality standards for the surface and ground waters. Additionally, groundwater recharge is identified as a beneficial use in the Basin Plan.

Urban Water Management Planning Act (1983)

The Urban Water Management Planning Act (California Water Code, Division 6, Part 2.6, Section 10610 et seq.) requires water suppliers to document water supplies available during normal, single dry, and multiple dry water years during a 20-year projection period and to document the existing and projected future water demand during a 20-year projection period. The Act applies to municipal water suppliers that serve more than 3,000 customers or provides more than 3,000 afy of water. All urban water suppliers should prepare urban water management plans (UWMPs) and update them every 5 years. The Act requires that UWMPs include a description of water management tools and options used by that entity to maximize resources and minimize the need to import water.

Senate Bill 610 and Senate Bill 221

SB 610 (now CEQA Guidelines Section 15155) amended the Water Code requirements within the CEQA process and broadened the types of information required in a UWMP. SB 221 applies within the Subdivision Map Act and allows jurisdictions to condition a tentative map such that documentation from a public water supplier regarding the availability of sufficient water supply is needed.

Water Management & Efficiency Legislation

California's Water Code contains two new laws which aims to make California more resilient to the impacts of future droughts. The legislation was approved as SB 606 (Hertzberg) and AB 1668 (Friedman), and it emphasizes efficiency and stretching existing water supplies in cities and farms. Efficient water use is the most cost-effective way to achieve long-term conservation goals and provide the water supply reliability needed to adapt to the longer and more intense droughts climate change is causing in California. Specifically, the laws call for the creation of new urban efficiency standards for indoor use, outdoor use, and water lost to leaks, as well as any appropriate variances for unique local conditions. The State Water Board will adopt these standards by regulation no later than June 30, 2022, after full and robust public and stakeholder processes. In addition, each urban retail water agency will annually, beginning November 2023, calculate its own objective based on the water needed in its service area for efficient indoor residential water

use, outdoor residential water use, commercial, industrial, and institutional (CII) irrigation with dedicated meters, and reasonable amounts of system water loss, along with consideration of other unique local uses (i.e., variances) and "bonus incentive," or credit, for potable water reuse, using the standards adopted by the Board. (DWR, 2018). Specifically, SB606 is codified as Water Code Section 10632, which requires each urban water supplier to conduct an annual water supply and demand assessment and submit an annual water shortage assessment report to DWR on or before July 1 of each year. The annual report should include information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan.

California Water Conservation Act

The California Water Conservation Act (SB X7-7), enacted in November 2009, requires each urban water supplier to select one of four water conservation targets contained in California Water Code Section 10608.20 with the statewide goal of achieving a 20 percent reduction in urban per capita water use by 2020. Urban retail water suppliers are required to develop water use targets and submit a water management plan to the Department of Water Resources (DWR) by July 2011, under SBX7-7. The plan must include the baseline daily per capita water use, compliance daily per capita water use, water use target, and interim water use target.

Integrated Regional Water Management – Planning Act of 2002

Integrated regional water management (IRWM) was officially established by the State of California in 2002 through the passage of the Integrated Regional Water Management Planning Act (SB 1672). Special districts, such as water agencies, are typically separate entities with clearly defined service areas within which they have exclusive authority to provide services. However, many water agencies receive water supplies from a source that is shared with other water agencies. Projects and plans developed by one water agency may conflict with projects or plans of another agency that shares the same source of water. IRWM provides a mechanism for regional planning to reduce potential conflicts. Additionally, IRWM supports collaborative prioritization of water-related efforts in the region in a systematic way to ensure sustainable water uses, reliable water supplies, better water quality, environmental stewardship, efficient urban development, and the protection of agriculture. Various bond acts approved by California voters have provided over $1.5 billion in State funding to support and advance integrated, multi-benefit regional projects. Cities, counties, water districts, community/environmental groups, Tribes, and others across the State have worked collaboratively to organize and establish 48 regional water management groups, covering over 87 percent of the State's area and 99 percent of its population. Over the years, numerous IRWM planning grants have helped RWMGs develop, adopt and update IRWM plans to identify strategies and projects to address the unique needs and conditions of their regions. Detailed information about IRWM is available from DWR at: <*https://water.ca.gov/Programs/Integrated-Regional-Water-Management*>.

California Health and Safety Code

Water supply requirements for service connections to public water systems are established in Section 64562 of the California Health and Safety Code. Sufficient water must be available to the public water system from its water sources and distribution reservoirs to

adequately, dependably, and safely meet the total requirements of all water users under maximum-demand conditions before additional service connections can be permitted.

Recycled Water Regulations

Recycled water is regulated by the U.S. Environmental Protection Agency (EPA), the State Water Resources Control Board (SWRCB), Regional Water Quality Control Boards (RWQCB), and the CA Department of Health Services (DHS). Resolution No. 77-1 from the SWRCB allows the SWRCB and RWQCB to encourage and consider funding water reclamation projects that do not impair water rights or beneficial instream uses. Recycled water is safely used to irrigate home landscapes, vegetable gardens, parks, schoolyards, golf courses, and agriculture throughout California. However, recycled water is not for human consumption. Information about the Oroville area water service provider's recycled water program is provided in Chapters 2 to 7 of this MSR.

Title 22

Title 22 of California's Water Recycling Criteria was authored in 1975 as California's guidelines on the discharged and use of treated and recycled water. The standards require the California Department of Health Services to develop and enforce water and bacteriological treatment standards for water recycling and reuse. State discharge standards for reclaimed water and its reuse are regulated under the Water Recycling Criteria and the 1969 Porter-Cologne Water Quality Control Act.

California Water Code (Division 3, Dams and Reservoirs)

The State of California inspects dams to prevent failure in order to safeguard life and protect property. DWR Division of Safety of Dams implements this legislation.

Assembly Bill 1668

Assembly Bill 1668, Friedman, addressed water management planning and was passed in 2018. This new law requires agricultural water management plans to include "an annual water budget based on the quantification of all inflow and outflow components for the service area of the agricultural water supplier." DWR provides a handbook outlining the development of a water budget, and it is available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Water-Budget-Handbook.pdf?la=en&hash=30AD0DFD02468603F21C1038E6CC6BFE32381233

Drought Resilient Communities Act

The Drought Resilient Communities Act (SB 971 [Hertzberg]) was introduced in February 2020 to strengthen drought planning for small and rural communities.

SWRCB Handbook - Microplastic Testing Policy

The State Water Resources Control Board recently published the Policy Handbook establishing a Standard Method of Testing and Reporting of Microplastics in Drinking Water to reinforce the

Health and Safety Code section 116376. The Health and Safety Code section 116376 was added as part of the Senate Bill No. 1422 (SB 1422), which was approved by the Governor and filed with the Secretary of State on September 28, 2018 (SWRCB, 2022). The State Water Board developed a two-phase approach to monitor the microplastic material in drinking water and develop an understanding of the risk via exposure. During Fall of 2022, the State Water Board planned to issue monitoring guidelines for Phase One of microplastic testing to selected public water systems.

Local Regulations

Butte County has several policies related to water quality, including its General Plan. The County Environmental Health Department also aims to ensure drinking water is safe. The City of Oroville General Plan also contains several policies related to public services and health of the natural environment.

RULES GOVERNING GROUNDWATER

The California Water Code indicates groundwater law applies to underground water not flowing in known and definite channels. Whereas "surface waters and subterranean streams flowing through known and definite channels" (Water Code § 1200.) are legally classified as surface water. Groundwater is subject to California's constitutional requirement that all water used be put to reasonable and beneficial use. There are two types of groundwater rights in California: overlying rights and appropriative rights. Overlying rights are similar to riparian rights with surface water. Appropriative groundwater rights are similar to surface water appropriative right (Burch, 2005).

Overlying Rights for Groundwater

In California, property overlying a groundwater basin has entitlements to the percolating groundwater of the basin beneath the lands for reasonable beneficial uses on the overlying land. This entitlement is equal and correlative with respect to other property owners within the same groundwater basin exercising their respective rights; that is, each property owner is entitled to a reasonable share of the available groundwater. (Katz v. Walkinshaw (1903) 141 Cal. 116.) As a result, one property owners' rights do not have priority over any other property owner, regardless of when the rights are exercised. The quantity attributed to the water entitlement is a function of the number of parties rightfully producing the available water (Burch, 2005).

Although overlying property owners can extract as much groundwater as is reasonably needed for use on overlying land; during times of reduced groundwater supply, each overlying property owner must reduce extractions proportionately (Wright v. Goleta Water District (1985) 174 Cal. App.3d 74,84.). Overlying groundwater rights are generally superior to appropriative rights. (City

of Pasadena v. City of Alhambra (1949) 33 Cal.2d 908, 926. See Hutchins, The California Law of Water Rights (1956) p. 441 et seq.)

Appropriative Right to Groundwater

If there is surplus groundwater, it may be appropriated for use on non-overlying land. An appropriative right to groundwater is a right to use groundwater outside of the groundwater basin or for public service in communities overlying the basin, as long as enough water is left to meet all overlying landowner needs. *(Tehachapi-Cummings County Water Dist.* v. *Armstrong* (1975) 49 Cal.App.3d 992, 1000 n.6, 1001.) There are three basic types of groundwater appropriators:

1. strangers to the groundwater basin (who do not own or use groundwater on overlying lands) who act to appropriate available groundwater;
2. overlyers who use all or a portion of their groundwater on lands that do not overlie the groundwater basin; or
3. an overlying municipality that extracts available groundwater for municipal purposes (Burch, 2005).

The South Feather Water and Power Agency studied within this MSR is an overlying municipal service provider that does not extract available groundwater for municipal purposes. However, the Thermalito Water and Sewer District does rely on groundwater.

Overlyers have priority above appropriators, and priority follows the rule of "first in time, first in right." *(City of Pasadena* v. *City of Alhambra, supra,* 33 Cal.2d at p. 926.) Earlier appropriative users have priority over later appropriative users. If a groundwater basin is overdraft, such that **groundwater** use exceeds the amount of recharge into an aquifer, no appropriative rights can be acquired except by prescription. (*City of Pasadena* v. *City of Alhambra, supra*, 33 Cal.2d at pp. 926-27; *City of Los Angeles* v. *City of San Fernando, supra*, 14 Cal.3d at p. 278.)

Sustainable Groundwater Management Act (SGMA)

Effective in 2015, the Sustainable Groundwater Management Act (SGMA) codified Assembly Bill No. 1739 and Senate Bill Nos. 1168 and 1319, which require local regions to create a groundwater sustainability agency (GSA) and adopt groundwater management plans. Under the SGMA, DWR designated groundwater basins in the State as high, medium, low, or very low priority for purposes of groundwater management. This Act requires local regions to create a GSA and to adopt groundwater management plans for groundwater basins or subbasins that are designated as medium or high priority.

There is a GSA within or near Oroville area water service providers called the Wyandotte Creek Subbasin. The Wyandotte Creek GSA considered adopting the Wyandotte Creek GSP on December 16, 2021. Visit *https://www.wyandottecreekgsa.com/* for meeting details and information on GSP development and adoption. In addition, two other GSAs are in proximity to the Oroville Area, including the Vina Subbasin and the Butte Subbasin, as described on the County's website at: <*https://www.buttecounty.net/waterresourceconservation/Sustainable-Groundwater-Management-Act* >.

Local Groundwater Rules

Permits for Wells: The Butte County Environmental Health Department requires a permit prior to the installation of a well. This permit process is intended to ensure the protection of natural resources from a health and safety perspective.

Other Groundwater Rules

Adjudicated Basins: In some areas of California, groundwater basins are managed pursuant to rules established in an adjudication of groundwater rights. An adjudication is a court proceeding that establishes the relative rights of all parties claiming an interest in the water source. In these equitable proceedings, the court usually maintains continuing jurisdiction, supervising, through a special master or watermaster, the use of water from the adjudication basins (Burch, 2005). CA DWR keeps track of adjudicated basins in California as described on their website at: <https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Adjudicated-Areas >. The groundwater basin areas within or near Butte County are not currently adjudicated.

Water Quality Regulation: As is the case with surface water, various federal statutes control the use of water from groundwater basins. These statutes deal primarily with the discharge of pollutants but may also regulate the pumping of groundwater (Burch, 2005).

Springs: When the flow of a spring naturally becomes part of the flow of a stream system which extends beyond the property on which the spring arises, rights to use are obtained as either riparian or appropriative surface water rights. When the flow does not naturally leave the land upon which it arises, the flow is exclusively owned by the owner of the land and can be used on that land for reasonable, beneficial purposes (Burch, 2005).

Butte County Regulations Regarding Groundwater

In 1996 the voters of Butte County passed measure G, "An ordinance to protect the groundwater resources in Butte County." The measure was codified in Chapter 33 of the Butte County Code. In 1997, upon the recommendation of the Butte County Water Commission, the Board of Supervisors (Board) established the Water Division of the Department of Agriculture. In 1999 the Water and Resource Conservation Department (DWRC) was formed and moved, along with staff, out of the Agriculture Department. The DWRC's mission is "To manage and conserve water and other resources for the citizens of Butte County." A primary function of this Department is Groundwater Elevation Monitoring (Butte Superior Court, 2015).

REFERENCES

Burch, Marsha A. Law Office. 2005. Presentation to CALAFCo Annual Conference entitled "WATER RIGHTS: Supply Issues for Local Agency Formation Commissions". 18-pages. Available on-line at: *https://calafco.org/resources/lafco-procedures-special-districts/water-management.*

Butte Superior Court, Grand Jury Report 2014/2015. 166-pages. Available on-line at: <*https://www.buttecounty.net/administration/Grand-Jury*>.

California Department of Water Resources (DWR). 2018. Fact Sheet on Water Efficiency Legislation. 3-pages. Available on-line at: *https://www.waterboards.ca.gov/publications.../water_efficiency_bill_factsheet.pdf*.

_____. 2018. Groundwater Sustainability Agencies. Available online at: *https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Groundwater-Sustainable-Agencies*

California Regional Water Quality Control Board (CRWQB). Revised May 2018. The Water Quality Control Plan (Basin Plan) for the CRWQB Central Valley Region, Fifth Edition: The Sacramento River Basin and the San Joaquin River Basin. Available on-line at: *https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_ 201805.pdf*

State Water Resources Control Board, State of California. (2022). *Policy Handbook Establishing a Standard Method of Testing and Reporting of Microplastics in Drinking Water*. Retrieved on September 12, 2022 from: <*https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/docs/2022/mp-hndbk.pdf*>.

Appendix E:

Public Water Systems in Butte County

Appendix E: Public Water Systems in Butte County

There are **95** public water systems providing drinking water and/or irrigation water in *Butte County*. Drinking water comes from aquifers, streams, rivers, and lakes. Under the federal Safe Drinking Water Act, EPA sets standards for drinking water quality and with its partners implements various technical and financial programs to ensure drinking water safety. Details about public water systems in Butte County can be found on the U.S. Environmental Protection Agency website at: https://mywaterway.epa.gov/community/Thermalito,%20CA,%20USA/drinking-water. Below is a list of the **95** public water systems serving *Butte County*.

CAL-WATER SERVICE CO.-CHICO
Public Water System Population Served: 104,908
Drinking Water System Source: Ground Water

SFWP-MINERS RANCH
Public Water System Population Served: 22,780
Drinking Water System Source: Surface Water

BUTTE-GLENN COMMUNITY COLLEGE DIST
Public Water System Population Served: 18,000
Drinking Water System Source: Ground Water

CAL-WATER SERVICE CO.-OROVILLE
Public Water System Population Served: 10,698
Drinking Water System Source: Surface Water

DEL ORO WATER CO.-PARADISE PINES
Public Water System Population Served: 10,513
Drinking Water System Source: Ground Water

THERMALITO WATER & SEWER DIST
Public Water System Population Served: 10,154
Drinking Water System Source: Surface Water

GRAY LODGE CHECK STATION
Public Water System Population Served: 8,000
Drinking Water System Source: Ground Water

CITY OF GRIDLEY
Public Water System Population Served: 7,246
Drinking Water System Source: Ground Water

PARADISE IRRIGATION DISTRICT
Public Water System Population Served: 4,600
Drinking Water System Source: Surface Water

CITY OF BIGGS
Public Water System Population Served: 1,805
Drinking Water System Source: Ground Water

DURHAM IRRIGATION DISTRICT
Public Water System Population Served: 1,561
Drinking Water System Source: Ground Water

PALERMO BIBLE FAMILY CHURCH
Public Water System Population Served: 1,000
Drinking Water System Source: Ground Water

CHICO COMMUNITY GUILD
Public Water System Population Served: 800
Drinking Water System Source: Ground Water

DEL ORO WATER CO.-LIME SADDLE MARINA
Public Water System Population Served: 792
Drinking Water System Source: Surface Water

GRIDLEY GRILL & CRAB SHACK
Public Water System Population Served: 750
Drinking Water System Source: Ground Water

PLEASANT VALLEY BAPTIST CHURCH
Public Water System Population Served: 600
Drinking Water System Source: Ground Water

DWR-MONUMENT HILL RESTROOMS
Public Water System Population Served: 593
Drinking Water System Source: Ground Water

DEL ORO WATER CO.-STIRLING BLUFFS
Public Water System Population Served: 514
Drinking Water System Source: Surface Water

CHICO EASTSIDE LITTLE LEAGUE
Public Water System Population Served: 500
Drinking Water System Source: Ground Water

FARM LABOR HOUSING
Public Water System Population Served: 460
Drinking Water System Source: Ground Water

DINGERVILLE USA PARK
Public Water System Population Served: 447
Drinking Water System Source: Ground Water

BUTTE CREEK ESTATES MUTUAL WATER CO
Public Water System Population Served: 399
Drinking Water System Source: Ground Water

PLEASANT GROVE MHP
Public Water System Population Served: 327
Drinking Water System Source: Ground Water

BIDWELL PARK GOLF COURSE
Public Water System Population Served: 325
Drinking Water System Source: Ground Water

DEL ORO WATER CO.-MAGALIA
Public Water System Population Served: 297
Drinking Water System Source: Ground Water

LAKE MADRONE WATER DISTRICT
Public Water System Population Served: 297
Drinking Water System Source: Ground Water

MANZANITA ELEMENTARY SCHOOL
Public Water System Population Served: 295
Drinking Water System Source: Ground Water

GOLDEN FEATHER MHP
Public Water System Population Served: 275
Drinking Water System Source: Ground Water

ALMOND GROVE MOBILE PARK
Public Water System Population Served: 250
Drinking Water System Source: Ground Water

LUNDBERG RICE PRODUCTS
Public Water System Population Served: 240
Drinking Water System Source: Ground Water

MOUNTAIN VIEW MHC LLC
Public Water System Population Served: 230
Drinking Water System Source: Ground Water

GRAN MUTUAL WATER CO
Public Water System Population Served: 200
Drinking Water System Source: Ground Water

SILVER DOLLAR FAIRGROUNDS
Public Water System Population Served: 195
Drinking Water System Source: Ground Water

FOOTHILL SOLAR COMPANY
Public Water System Population Served: 180
Drinking Water System Source: Ground Water

KEEFER CREEK ESTATES
Public Water System Population Served: 160
Drinking Water System Source: Ground Water

LIBERTY 1ST WARD MEETING HOUSE
Public Water System Population Served: 151
Drinking Water System Source: Ground Water

YOUTH WITH A MISSION-SPRINGS OF LIVING W
Public Water System Population Served: 150
Drinking Water System Source: Ground Water

BOY SCOUTS OF AMERICA-CAMP LASSEN
Public Water System Population Served: 150
Drinking Water System Source: Ground Water

PARADISE ADVENTIST CHURCH
Public Water System Population Served: 150
Drinking Water System Source: Ground Water

FOREST RANCH CHARTER SCHOOL
Public Water System Population Served: 146
Drinking Water System Source: Ground Water

RIVER REFLECTIONS RV & CAMPGROUND
Public Water System Population Served: 125
Drinking Water System Source: Ground Water

SIERRA MOON WATER COMPANY
Public Water System Population Served: 120
Drinking Water System Source: Ground Water

FEDEX GROUND
Public Water System Population Served: 120
Drinking Water System Source: Ground Water

CONCOW ELEMENTARY SCHOOL
Public Water System Population Served: 115
Drinking Water System Source: Ground Water

PSEA CAMP - DESABLA
Public Water System Population Served: 108
Drinking Water System Source: Ground Water

DURHAM DAYTON INDUSTRIAL PARTNERS-PRO PA
Public Water System Population Served: 102
Drinking Water System Source: Ground Water

MERRY MOUNTAIN MUTUAL
Public Water System Population Served: 100
Drinking Water System Source: Ground Water

DOWN RANGE INDOOR TRAINING CENTER
Public Water System Population Served: 100
Drinking Water System Source: Ground Water

DAUTERMAN WELL
Public Water System Population Served: 100
Drinking Water System Source: Ground Water

DEL ORO WATER COMPANY - BUZZTAIL DIST.
Public Water System Population Served: 99
Drinking Water System Source: Ground Water

BERRY CREEK SCHOOL
Public Water System Population Served: 95
Drinking Water System Source: Ground Water

FOREST RANCH MUTUAL WATER SYSTEM
Public Water System Population Served: 92
Drinking Water System Source: Ground Water

SFWP - SLY CREEK CAMPGROUND
Public Water System Population Served: 85
Drinking Water System Source: Ground Water

SMUCKER NATURAL FOODS
Public Water System Population Served: 85
Drinking Water System Source: Ground Water

BAMBI INN
Public Water System Population Served: 80
Drinking Water System Source: Ground Water

BERRY CREEK COMMUNITY SERVICE DIST
Public Water System Population Served: 77
Drinking Water System Source: Ground Water

HUMBOLDT WOODLANDS MUTUAL
Public Water System Population Served: 75
Drinking Water System Source: Ground Water

SFWP - STRAWBERRY CAMPROUND
Public Water System Population Served: 75
Drinking Water System Source: Ground Water

OROVILLE MOBILE HOME PARK
Public Water System Population Served: 74
Drinking Water System Source: Ground Water

SFWP-BANGOR
Public Water System Population Served: 73
Drinking Water System Source: Surface Water

SPRING VALLEY SCHOOL
Public Water System Population Served: 70
Drinking Water System Source: Ground Water

NORD COUNTRY SCHOOL
Public Water System Population Served: 66
Drinking Water System Source: Ground Water

RICHVALE ELEMENTARY SCHOOL
Public Water System Population Served: 63
Drinking Water System Source: Ground Water

FALLING ROCK RV PARK
Public Water System Population Served: 52
Drinking Water System Source: Ground Water

FRANCIS PROPERTY MANAGEMENT
Public Water System Population Served: 51
Drinking Water System Source: Ground Water

BLUE OAK TERRACE MUTUAL
Public Water System Population Served: 50
Drinking Water System Source: Ground Water

HUMBOLDT HIGHLANDS MUTUAL
Public Water System Population Served: 50
Drinking Water System Source: Ground Water

MEADOWBROOK OAKS
Public Water System Population Served: 50
Drinking Water System Source: Ground Water

DURHAM PARK
Public Water System Population Served: 50
Drinking Water System Source: Ground Water

WILD GOOSE DUCK CLUB
Public Water System Population Served: 50
Drinking Water System Source: Ground Water

G & J PROPERTIES
Public Water System Population Served: 50
Drinking Water System Source: Ground Water

COHASSET INDUSTRIAL PARK
Public Water System Population Served: 47
Drinking Water System Source: Ground Water

FOREST KNOLLS MUTUAL WATER CO
Public Water System Population Served: 46
Drinking Water System Source: Ground Water

SUNSET MOULDING CHICO
Public Water System Population Served: 45
Drinking Water System Source: Ground Water

MOUNTAIN VILLAGE HOMEOWNER'S ASSOC
Public Water System Population Served: 40
Drinking Water System Source: Ground Water

CRAIN PARK WATER SYSTEM
Public Water System Population Served: 40
Drinking Water System Source: Ground Water

PG&E: PHILBROOK DAM
Public Water System Population Served: 40
Drinking Water System Source: Ground Water

LLANO SECO RANCHO
Public Water System Population Served: 40
Drinking Water System Source: Ground Water

FEATHER RIDGE ESTATES WATER CO
Public Water System Population Served: 37
Drinking Water System Source: Ground Water

FEDEX FREIGHT, INC. CHI
Public Water System Population Served: 37
Drinking Water System Source: Ground Water

FOREST VILLAGE LLC
Public Water System Population Served: 34
Drinking Water System Source: Ground Water

GOLDEN OAKS MOBILE ESTATES
Public Water System Population Served: 34
Drinking Water System Source: Ground Water

HARTLEY MUTUAL WATER SYSTEM
Public Water System Population Served: 31
Drinking Water System Source: Ground Water

BUTTE MEADOWS CAMP
Public Water System Population Served: 30
Drinking Water System Source: Ground Water

CHERRY HILL CAMPGROUND
Public Water System Population Served: 30
Drinking Water System Source: Ground Water

SIERRA NEVADA BREWING CO.
Public Water System Population Served: 30
Drinking Water System Source: Ground Water

RIVER ONE RV PARK
Public Water System Population Served: 26
Drinking Water System Source: Ground Water

BIGGERS GLEN MUTUAL WATER CO
Public Water System Population Served: 25
Drinking Water System Source: Ground Water

FOREST RANCH MOBILE PARK
Public Water System Population Served: 25
Drinking Water System Source: Ground Water

CHICO ROD & GUN CLUB
Public Water System Population Served: 25
Drinking Water System Source: Ground Water

EATHER RIVER SCHOOL
Public Water System Population Served: 25
Drinking Water System Source: Ground Water

HONCUT ELEMENTARY SCHOOL
Public Water System Population Served: 25
Drinking Water System Source: Ground Water

PG&E - TABLE MOUNTAIN
Public Water System Population Served: 25
Drinking Water System Source: Ground Water

ROBINSON'S CORNER MHP
Public Water System Population Served: 20
Drinking Water System Source: Ground Water

L. C. HUNTING CLUB
Public Water System Population Served: 10
Drinking Water System Source: Ground Water

Appendix F

U.S. EPA Drinking Water Regulations

National Primary Drinking Water Regulations

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
Acrylamide	TT[4]	Nervous system or blood problems; increased risk of cancer	Added to water during sewage/ wastewater treatment	zero
Alachlor	0.002	Eye, liver, kidney, or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops	zero
Alpha/photon emitters	15 picocuries per Liter (pCi/L)	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation	zero
Antimony	0.006	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	0.006
Arsenic	0.010	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer	Erosion of natural deposits; runoff from orchards; runoff from glass & electronics production wastes	0
Asbestos (fibers >10 micrometers)	7 million fibers per Liter (MFL)	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits	7 MFL
Atrazine	0.003	Cardiovascular system or reproductive problems	Runoff from herbicide used on row crops	0.003
Barium	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	2
Benzene	0.005	Anemia; decrease in blood platelets; increased risk of cancer	Discharge from factories; leaching from gas storage tanks and landfills	zero
Benzo(a)pyrene (PAHs)	0.0002	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines	zero
Beryllium	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries	0.004
Beta photon emitters	4 millirems per year	Increased risk of cancer	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit forms of radiation known as photons and beta radiation	zero
Bromate	0.010	Increased risk of cancer	Byproduct of drinking water disinfection	zero
Cadmium	0.005	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints	0.005
Carbofuran	0.04	Problems with blood, nervous system, or reproductive system	Leaching of soil fumigant used on rice and alfalfa	0.04

LEGEND

DISINFECTANT | DISINFECTION BYPRODUCT | INORGANIC CHEMICAL | MICROORGANISM | ORGANIC CHEMICAL | RADIONUCLIDES

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
Carbon tetrachloride	0.005	Liver problems; increased risk of cancer	Discharge from chemical plants and other industrial activities	**zero**
Chloramines (as Cl_2)	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort; anemia	Water additive used to control microbes	**MRDLG=4[1]**
Chlordane	0.002	Liver or nervous system problems; increased risk of cancer	Residue of banned termiticide	**zero**
Chlorine (as Cl_2)	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort	Water additive used to control microbes	**MRDLG=4[1]**
Chlorine dioxide (as ClO_2)	MRDL=0.8[1]	Anemia; infants, young children, and fetuses of pregnant women: nervous system effects	Water additive used to control microbes	**MRDLG=0.8[1]**
Chlorite	1.0	Anemia; infants, young children, and fetuses of pregnant women: nervous system effects	Byproduct of drinking water disinfection	**0.8**
Chlorobenzene	0.1	Liver or kidney problems	Discharge from chemical and agricultural chemical factories	**0.1**
Chromium (total)	0.1	Allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits	**0.1**
Copper	TT[5]; Action Level=1.3	Short-term exposure: Gastrointestinal distress. Long-term exposure: Liver or kidney damage. People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level	Corrosion of household plumbing systems; erosion of natural deposits	**1.3**
Cryptosporidium	TT[7]	Short-term exposure: Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	**zero**
Cyanide (as free cyanide)	0.2	Nerve damage or thyroid problems	Discharge from steel/metal factories; discharge from plastic and fertilizer factories	**0.2**
2,4-D	0.07	Kidney, liver, or adrenal gland problems	Runoff from herbicide used on row crops	**0.07**
Dalapon	0.2	Minor kidney changes	Runoff from herbicide used on rights of way	**0.2**
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	Reproductive difficulties; increased risk of cancer	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards	**zero**
o-Dichlorobenzene	0.6	Liver, kidney, or circulatory system problems	Discharge from industrial chemical factories	**0.6**
p-Dichlorobenzene	0.075	Anemia; liver, kidney, or spleen damage; changes in blood	Discharge from industrial chemical factories	**0.075**
1,2-Dichloroethane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	**zero**

LEGEND DISINFECTANT | DISINFECTION BYPRODUCT | INORGANIC CHEMICAL | MICROORGANISM | ORGANIC CHEMICAL | RADIONUCLIDES

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
1,1-Dichloroethylene	0.007	Liver problems	Discharge from industrial chemical factories	**0.007**
cis-1,2-Dichloroethylene	0.07	Liver problems	Discharge from industrial chemical factories	**0.07**
trans-1,2, Dichloroethylene	0.1	Liver problems	Discharge from industrial chemical factories	**0.1**
Dichloromethane	0.005	Liver problems; increased risk of cancer	Discharge from industrial chemical factories	**zero**
1,2-Dichloropropane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	**zero**
Di(2-ethylhexyl) adipate	0.4	Weight loss, liver problems, or possible reproductive difficulties	Discharge from chemical factories	**0.4**
Di(2-ethylhexyl) phthalate	0.006	Reproductive difficulties; liver problems; increased risk of cancer	Discharge from rubber and chemical factories	**zero**
Dinoseb	0.007	Reproductive difficulties	Runoff from herbicide used on soybeans and vegetables	**0.007**
Dioxin (2,3,7,8-TCDD)	0.00000003	Reproductive difficulties; increased risk of cancer	Emissions from waste incineration and other combustion; discharge from chemical factories	**zero**
Diquat	0.02	Cataracts	Runoff from herbicide use	**0.02**
Endothall	0.1	Stomach and intestinal problems	Runoff from herbicide use	**0.1**
Endrin	0.002	Liver problems	Residue of banned insecticide	**0.002**
Epichlorohydrin	TT[4]	Increased cancer risk; stomach problems	Discharge from industrial chemical factories; an impurity of some water treatment chemicals	**zero**
Ethylbenzene	0.7	Liver or kidney problems	Discharge from petroleum refineries	**0.7**
Ethylene dibromide	0.00005	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer	Discharge from petroleum refineries	**zero**
Fecal coliform and *E. coli*	MCL[6]	Fecal coliforms and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes may cause short term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.	Human and animal fecal waste	**zero[6]**

LEGEND DISINFECTANT | DISINFECTION BYPRODUCT | INORGANIC CHEMICAL | MICROORGANISM | ORGANIC CHEMICAL | RADIONUCLIDES

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
Fluoride	4.0	Bone disease (pain and tenderness of the bones); children may get mottled teeth	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories	**4.0**
Giardia lamblia	TT[7]	Short-term exposure: Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	**zero**
Glyphosate	0.7	Kidney problems; reproductive difficulties	Runoff from herbicide use	**0.7**
Haloacetic acids (HAA5)	0.060	Increased risk of cancer	Byproduct of drinking water disinfection	**n/a[9]**
Heptachlor	0.0004	Liver damage; increased risk of cancer	Residue of banned termiticide	**zero**
Heptachlor epoxide	0.0002	Liver damage; increased risk of cancer	Breakdown of heptachlor	**zero**
Heterotrophic plate count (HPC)	TT[7]	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is.	HPC measures a range of bacteria that are naturally present in the environment	**n/a**
Hexachlorobenzene	0.001	Liver or kidney problems; reproductive difficulties; increased risk of cancer	Discharge from metal refineries and agricultural chemical factories	**zero**
Hexachloro-cyclopentadiene	0.05	Kidney or stomach problems	Discharge from chemical factories	**0.05**
Lead	TT[5]; Action Level=0.015	Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities; Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits	**zero**
Legionella	TT[7]	Legionnaire's Disease, a type of pneumonia	Found naturally in water; multiplies in heating systems	**zero**
Lindane	0.0002	Liver or kidney problems	Runoff/leaching from insecticide used on cattle, lumber, and gardens	**0.0002**
Mercury (inorganic)	0.002	Kidney damage	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands	**0.002**
Methoxychlor	0.04	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, and livestock	**0.04**
Nitrate (measured as Nitrogen)	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	**10**

LEGEND DISINFECTANT | DISINFECTION BYPRODUCT | INORGANIC CHEMICAL | MICROORGANISM | ORGANIC CHEMICAL | RADIONUCLIDES

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
Nitrite (measured as Nitrogen)	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	1
Oxamyl (Vydate)	0.2	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes	0.2
Pentachlorophenol	0.001	Liver or kidney problems; increased cancer risk	Discharge from wood-preserving factories	zero
Picloram	0.5	Liver problems	Herbicide runoff	0.5
Polychlorinated biphenyls (PCBs)	0.0005	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer	Runoff from landfills; discharge of waste chemicals	zero
Radium 226 and Radium 228 (combined)	5 pCi/L	Increased risk of cancer	Erosion of natural deposits	zero
Selenium	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines	0.05
Simazine	0.004	Problems with blood	Herbicide runoff	0.004
Styrene	0.1	Liver, kidney, or circulatory system problems	Discharge from rubber and plastic factories; leaching from landfills	0.1
Tetrachloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from factories and dry cleaners	zero
Thallium	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories	0.0005
Toluene	1	Nervous system, kidney, or liver problems	Discharge from petroleum factories	1
Total Coliforms	5.0 percent[8]	Coliforms are bacteria that indicate that other, potentially harmful bacteria may be present. See fecal coliforms and *E. coli*	Naturally present in the environment	zero
Total Trihalomethanes (TTHMs)	0.080	Liver, kidney, or central nervous system problems; increased risk of cancer	Byproduct of drinking water disinfection	n/a[9]
Toxaphene	0.003	Kidney, liver, or thyroid problems; increased risk of cancer	Runoff/leaching from insecticide used on cotton and cattle	zero
2,4,5-TP (Silvex)	0.05	Liver problems	Residue of banned herbicide	0.05
1,2,4-Trichlorobenzene	0.07	Changes in adrenal glands	Discharge from textile finishing factories	0.07

LEGEND DISINFECTANT | DISINFECTION BYPRODUCT | INORGANIC CHEMICAL | MICROORGANISM | ORGANIC CHEMICAL | RADIONUCLIDES

Contaminant	MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
1,1,1-Trichloroethane	0.2	Liver, nervous system, or circulatory problems	Discharge from metal degreasing sites and other factories	**0.2**
1,1,2-Trichloroethane	0.005	Liver, kidney, or immune system problems	Discharge from industrial chemical factories	**0.003**
Trichloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from metal degreasing sites and other factories	**zero**
Turbidity	TT[7]	Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness (e.g., whether disease-causing organisms are present). Higher turbidity levels are often associated with higher levels of disease-causing microorganisms such as viruses, parasites, and some bacteria. These organisms can cause short term symptoms such as nausea, cramps, diarrhea, and associated headaches.	Soil runoff	**n/a**
Uranium	30µg/L	Increased risk of cancer, kidney toxicity	Erosion of natural deposits	**zero**
Vinyl chloride	0.002	Increased risk of cancer	Leaching from PVC pipes; discharge from plastic factories	**zero**
Viruses (enteric)	TT[7]	Short-term exposure: Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	**zero**
Xylenes (total)	10	Nervous system damage	Discharge from petroleum factories; discharge from chemical factories	**10**

LEGEND DISINFECTANT | DISINFECTION BYPRODUCT | INORGANIC CHEMICAL | MICROORGANISM | ORGANIC CHEMICAL | RADIONUCLIDES

NOTES

1 Definitions
- **Maximum Contaminant Level Goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.
- **Maximum Contaminant Level (MCL):** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.
- **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.
- **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.
- **Treatment Technique (TT):** A required process intended to reduce the level of a contaminant in drinking water.

2 Units are in milligrams per liter (mg/L) unless otherwise noted. Milligrams per liter are equivalent to parts per million (ppm).

3 Health effects are from long-term exposure unless specified as short-term exposure.

4 Each water system must certify annually, in writing, to the state (using third-party or manufacturers certification) that when it uses acrylamide and/or epichlorohydrin to treat water, the combination (or product) of dose and monomer level does not exceed the levels specified, as follows: Acrylamide = 0.05 percent dosed at 1 mg/L (or equivalent); Epichlorohydrin = 0.01 percent dosed at 20 mg/L (or equivalent).

5 Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10 percent of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.

6 A routine sample that is fecal coliform-positive or E. coli-positive triggers repeat samples--if any repeat sample is total coliform-positive, the system has an acute MCL violation. A routine sample that is total coliform-positive and fecal coliform-negative or E. coli-negative triggers repeat samples--if any repeat sample is fecal coliform-positive or E. coli-positive, the system has an acute MCL violation. See also Total Coliforms.

7 EPA's surface water treatment rules require systems using surface water or ground water under the direct influence of surface water to (1) disinfect their water, and (2) filter their water or meet criteria for avoiding filtration so that the following contaminants are controlled at the following levels:
- required ***Cryptosporidium*:** 99 percent removal for systems that filter. Unfiltered systems are to include Cryptosporidium in their existing watershed control provisions.
- **Giardia lamblia:** 99.9 percent removal/inactivation
- **Viruses:** 99.9 percent removal/inactivation
- ***Legionella*:** No limit, but EPA believes that if *Giardia* and viruses are removed/inactivated, according to the treatment techniques in the surface water treatment rule, *Legionella* will also be controlled.
- **Turbidity:** For systems that use conventional or direct filtration, at no time can turbidity (cloudiness of water) go higher than 1 nephelometric turbidity unit (NTU), and samples for turbidity must be less than or equal to 0.3 NTU in at least 95 percent of the samples in any month. Systems that use filtration other than the conventional or direct filtration must follow state limits, which must include turbidity at no time exceeding 5 NTU.
- **HPC:** No more than 500 bacterial colonies per milliliter
- **Long Term 1 Enhanced Surface Water Treatment:** Surface water systems or ground water systems under the direct influence of surface water serving fewer than 10,000 people must comply with the applicable Long Term 1 Enhanced Surface Water Treatment Rule provisions (e.g. turbidity standards, individual filter monitoring, *Cryptosporidium* removal requirements, updated watershed control requirements for unfiltered systems).
- **Long Term 2 Enhanced Surface Water Treatment:** This rule applies to all surface water systems or ground water systems under the direct influence of surface water. The rule targets additional *Cryptosporidium* treatment requirements for higher risk systems and includes provisions to reduce risks from uncovered finished water storages facilities and to ensure that the systems maintain microbial protection as they take steps to reduce the formation of disinfection byproducts. (Monitoring start dates are staggered by system size. The largest systems (serving at least 100,000 people) will begin monitoring in October 2006 and the smallest systems (serving fewer than 10,000 people) will not begin monitoring until October 2008. After completing monitoring and determining their treatment bin, systems generally have three years to comply with any additional treatment requirements.)
- **Filter Backwash Recycling:** The Filter Backwash Recycling Rule requires systems that recycle to return specific recycle flows through all processes of the system's existing conventional or direct filtration system or at an alternate location approved by the state.

8 No more than 5.0 percent samples total coliform-positive in a month. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive per month.) Every sample that has total coliform must be analyzed for either fecal coliforms or E. coli. If two consecutive TC-positive samples, and one is also positive for E. coli or fecal coliforms, system has an acute MCL violation.

9 Although there is no collective MCLG for this contaminant group, there are individual MCLGs for some of the individual contaminants:
- **Haloacetic acids:** dichloroacetic acid (zero); trichloroacetic acid (0.3 mg/L)
- **Trihalomethanes:** bromodichloromethane (zero); bromoform (zero); dibromochloromethane (0.06 mg/L)

NATIONAL SECONDARY DRINKING WATER REGULATION

National Secondary Drinking Water Regulations are non-enforceable guidelines regarding contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, some states may choose to adopt them as enforceable standards.

Contaminant	Secondary Maximum Contaminant Level
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	Noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids	500 mg/L
Zinc	5 mg/L

FOR MORE INFORMATION ON EPA'S SAFE DRINKING WATER:

visit: **epa.gov/safewater**

call: **(800) 426-4791**

ADDITIONAL INFORMATION:

To order additional posters or other ground water and drinking water publications, please contact the National Service Center for Environmental Publications at: **(800) 490-9198**, or email: **nscep@bps-lmit.com**.

Appendix G

Wastewater Regulations

October 2022

Appendix G: Wastewater Regulations

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REGULATIONS FOR WASTEWATER SYSTEMS

Both state and federal regulatory authority exists for the control of water quality in surface waters of California. Under the Clean Water Act (CWA), the Environmental Protection Agency (EPA) regulates municipal and industrial effluent discharges to navigable waters through the issuance of National Pollutant Discharge Elimination System (NPDES) permits. The basic approach used in both state and federal processes is 1) to designate beneficial uses to be protected, 2) to set water quality objectives that are protective of the most sensitive uses, and 3) to control municipal, industrial, and other sources to meet these objectives.

Federal Wastewater Treatment Regulations

Clean Water Act

The Clean Water Act (33 U.S.C. § 1251 et seq.) is the federal law that governs and authorizes water quality control activities by the EPA. Pursuant to federal law, the EPA has published water quality regulations under Volume 40 of the Code of Federal Regulations (40 CFR). The CWA regulates water pollution through two different and supplementary approaches:

- Water quality and technology-based standards; and
- Section 303 of the CWA requires states to adopt water quality standards for all surface waters of the United States.

The two approaches to regulating water pollution are implemented through discharge permits, which contain mass or concentration-based effluent limits for the pollutants in the permittee's wastewater. These approaches are applied to pollutant dischargers through the implementation of the national wastewater discharge permitting program set up under the CWA. The CWA established national goals to eliminate pollutant discharges to navigable waters and to assure that all navigable waters would be fishable and swimmable.

National Pollutant Discharge Elimination System (NPDES)

The NPDES permit system was established under section 402 of the CWA 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 has been issued, which allows that discharge. Each NPDES permit contains limits on allowable concentrations and/or mass emissions of pollutants contained in the discharge. Under the NPDES program, dischargers are required to monitor and provide reports on compliance with their permit limits. These reports, formally titled Discharge Monitoring Reports (DMRs), are submitted to the appropriate regulatory agency, and they describe water quality data and analysis. The regulatory agency or any interested citizen can review this data to determine whether or not the discharger has complied with its NPDES permit requirements and, if appropriate, pursue action to enforce compliance.

Stormwater: Areas within Butte County are subject to the NPDES stormwater permit regulations and are subject to the Municipal Regional Stormwater NPDES Permit, Phase II Small Municipal Separate Storm Sewer System (MS4) General Permit (Order No. 2013-0001-DWQ). This Permit regulates the discharge of stormwater runoff from the municipal separate storm sewer systems ("MS4s") and other designated stormwater discharges from municipalities and flood management agencies throughout Butte County. The purpose of the stormwater permitting program is to prevent pollution in local waterways. Stormwater can adversely impact avian, aquatic, and plant life in receiving waters and can cause serious human health impacts. For example, high mercury

levels can make regular consumption of fish unsafe. Urban stormwater runoff is one of the largest sources of pollution in the USA. Additional details on Butte County's stormwater management can be found on their website at <*https://www.buttecounty.net/publicworks/Services/Stormwater-Program/Stormwater_Program_Butte* >.

Enforcement of NPDES guidelines and permits in the western portion of Butte County falls within the jurisdiction of the Central Valley Regional Water Quality Control Board (CV RWQCB) and is subject to review by the EPA Regional Administrator [EPA Pacific Southwest (Region 9)]. In addition, the RWQCB regulates activities involving discharges to land or groundwater from diffused sources. A Report of Waste Discharge must be filed with the Central Valley RWQCB to obtain a Waste Discharge Requirement (WDR) for these types of non-surface water discharge.

Congress amended the CWA in 1987 to include non-point source pollutants. Non-point source pollutants are often chemicals from lawns or gardens, automobile residues, urban runoff, or household cleaning agents or compounds. Non-point source pollution can also include runoff from agricultural uses. Most non-point source pollutants enter the wastewater stream and the water supply in large quantities and sudden surges, largely due to storm events. Although the EPA has established NPDES requirements for stormwater, control of this type of pollution has proven to be difficult and could require upgrades to existing wastewater treatment plants. In November 2020, the State Water Resources Control Board submitted its 2020-2025 Nonpoint Source Implementation Plan, which was subsequently approved by the EPA. The Implementation Plan identifies a set of targeted performance measures and describes NPS Program activities from 2020 through 2025. The Regional Water Quality Control Boards is working with local agencies to implement the Nonpoint Source Program. These regulations may further affect the wastewater agencies in Butte County, especially those with high storm water infiltration rates.[1]

Section 303(d) Impaired Waters List and TMDLs

Under Section 303(d) of the CWA, states are required to develop lists of water bodies which will not attain water quality objectives after implementation of required levels of treatment by point source dischargers (municipalities and industries) (40 C.F.R. §130.7(b)(4)). For example, the EPA and RWQCB have placed a few water bodies located in Butte County on the 303(d) list including:

the Feather River, Lower (Lake Oroville Dam to Confluence with Sacramento River). This section of the Feather River, Lower, identified as State Waterbody ID: CAR5192200019980817161057, is impaired for several specific uses, including cold freshwater habitat, commercial and sport fishing, municipal and domestic supply, spawning, reproduction, and/or early development, warm freshwater habitat, and wildlife habitat as described in Appendix D. Activities within Butte County that have been identified to contribute to water quality degradation include grading and other construction activities, agricultural uses, confined animals, urban runoff, sewage and other wastewater from treatment plants, industrial sources, and recreation. See Central Valley RWQCB website at:
<*https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/#impaired* > for additional details.

[1] State Water Resources Control Board. Nonpoint Source Pollution (NPS) Control Program. www.waterboards.ca.gov/water_issues/programs/nps.

National Toxics Rule

The EPA established the National Toxics Rules (NTR) to create numeric criteria for priority toxic pollutants for California and 13 other states and territories that were not in complete compliance with the CWA. For California, the NTR established water quality standards for protection of aquatic life and/or human health for 36 pollutants for which water quality criteria exist, but which were not covered under California's statewide water quality regulations.

California Toxics Rule

The Clean Water Act (33 U.S.C. § 1251 et seq.) is the federal law that governs and authorizes water quality control activities by the EPA. Pursuant to federal law, the EPA has the NTR. There are 126 constituents listed in the California Toxics Rule (CTR) criteria, which include the previously issued NTR criteria for California. Some of the key elements of the CTR include:

- Amended numeric standards for 30 toxic pollutants and added new criteria for 8 toxic pollutants to protect aquatic life and human health uses for water bodies.
- Dissolved-based standards for most trace metals and endorsement of the use of translator mechanisms for determination of local metals objectives.
- Provisions for compliance schedules to provide time for permittees to meet the new toxics standards.
- Provisions for mixing zones when calculating toxic constituent effluent limitations.
- Use of interim effluent limits to provide time for dischargers to take actions to meet final limits.

The EPA promulgated numeric water quality criteria for priority toxic pollutants and other water quality standards for waters in the State of California pursuant to section 303(c)(2)(B) of the CWA if those pollutants could be reasonably expected to interfere with the designated uses of states' waters. Although California had adopted numeric criteria for priority toxic pollutants in 1992, the courts ordered California to rescind these water quality control plans in 1994 and the new water quality criteria rule, known as the California Toxics Rule (CTR), temporarily replaced the standards adopted in 1991. The CTR established:

- Ambient aquatic life criteria for 23 priority toxics;
- Ambient human health criteria for 57 priority toxics; and
- Compliance schedule provision.

Under the CTR, various regional water quality control boards will issue compliance schedules for new or revised NPDES permit limits based on the federal criteria when certain conditions are met. Currently, each basin plan, as prepared by the regional water quality control board, contains a water quality criterion that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This has been contested by local jurisdictions all over California since it is expected to add significantly to the cost of wastewater treatment.

EPA contends that since California is implementing EPA's current regulations, the CTR will not impose any incremental costs and that the water quality criterion does not directly create economic impacts. EPA staff notes that California has some discretion to develop mechanisms that could result in more flexibility for local areas (e.g., site-specific criteria, phased TMDL program).

For Butte County, the Central Valley RWQCB does not require a separate and specific CTR permit. RWQCB determined that three years of CTR monitoring data did not measure CTR pollutants in concentrations that resulted in receiving water violations, thus Board eliminated the CTR priority pollutant monitoring requirement. The wastewater agencies that discharge to surface waters were required to complete a number (depending on whether discharger is major or minor, municipal or industrial) of rounds of sampling under the CTR.

California Wastewater Treatment Regulations

CA Water Code

The California Water Code is the principal state regulation governing the use of water resources within the State of California. This law controls, among other issues, water quality protection and management and management of water-oriented agencies. Division 7 of the California Water Code, commonly referred to as the Porter-Cologne Act, is the principal mechanism for the regulation of water quality and pollution issues within California. This act established a regulatory program to protect the water quality and beneficial uses of all state waters. The Porter-Cologne Act also established the State Water Resources Control Board and California Regional Water Quality Control Boards (RWQCB) as principal state agencies responsible for water quality control. The SWRCB has divided California into nine regions, with Butte County located in the Central Valley RWQCB, Region 5.

The Porter-Cologne Act grants the SWRCB and regional offices broad powers to protect water quality and is the primary vehicle for implementation of California's responsibilities under the federal CWA. These broad powers include the authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites, and to require cleanup of hazardous materials and other pollutants. The Porter-Cologne Act also includes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil/petroleum product.

The Central Valley RWQCB, as with all other regional boards, must formulate and adopt a water quality plan for its region, which must conform to the Porter-Cologne Act. The Porter-Cologne Act also provides that a regional office, such as the Central Valley RWQCB, may include within its regional plan water discharge prohibitions applicable to local conditions, areas, and types of waste. The regional offices are also authorized to enforce discharge limitations, take actions to prevent violations, and conduct investigations about the quality of any of the waters of the State. Civil and criminal penalties are applicable to persons who violate the requirements of the Porter-Cologne Act or SWRCB/RWQCB orders.

The Porter-Cologne Act also requires dischargers of fill and dredged material to all waters of the State be regulated. Additional protections are provided for wetlands, special aquatic sites, and headwaters because these waterbodies have high resource value, are vulnerable to filling, and are not protected by other programs. The Central Valley RWQCB CWA Section 401 program is involved with the protection of special-status species and the regulation of hydromodification impacts. The RWQCB encourages watershed-level analysis and protection because some

functions of wetlands, riparian areas, and headwater streams–including pollutant removal, flood water retention, and habitat connectivity–are expressed at the watershed or landscape level. (Central Valley RWQCB, 2019).

Other state agencies with jurisdiction or involvement in water quality regulation in California include the Department of Public Health (DPH) for drinking water regulations and water reclamation criteria, the Department of Pesticide Regulation, the Department of Fish and Game, and the Office of Environmental Health and Hazard Assessment.

Assembly Bill 885

Legislation (AB 885 by Hannah-Beth Jackson) passed in 2000 requires SWRCB to adopt regulations for the permitting and operation of septic systems. The law establishes a process for developing statewide performance standards for on-site wastewater treatment systems (OWTS) (aka septic tanks). Furthermore, the bill directs the SWRCB to adopt regulations or standards for on-site septic systems by 2004 to consider minimum operating requirements, including construction, siting, and performance requirements. The SWRCB also has specific requirements for OWTS adjacent to impaired waters. These standards apply to newly constructed systems, replaced, pooling to the surface, or can impair public health and safety.

In 2018, the SWRCB adopted Resolution No. 2018–0019, which amends the Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (OWTS). This resolution amends resolution 2012–0032, adopted in 2012, authorizes subsurface disposal of domestic wastewater, and establishes minimum requirements for the permitting, monitoring, and operation of OWTS for protecting beneficial uses of waters of the State. Butte County Environmental Health is the local permitting authority that ensures compliance with all applicable State and local regulatory requirements for the installation and repair of OWTS. Butte County has adopted a Wastewater Ordinance as described on their website at: <*https://www.buttecounty.net/publichealth/Environmental-Health/LandUse_Wastewater/WastewaterProgram*>.

Statewide General Waste Discharge Requirements

A consistent, statewide regulatory approach to address sanitary sewer overflows (SSOs) is provided by the SWRCB's adopted Statewide General Waste Discharge Requirements (WDRs) for Sanitary Sewer Systems (SSS), Water Quality Order No. 2006–0003 (Sanitary Sewer Systems WDR) in 2006. The Sanitary Sewer Systems WDR requires public agencies that own or operate sanitary sewer systems to develop and implement Sewer System Management Plans and report all SSOs to the State Water Board's online SSO database. The SSO database was queried for each wastewater service provider studied in this MSR. Oroville Area wastewater service providers have completed their Sewer System Management Plans as described in this MSR.

California Storm Drainage & Flood Control Regulations

Section 10561 of the Water Code addresses runoff recapture and requires that State and local agencies regulating stormwater diversion systems to identify opportunities for capturing that runoff -- including summer season runoff -- for some form of reuse.

Local Wastewater Regulations

Butte County has policies and procedures consistent with the Central Valley RWQCB recommendation for connection to a public wastewater system in urbanized areas. Specifically, in relation to new development in the unincorporated area, the County implements its Improvement Standards that provide minimum standards applied to all site improvements, private and public works, as well as improvements to be installed within existing rights-of-way and easements. The County's Improvement Standards, originally approved in 2006 and updated in 2020, describe standards for connection to public sewer systems such that:

> When a subdivision is located within a reasonable distance of an existing, operating, and available public or community sewage system, and it is practical and feasible to sewer the proposed subdivision by connecting to said system, the subdivider shall be required to sewer the proposed subdivision to said system. Sewer mains, lift stations, and other related facilities located within the subdivision and/or necessary to connect said subdivision to the public or community system shall be designed and installed in accordance with the standards of the governing board of the public or community sewer system. All such facilities shall be operated and maintained by the public or community sewer entity unless a separate public entity is established for that purpose. No final map shall be approved until the required facilities are installed and accepted by the public entity or until the public entity advises the Board of Supervisors in writing it holds a bond adequate to insure the installation of required facilities. If it is NOT practicable and feasible to sewer a subdivision by connecting to an existing public or community sewer system, or if such system is unable to provide the subdivision with sewer service, the subdivider may provide for sewer service by the development of a community sewer system with treatment and disposal facilities. When a subdivider proposes to develop such a community sewer system, he must:
>
> a. Provide for the establishment of a public entity empowered and adequate to maintain and operate the system.
> b. Obtain discharge requirements from the Regional Water Quality Control Board. (Source: Butte County, 2006, as updated 2020).

Butte County's On-Site Wastewater Systems Ordinance was adopted by the Board of Supervisors on March 10, 2010, and became effective May 12, 2016. This Ordinance is incorporated into the Butte County Code as Chapter 19, and it requires that an Onsite Wastewater Treatment Systems (OWTS) receiving a projected flow over 10,000 gallons per day be referred to California Regional Water Quality Control Board (RWQCB), Central Valley Region for waste discharge requirements (Butte County, 2016).

As described in Chapters 2 to 7 of this MSR, wastewater service providers have requirements related to the provision of sewer service. Specifically, parcels must be within District boundaries to be eligible for service. Any parcel that is currently outside District boundaries may apply for annexation, provided that the parcel is contiguous with current District boundaries.

Wastewater Solids Regulations

Solids generated at a wastewater treatment facility comprise screenings, grit, primary or raw sludge (PS), and secondary or waste-activated sludge (WAS). The screenings and grit are typically dewatered and disposed of in a landfill. Sludge generated by a wastewater treatment facility is defined as biosolids once beneficial use criteria, as determined by compliance with EPA regulations, have been achieved through stabilization processes. Stabilization processes are described as those that help reduce pathogens and reduce vector attraction.

Several federal, State and local regulations are in place that influence whether biosolids from municipal wastewater treatment plants can be reused or disposed of. Increased concerns and debate over biosolids disposal and its associated environmental impacts have led to more stringent revisions and amendments for many of these regulations. Continuing changes in regulations affecting biosolids management make a flexible management program essential.

Federal, State, and local agencies are responsible for regulating biosolids beneficial reuse/disposal. The authority of each agency varies based on the beneficial reuse/disposal methods employed. However, overall guidelines are established by the EPA. These guidelines are, in turn, implemented by state and local governments. Many state and local agencies in California have developed additional rules, guidelines, and criteria for biosolids management.

In order to implement the long-term biosolids permitting program required by the Water Quality Act of 1987, the EPA initiated two rule makings. The first rulemaking established requirements and procedures for including biosolids management in NPDES permits, procedures for granting state biosolids management programs primacy over federal programs, or for federal programs to implement biosolids permits if a state so chooses.

The second rulemaking proposed to regulate and control biosolids permitting was 40 CFR Part 503, Standards for the Use and Disposal of Sewage Sludge. This rule addresses three general categories of beneficial reuse/disposal of biosolids, including:

- Land application of sewage sludge for beneficial use of organic content;
- Surface disposal of biosolids in a monofill, surface impoundment, or other dedicated site; and
- Incineration of sewage sludge with or without, auxiliary fuel.

Future Regulatory Considerations

This section provides insight into the future regulatory considerations that may affect Butte County sewer systems' effluent discharges. Identifying future regulatory trends is critical for the following reasons:

- Developing treatment scenarios and alternatives;
- Planning for process and layout requirements for future regulatory compliance; and
- Making budget considerations for major design and construction projects.

Identifying future pollutants of concern (POCs), such as metals, nutrients, and/or pathogens, will help to develop alternatives that are flexible and can be easily expanded or upgraded to treat future POCs. For example, planning may include reserving space in the site layout for nutrient reduction, tertiary filtration, advanced oxidation, or an alternative disinfection method that would provide treatment for future POCs.

Nutrients, including nitrogen and phosphorus, are the leading cause of impairments to the nation's surface waters and, as a result, are receiving greater regulatory scrutiny regarding their contribution to the overall quality of the nation's receiving waters. Although appropriate amounts of nutrients are vital for the health and proper functioning of water bodies, excessive nutrient concentrations can cause water quality degradation.

Nationwide Nutrient Criteria

In November 2007, the National Resources Defense Council (NRDC) filed a petition with the EPA to require that nutrient removal be included in the definition of secondary treatment. The petition stated that "there are many [biological processes] which can achieve total phosphorus levels of 1.0 milligrams per liter (mg/L) as a monthly average, and a total nitrogen of 6 to 8 mg/L as an annual average" (NRDC et al, 2007).

In response to the petition by NRDC, the National Association of Clean Water Agencies (NACWA) wrote to the EPA in February 2008, September 2009, and June 2010, urging the EPA to deny the petition to modify the secondary treatment regulations for several legal, technical, and political reasons including but not limited to the potentially exorbitant cost to publicly owned treatment works and the inappropriateness of establishing national limits for local and regional water quality issues (NACWA, 2008; NACWA, 2009). In October 2009, the EPA stated they were actively analyzing the data and information to prepare a report and preliminary response to the NRDC petition. They stated they would consider NACWA, other stakeholders, and all information carefully before taking action on the NRDC petition (U.S. EPA, 2009a).

Due to the scientific uncertainties associated with the development of numeric nutrient criteria and the magnitude of the expected costs of compliance, nutrient water quality policies are very controversial and have sparked several legal actions across the country. The State of Florida has become the initial focus of environmental groups' efforts to push the EPA to develop federal numeric nutrient criteria to be imposed on the states. The EPA has agreed to a consent decree in the environmental suit and has made a determination that numeric nutrient standards are necessary for Florida. Proposed criteria for total nitrogen and total phosphorus were released in January 2010. The EPA withdrew federal water quality standards (WQS) applicable to waters of the State of Florida in 2014 because Florida adopted— and EPA approved— relevant numeric nutrient criteria (NNC).

State of California Nutrient Numeric Endpoints

In addition to the increasingly stringent regulation of nutrients, there is a trend towards increasing regulation of emerging microconstituents and bioaccumulative pollutants in treated effluent discharges.

Microconstituents and Bioaccumulative Constituents

Microconstituent, also referred to as "contaminants of emerging concern" (CECs) by the EPA Office of Water, are substances that have been detected in surface waters and the environment and may potentially cause deleterious effects on aquatic life and the environment at relevant concentrations. Microconstituents include:

- Persistent organic pollutants (POPs) such as polybrominated diphenyl ethers (PBDEs; used in flame retardants, furniture foam, plastics, etc.) and other organic contaminants.
- Pharmaceuticals and personal care products (PPCPs), including a wide suite of human prescribed drugs, over-the-counter medications, bactericides, sunscreens, and synthetic musks.
- Veterinary medicines such as antimicrobials, antibiotics, anti-fungals, growth promoters, and hormones.
- Endocrine-disrupting chemicals (EDCs), including synthetic estrogens and androgens, naturally occurring estrogens, as well as many other compounds capable of modulating normal hormonal functions and steroidal synthesis in aquatic organisms.
- Nanomaterials such as carbon nanotubes or nano-scale particulate titanium dioxide.

Bioaccumulative constituents are substances taken up by organisms at faster rates than the organisms can remove them. As a result, these constituents accumulate in the organism and the food chain and can remain in the environment for long periods of time. Mercury, polychlorinated biphenyls (PCBs), and dioxins are some bioaccumulative constituents that are being increasingly regulated.

Monitoring requirements for these trace pollutants are increasing, including requirements to analyze constituents at lower detection limits. It is likely that water quality criteria followed by new effluent limits will be added to permits. Implementation of CEC standards is not expected to be imminent as the EPA is currently focused on assessing the potential impact CECs have on the environment and human health.

The State Water Resources Control Board (SWRCB) is in the process of developing statewide policies for nutrients. The SWRCB held a scoping meeting in October 2011 to seek input on content for a proposed Nutrient Numeric Endpoint (NNE) framework and policy for inland surface waters.

Biostimulatory Substances Objective and Implementation of Biological Integrity

The existing statutes and regulations are in various forms, such as regional narrative or numeric nutrient objectives, an objective in the State Ocean Plan, water quality orders, and TMDLs, which were adopted or are under development by various Regional Water Boards. Currently, there are approximately 32 TMDLs statewide which list nutrients as toxicants or eutrophication-related effects on beneficial uses.

The State Water Resources Control Board (State Water Board) is proposing to adopt a statewide water quality objective for biostimulatory substances along with a program of implementation as an amendment (Biostimulatory Substances Amendment or project) to the Water Quality Control Plan for Inland Surface Water, Enclosed Bays and Estuaries of California (ISWEBE Plan). The Biostimulatory Substances Amendment could include a statewide numeric objective or a statewide narrative objective (with a numeric translator) and various regulatory control options for point and non-point sources.

It is anticipated that a comprehensive program to implement the water quality objective for biostimulatory substances will be established in three phases as three amendments to the ISWEBE Plan. Each phase would reflect implementation unique to three different water body types. If the Biostimulatory Substances Amendment establishes a numeric water quality objective, rather than a narrative water quality objective, then potentially each subsequent phase would also establish a new numeric water quality objective. The latter depends on whether the numeric water quality objective is developed from factors unique to the different types of waterbodies. The Biostimulatory Amendment would be the first phase, applicable to wadeable streams. The second phase will focus on lakes, and the third phase will focus on estuaries, enclosed bays, and non-wadeable rivers.

This project will also now include a water quality control policy to establish and implement biological condition assessment methods, scoring tools, and targets aimed at protecting the biological integrity in wadeable streams (SWRCB, 2017).

California State Recycled Water Policy

The SWRCB adopted a Recycled Water Policy (RW Policy) in 2009 and updated it in 2018 to establish more uniform requirements for water recycling throughout the State and to streamline the permit application process in most instances[2]. The RW Policy includes a goal for the State to increase the use of recycled water from 714,000 acre-feet per year (afy) in 2015 to 1.5 million afy by 2020 and to 2.5 million afy by 2030. It also includes goals for stormwater reuse and conservation and potable water offsets by recycled water. The onus for achieving these mandates and goals is placed on both recycled water purveyors and potential users. Since the recycled water project permit process is streamlined, projects will not be required to include a monitoring component. If any regulations arise from new knowledge of risks associated with CECs, then projects will be given compliance schedules. New regulations are not expected to arise in the imminent future (SWRCB, 2018).

[2] Details are at the State Water Board website at www.swrcb.ca.gov/water_issues/programs/water_recycling_policy/.

References

Butte County Department of Public Health. Adopted March 10, 2010, Updated April 12, 2016, Effective May 12, 2016. Butte County Onsite Wastewater Ordinance as incorporated into Butte County Code Chapter 19. 26-pages. Retrieved August 27, 2022 from <*https://www.buttecounty.net/publichealth/Environmental-Health/LandUse_Wastewater/WastewaterProgram*>.

Butte County Department of Public Works. 2006 as updated in 2020. Improvement Standards. 236-pages. Retrieved on August 27, 2022 from <*https://www.buttecounty.net/publicworks/Divisions/Land-Development/Improvement-Standards*>.

California Regional Water Quality Control Board: Central Valley Region. About Us Webpage. Retrieved on November 5, 2019 from: <*https://www.waterboards.ca.gov/centralvalley/about_us/*>.

Environmental Protection Agency. 2017. Nutrient Policy Data. Available online at: <*https://www.epa.gov/nutrient-policy-data/state-progress-toward-developing-numeric-nutrient-water-quality-criteria*>.

_____2017. Water Quality Standards. Available online at: <*https://www.epa.gov/wqs-tech/water-quality-standards-regulations-california*>.

Southern California Coastal Water Research Project. 2014. Technical Support for Nutrient Numeric Endpoint and TMDL Tool Development. Available online at: <*http://archive.sccwrp.org/ResearchAreas/Nutrients/TechnicalSupportForNutrientNumericEndpoint.aspx*>.

State Water Resources Control Board. 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report).

State Water Resources Control Board. *Phase II MS4 Small Permit.* <*https://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml*>

State Water Resources Control Board. July 2017. *Biostimulatory Substances Objective and Program to Implement Biological Integrity*. Retrieved from:<*https://www.waterboards.ca.gov/water_issues/programs/biostimulatory_substances_biointegrity/*>.

State Water Resources Control Board. *Nonpoint Source Pollution (NPS) Control Program*. *www.waterboards.ca.gov/water_issues/programs/nps*.

State Water Resources Control Board with the California Environmental Protection Agency. December 11, 2018. Water Quality Control Policy for Recycled Water. Effective April 8, 2019. 49-pages. Retrieved on March 4, 2020 from: <*https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2018/121118_7_final_amendment_oal.pdf*>.

Appendix H:

Economy of Butte County

Appendix H: Economy of Butte County

One of the goals of this MSR is to understand whether the local water and sewer infrastructure has the capacity to support future housing growth in the Oroville region. Local economic factors also influence the development of housing in the Oroville region. Understanding the basic economy of a region can provide valuable insight into:

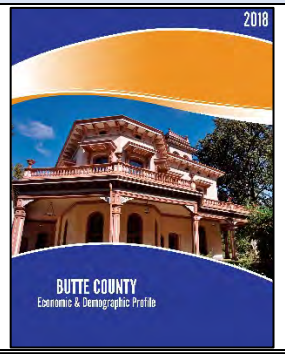
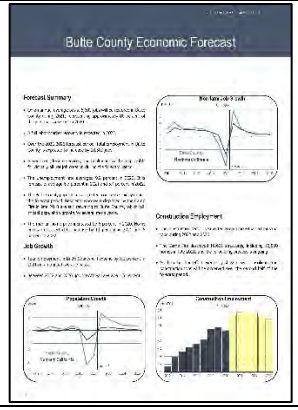
- the relative availability of financial and employment resources for a population,
- the growth or decline of wages in particular industries, and
- the average cost of housing.

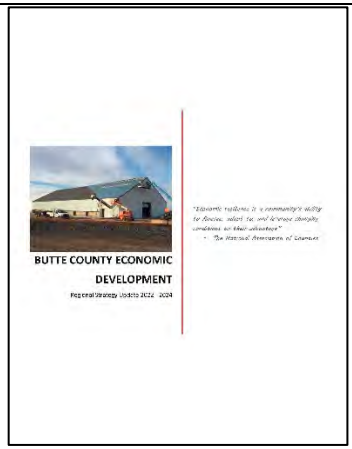
This appendix provides 2 key pieces of economic information related to Butte County:

- Local Area Profile for Butte County by the California Economic Indicators project, and
- Distressed Community Index Analysis by the Economic Innovation Group

In addition to the Local Area Profile and the Distressed Community Index Analysis presented on the following pages, several local community groups provide detailed economic information for Butte County as shown in Table A-H-1, next page.

Table A-H-1: List of Economic Studies for Butte County

Author/ Organization	Description/Reference	Website	Report Image
Rural County Representatives of California	Butte County Economic & Demographic Profile. 2018. 63-pages. Contributions from: Center for Economic Development. California State University, Chico.	www.rcrcnet.org/sites/default/files/useruploads/Documents/Advocacy/Economic_Development/County_Profiles/2018%20Butte%20Economic%20&%20Demographic%20Profile.pdf	
Butte County Economic Development Corporation	Website provides economic statistics related to labor, wages, population, and employers.	http://butte-edc.com/	
Caltrans Economic Analysis Branch	The Caltrans Economic Analysis Branch prepares long-term socio-economic forecasts for each county on an annual basis to assist local and regional agencies in their planning and travel forecasting efforts. Butte County forecasts are available for download	https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/data-analytics-services/transportation-economics/long-term-socio-economic-forecasts-by-county	

Butte County Economic and Community Development	Regional Economic Development Strategy Update, 2022 – 2024. Butte County Board of Supervisors on November 9, 2021. 10-pages The Strategy Update for 2022-2024 updates the program of work to include various new action items which will further the economic development efforts of the County over the next three years. The update specifically includes action items targeting key areas within the County for economic development activity.	https://www.buttecounty.net/economicdevelopment/Doing-Business/Reports-and-Strategies	

California Economic Indicators. Local Area Profile for Butte County

California Employment Development Dept at

https://labormarketinfo.edd.ca.gov/data/economic-indicators.html

Profile

About this area:

Butte County is located in the northern portion of the Sacramento Valley. Surrounding counties include Plumas to the northeast, Tehama to the northwest, and Glenn to the west, with Sutter, Yuba, and Colusa counties bordering to the south. Major transportation routes in the county include highways 99 and 70. Butte County is also home to a municipal airport and two railroad lines, which provide both freight and passenger services.

EMPLOYMENT AND WAGES

Unemployment Rate and Labor Force (Not Seasonally Adjusted)

Area	Year	Time Period	Labor Force	No. of Employed	No. of Unemployed	Unemployment Rate
Butte County	2022	May	92,600	89,500	3,100	3.4

More Areas Historical Data Get More Info (Data Library)

Employment by Industry (Not Seasonally Adjusted)

Year	Time Period	CES Industry Title	No. of Employed
2022	May	Total Wage and Salary	80,700
2022	May	Total Nonfarm	77,600
2022	May	Service Providing	69,000
2022	May	Total Private	62,600
2022	May	Private Service Providing	54,000

More Historical Data Get More Info (Data Library)

Occupations with Fastest Job Growth (% change)

Occupation	Estimated Year - Projected Year	Employment		Employment Change	
		Estimated	Projected	Number	Percent
Solar Photovoltaic Installers	2018 - 2028	50	80	30	60.0
Helpers, Installation and Repair Workers	2018 - 2028	30	40	10	33.3
Helpers, Brickmasons and Tile Setters	2018 - 2028	30	40	10	33.3
Database Administrators	2018 - 2028	30	40	10	33.3
Computer Network Support Specialists	2018 - 2028	30	40	10	33.3

More Get More Info (Data Library)

Projections of Employment by Industry

High Wage Occupations

Occupation	Year	Time Period	Hourly Mean	Hourly by Percentile		
				25th	Median	75th
Pediatricians, General	2022	1st Qtr	$142.20	$0.00	$0.00	$0.00

Family Medicine Physicians	2022	1st Qtr	$107.93	$76.59	$0.00	$0.00
Chief Executives	2022	1st Qtr	$87.79	$51.03	$75.26	$0.00
Dentists, General	2022	1st Qtr	$85.82	$37.86	$0.00	$0.00
Computer and Information Systems Managers	2022	1st Qtr	$71.90	$48.67	$65.42	$0.00

More Get More Info (Data Library)

Data for Butte County is not available. Data for Chico MSA has been displayed for High Wage Occupations

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ECONOMIC INDICATORS

Building Permits (US Census Bureau)

Type of Permit	Year	Time Period	No. of Permits	Total Costs
Multi-Family	2020	Annual	407	$50,147,187
Single Family	2020	Annual	1,189	$247,481,984
Total all types construction permits	2020	Annual	1,596	$297,629,171

Historical Data

Consumer Price Index (US BLS & Calif. DIR)

Area	Consumer Price Index				% Change
	Time Period	2020	Time Period	2019	
United States	Annual	258.8	Annual	255.7	1.2
California	Annual	285.3	Annual	280.6	1.7

Historical Data Get More Info (Data Library)

Data for Butte County is not available. Data for California has been displayed for Consumer Price Index (US BLS & Calif. DIR)

Median Price of Existing Homes Sold

Year	Time Period	Type	Median Price
2020	Annual	Median Price of Homes Sold	$392,500

More Areas Historical Data Data from the California Association of Realtors

State Revenues by Source

Tax Type Description	Year	Time Period	Tax Revenue
Alcoholic Beverage Taxes and Fees	2019	Annual	$382,745
Bank and Corporation (Income) Taxes	2019	Annual	$14,035,432
Cigarette Tax	2019	Annual	$1,957,788
Horse Racing (Parimutuel) License Fees	2019	Annual	$16,013
Estate, Inheritance and Gift Taxes	2019	Annual	$0

More Areas Historical Data

Data for Butte County is not available. Data for California has been displayed for State Revenues by Source

Taxable Sales (Calif. Board of Equalization)

Year	Time Period	Sales Type Description	Sales
2020	Annual	Retail	$3,831,215,883

More Areas Historical Data

POPULATION AND CENSUS DATA

Population

Area	Year	Time Period	Source	Population
Butte County	2019	Annual	California Dept of Finance	214,532

More Areas Historical Data Get More Info (Data Library)

Measures of Income

Income Type	Year	Time Period	Income	Population
Per Capita Personal Income - BEA	2019	Annual	$47,860	214,532

Total Personal Income - BEA	2019	Annual	$10,490,209	214,532

More Areas Historical Data Get More Info (Data Library)

County-to-County Commute Patterns (US Census Bureau)

Year	Time Period	Area of Residence	Area of WorkPlace	Number of Workers
2015	Census	Butte County , CA	Butte County , CA	79,201
2015	Census	Glenn County , CA	Butte County , CA	1,862
2015	Census	Tehama County , CA	Butte County , CA	1,565
2015	Census	Sutter County , CA	Butte County , CA	1,458
2015	Census	Butte County , CA	Sutter County , CA	1,330

More Historical Data

JOB OPENINGS & TRAINING PROVIDERS

Job Openings from JobCentral National Labor Exchange

Job Openings

Training Providers in Area

Provider Name	Provider Type	Location
Sierra Technical Institute	Apprenticeship, Business, Career, & Tech Schools	Paradise,CA
School of Alternative Healthcare	Apprenticeship, Business, Career, & Tech Schools	Chico,CA
Butte County Regional Occupational Program	Schools with Occupational Programs (ROP)	Chico,CA
Oroville Adult School	Schools with Occupational Programs (ROP)	Oroville,CA
H & R Block Tax Training School	Apprenticeship, Business, Career, & Tech Schools	Chico,CA

More

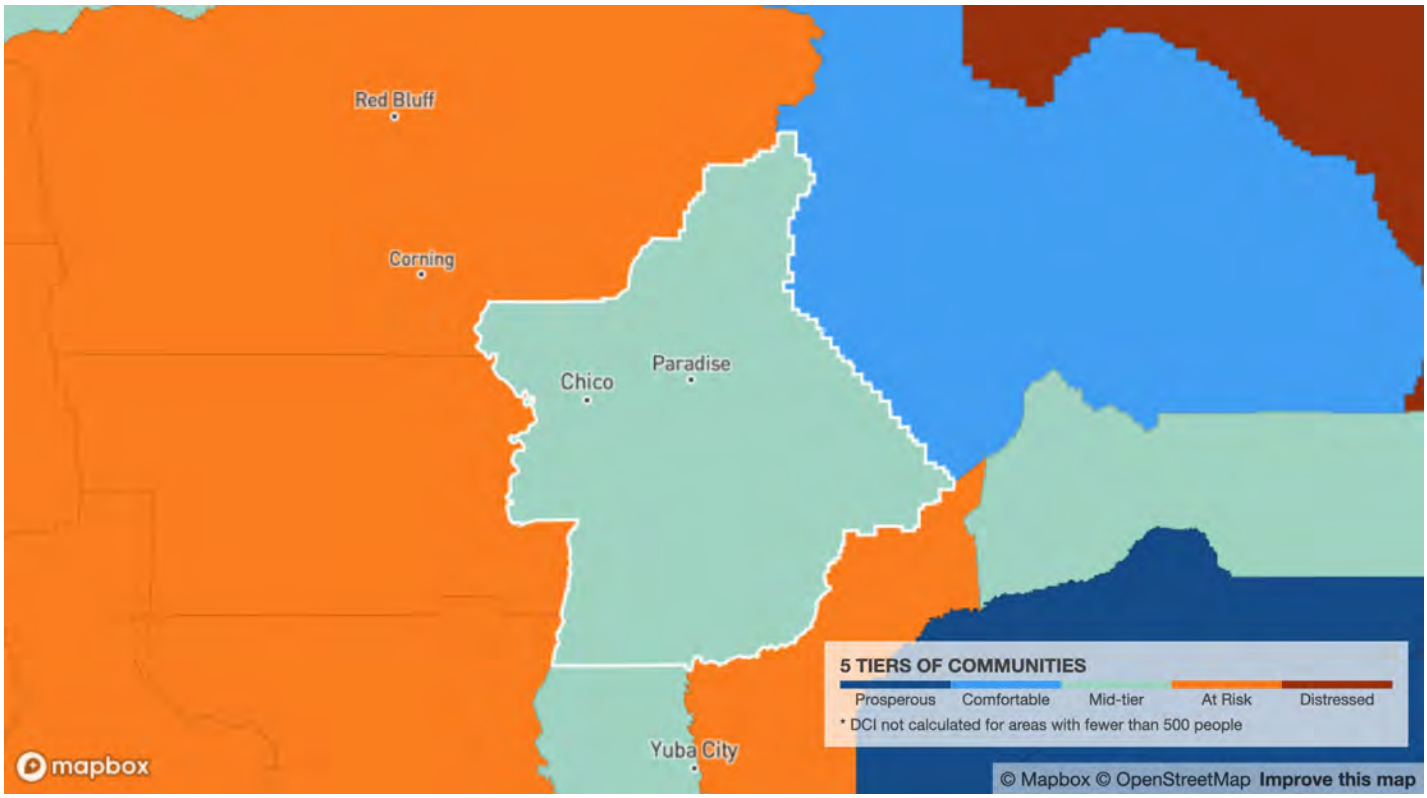
Related Links

View Employers By Occupation
View Employers By Industry
Local Area Comparisons

Visit eig.org/dci to explore the digital mapping interactive and more

Butte County

National > California > CA-1 > Butte County

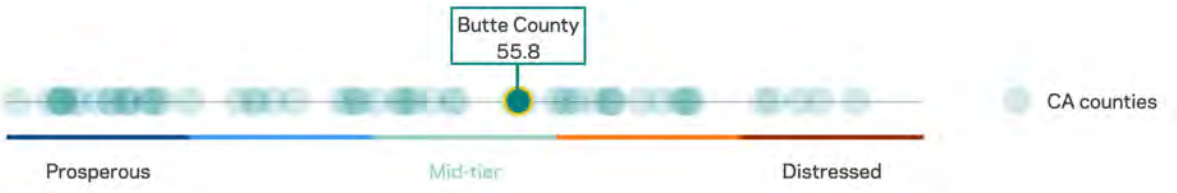


DESIGNED & BUILT BY Graphicacy

DCI score

CURRENT

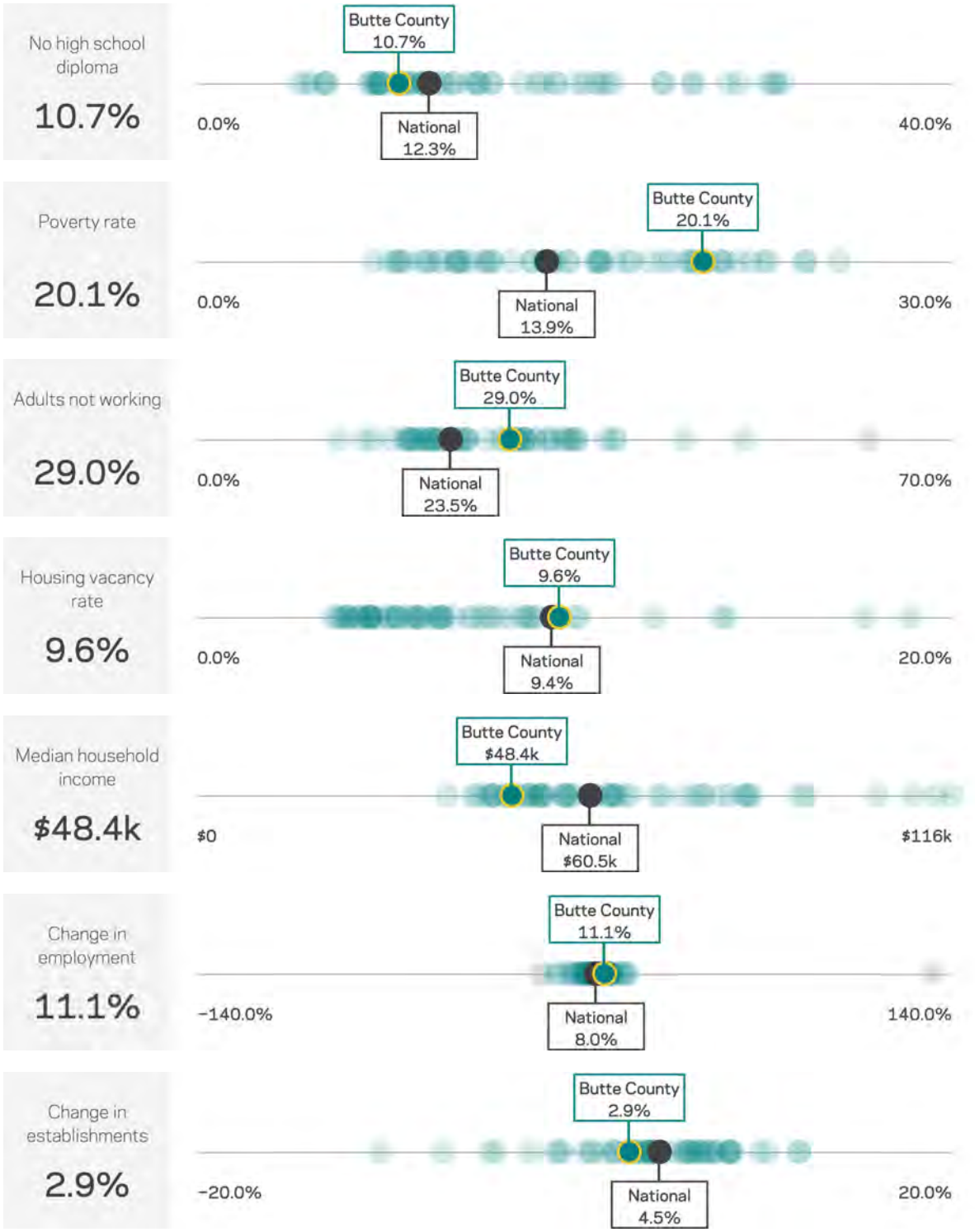
Distress score
55.8
Mid-tier



PREVIOUS

2000 60.7 At Risk

DCI factors


No high school diploma
10.7%
Butte County 10.7%
National 12.3%
0.0%
40.0%
Poverty rate
20.1%
Butte County 20.1%
National 13.9%
0.0%
30.0%
Adults not working
29.0%
Butte County 29.0%
National 23.5%
0.0%
70.0%
Housing vacancy rate
9.6%
Butte County 9.6%
National 9.4%
0.0%
20.0%
Median household income
$48.4k
Butte County $48.4k
National $60.5k
$0
$116k
Change in employment
11.1%
Butte County 11.1%
National 8.0%
−140.0%
140.0%
Change in establishments
2.9%
Butte County 2.9%
National 4.5%
−20.0%
20.0%

Demographics distribution

RACE OR ETHNICITY

% of population by race or ethnicity

Non-Hispanic White	72.4%
Hispanic or Latino	16.0%
Black or African-American	1.5%
American Indian or Alaska Native	0.8%
Asian or Pacific Islander	4.5%
Some Other Race	4.9%

NATIVITY

% of population by nativity

Foreign-born	7.6%
Native-born	92.4%

EDUCATION

% of population 25+ by educational attainment

Advanced degree	9.0%
Bachelor's degree	17.5%
Some college	40.0%
High school diploma	22.7%
No high school diploma	10.7%

OCCUPATION

% of 16+ population by occupation

Management and Professional	36.2%
Service	21.7%
Sales and Office	21.6%
Natural Resources and Construction	9.0%
Production and Transportation	11.6%

DEFINING DCI FACTORS

No high school diploma

The share of the population age 25 and older who lack a high school diploma or equivalent.

Poverty rate

The share of individuals living below the federal poverty line.

Adults not working

The share of the population age 25 to 54 not working (i.e. either unemployed or not in the labor force).

Housing vacancy rate

The share of housing units that are vacant, adjusted for recreational, seasonal, or occasional use vacancies.

Median household income

Median household income enters into the DCI as a percent of metro area or state median household income.

Change in employment

The change from 2014 to 2018 in the number of employees working in the geography.

Change in establishments

The change from 2014 to 2018 in the number of establishments located in the geography.

https://eig.org/dci/interactive-map?path=county/06007&view=county

Source: Economic Innovation Group. Retreived from above website on 23June2022

Appendix I

Description of Feather River Watershed Near Oroville, CA

Table of Contents

Introduction - Feather River Watershed

The Feather River is the largest river in the Sierra Nevada. The Feather River is the primary watercourse that influences the communities studied in this MSR. The Feather River begins at its headwaters near the town of Chester to the north and the upper part of the Feather River has four tributaries:

- North Fork
- Middle Fork
- South Fork
- West Branch

All these tributaries join at their confluence in Lake Oroville and from there the mainstream river flows into the Sacramento River.

The highest elevation of the watershed is in the eastside foothills at 3,700 ft msl. The lowest elevation is at the confluence of the Sacramento River at 20 ft msl. Management issues associated with the watershed are drought, water quality, habitat preservation, and risks from local hazards such as wildland fires or floods. Water quality is an issue of concern because the Lower Feather River is listed on the Clean Water Act Section 303(d) list of impaired water bodies for temperature, diazinon, chlorpyrifos, mercury, and unknown toxicity. Constituents of concern for groundwater are nitrate, total dissolved solids, and several other chemical constituents. The lower Feather River Watershed provides both groundwater supply and surface water supply to local farmers, water districts, and other water uses. Other environmental services provided by the watershed include soil fertility and recreation. The River also plays an important role in flood management, hydroelectric power production, water quality, and the health of fisheries downstream (as far as the Sacramento/San Joaquin River Delta). It is important to note that historically the local watersheds were managed by the native Maidu American Indians, who successfully managed local water resources, fisheries, and forests for many generations. The Berry Creek Rancheria of Maidu Indians of California continue to reside in and have facilities in the Oroville area. The Oroville area has a mediterranean climate with the average annual precipitation for the area at 29.83 inches and the average temperature at 61.6° F (NRCS, et.al., 2006).

Drinking water suppliers in the Oroville Area harvest water from the water cycle where it is utilized by residents and visitors. The three water services providers (TWSD, SFWPA, and Cal Water Oroville) are heavily dependent upon local precipitation and are drought sensitive. Treating drinking water generates some limited quantity of backwash which is cleaned and returned to ponds or other drainages. After local residents, workers, and visitors utilize the municipal water supply, it is collected into sewage pipes and transported for treatment at the SCOR wastewater treatment plant. After undergoing extensive treatment, the wastewater is then discharged into the Feather which then travels into the Sacramento River. Sludge is hauled away. Storm water runoff from local non-permeable surfaces travel down the storm drain system and eventually drains into local streams and the Feather River.

Watershed Basics

A watershed is the area of land that drains into a body of water such as a river, lake, stream, or bay. In the Feather River watershed, all water eventually drains into the Feather River. The watershed includes surface water in streams, rivers, lakes, ponds, and the groundwater in local aquifers. The drinking water that comes out of our taps comes from all these sources. Watersheds are shaped by the natural contours of the land: hills and valleys. Think of a watershed as a basin, formed by the highest ridges surrounding a network of streams. Every raindrop falling inside these high points drains into the watershed.

Natural ecological processes support the production of clean water within local watersheds. For example, intact forests create airborne particles which support raindrop formation. Forests also retain soil moisture, which reduces fire intensity and extent. Oak woodlands, riparian forests, and other vegetated habitats maintain hydrological processes that recharge subsurface aquifers and surface water flows. Protection of the natural habitat within watersheds will sustain yields of clean water, agricultural and forestry products, and provide more opportunities for nature-based recreation, reduced pollution treatment costs, and other economic returns. Agriculture also plays an important role within local watersheds. Timber landowners, farmers, ranchers, and other private landowners have deep knowledge about the land and rivers. Farmers are some of the best protectors of biodiversity in California.

Forest, meadows, and wetland ecosystems in a watershed naturally filter and replenish water. What we do on the land and in our homes, yards, businesses, schools, parks, and communities has the potential to affect the health of our watershed and the quality of our drinking water. Watersheds are a key component of the natural hydrologic cycle. Each watershed has specific and unique geomorphic, hydrologic, and ecological characteristics. Watershed systems are best viewed as holistic natural systems. Watersheds are important not merely for the creeks and rivers that flow within them, but also for the ecosystem services provided by the flora (including forests), fauna and soils. To have a dependable and quality water supply, it is critical that local communities be good stewards of local watersheds.

Water Cycle

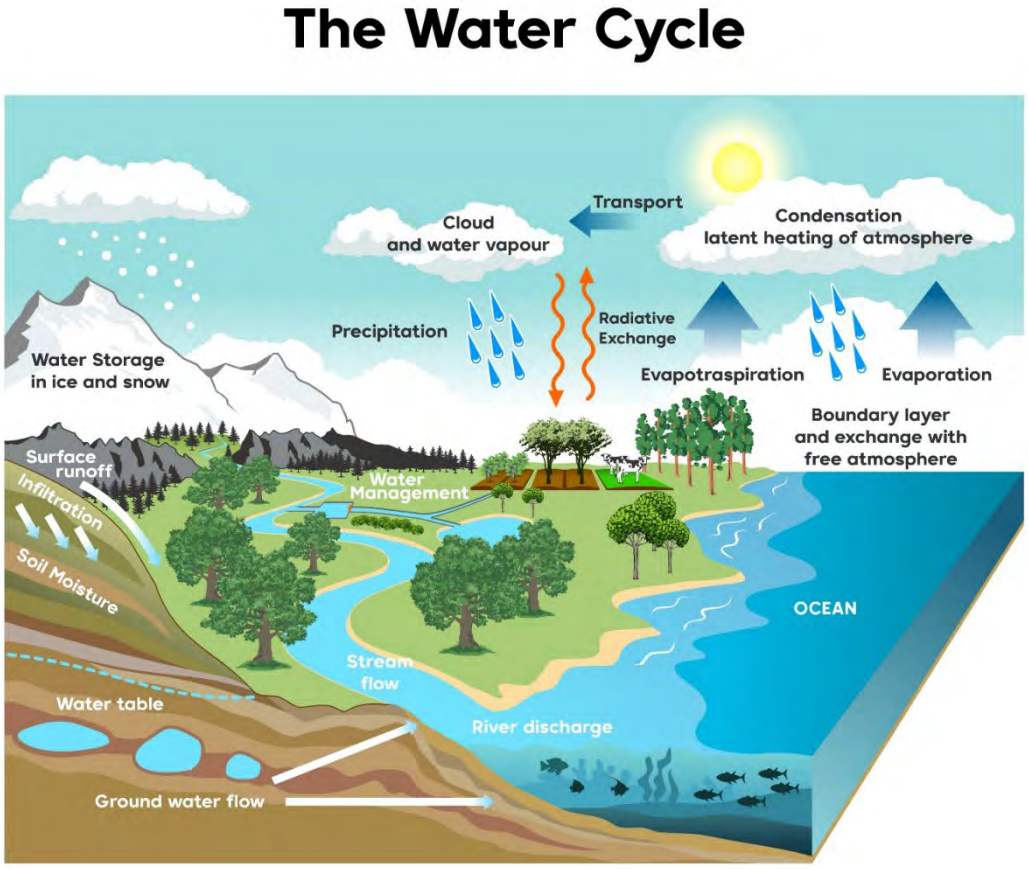


Figure A-I-1:

Water is part of the natural hydrologic cycle, which is part of Earth's ancient operating system.

The hydrologic cycle involves Earth's land, oceans, and atmosphere. The cycling of water involves processes known as precipitation, evaporation, evapotranspiration, and condensation. Ultimately, the ocean is a vital part of the water cycle, considering that it holds approximately 97% of the total water on Earth (NASA, n.d.). Evaporation occurs when a heat source causes water, found on a body of water, to alter from a liquid to a gas state and results in water vapor that undergoes condensation. Evaporation occurs on various water sources on Earth, but mainly on the ocean. Condensation is the process by which molecules of water vapor in the air become liquid (NASA, n.d.). Then, precipitation, which is the product of condensation, falls out of an atmospheric cloud. Precipitation takes the form as rain, snow, sleet, and other forms. On land, the precipitation of water allows for the development of runoff or the infiltration of water into the soil to form groundwater. Additionally, the water that reaches land undergoes evapotranspiration which is the process that involves water transfer from land to the atmosphere. The water cycle is a system that is energized by the sun and involves the continuous exchange of moisture between the ocean, the atmosphere, and the land (NASA, n.d.).

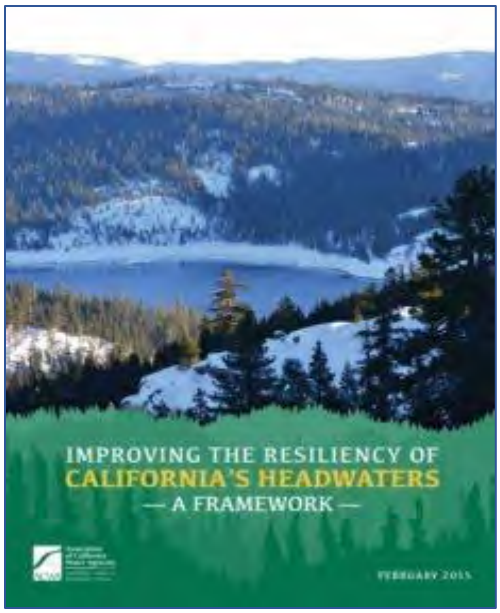
Connected to Sacramento/San Joaquin Watershed

The Feather River eventually drains into the Sacramento River and therefore is an important part of the greater Sacramento/San Joaquin watershed. The greater Sacramento/San Joaquin watershed is comprised of water that drains from the entire western slope of the Sierra, the eastern slope of the Coast Ranges and the south- and west-facing drainages of Mount Shasta and Lassen Peak. Water in the Sacramento/San Joaquin rivers flows through the Delta, into San Francisco Bay, and out through the Golden Gate. This

natural system is massive and geographically diverse, including some of the highest mountains and the largest agricultural valleys on the continent.

Watershed Management

Water districts, sewer districts, private property owners, public land management agencies, stormwater management experts, environmental specialists, land-use planning regulators, and communities all play an integral part in watershed management. Land managers and property owners within the watershed often collaborate to protect watershed health and water quality. The Plumas National Forest manages much of the upper Feather River watershed. The U.S. Forest Service is an example of an agency that recognizes that watershed conditions and health is crucial to their mission. PG&E is another key water and land management organization in the watershed. A great deal of the water routing, accessibility, and infrastructure is controlled by PG&E.



Ideally watershed management would be aimed at creating and implementing plans, programs and projects to sustain and enhance watershed functions that affect the plants, animals, and human communities within the watershed boundary. Features of a watershed that agencies seek to manage to include water supply, water quality, drainage, stormwater runoff, water rights and the overall planning and utilization of watersheds.

The Northern California Water Association (NCWA) is a group comprised of water districts, water companies, small towns, rural communities, and landowners that utilize both surface and groundwater resources in the Sacramento Valley. NCWA's Board of Director's and staff aim to safeguard water supplies in the Sacramento Valley. They provide constructive advocacy in the pursuit of solutions to resolve California's most perplexing water problems. NCWA represents the entire Sacramento Valley, which extends from Sacramento to north of Redding, and between the crests of the Sierra Nevada and the Coast Range. NCWA regularly publishes an updated and informative blog here: https://norcalwater.org/blog/

In February 2015, the Association of California Water Agencies (ACWA) developed Improving the Resiliency of California's Headwaters – A Framework, which makes specific recommendations designed to create more resilient water resources through effective headwaters management.

Developed by ACWA's Headwaters Framework Working Group, the policy document details the role that headwaters play in California's water management system, outlines the benefits of healthy headwaters, identifies current challenges, and provides a brief history of the headwaters management.

The Water Education Foundation has developed a booklet to show the value of water, and the importance of the Sierra Nevada region in providing water for California. The information is based on the report *Looking to the Source: Watersheds of the Sierra Nevada by the Water Education Foundation*.

Integrated water management plans and activities are often sponsored by local non-profit organizations. A collaborative effort across agency, government, and NGOs is essential for proper stewardship on a watershed-wide basis. In 2006 the Integrated Regional Watershed Management Plan for the Northern Sacramento Valley was published here: https://norcalwater.org/efficient-water-management/efficient-water-management-regional-sustainability/regional-planning/irwmp/

Butte County has a range of hydrologic and geographic features. Human water systems are linked to natural watersheds. Residents of Butte County have developed a range of water infrastructure designed to optimize modern human use of water as listed in Table A-I-1 below.

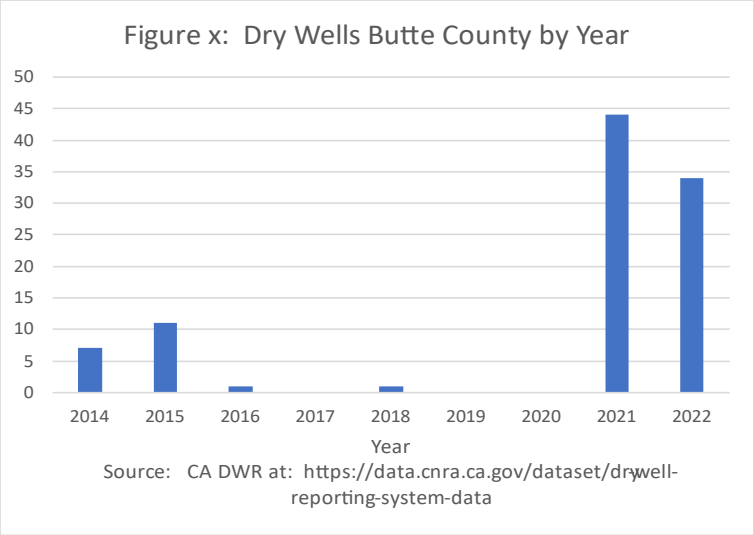
Table A-I-1: Butte County Water Infrastructure

Number of Domestic Wells	12,853
Number of People on Domestic Wells	65,018
Number of Community Water Systems	48
Number of Groundwater Sustainability Agencies	18
Number of Sub-Basins	8
Number of Disadvantaged Communities	11
Number of Severely Disadvantaged Communities	4
Median Household Income	$46,516 (+/- 1,130)
Percentage of Renters	40.99 %
Linguistic Isolation	2.33 %
Number of Households	28,359
Number of Drought Impacted Domestic Wells, 100% Drought Scenario	20
Total Cost to Retrofit Drought Impacted Wells, 100% Drought Scenario	$253,740

Data Source: Community Water Center Drinking Water Tool, 2021 https://drinkingwatertool.communitywatercenter.org/ca-water/?z=9&y=39.72508&x=-121.57293&l=&r=afamer%2Cafamer%2Cafamer&v=county&q=50&a=

Approximately 65,018 people in Butte County depend on domestic water wells which rely on groundwater. In Butte County, between the years 2014 to 2022, there were a total of 98 wells that were reported “dry” to the DWR database. In the year 2022, a total of 34 dry wells were reported and 11 of these reports derived from the Oroville area. As seen in Figure A-I-2, the year 2021 had the greatest number of reported dry wells. The years 2017, 2019, and 2020 did not have reported dry wells. The wells are primarily used for households, but some are used for schools and agricultural purposes. From the database query, it is evident that many of the wells are no longer producing water, or their pumps are not functioning properly (DWR, 2022).

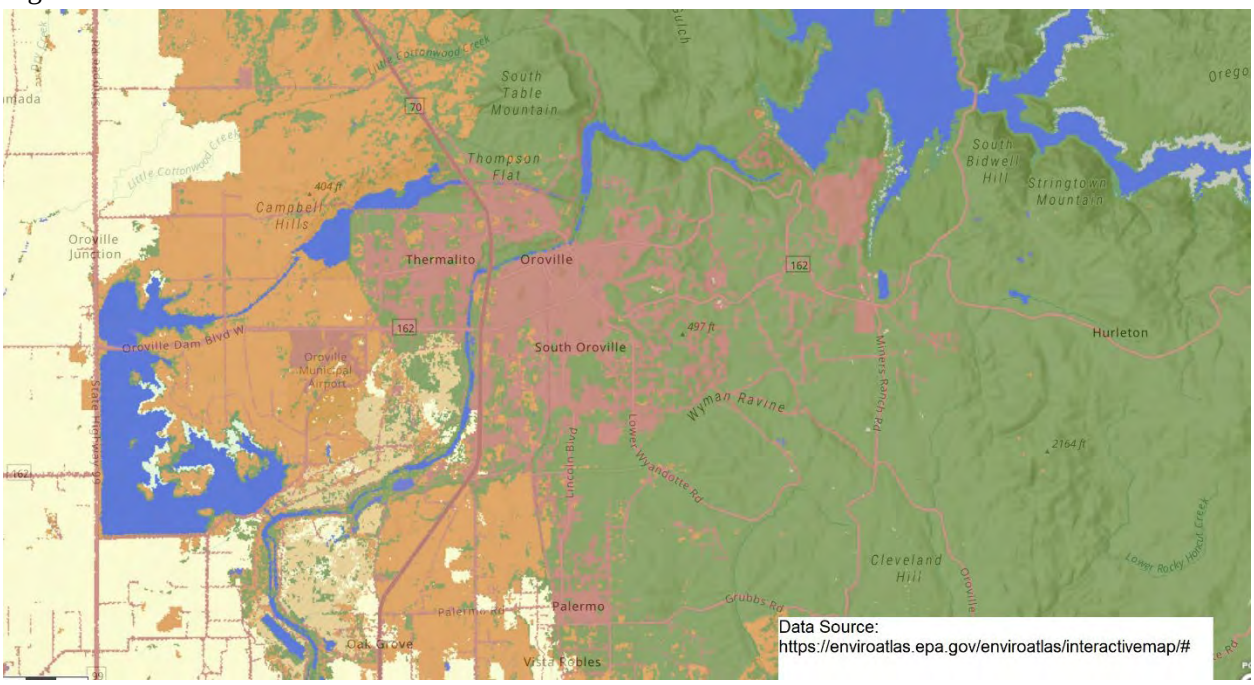
Figure A-I-2: Dry Wells in Butte County



Water is often viewed as only a commodity which is bought, sold, and transferred. As a commodity, water is utilized for drinking water, agricultural irrigation, and hydropower production. However, considering watershed systems from a holistic viewpoint is useful to highlight the linkage between water production and the water cycle, climate, and all the other aspects of natural systems.

Management of local watershed and water supply is most important to support residents of cities and rural communities. Urban areas in the Oroville area are especially dependent upon a clean water supply and these urbanized areas within and near the City of Oroville are shown in "pink" in Figure A-I-3, below.

Figure A-I-3: Urbanized areas



Larger-Scale Watersheds

Lake Oroville/Upper Feather River Watershed

The Lake Oroville/Upper Feather River Watershed has a total area of approximately 532 square miles (340,699 acres). The North Fork of the Feather River originates in northern California, in the Lassen Volcanic National Park. It flows south into Lake Oroville, where it joins the south and middle forks of the Feather River. Oroville Dam, constructed in 1968, houses six power generation units and four additional units in the Thermalito Power Plant. The Thermalito Forebay and Afterbay are holding reservoirs located downstream of Lake Oroville; they allow water released from Lake Oroville to generate power during established peak periods and to be pumped back into the lake during off-peak periods. Other smaller creeks in the watershed flow into Lake Oroville, including the Cirby and Concow Creek, which initially join to flow into the Concow Reservoir upstream of Lake Oroville.

Lower Feather River Watershed

Directly downstream of Lake Oroville is the start of the Lower Feather River Watershed. The Lower Feather travels south downstream 60 miles to enter the Sacramento River at Verona. There are several major groundwater subbasins in the vicinity and groundwater plays an important part in the delivery of water to agricultural lands. the Oroville Dam was constructed during the years 1961 to 1968 and it created Lake Oroville which is a key part of the State Water Project. Lake Oroville provides drinking and irrigation water for central and southern California. The cost/benefit tradeoff associated with Lake Oroville is that river flows are now highly regulated for water supply and flood control through releases at Oroville Dam. This means that a portion of the River's natural variability has been lost and native fish populations and riparian habitat have declined. The Lower Feather River Watershed contains important agricultural areas, provides recreational opportunities, and supports key fishery resources. In the future, local land managers foresee stakeholder concerns about the conversion of farmland to urban use, increased demands on water supply, protection of water quality. The Lower Feather River is listed on the Clean Water Act Section 303(d) list of impaired water bodies for temperature, chlorpyrifos, diazinon, mercury, and unknown toxicity. Constituents of concern for groundwater are total dissolved solids, nitrate, and several other individual chemical constituents. Surface and groundwater quality is a concern for both fisheries and agricultural supply use. The map shown in Figure A-I-4 below shows the spatial distribution of watershed planning areas in Butte County. The next map, Figure A-I-5, shows the sub-watershed boundaries in relation to the Sewerage Commission of Oroville Region (SC-OR) which is an agency studied in this MSR.

Description of Sub-Watersheds

Streams and creeks form naturally smaller sub-areas that contribute to the greater Feather River watershed. The following paragraphs describe some of these small sub-areas.

South Fork of the Feather River

The combined South Fork Feather River/Slate Creek watershed is an expansive watershed within the Sierra Nevada Mountain Range, covering approximately 100,814 acres, or 158 square miles. The South Fork Feather River watershed headwaters originate at an elevation of 7,457 feet and are bounded by the volcanic Cascade Range to the north, the Great Basin to the east, the Sacramento Valley to the west, and higher portions of the Sierra Nevada to the south. The upper watershed is ruggedly mountainous, bisected by deep canyons in the eastern third of the watershed. The central third of the watershed is a transition zone. Principal tributaries include Lost Creek, and the upper portion of Slate Creek, a tributary of the North Fork Yuba River (which contributes to the South Fork Feather River watershed by way of a tunnel through the Gibsonville Ridge). This watershed falls within the jurisdictions of four adjacent counties: Plumas County, Butte County, Sierra County, and Yuba County. (Data source: Draft Environmental Impact Report –Golf Resort at Lake Oroville).

Butte Creek Watershed

The Butte Creek watershed is approximately 809 square miles (162,199 acres) in size. Butte Creek originates in the Lassen National Forest at over 7,000 feet in elevation. Butte Creek travels through canyons, through the northwestern region of Butte County, and then through the valley, entering the floor near Chico. Butte Creek enters the valley section of the watershed near Chico, and then travels approximately 45 miles before it enters the Sacramento River. Several levees were constructed along Butte Creek by the US Army Corps of Engineers during the 1950s. The levees extend for over 14 miles along the Butte Creek channel. The mean monthly flow near Chico is 417 cfs, with peak flow occurring mid-February averaging 826 cfs. September typically sees the lowest flows, averaging 119 cfs. Downstream from Chico, instream flows typically range from 5 to 25 cfs during irrigation season. For additional information on the Butte Creek Watershed, please refer to this document: *California State University, Chico. Butte Creek Watershed Project Existing Conditions Report. 2000*.

Dry Creek/Cherokee Canal

The Cherokee Watershed has an area of approximately 261 square miles (167,053 acres). The Cherokee Canal was originally constructed to protect agricultural land from mining debris. The canal now serves as an irrigation drainage canal. Dry Creek becomes Cherokee Canal northeast of Richvale. The Gold Run and Cottonwood Creeks join the Cherokee Canal upstream of the Richvale Road crossing. Cherokee Canal eventually enters Butte Creek near the southwestern corner of Butte County, south of Highway 162.

Figure A-I-4: Spatial Distribution of Watershed Planning Areas in Butte County

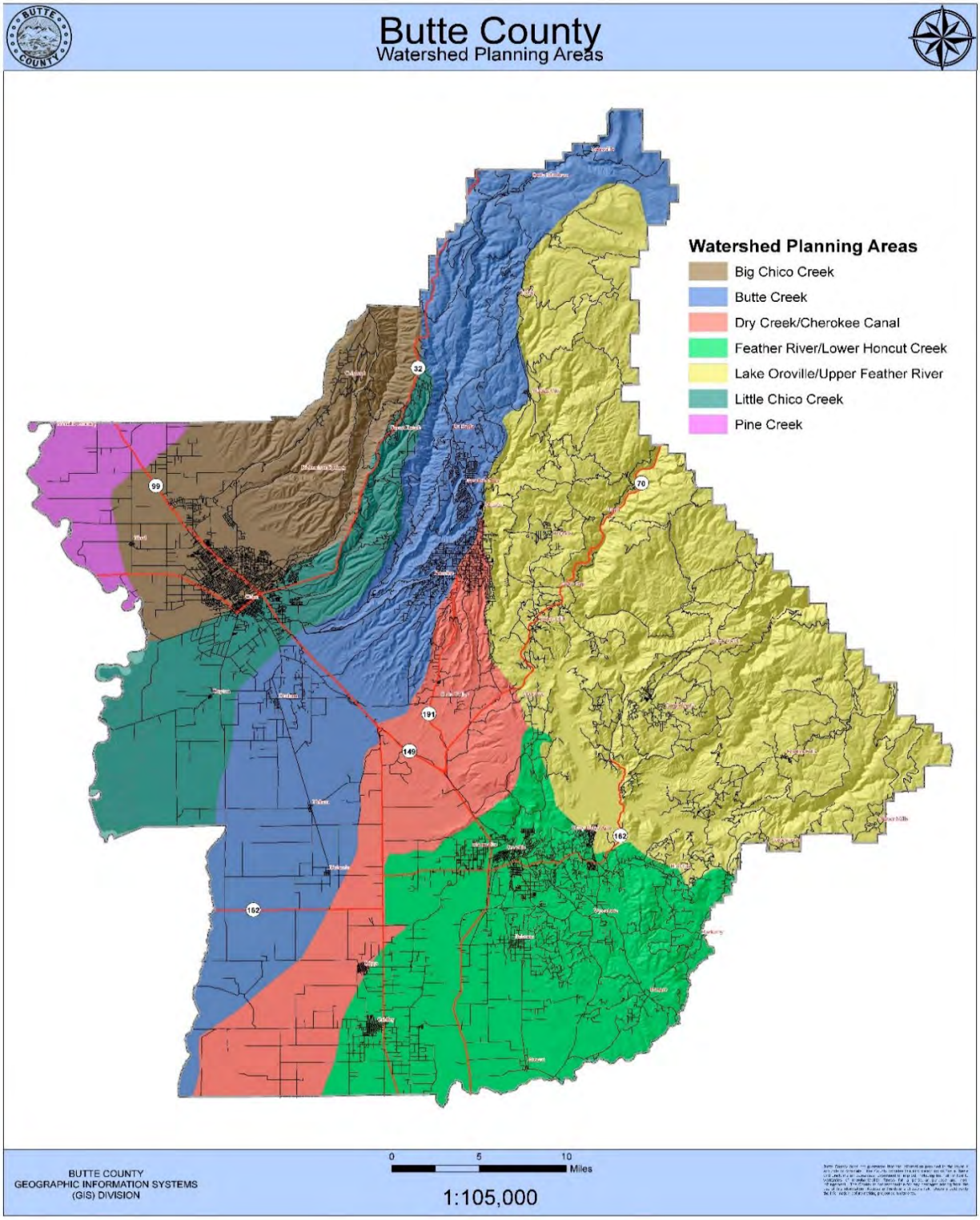
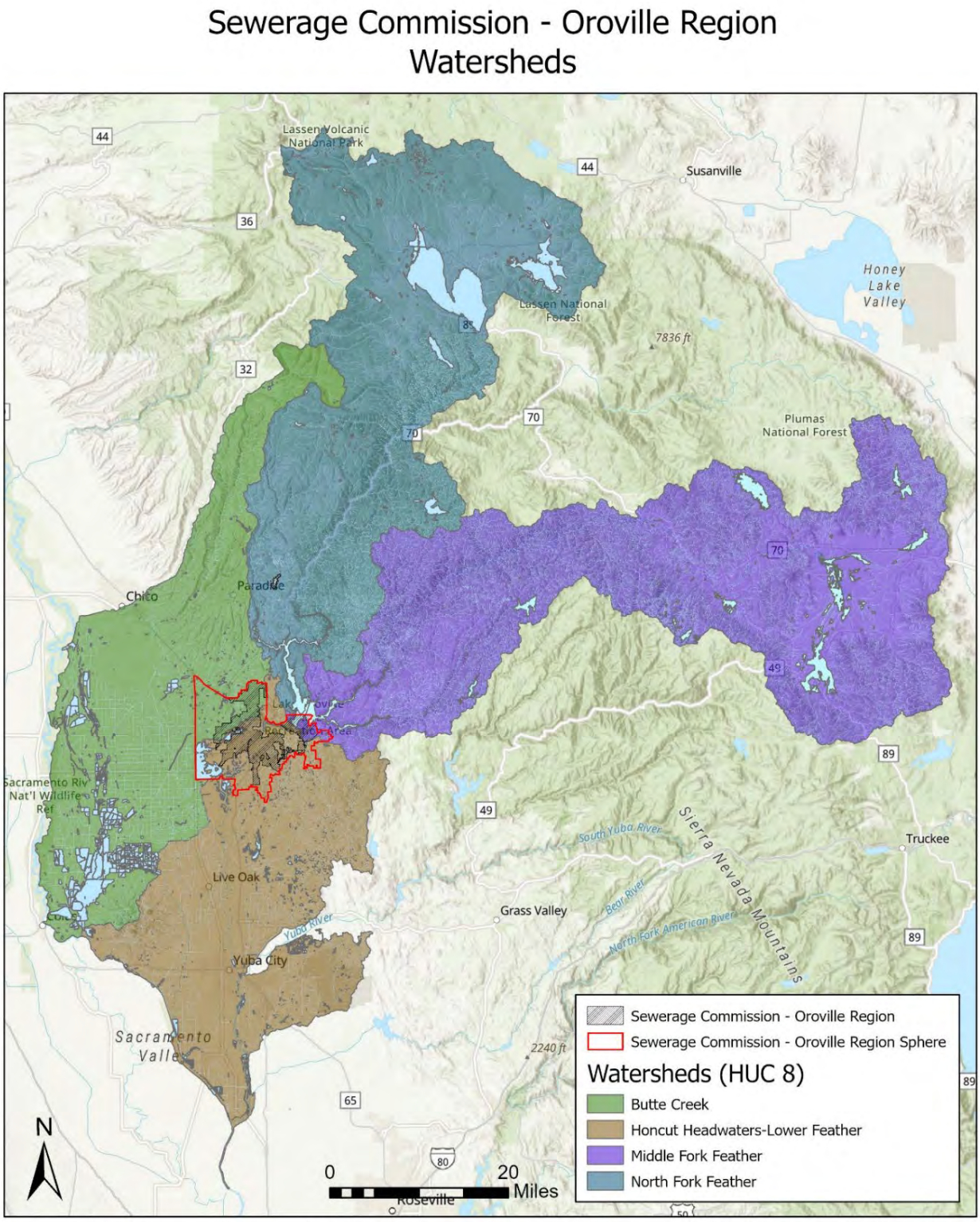


Figure A-I-5: Watershed Boundaries in Relation to the Sewerage Commission of Oroville Region (SC-OR)



Source: Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, Esri, CGIAR, USGS, Butte County LAFCo GIS

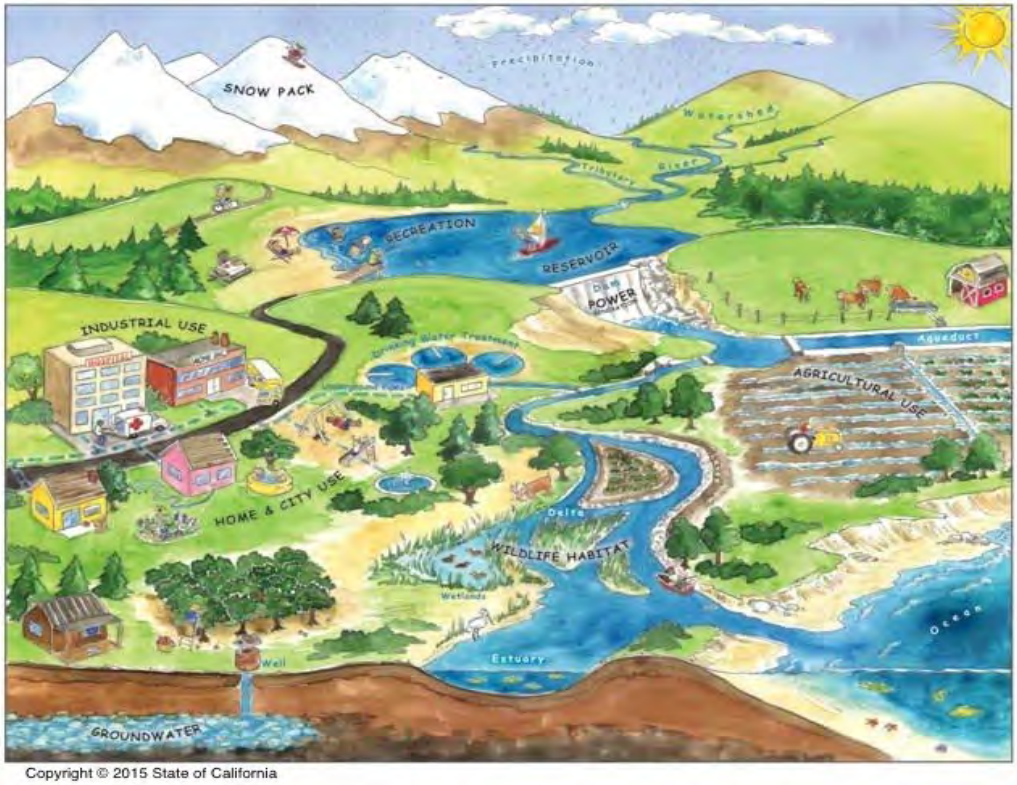
Feather River/Lower Honcut Creek Watershed

The Feather River/Lower Honcut Creek Watershed has a total area of approximately 280 square miles (178,925 acres). After the Feather River flows through the Oroville Dam, it enters the City of Oroville and continues south, joining with the Yuba River at Marysville and Yuba City, and eventually the Sacramento River. The Feather River/Lower Honcut Creek Watershed also contains another Dry Creek, unrelated to the Dry Creek in the Cherokee Watershed. This Dry Creek is located within the City of Oroville, contains three tributaries that join, and has a main channel that ends within the City of Oroville. Wyman Ravine, which originates south of the City of Oroville, drains the southern portion of the watershed, and flows into Honcut Creek. The north, middle, and south of Honcut Creek drain both the Lake Oroville/Upper Feather River Watershed and the Feather River/Lower Honcut Creek Watershed. The south fork of Honcut Creek forms the southern border of Butte County.

Infrastructure in the Watershed

The Feather River watershed surrounding the Oroville Area contains a diverse array of infrastructure designed to support both natural functions and human communities. A snapshot of some of this infrastructure is described in the following paragraphs. The CA Department of Water Resources prepared Figure A-I-6 to depict a typical northern California community that supplies water to the State Water Project. Lake Oroville is a key piece of the State Water Project.

Figure A-I-6: Typical Community Near State Water Project Infrastructure

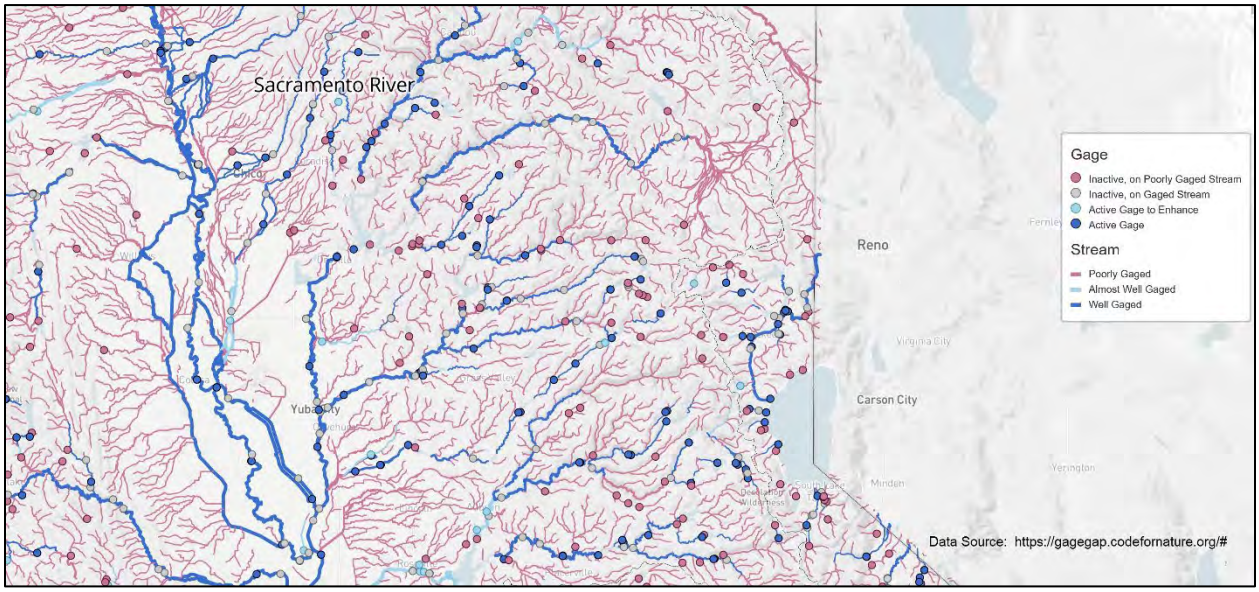


Streamflow Gages

It is important for water districts in California to understand the monitoring of surface water because it is the primary source of water for many. California has a highly engineered water system which moves millions of gallons of water from north to south and east to west. However, surprisingly little is known about how much water is moving through our streams at any given time. As our climate becomes increasingly erratic, tracking water flow becomes more critical. California's gage network overall is quite large — there are over 3,600 locations in California where stream gages have been active at some point; however, funding and staffing to maintain and upkeep many of the gages have been lost.

The Nature Conservancy and its partners utilized GIS to collect existing data on gages. With multiple databases (CDEC, USGS, NSIP, NWIS, NOAA), they tested for duplicates (while retaining attributes from multiple sources), crosswalk attributes, and collected information that is present on websites but not readily available for download. Using scripts, data scraping, and conversations with current data managers, they compiled the most comprehensive database of gages in California with over 4,000 records. A screenshot of the GIS map is shown in Figure A-I-7, below. Readers can access the full interactive web map here: <https://gagegap.codefornature.org/#>. In the Oroville area, the Feather River has several operating gages as depicted by the blue dots on Figure A-I-7. However, many of the smaller tributaries that feed into the river do not have actively working gages as depicted by red and grey dots in Figure A-I-7.

Figure A-I-7: Analysis of California's Stream Gage Network

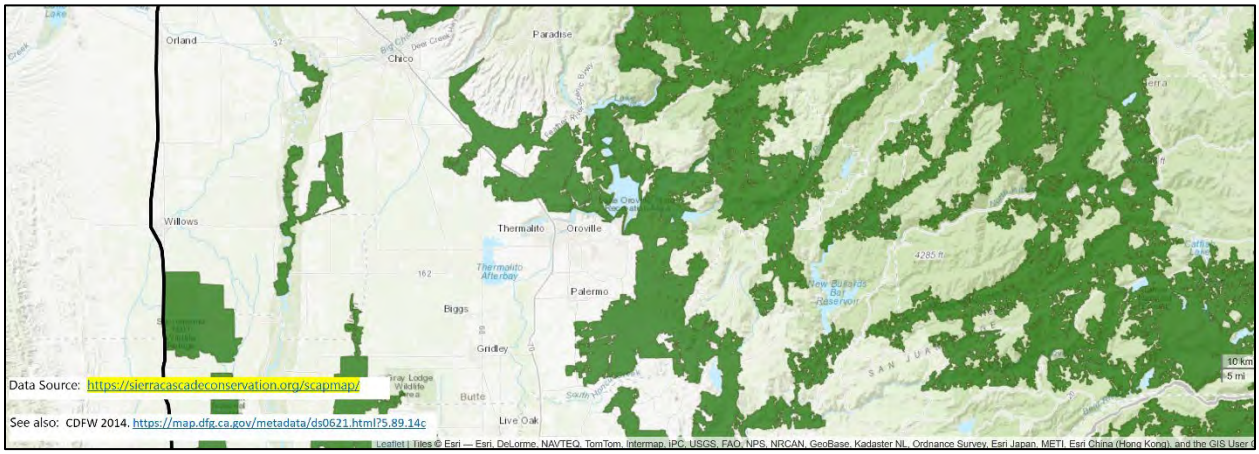


Green Infrastructure - Natural Blocks:

Although the City of Oroville is urbanized, it is surrounded by natural blocks of land. Figure A-I-8 depicts large, relatively natural habitat blocks, that support native biodiversity (Natural Landscape Blocks) and areas essential for ecological connectivity between them. This coarse-scale map was based primarily on the concept of ecological integrity, rather than the needs of a particular species. The watershed near Oroville benefits from existing open space. In Figure A-I-8, below, the green areas represent land that is managed

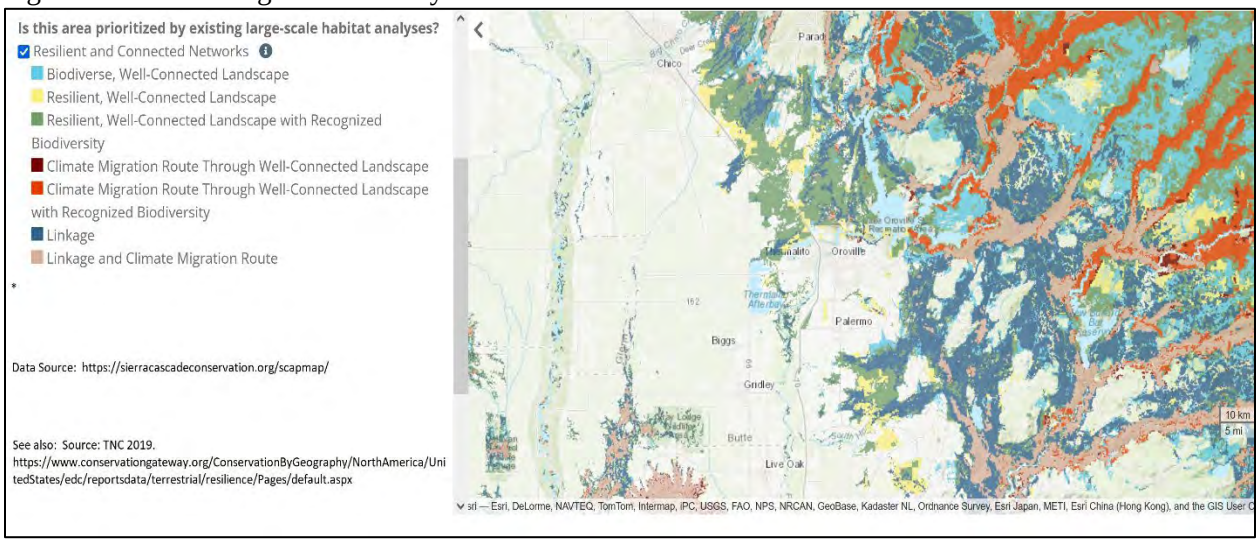
for the purpose of protecting natural resources. (Source: SCLTC n/d. and see also CDFW 2014. https://map.dfg.ca.gov/metadata/ds0621.html?5.89.14c

Figure A-I-8: Existing Large-Scale Habitat Analysis



Species diversity is site specific in the Oroville area with some areas having high biodiversity and other areas low biodiversity. The watershed hosts a diverse array of vegetation. The watershed also provides habitat for amphibians, aquatic macroinvertebrates, birds, fish, mammals, plants, and reptiles. Figure A-I-9 brings together resilience, permeability, and diversity to develop a connected network of sites that both represents the full suite of geophysical settings and has the connections and networks necessary to support the continued rearrangement of species in response to change. Source: SCLTC, n/d. and see also CDFW 2018. https://map.dfg.ca.gov/metadata/ds2769.html?5.84.09

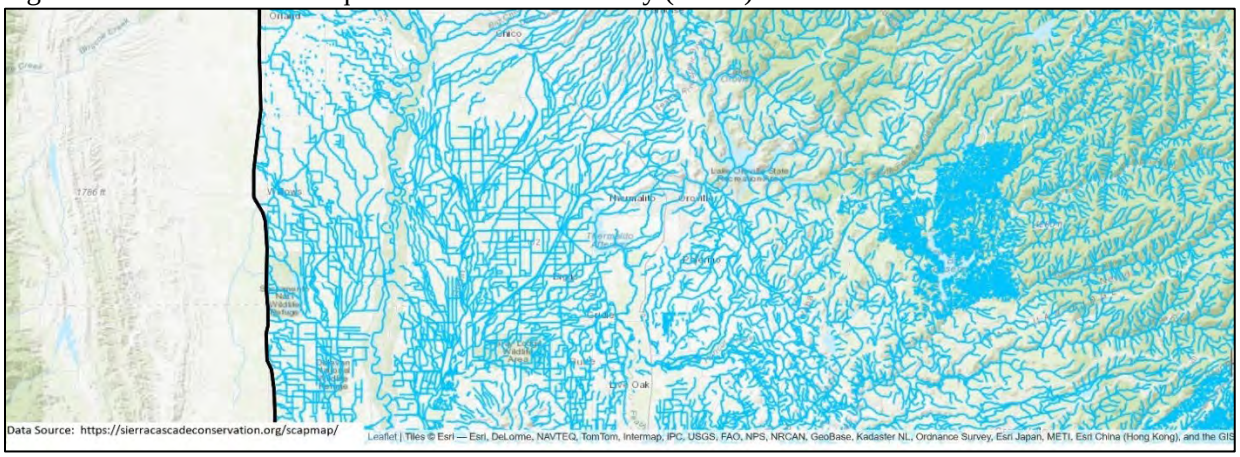
Figure A-I-9: Existing Habitat Analysis



Rivers and Streams

There is an extensive network of rivers and streams in the Oroville area. Figure A-I-10 below depicts the California Aquatic Resources Inventory (CARI) Streams: The current version of CARI is a compilation of local, regional, and statewide aquatic GIS datasets into a seamless, statewide coverage of aquatic resources that employs a common wetland classification system. Source: SCLTC, n/d. and see also CDFW 2017. https://map.dfg.ca.gov/metadata/ds2836.html?5.92.26

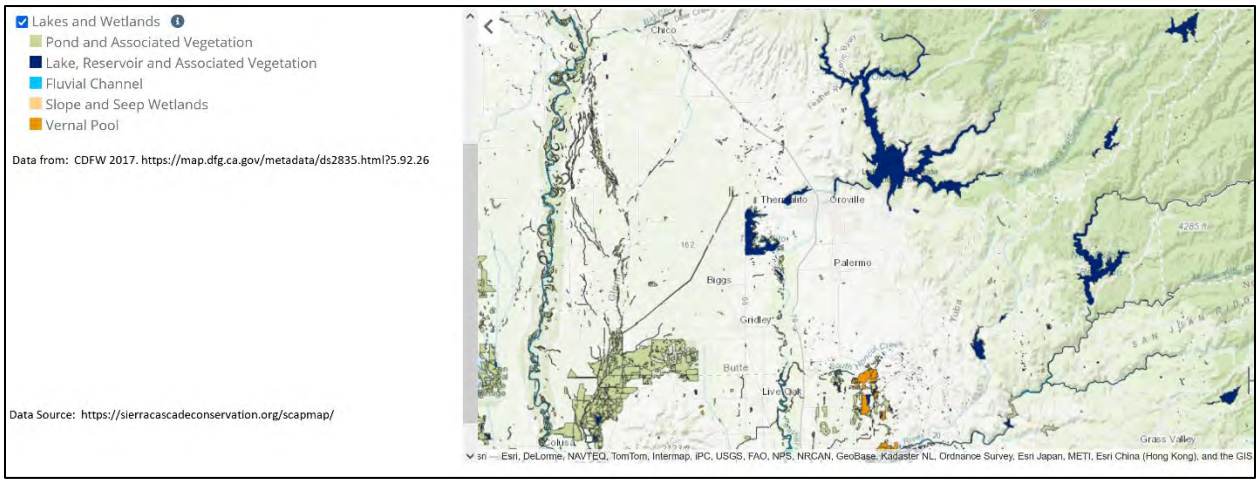
Figure A-I-10: California Aquatic Resources Inventory (CARI) Streams



Lakes

The lakes within the watershed are highlighted in dark blue in the following Figure A-I-11. The map is derived from the California Aquatic Resources Inventory (CARI) Wetlands. The current version of CARI is a compilation of local, regional, and statewide aquatic resource GIS datasets into a seamless, statewide coverage of aquatic resources that employs a common wetland classification system. The area surrounding Oroville has several types of aquatic features including ponds, lakes, reservoirs and associated vegetation, fluvial channels, slope and seep wetlands, and vernal pools. Source: SCLTC, n/d. and see also CDFW 2017. https://map.dfg.ca.gov/metadata/ds2835.html?5.92.26

Figure A-I-11: Lakes

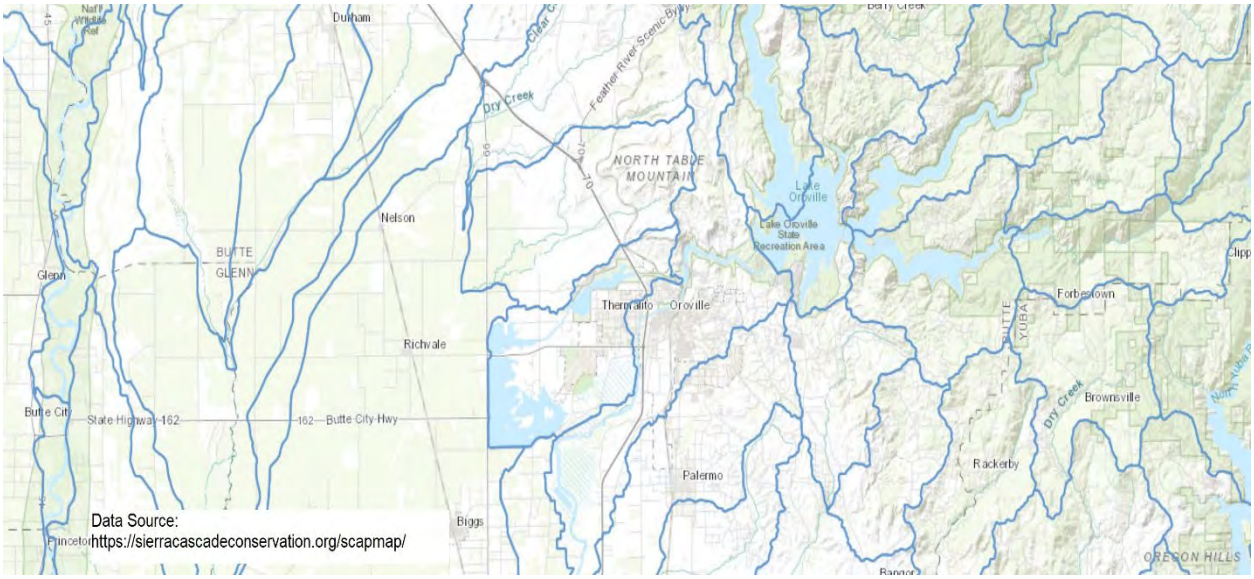


Sub-Watersheds

The National Hydrography Data Plus High Resolution (NHD Plus HR) provides delineation of HUC8 Watersheds and HUC12 Watersheds as shown in Figures A-I-12 and A-I-13 below.

Figure A-I-12: HUC-8 Watersheds

Figure A-I-13: HUC-12 Watersheds



For each of the watersheds depicted in the sub-watershed maps shown above, a profile is provided below in table format. Each table contains information specific to a watershed. Due to space limitations, only two profile samples are provided in Tables A-I-2 and A-I-3 below.

Table A-I-2: Profile of Honcut Headwaters-Lower Feather

Location	39.5202, -121.5088
County	Butte County
Species Biodiversity	Very High
Terrestrial Significant Habitats	Very High
Freshwater Conservation Blueprint	Freshwater Conservation Blueprint Area
CNDDB-Tracked Elements	bald eagle, Butte County meadowfoam, California black rail, California red-legged frog, chinook salmon - Central Valley spring-run ESU, foothill yellow-legged frog, green sturgeon, steelhead - Central Valley DPS, tricolored blackbird, vernal pool fairy shrimp, and vernal pool tadpole shrimp
Vegetation	Blue Oak-Foothill Pine
Rivers and Streams	8.3 linear miles within 1 mile radius
Watershed (HUC-8)	18020159 Honcut Headwaters-Lower Feather

Data Source: Sierra Cascade Land Trust Council at:
https://sierracascadeconservation.org/scapmap/

Table A-I-3: Profile of Honcut Headwaters-Lower Feather Watershed	
Location	39.4980, -121.6029
County	Butte County
Species Biodiversity	Moderate
Terrestrial Significant Habitats	Very High
Freshwater Conservation Blueprint	Freshwater Conservation Blueprint Area
CNDDB-Tracked Elements	bald eagle, bank swallow, California black rail, chinook salmon - Central Valley spring-run ESU, slender Orcutt grass, steelhead - Central Valley DPS, Swainson's hawk, tricolored blackbird, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp
Vegetation	Annual Grass
Rivers and Streams	2.7 linear miles within 1 mile radius
Watershed (HUC-8)	18020159 Honcut Headwaters-Lower Feather
Watershed (HUC-12)	180201590201 Thermalito Afterbay
Flood Hazard	Area of minimal Flood Hazard
Soil Carbon Storage	0 Metric tons CO2/hectare
Aboveground Carbon Storage	0 Metric tons CO2/hectare
Wildfire Hazard Potential	Moderate
Burn Probability	1-in-1,000 to 1-in-464
Future Land Use 2050	Suburban
Park Access	20.0 people per square mile
CalEnviroScreen Score	81
Indigenous Traditional Territory	Koyom:k'awi (Konkow) Mechoopda Maidu
Agricultural Land (FMMP)	Urban and Built-Up Land

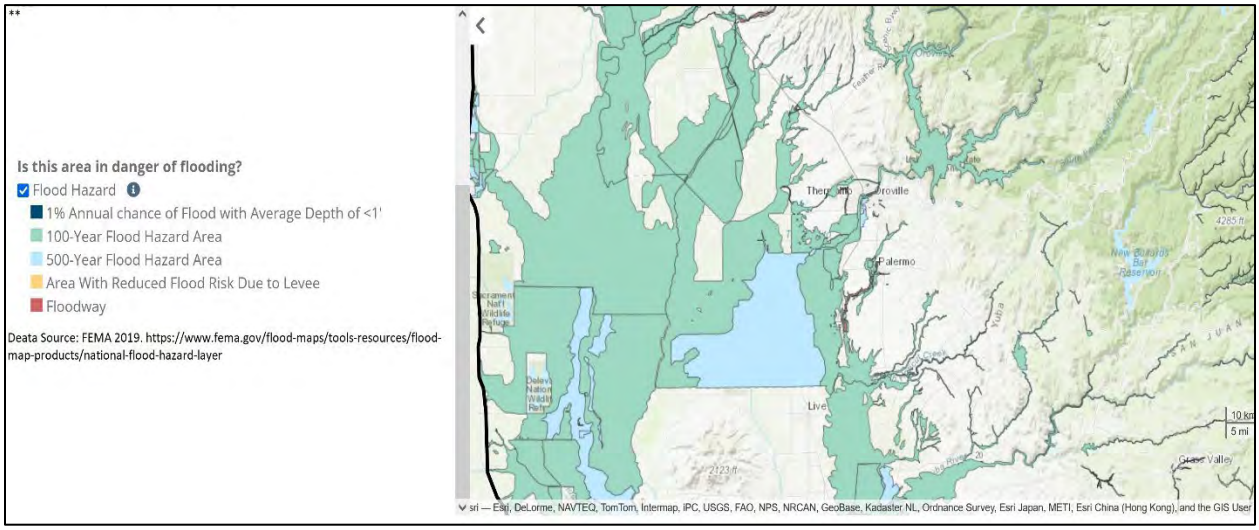
Data Source: Sierra Cascade Land Trust Council at:
https://sierracascadeconservation.org/scapmap/

Hazards and Planning Factors

Flooding

The 100-year floodplain in the Oroville area tends to follow the Feather River. The FIRM Database depicts flood risk information and supporting data used to develop the risk data. The primary risk classifications used are the 1-percent-annual-chance flood event, the 0.2-percent-annual-chance flood event, and areas of minimal flood risk. The FIRM Database is derived from Flood Insurance Studies (FISs), previously published FIRMs, flood hazard analyses performed in support of the FISs and FIRMs, and new mapping data, where available. Source: SCLTC, n/d. and see also FEMA 2019. https://www.fema.gov/flood-maps/tools-resources/flood-map-products/national-flood-hazard-layer

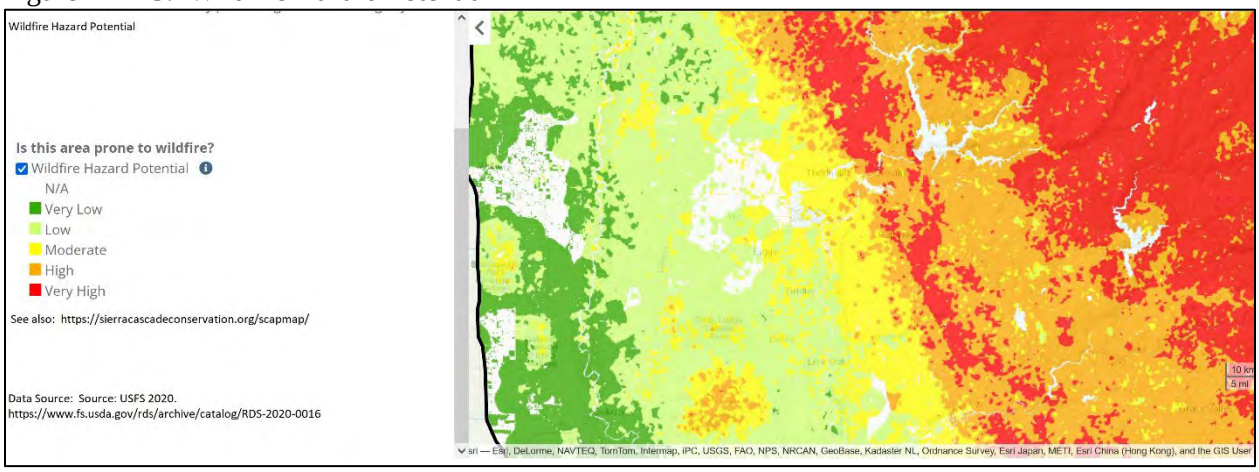
Figure A-I-14: Flood Risk



Wildfire Hazards

The Wildfire Hazard Potential is an index that quantifies the relative potential for wildfires that may be difficult to control, and it is used as a measure to help prioritize where fuel treatments may be needed. The City of Oroville's Wildfire Hazard Potential is rated as moderate and the surrounding areas are rated as high potential for wildfire as shown in Figure A-I-15, below. (Source: SCLTC, n/d. and see also USFS 2020. https://www.fs.usda.gov/rds/archive/catalog/RDS-2020-0016)

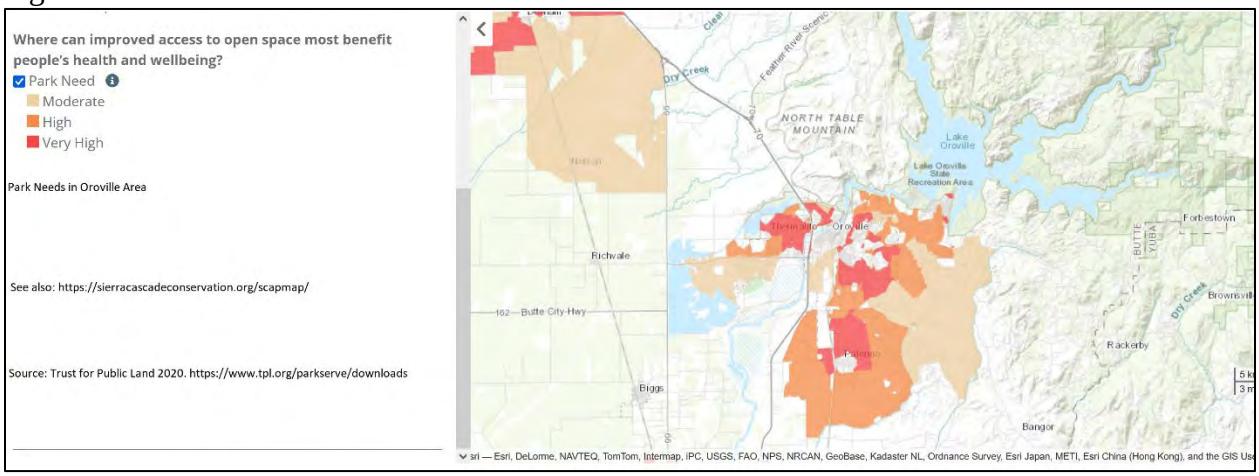
Figure A-I-15: Wildfire Hazard Potential



Park Needs

The City of Oroville and the Feather River Park and Red District provide several parks in the City of Oroville. However, the outlying areas surrounding Oroville may lack access. The Trust for Public Land (TPL) Park Access identifies block groups that do not have access to a park within a 10-minute walk. The area analyzed is limited to census designated places. Source: Trust for Public Land 2020. https://www.tpl.org/parkserve/downloads

Figure A-I-16: Park Needs in the Oroville Area

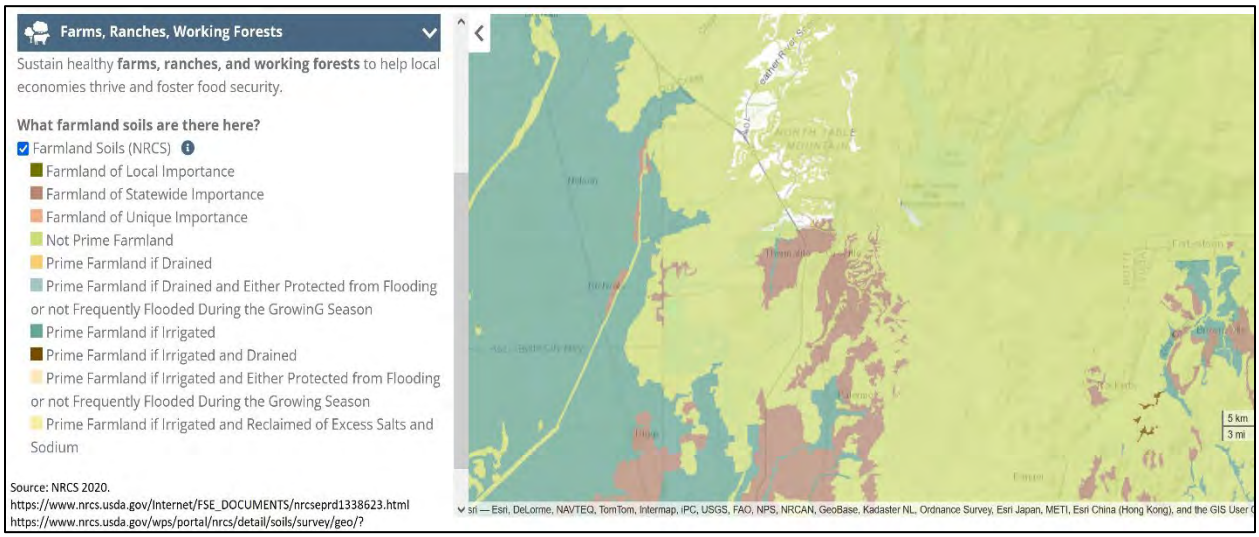


Farmland Soils:

The Oroville area has many different soil types as shown in Figure A-I-17, below. Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited for food, feed, fiber, forage, and oilseed crops. Near the City of Oroville, most existing farmland is utilized for grazing. West of the City of Oroville, prime farmland and unique farmland exist. (Source: SCLTC, n/d. and see also NRCS

2020. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1338623.html https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcseprd1464625)

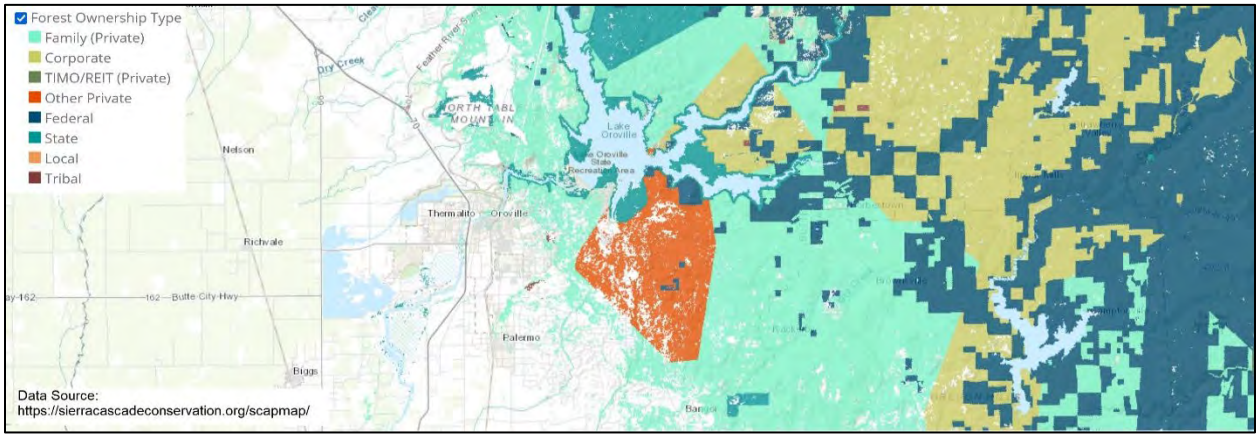
Figure A-I-17: Farmland Soils



Forests

Ponderosa pine forests are located East of Oroville. Timberland forests may be owned by private families, corporations, or TIMO/REIT. Other forests are managed by the U.S Forest Service. A geospatial dataset depicts ownership patterns of forest land across the conterminous United States. Eight ownership categories are modeled, including three public ownerships: federal, state, and local; four private categories: family, corporate, Timber Investment Management Organization (TIMO) and Real Estate Investment Trust (REIT), and other private (including conservation organizations and unincorporated associations); and Native American tribal land. The data are modeled from Forest Inventory and Analysis (FIA) points from 2012-2017 and the most up-to-date publicly available boundaries of federal, state, and tribal lands. The "red" area in Figure A-I-18 below is classified as "Other Private". (Source: SCLTC, n/d. and see also USFS 2020. https://www.fs.usda.gov/rds/archive/catalog/RDS-2020-0044)

Figure A-I-18: Forests



Bibliography

Butte County. June 2021. General Plan 2040 Update, Settings and Trends Report, Chapter 6, Wastewater, Stormwater, And Solid Waste. 42-pages. Contributions from Placeworks Consultants. Retrieved on May 1, 2022 from <*http://www.buttecounty.net/Portals/10/GeneralPlanUpdate/Settings%20and%20Trends/06_WastewaterStormwaterSolidWaste_June%202021_Final.pdf?ver=2021-06-21-082112-513* >.

CA Department of Water Resources (DWR). 2022. *Dry Well Reporting System Data*. Retrieved on August 16, 2022, from: <*https://data.cnra.ca.gov/dataset/dry-well-reporting-system-data*>.

NASA. (n.d.). *NASA Earth Science: Water Cycle*. Retrieved on July 18, 2022, from: <*https://gpm.nasa.gov/education/articles/nasa-earth-science-water-cycle*>.

Sierra Cascade Land Trust Council (SCLTC). n/d. Strategic Conservation Action Plan web tool. Retrieved July 18, 2022, from: < *https://sierracascadeconservation.org/scapmap/* >.

Stanford University. April 2014. Water In The West. Before the Well Runs Dry: Improving the Linkage Between Groundwater and Land Use Planning Based on an Uncommon Dialogue on Groundwater and Land Use Planning, 35-pages. Contributions from the Stanford Woods Institute for the Environment and The Bill Lane Center for the American West Retrieved May 4, 2022 from <*https://waterinthewest.stanford.edu/sites/default/files/Before%20The%20Well%20Runs%20Dry%20-%20Water%20in%20the%20West%20Stanford_0.pdf*>.

U.S. Environmental Protection Agency (EPA). November 2013. California Integrated Assessment Of Watershed Health EPA 841-R-14-003 Prepared by The Cadmus Group, Inc. for U.S. Environmental Protection Agency Support for this project was provided by the U.S. EPA Healthy Watersheds Initiative (http://www.epa.gov/healthywatersheds). Retrieved on 17July2022 from <https://databasin.org/datasets/84270b4364174451ae978f9872e30574/>.

APPENDIX J:

FLOOD RISK IN OROVILLE

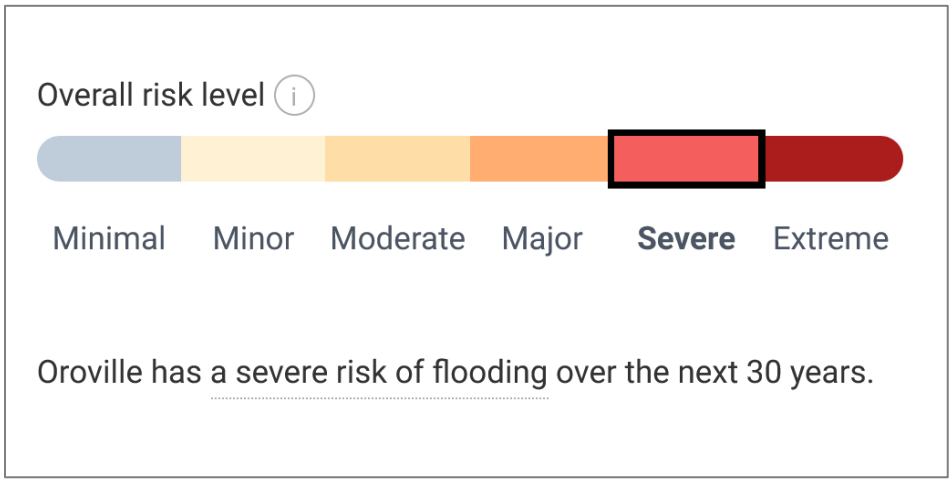
Appendix J: Flood Risk in Oroville

First Street Foundation, the science and technology nonprofit that developed the First Street Foundation Flood Model and created Flood Factor, has released the first ever nationwide community level flood resilience report titled "*The 3rd National Risk Assessment: Infrastructure on the Brink*", highlighting the flood risk over a 30 year period for every city and county across the conterminous United States. The report calculates the risk of five key dimensions of community risk: residential properties, roads, commercial properties, critical infrastructure, and social infrastructure. Based on the findings from this new study, the flood risk profile for the City of Oroville is described below.

Flood risk overview for Oroville

There are **1,464** properties in Oroville that have **greater than a 26% chance** of being severely affected by flooding over the next 30 years. This represents **20%** of all properties in the City. In addition to damage on properties, flooding can also cut off access to utilities, emergency services, transportation, and may impact the overall economic well-being of an area. Overall, **Oroville has a severe risk of flooding** over the next 30 years, which means flooding is likely to impact day to day life within the community.

Figure J-1: Risk Level

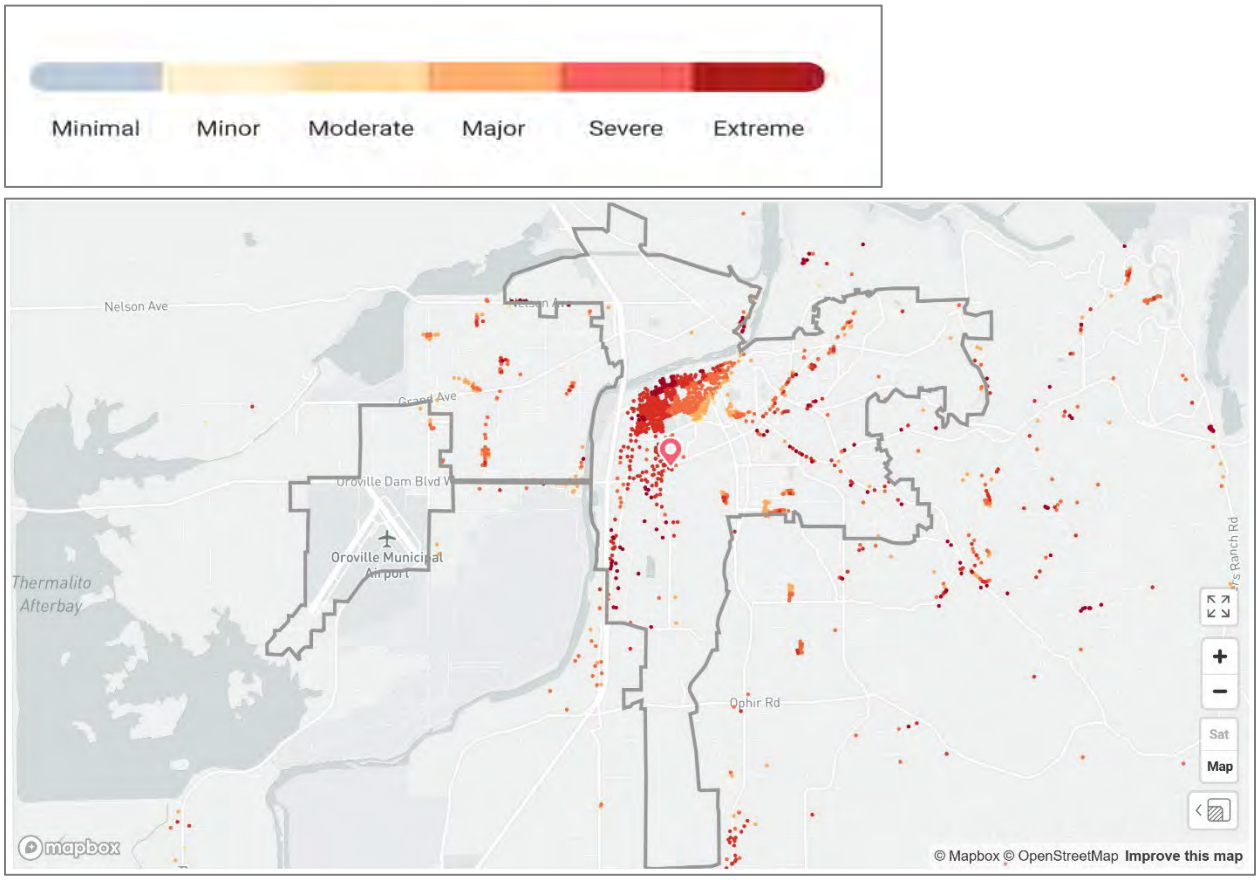


The overall flood risk assessment for Oroville was based on the risk of 5 categories: properties, businesses, roads, infrastructure and social. Each metric is graded on a 6-point scale, and combined to form the overall risk as shown in Figure J-1. This risk level considers risk over a 30-year period to account for the changing climate.

Figure J-2: Five Categories of Risk

The flood risk is spatially distributed in a patchy pattern such that some neighborhoods in Oroville have much higher flood risk as compared to others as shown in the map, Figure J-3, Map of Risk below.

Figure J-3: Map of Risk



There are solutions to protect Oroville

Communities that adapt to higher risks can limit damage and lower flood insurance costs. Oroville is already investing in flood risk reduction projects, but more may be needed. 9,758 properties located within the boundaries of the City of Oroville are at least partially protected by local flood risk reduction measures, known as adaptation.

Lowering flood risk starts with higher standards

Some places plan to a higher standard (a "500 year" standard) that lowers the number of properties at severe risk. Protecting homes to this level would reduce the risk to the **1,464** severely affected properties by 77%.

Table J-1: Chance of Floods

Flood Event	% chance of flooding in a given year	% chance of flooding over 30 years
100 year	1%	26%
500 year	.02%	6%

Flood risks vary by depth and likelihood.

Deeper floods from major events, like hurricanes, are less likely to occur, but cause greater damage than more shallow flood events, like heavy rains.

Table J-2: Projected flood risk					
Flooding likelihood	0.2%	1%	5%	20%	50%
# of Properties impacted	1,762	1,418	1,081	35	0

Figure J-4:

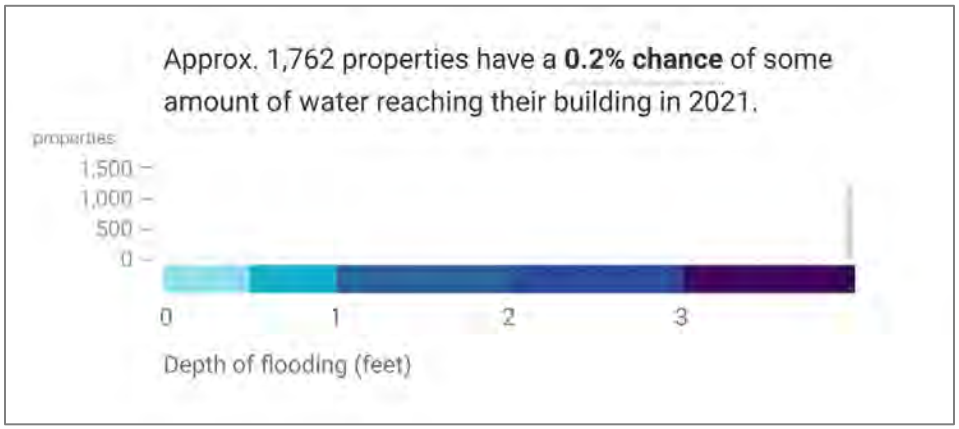
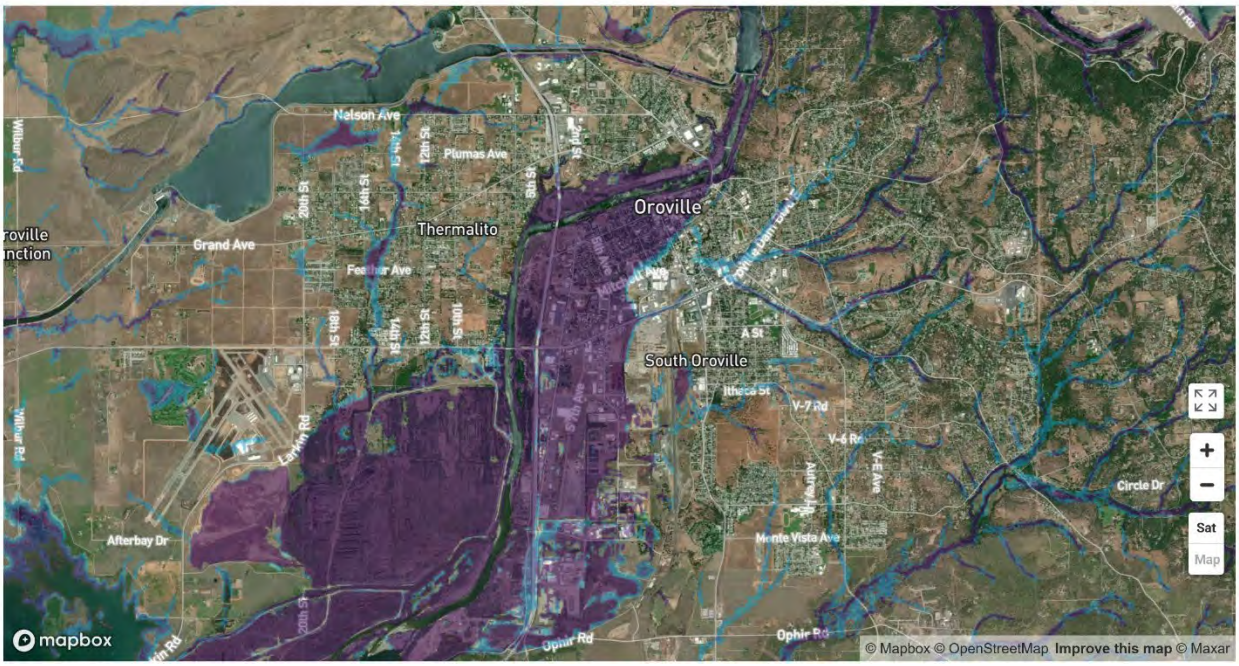


Figure J-5: Depth of Flooding



Solutions can protect Oroville.

Individuals, mayors, governors, and Congress can work together to build protections before flooding, build back stronger after flooding, and create plans that future-proof communities.

Flood risks are increasing because of the environment.
A changing environment means higher seas, new weather patterns, and stronger storms. As the atmosphere warms, there is more evaporation and more water available when it rains. A warmer atmosphere also means warmer oceans, which can intensify flooding from hurricanes and offshore storms.

About this Flood Risk Analysis
Flood Factor is a free online tool created by the nonprofit First Street Foundation that makes it easy for Americans to find their property's risk of flooding and understand how flood risks are changing because of a changing environment.

Flood Factor was created to make the most cutting-edge flood science:

- Accessible to all
- Available at the property level
- Easy to understand

First Street Foundation aims to quantify and communicate America's flood risk. By making flood risk data freely available for all, individuals and communities can prepare for and mitigate risks before they become a reality. The creation of Flood Factor required an unprecedented partnership of more than 80 world-renowned scientists, technologists and analysts working towards a unified goal: creating the First Street Foundation National Flood Model, the first publicly available, peer-reviewed model to consider changes in the environment and show how property-level flood risks change over time as a result.
The model calculates any location's probability of flooding from the four major flood types: rain, riverine, tidal events, and storm surge. The model further incorporates high-precision elevation data and local adaptation measures like seawalls and levees into its flood projections, validates against modeled historic floods, and then analyzes and maps the combined flood risk. First Street Foundation supports scientific collaboration and data transparency, and created Flood Factor to make its peer-reviewed research on these risks freely available to all. Flood Factor simplifies flooding so every American can find their risk, understand the science, and make informed decisions to prepare for the future.

Bibliography

First Street Foundation. October 2021. Flood Factor Website, An On-Line Tool. Retrieved on November 2, 2021 from: <*https://www.floodfactor.com/city/oroville-california/654386_fsid#summary* >.

Appendix K

Water and Wastewater Recommendations from American Society of Civil Engineers

Appendix K

Water and Wastewater Recommendations from American Society of Civil Engineers

Appendix K: Water and Wastewater Recommendations from American Society of Civil Engineers

Introduction

The American Society of Civil Engineers (ASCE) was founded in 1852 and is the nation's oldest engineering society. ASCE represents more than 150,000 members of the civil engineering profession in 177 countries. In the California, the chapter of ASCE published a report entitled "Report Card for California's Infrastructure". An excerpt from this report is provided in the following pages. Readers are invited to view the full-report on the ASCE website as listed in the bibliography provided on the next page.

Drinking Water: Recommendations To Raise The Grade

Recommendations related to potable water supply and associated infrastructure are listed below.

- ADDRESS AGING INFRASTRUCTURE NEEDS. As water rates are usually set by locally elected boards and commissions that generally run on low water rate platforms, there is a need for additional consumer education on the current funding needs and the negative impacts of further delaying action to facilitate fair and appropriate water rates needed to fund infrastructure improvements for all water systems statewide.
- CONTINUE TO MAKE CONSERVATION A CALIFORNIA WAY OF LIFE. The Water Conservation Act of 2009 requires a 20% reduction in urban per capita water use by December 31, 2020. Though a great start, more can and must be done. Key areas of future focus include expanded development of sustainable water supplies at the regional level and agricultural water use efficiency.
- INCREASE REGIONAL SELF RELIANCE AND INTEGRATED WATER MANAGEMENT ACROSS ALL LEVELS OF GOVERNMENT. The State's Integrated Water Management Planning program is a 21st century approach that supports regionally driven, multi benefit projects that increase regional self-reliance and sustainable practices. Funding for the program should be expanded to foster improved alignment between land use and water, provide assistance to disadvantaged communities, and support better use of local water supplies such as recycling, stormwater capture, and desalination.
- ACHIEVE THE CO EQUAL GOALS FOR THE DELTA. The co-equal goals of the Delta Stewardship Council are to provide a more reliable water supply for California and to protect, restore and enhance the Delta ecosystem. Implementation must start on the Delta Plan, including California EcoRestore, which will restore more than 30,000 acres of critical Delta habitat.

- MANAGE AND PREPARE FOR DRY PERIODS. Temporary shortages caused by extended, severe dry periods will become more frequent with climate change. Effective management of water resources through all hydrologic conditions will reduce impacts of shortages and lessen costs of response actions. Among the necessary steps to secure more reliable water supplies is updating dam and delivery operations to respond to extreme conditions. This will require continued improvement in water forecasting and cooperation among agencies.

Wastewater: Recommendations To Raise The Grade

- Make risk-based decisions on capital improvements, maintenance, and operations (i.e. – implement asset management programs).
- The State of California should continue to provide loans and grant funding for the repair and rehabilitation of wastewater collection and treatment systems, as well as reuse projects.
- The State of California should continue to implement indirect and direct potable reuse regulations.
- Implement an education program at the state and local level about what a wastewater treatment plant is, what kind of wastes it can treat, as well as what impact wastes have on the sewer pipes such as grease and flushable wipes, etc. Continue educational programs on how to identify a sewer overflow and who to call if such an event occurs.
- Continue advancements in water reuse/recycling. Expand recommendation on re-use/recycling

Bibliography

American Society of Civil Engineers, Region 9. May 2019. Report Card for California's Infrastructure 19. 132 pages. Retrieved on September 21, 2021 from: *https://infrastructurereportcard.org/state-item/california/*

##

Appendix L
Housing in the Oroville Area

Appendix L
Housing in the Oroville Area

The State of California has a well-documented housing shortage which increases the price of housing (LA Times, 2022). New home construction is complex due to factors such as land costs, materials, labor availability, financing for developers, and interest rates on mortgages for homeowners. The provision of a range of housing types in the Oroville Area is a topic of conversation within the community. City and County planning officials generally aim to balance considerations around costs, quality of life, and housing shortage in the community. One question that has been raised in the Oroville Area is whether sewer or municipal water infrastructure capacity might be a limiting factor constraining new development in the area.

POPULATION

The existing and projected population in the Oroville area is described in this MSR in Chapters 1 to 7. Appendix A provides details on the existing population in Butte County, and Appendix B describes the population in the City of Oroville. Appendix H describes the economy of Butte County and contains references and links to more detailed economic information.

AFFORDABLE HOUSING

The Housing Authority of the County of Butte (HACB) is a non-profit public agency incorporated in 1946. HACB's mission is to assist low- and moderate-income residents of Butte and Glenn Counties to secure and maintain high quality affordable housing. HACB utilizes funding provided by the U.S. Department of Housing and Urban Development and the USDA Rural Development. Low-income families, seniors and disabled individuals are eligible for subsidized housing as described on their website at: < *http://www.butte-housing.com*>.

California's most recent eight-year housing plan, which ended in 2014, shows that Oroville and BCAG identified a need for 2,363 new housing units. However, only 300 were actually built. This represents a build rate of only 13 percent of what is needed (LA Times, 2022).

BUTTE AREA COUNCIL OF GOVERNMENTS

In Butte County, the Butte County Association of Governments (BCAG) describes how many new homes are needed across four income levels: very low, low, moderate, and above-moderate. This is intended to allow all cities and counties to receive their fair share of growth. Local governments utilize their Housing Elements to show they've zoned enough land for the new housing. Then, the Housing Element is sent to the State who must sign off on those plans.

CITY OF OROVILLE – 2022-2030 HOUSING ELEMENT

The City of Oroville's 2022-2030 Housing Element was adopted by the City Council on July 19, 2022. The document can be found at this link: <*https://www.orovillehousingelement.com/_files/ugd/5c8158_041024f4c66544918855ffd6cc4a1cbc.pdf*>. The updated Housing Element covers the eight-year period from June 2022 to June 2030. This update will provide the City of Oroville with a plan to "…promote the production of safe,

decent, and affordable housing for all of its residents" (City of Oroville, 2022). The previous Housing Element in June 2014 was adopted during a time of reduced funding, primarily due to the elimination of Redevelopment Agencies (RDA) (City of Oroville, 2022). Due to the lack of funding, the City was unable to provide rehabilitation assistance to multi-family units (City of Oroville, 2022). The new Housing Element highlights new goals and visions that address the City of Oroville's housing needs. The housing needs were established through the assessment of various data sources, which then allowed the development of Goals, Policies, and Actions. A Site Inventory and infrastructure assessments established that the City has the necessary infrastructure to support the new development of units found in the Site Inventory (City of Oroville, 2022). According to the 2022-2030 Housing Element, the City 2030 General Plan, municipal code, and design guidelines greatly reinforce community character and safety. The Regional Housing Needs Allocation for the City of Oroville, 2022-2030, suggests that 625 new residential units will be needed prior to the year 2030 (COOR, 2022).

BUTTE COUNTY PUBLIC REVIEW DRAFT 2022-2030 HOUSING ELEMENT

Butte County released the Public Review Draft of the 2022-2030 Housing Element in June 2022. The document can be found at this link: <*https://www.buttecounty.net/Portals/10/Docs/GP2040/BUTTECOUNTY_2022-2030_Housing_Element_Public_Review_Draft_June%202022.pdf?ver=2022-06-01-105242-350*>. The document highlights the goals, policies, and actions that the County of Butte will follow as it develops new housing, rehabilitates, and preserves throughout the eight-year planning period (County of Butte, 2022). The previous 2014-2022 Housing Element provided a basis for programs, including the completion of zoning ordinance amendments, completion of rezone efforts, and the completion of the Butte County Homeless Continuum of Care Homeless Count Report. Between 2010-2021, the number of households within the Unincorporated Area decreased due to events such as the 2018 Camp Fire and the 2020 North Complex Fire. During this period, the population decreased from 83,758 to 59,414 (County of Butte, 2022). This decrease in Unincorporated Area residents resulted from people moving to local cities. The Unincorporated Area lacks multi-family options, limiting housing affordability overall. It is indicated that in the Unincorporated Area there were "…approximately 67 percent of households earning 30 percent or less of the AMI spent more than 30 percent of their income on housing costs, with 58 percent of households that spent more than 50 percent of their income on housing costs experiencing severe housing cost burdens" (County of Butte, 2022). The Regional Housing Needs Allocation (RHNA) for the County has mandated that the Unincorporated Area develop 3,782 units that suffice all income categories (County of Butte, 2022).

BUILDING HOMES AND JOBS ACT

California's legislature approved the Building Homes and Jobs Act (SB 2, 2017), administered by the California Department of Housing and Community Development (CA HCD). CA HCD allocates SB 2 Planning Grants that provide Funding and technical assistance to local governments in California to help cities and counties prepare, adopt, and implement plans and process improvements that streamline housing approvals and accelerate housing production. Details regarding SB 2 Planning Grants can be found on this website: <*https://www.hcd.ca.gov/sb-2-*

planning-grants >. This MSR was funded through a SB 2 Planning Grant in cooperation with Butte County, Butte LAFCO, and CA HCD.

CALIFORNIA HOUSING ACT (SB 9)

Effective January 1, 2022, Senate Bill 9 (SB 9) was designed to provide new ways to increase housing supply options in urban areas. Property owners in many single-family zones now have the option to build a secondary dwelling unit on their current property or subdivide their land into two separate entities and possibly construct a total of three new units (in addition to the existing single-family home). Several other rules apply, and property owners are encouraged to contact their city planning department for additional details. Ultimately, SB 9 may encourage additional infill development.

California Middle Class Housing Act

California Middle Class Housing Act [Senate Bill 6 (Caballero)] was passed by the California Legislature on Aug. 29, 2022. This new law takes effect on July 1, as *Governor Newsom signed it.* If the project proponents commit to providing both prevailing wage *and* more costly "skilled and trained workforce" requirements for project labor then *under this law, underutilized commercial space (i.e. retail, office, and parking lots) can be converted into housing* without needing rezoning approval. SB 6 projects may be either a 100-percent residential project or a mixed-use project where at least 50 percent of the square footage is dedicated to residential uses. SB 6 projects are not exempt from CEQA but need not provide any affordable housing. Project proponents must also comply with the laws lot size requirements, location requirements, and must be consistent with any applicable and approved sustainable community strategy. This law aims to provide expedited development to convert vacant buildings and parking lots into homes for middle- and working-class families.

Affordable Housing and High Road Jobs Act

Assembly Bill (AB) 2011 (Wicks), the Affordable Housing and High Road Jobs Act of 2022, was approved by the California Legislature. This new law was approved by Gov. Gavin Newsom and becomes effective on July 1, 2023. This legislation aims to unlock the potential for housing production on sites currently zoned and designated for commercial or retail uses.

AB 2011 creates a CEQA-exempt, ministerial approval process for multifamily housing developments on sites within a zone where office, retail or parking are the principally permitted use. AB 2011 projects must pay prevailing wages to construction workers and meet other labor standards. The law provides for slightly different qualifying criteria:

1) for 100-percent affordable projects, and
2) for mixed-income projects located commercial corridors.

SEWAGE CAPACITY

The wastewater treatment plant operated by SC-OR (Chapter 5) bases sewer utility capacity on equivalent residential dwelling units (EDUs). EDUs can be considered metaphorically analogous to the allotment of shares that LOAPUD, TWSD, and COOR have in the SC-OR JPA WWTP. The capacity of local wastewater service providers to provide service to existing and newly constructed homes is described in this MSR in Chapters 2 to 7.

MUNCIPAL WATER INFRASTRUCTURE

Municipal water service is provided by the following service providers:

- Cal Water, a private company, described in Appendix Q.
- Thermalito Water and Sewer District, a local public agency described in Chapter 7.
- South Feather Water and Power Agency, a local public agency described in Chapter 6.

AFFORDABILITY OF UTILITIES (INCLUDING WATER AND SEWER)

In California, there are a number of well-established affordability programs based on household income data, including:

- California Alternate Rates for Energy (CARE);
- Family Electric Rate Assistance Program (FERA);
- Federal Low Income Home Energy Assistance Program (LIHEAP);
- Low Income Energy Efficiency Program (LIEE); and
- California LifeLine Program.

Welfare and social service experts can provide details about eligibility and the application process for these programs.

OTHER FINANCING OPPORTUNITIES

Oroville contains a federally recognized "Opportunity Zone," as shown on the map in Figure M-1, below. Opportunity Zones are census tracts that are economically-distressed communities where new investments may, under certain conditions, be eligible for preferential federal tax treatment or preferential consideration for federal grants and programs as described at this website: <*https://www.opzones.ca.gov/*>.

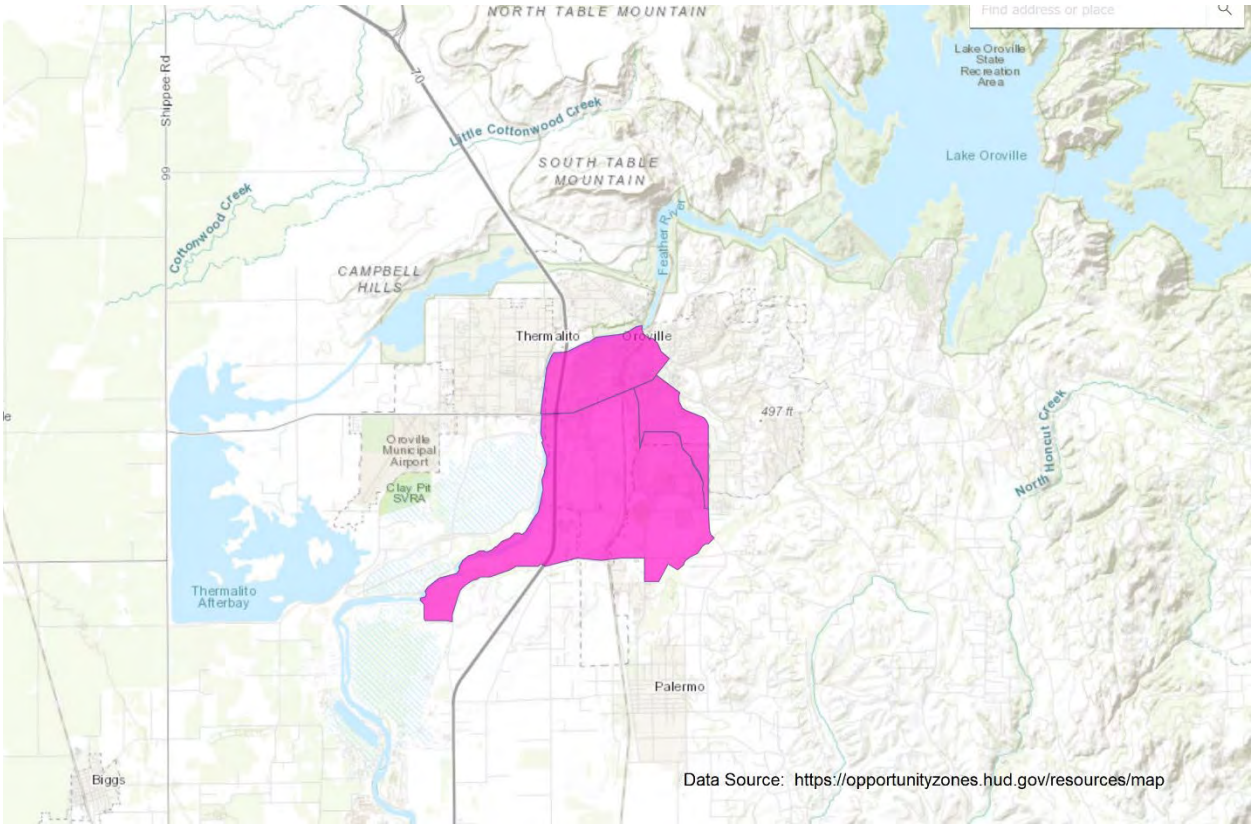


Figure M-1: Federal Opportunity Zone

BIBLIOGRAPHY

Butte County Department of Development Services. October 8, 2019 Letter Agreement for the County of Butte and Butte LAFCo concerning the preparation of a Master Municipal Service Review Utilizing SB 2 Planning Grant Funds. Signed by Tim Snellings, Director. 4-pages. Available in LAFCO files upon request.

Butte County. (2022). *2022-2030 Housing Element: Public Review Draft.* 398-pages. Retrieved on August 30, 2022 from: <*https://www.buttecounty.net/Portals/10/Docs/GP2040/BUTTECOUNTY_2022-2030_Housing_Element_Public_Review_Draft_June%202022.pdf?ver=2022-06-01-105242-350*>.

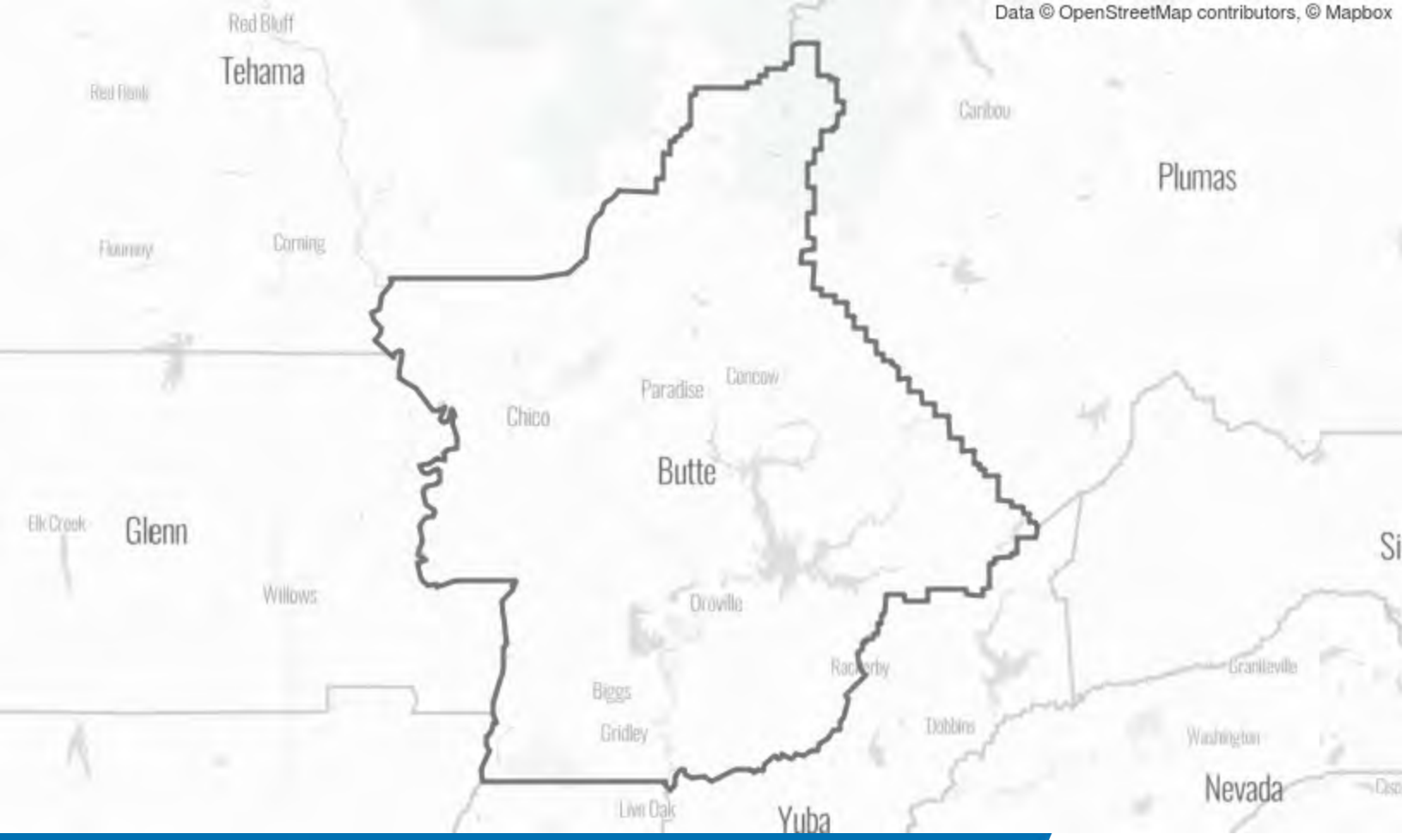
California Housing Partnership. May 2021. Butte County 2021 Affordable Housing Needs Report. 4-pages. Retrieved December 2021 from: < *chpc.net*>.

City of Oroville. July 19, 2022. Adopted 2022-2030 Housing Element. 291-pages. Retrieved August 30, 2022 from: <*https://www.orovillehousingelement.com/_files/ugd/5c8158_041024f4c66544918855ffd6cc4a1cbc.pdf*>.

LA Times. June 29, 2017. California lawmakers have tried for 50 years to fix the state's housing crisis. Here's why they've failed. Authored by Reporter Liam Dillon. Retrieved on August 27, 2022 from <*https://www.latimes.com/projects/la-pol-ca-housing-supply/*>.

Attachment:

- Butte County 2021 Affordable Housing Needs Report



BUTTE COUNTY 2021
Affordable Housing Needs Report

California Housing Partnership
California's Experts on Affordable Housing Finance, Advocacy & Policy

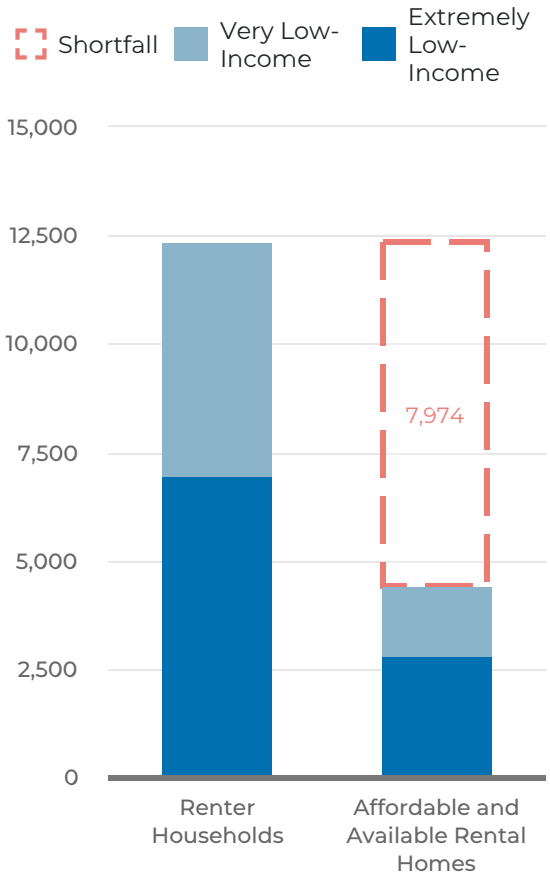
KEY FINDINGS

- **81% of extremely low-income households** are paying more than half of their income on housing costs compared to just 1% of moderate-income households.
- **7,974 low-income renter households** in Butte County do not have access to an affordable home.
- Low-Income Housing Tax Credit production and preservation in Butte County has **increased by 1,278 homes** between 2019 and 2020.
- Renters in Butte County need to earn $21.36 per hour - **1.5 times** the state minimum wage - to afford the average monthly asking rent of $1,111.
- In Butte County, state funding **increased 961%** while federal funding **decreased 40%** for housing production and preservation from FY 2018-19 to FY 2019-20.

MAY 2021

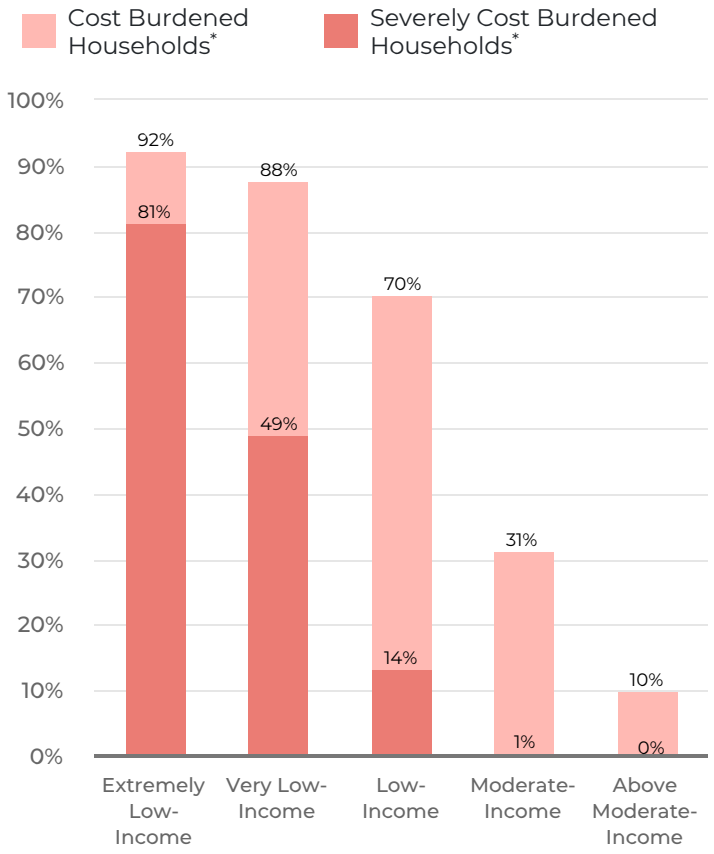
AFFORDABLE HOMES SHORTFALL

7,974 low-income renter households in Butte County do not have access to an affordable home.



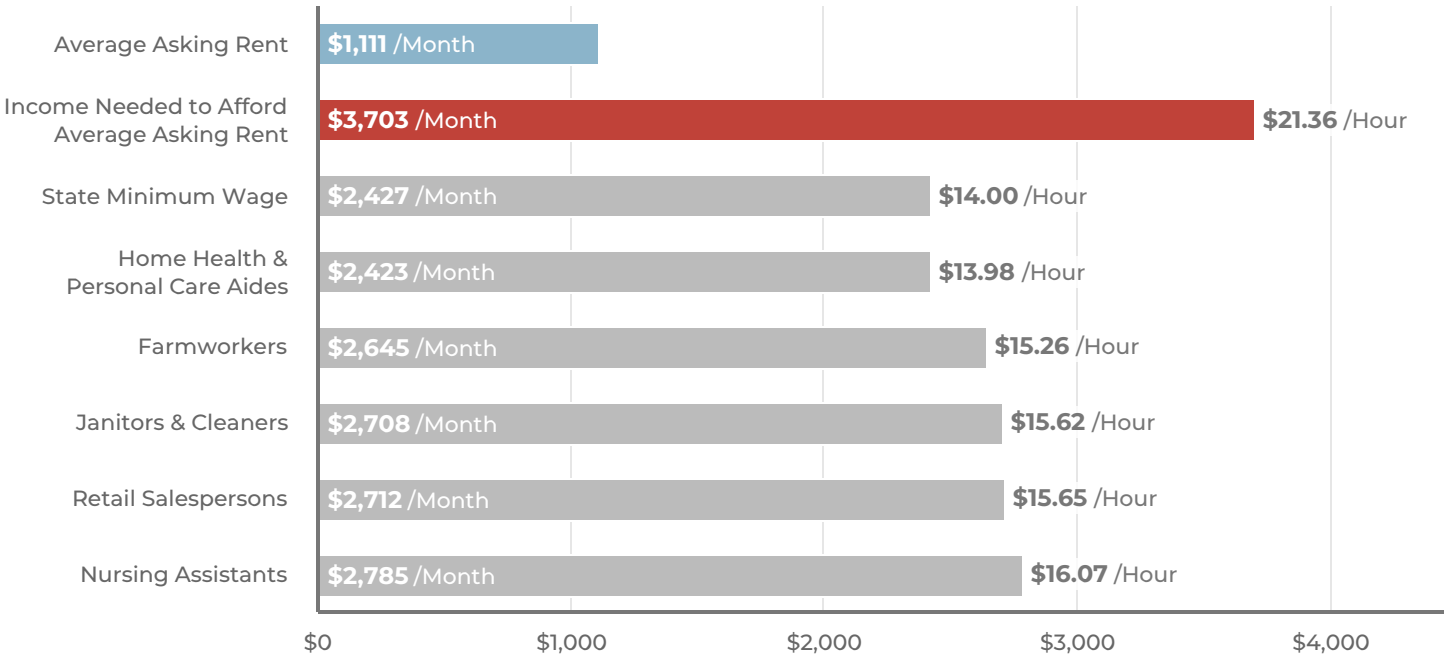
COST BURDENED RENTER HOUSEHOLDS

81% of ELI households in Butte County are paying more than half of their income on housing costs compared to just 1% of moderate-income households.



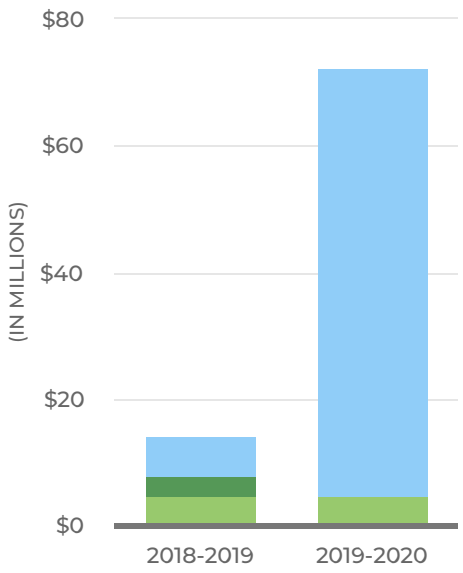
WHO CAN AFFORD TO RENT

Renters need to earn **1.5 times** minimum wage to afford the average asking rent in Butte County.



FUNDING FOR HOUSING

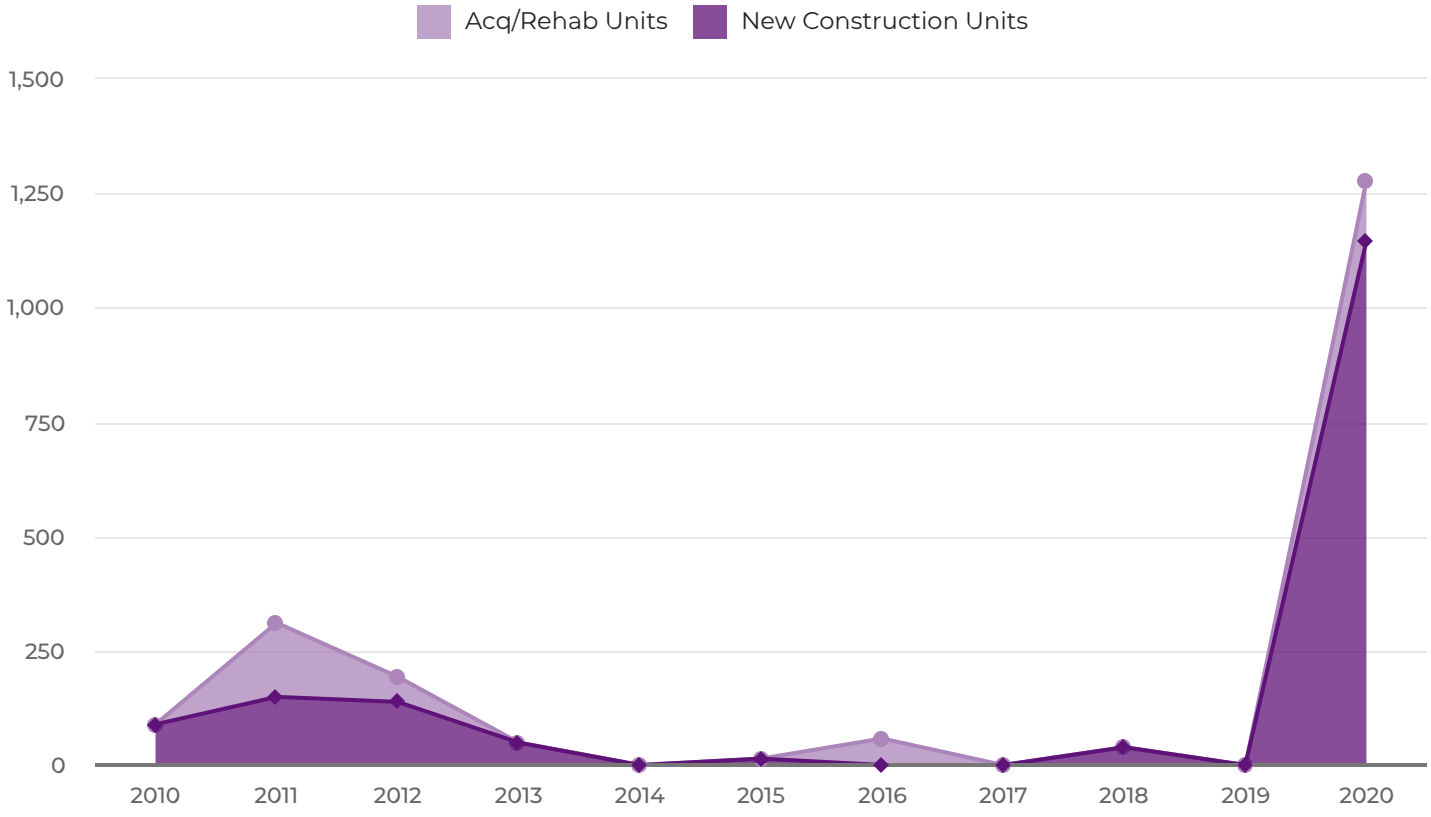
In Butte County, state funding **increased 961%** while federal funding **decreased 40%** for housing production and preservation from FY 2018-19 to FY 2019-20.



FUNDING SOURCE	FY 2018-19 (in thousands)	FY 2019-20 (in thousands)	% CHANGE
State Housing Bonds and Budget Allocations	$6,393	$67,851	961%
State LIHTC	$0	$0	--%
STATE TOTAL	**$6,393**	**$67,851**	**961%**
Federal LIHTC	$3,107	$0	-100%
HUD Block Grants	$4,752	$4,687	-1%
FEDERAL TOTAL	**$7,859**	**$4,687**	**-40%**

LIHTC PRODUCTION AND PRESERVATION

Low-Income Housing Tax Credit production and preservation in Butte County has **increased by 1,278 homes** between 2019 and 2020.



STATEWIDE POLICY RECOMMENDATIONS

In addition to critical COVID-19 efforts, the Partnership calls on State leaders to take the following actions to provide relief to low-income families struggling with unaffordable and unstable housing:

- Initiate a $10 billion statewide housing bond to fund five more years of affordable housing for low-income families and people experiencing homelessness.
- Permanently fund local governments to implement flexible homelessness solutions by recapturing $2.4 billion per year lost through corporate tax loopholes and reductions.
- Make permanent the $500 million expansion of the state Low-Income Housing Tax Credit to increase affordable housing production through public/private partnerships.
- Empower voters to support building affordable homes locally by lowering the supermajority approval threshold required for housing ballot measures to 55%.
- Fund the conversion of commercial properties and market-rate rental properties occupied by low-income households into affordable homes.
- Allow new apartment and condominium developments to be built in commercial and mixed-use zones when at least 20% of the homes are affordable to low-income households.
- Speed the construction of affordable homes and reduce uncertainty and costs by streamlining the award of state funding for affordable housing developments from four different state agencies into one decision-making process.

DATA SOURCES & NOTES

- **FUNDING FOR HOUSING**
  California Housing Partnership analysis of HCD Program Awards and Annual Reports, HUD CPD Appropriations Budget Reports, CalHFA Mixed Income Program, BCHS Program Reports, California Strategic Growth Council Affordable Housing Sustainable Communities Program, and federal and state Low-Income Housing Tax Credits.
- **AFFORDABLE HOMES SHORTFALL**
  California Housing Partnership analysis of 2019 1-year American Community Survey (ACS) Public Use Microdata Sample (PUMS) data with HUD income levels. Methodology was adapted from NLIHC gap methodology.
- **COST BURDENED RENTER HOUSEHOLDS**
  California Housing Partnership analysis of 2019 1-year ACS PUMS data with HUD income levels. Methodology was adapted from NLIHC gap methodology.
  * Cost burdened households spend 30% or more of their income towards housing costs. Severely cost burdened households spend more than 50%.
- **WHO CAN AFFORD TO RENT**
  CoStar Group average asking rent for two bedroom as of January 2021. Bureau of Labor Statistics Average Annual Wage Data for California Occupations, 2020.
- **LIHTC PRODUCTION AND PRESERVATION**
  California Housing Partnership's Preservation Database, January 2021. Please note that this data does not include manager units or market rate units created through the LIHTC program.

This report was produced by the California Housing Partnership | chpc.net

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Matt Schwartz, President & CEO

California Housing Partnership
California's Experts on Affordable Housing Finance, Advocacy & Policy

Appendix M

Miocene Canal Acquisition

Staff Report to the Butte County Board of Supervisors

October 2021

Butte County Board of Supervisors
Agenda Transmittal

Clerk of the Board Use Only

Agenda Item: 4.07

Subject: Miocene Canal Acquisition Follow Up Discussion

Department: County Counsel and County Administration

Meeting Date Requested: October 26, 2021

Contact: Bruce Alpert/Brian Ring **Phone:** 530.552.3311

Regular Agenda ☒ **Consent Agenda** ☐

Department Summary: *(Information provided in this section will be included on the agenda. Attach explanatory memorandum and other background as necessary).*

The Miocene Canal system is a PG&E hydroelectric water conveyance facility that includes PG&E's Upper Miocene and Middle Miocene Canals and California Water Service's Lower Miocene. The 2018 Camp Fire destroyed the Upper Miocene, thus, preventing water from entering the Miocene Canal system and ceasing hydro-power operations. As the cost of repairs and operation have become a prohibitive factor, PG&E is actively pursuing an entity to acquire the Upper and Middle portions of the Miocene Canal. On June 22, 2021, your Board directed staff to look into three specific questions regarding the potential acquisition of the Miocene canal. Staff are returning with these answers.

Fiscal Impact:

Depending on actions taken, additional funds could be needed.

Personnel Impact:

Depending on actions taken, could require additional staffing resources.

Action Requested:

Provide direction to staff.

Administrative Office Review: Brian Ring, Assistant Chief Administrative Officer

Butte County Administration

Andy Pickett
Chief Administrative Officer

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Oroville, California 95965

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buttecounty.net/administration

MEMORANDUM

DATE: October 26, 2021

TO: Butte County Board of Supervisors

FROM: Brian Ring, Assistant Chief Administrative Officer
Bruce Alpert, County Counsel

RE: Miocene Canal – Preliminary Questions regarding Acquisition

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The Board of Supervisors (Board) asked staff to initially look into three specific questions regarding the Miocene Canal in a preliminary manner prior to any further discussion and analysis on the potential acquisition of such a system. County Counsel engaged the services of long time Butte County outside water attorney, Roger Masuda, to assist in this analysis. In addition, Assistant County Administrative Officer Brian Ring and County Counsel Bruce Alpert had conversations with various representatives of PG&E to assist in the gathering of information to present to the Board. Many previous assumptions on the cost, time frame, and ability of PG&E to repair the Miocene Canal has significantly changed. Prior to reviewing the three questions asked, we feel it's important to share the latest information provided by PG&E representatives on the reconstruction of the Miocene Canal that were discussed during a Miocene Canal stakeholder meeting held on September 20.

Estimated Repair Costs

PG&E previously agreed to in the plea bargain with the District Attorney to pay $15 million to implement a plan to provide water to the residents while a long-term plan is developed. The preferred alternative in a recently completed PG&E engineering study estimated that the repair costs are now $40 to $60 million.

PG&E has already spent $2.1 million on engineering/alternatives analysis, water deliveries to landowners and other costs. There is an apparent disagreement between PG&E and the District Attorney on whether portions of the $2.1 million already spent is to be deducted from the $15 million plea bargain amount.

Estimated Repair Timing

It is now estimated that the environmental review (CEQA and NEPA) along with permitting requirements from CA Department of Fish and Wildlife, U.S. Department of Forestry, endangered species take issues with the yellow legged frog, and various other Clean Water/Storm Water issues could take 2-3 years.

Regarding actual construction, additional issues include obtaining the right of entry onto numerous properties not owned by PG&E to build pads to helicopter in heavy equipment, remove vegetation, cut down approximately 15,000 hazard trees and deal with other logistical issues that would arise. This phase could take another 2-3 years.

Next Steps

PG&E contends that it is not obligated to spend $40 to $60 million to repair the Upper Miocene Canal and upper PG&E management has not made any decision on the increased cost estimate. The District Attorney disagrees and believes that PG&E is obligated to make the repairs at the higher cost.

If the repairs are actually constructed, PG&E estimates a yearly maintenance and operational cost of between $1-$2 million per year and overall costs would exceed revenue.

PG&E, as an alternative solution, has engaged with Del Oro Water to scope the possibility of a traditional pipe based system from a different diversion point to provide water to those landowners with previous contracts with PG&E. There was no real discussion of the environmental issues and those landowners who have historically benefited from the historic leakage of the Miocene Canal. They expect the engineering of the pipe-based system to be finished by the end of 2021 and any construction to take about 2 years.

PG&E also stated that the Miocene Canal was never intended to be a delivery system for agriculture and that a pipeline was more efficient.

The whole framework of the previously discussed cost and repair timeline has been greatly altered. As stated above, Roger Masuda has assisted staff in providing responses to the Board's questions. His detailed report on the Miocene System's Water Rights and Water Uses Pre- and Post-Camp Fire is attached to this staff report. The specific questions and responses are below.

Question No. 1: Whether Butte County can legally acquire and operate a hydroelectric power plant and water conveyance facilities subject to a FERC license exemption?

Yes, however it is most likely not financially feasible in the case of PG&E's Miocene System's two small hydroelectric power plants. PG&E states that the Lime Saddle Powerhouse has a FERC-issued exemption from FERC's hydroelectric licensing requirement. License exemptions have no expiration date. The Coal Canyon Powerhouse has been retired as a result of the 2002 rupture of its penstock which has never been repaired because repairing it is not cost effective. Certain powerhouse equipment has been left in place but it cannot generate electricity without a working penstock.

A licensee may transfer a license to a municipality by jointly or severally fling an application for approval of such transfer and acquisition. See 18 C.F.R. § 16.6(d). Municipality means a city, county, irrigation district, drainage district, or other political subdivision or agency of a State competent under the laws thereof to carry on the business of developing, transmitting, utilizing, or distributing power. See FPA § 796(7).

At FERC, transfer of a small hydropower project with a FERC exemption appears to be a relatively simple process. The FERC Division of Hydropower Administration & Compliance's Compliance Handbook (2015) states, "Transfers of exemptions are not required to be approved by the Commission prior to the transfer. However, an

exemptee must notify the Commission of the transfer or sale of the exemption and must update the contact information. The Commission staff will issue a notice of the transfer of the exemption."

More problematic could be obtaining the California Public Utilities Commission's approval to sell PG&E's Miocene System assets. PG&E claims that the net book value of the Miocene assets as of year-end 2016 was $13,000,000. The CPUC could find that the cost to repair the Upper Miocene Canal should be added to PG&E's net book value. PG&E apparently has no intent to make repairs to the Middle Miocene Canal. Cal Water owns the Lower Miocene (Powers) Canal.

Because of the extensive development of solar power generation in California, today small hydroelectric power plants in mountainous areas are normally revenue negative. For example, the penstock to the 0.9 MW Coal Canyon Powerhouse ruptured in 2002 and PG&E has never repaired it because the projected revenue stream from a repaired powerhouse would not offset the cost of the repair. In addition, unless the Upper Miocene Canal is restored, there will be no water available to generate electricity at the 2.0 MW Lime Saddle Powerhouse. The installed electric generation capacity of PG&E's Miocene System is only 2.9 MW compared to PG&E's DeSabla System of 26.7 MW. In contrast, DWR's Thermalito Pumping-Generating Powerhouse has a 118 MW generating capacity. Pre-Camp Fire, PG&E customers and Cal Water customers were not covering the cost of maintaining the entire Miocene Canal.

Question No. 2: What are the scope and limitations of PG&E water rights?

From the West Branch of the Feather River, PG&E diverts water into its Miocene System and into its DeSabla System. PG&E water rights for the Miocene System are Pre-1914 water rights with a first year of use in 1865. The authorized purposes of uses for the water right are hydropower and for "public service" uses which has historically included municipal, industrial, domestic, and irrigation uses within the Miocene System, including the City of Oroville.

While there have been different estimates of the amount of PG&E Miocene water right, PG&E's water right has a maximum diversion rate of 65 cfs, which is 47,047 AFY [65 cfs x 365 days x 1.983 AF/day]. However, PG&E has never diverted 65 cfs 24/7/365. The maximum annual diversion into the Miocene System was 38,975 AF in 1967. PG&E's maximum annual diversion since 2007 has only been 23,962 AF. The average diversion from 2008 through 2017 at the Miocene Diversion Dam into the Upper Miocene canal was 19,333 AFY, or 50% of the 1967 maximum. The estimated total water used consumptively in the entire Miocene System for 2013 was estimated to be 8,050 AF, or about 42% of the water diverted, and about 58% was canal losses or spills that ended up in Lake Oroville. For 2009, there was an estimated 81% water loss from the Powers Canal. The year 2013 is a relatively good pre-Camp Fire representative year because it was a dry water year so consumptive uses would be higher than during a wet water year. Water that reached the Lime Saddle Powerhouse was used to generate electricity.

In summary, pre-Camp Fire, PG&E was using its water rights for the authorized purposes of uses. Regardless of the maximum amount of PG&E diversion rights, the biggest limitation on PG&E's water rights is that the authorized place of use is limited to the Miocene System. In other words, PG&E's Miocene water rights are tied directly to the Miocene System. Any water not consumptively used within the Miocene System flows into Lake Oroville or the Thermalito Power Canal and is then subject to DWR's water rights. A downstream water right holder, such as DWR, is mainly concerned about increases in consumptive uses by the upstream water right

holder. DWR appears to not be concerned about 8,000 to 9,000 AFY of Miocene Canal consumptive uses because all power water uses not otherwise consumptively used and canal leakage and spills end up in Lake Oroville.

Question No. 3: Is there the ability to wheel or transfer any of PG&E's Pre 1914 water out of the Miocene System for use elsewhere within the county or the State?

Water can be sold or transferred outside of its authorized place of use provided others are not "injured or harmed," which means that any such change would need to be approved by DWR. In addition, if the proposed transfer water were to flow through State Water Project facilities, e.g., Lake Oroville, it would need DWR approval.

Although it has tried, PG&E has not been able to wheel or transfer its Pre 1914 water out of the Miocene System. PG&E and Cal Water previously asked DWR for approval to implement conserved water projects in the Lower Miocene (Powers) Canal and to transfer the resulting conserved water, but DWR objected to proposed projects on environmental grounds so those water conservation projects were never constructed.

DWR has approved Butte County's requests to sell some of the County's Table A water via Lake Oroville to both Cal Water and Del Oro Water Company pursuant to the County's State Water Contract and the settlement terms of an area of origin lawsuit. DWR also approved PG&E's use of Lake Oroville to transport and deliver Miocene water to Cal Water at the Thermalito Power Canal.

Presently there is no infrastructure to facilitate the wheeling or use of PG&E's Pre 1914 water outside of the Miocene System. Any attempt to convey PG&E water outside of the Miocene System or to use Lake Oroville to transfer water is subject to approval by DWR.

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Celebrating our ***101st*** *Anniversary*

September 27, 2021

To: Board of Supervisors, County of Butte
Bruce Alpert, County Counsel
Brian Ring, Assistant CAO

Re: **Preliminary Report on the Miocene System's Water Rights and Water Uses Pre- and Post-Camp Fire**

Under the direction of County Counsel Bruce Alpert, Roger K. Masuda of Griffith, Masuda & Hobbs of Turlock, California, has conducted a preliminary high-level review of the information and documents immediately available on the Miocene System's water rights and water uses pre- and post-Camp Fire. Mr. Masuda has been assisted by Gerald Johns, an expert water consultant who was a career State Water Resources Control Board employee and who later served as a DWR Deputy Director. Mr. Masuda has been special water counsel to Butte County through the County Counsel's Office since 1991.

Reference Maps: Figures 1 - 3 for the Redirected Contract PG&E Water, dated 8/29/2017, prepared by NorthStar Designing Solutions for Butte County.

1. Overview Description of the Miocene System.

1.1. Pre-Camp Fire, West Branch Feather River water is diverted at the Miocene Diversion Dam pursuant to a PG&E pre-1914 water right into the Miocene Canal System. The system is divided into three constructed segments:

1.1.1. Upper Miocene Canal, owned by PG&E, from the Miocene Diversion Dam to Kunkle Reservoir;

1.1.2. Middle Miocene Canal, owned by PG&E, from Kunkle Reservoir to Coal Canyon Powerhouse with Lime Saddle Powerhouse in the middle; and

1.1.3. Lower Miocene Canal, also known as the Powers Canal, owned by Cal Water from the Coal Canyon Powerhouse to Cal Water's Cherokee Reservoir.

1.2. PG&E's 12 water customers; Cal Water's 12 irrigation customers; Cal Water's Oroville District customers: Pre-Camp Fire, in 2018, in addition to generating electricity at the Lime Saddle 2.0 MW Powerhouse, PG&E provided water to 12

customers within the Middle Miocene and delivered water to Cal Water which served 7 of its 12 irrigators within the Lower Miocene (Powers) Canal and some 10,000 people within its Oroville District. Prior to the Camp Fire, there was a fire in the Power Canal that prevented delivery of water to 5 of Cal Water's 12 irrigators. Pre-Camp Fire, a non-State Water Project water wheeling agreement between Butte County and DWR allows Cal Water to take its PG&E water at the Thermalito Power Canal. Consequently, Cal Water Oroville District customers have not been adversely impacted by the Camp Fire.

2. Miocene Canal Water Customers' Rights to Water appear to be Limited to the terms of their respective PG&E or Cal Water contracts and they are not subject to CPUC jurisdiction or protection.

   2.1. The Miocene Canal is an artificial water conveyance structure like the California Aqueduct. Landowners adjoining the canal cannot acquire riparian or appropriative surface water rights because the canal is not a natural stream. Landowners may have acquired a contract right to water because their predecessors in interest granted PG&E or Cal Water the right to construct the canal infrastructure on their lands. However, the PG&E customers would appear to be just contract water users and their right to water from the Miocene Canal is limited by what their respective contracts provide. Both PG&E and Cal Water represent that their respective water contracts only require them to deliver water when it is available at the customer's turnout. We have not reviewed any PG&E or Cal Water contracts, but in the 1986 CPUC decision discussed below in Paragraph 2.2 is a history and description of the various PG&E water service contracts from 1918 to 1980.

   2.2. In 1980, a number of PG&E water customers on the Middle Miocene Canal filed a complaint against PG&E alleging that PG&E has sold irrigation water from its Miocene Canal to complainants or their predecessors in interest and PG&E has dedicated the water to them. The CPUC in its Decision 86-02-016 (February 5, 1986) determined that PG&E's water service "is an accommodation service only" from PG&E's canal "which are dedicated to the production of hydroelectric power." Such "accommodation to neighbors" contracts are "terminable by PG&E and PG&E may unilaterally increase rates for such service. The contracts are exempt from CPUC jurisdiction. Cal Water believes that their irrigation customers are also exempt from CPUC jurisdiction.

3. PG&E's Water Rights and Uses.

   3.1. PG&E water rights for the Miocene System are recognized as Pre-1914 water rights with 1865 being the first diversion year. PG&E has filed with the State Water Resources Control Board two different Statements of Water Diversion and Use for these water rights since 1966. Those filing are S000892 and S000916. The diversions from the West Branch of the Feather River at the Miocene Diversion Dam have been summarized each year under S000892. The

S000916 is a relatively small diversion of about 0.3 cfs or about 100 AF per year from an unnamed tributary to the West Branch of the Feather River along the Upper Miocene Canal. During 1905-1906, the Oro W.L. and P Company started construction of the Lime Saddle Powerhouse and rehabilitated and enlarged the Miocene Canal. This water right is dedicated for hydro power and use for "public service" which has historically included municipal, industrial and irrigation uses. PG&E later acquired this right and claims a water right of between 60-65 cfs diverted at the Miocene Diversion Dam. A 60 cfs diversion right equals 43,428 AFY; however, as discussed below, PG&E's average diversion from 2008 through 2017 was only 19,333 AFY.

As discussed below, a key limitation on where PG&E can use it Miocene water right is that the authorized place of use for its water rights is limited to the Miocene System. We don't know to what extent (if any) PG&E has been able to divert some Miocene System water to its DeSabla System. We have not heard of any DWR protests in that regard.

Note: Neither of PG&E's pre-1914 water rights have been curtailed under the SWRCB's August 20, 2021 Delta Watershed Curtailment Order.

3.2. During the 20 years before the Camp Fire (1998 through 2017), PG&E reported diversions under S000892 at the Miocene Diversion Dam into the Miocene System of up to 29,400 AF (in 1999 a Wet water year). Since 1966, the maximum amount of water PG&E has reported to the SWRCB is 38,975 AF in 1967 a Wet year. Diversions under S000916 add only about an additional 100 AF/Y.

3.3. Estimate of Historical Miocene System's Available Water, Consumptive Uses, and Losses.

3.3.1. Based upon the information gathered thus far, the maximum pre-Camp Fire consumptive uses estimated for around 2013, as an example, were as follows: PG&E's 12 water users, 3,700 AF; Cal Water Oroville District, 3,000 AF; and Cal Water 12 irrigators, 1,350 AF, for total of 8,050 AFY.

3.3.2. PG&E's 10-year average diversion from 2008 through 2017 at the Miocene Diversion Dam into the Upper Miocene Canal plus the 100 AFY from PG&E's other pre-1914 right equals 19,333 AFY. 8,050/19,333 = 42%. 19,333-8,050 = 11,283/19,333 = 58%.

3.3.3. Based upon the above estimates, a maximum of 8,050 AFY or about 42% of the water diverted was used consumptively, and approximately 11,283 AFY or 58% was canal losses or spills. Water that reached the Lime Saddle Powerhouse was used for power generation and then either returned to the canal or surplus water discharged into Lake Oroville through an unnamed channel. Water returned to the canal were used consumptively or ended up

as Middle or Lower Miocene canal losses. The Coal Canyon Powerhouse's ruptured penstock in 2002 prevented any generation there.

3.3.4. The 11,283 AFY loss number is for the entire Miocene Canal and is a high-level back-of-the-envelope estimate number. As discussed in Paragraph 7.3.2 below, for 2009, Cal Water estimated that about 7,000 AF was either consumptively used or lost within the Powers Canal. Since only a maximum of 1,350 AF was reportedly delivered to its 12 irrigation customers, 5,650 AF or 81% was lost from the Powers Canal, which interestingly is 50% of the estimated 11,283 AFY total average Miocene System losses

3.4. Pre-Camp Fire, the Middle and Lower Miocene Canal sections reportedly had very high seepage losses. In a 2010 study by MBK Engineers for PG&E and Cal Water, the Lower Miocene (Powers) Canal was described as

"a gently sloping, predominantly unlined earthen canal from Coal Canyon Powerhouse to Cherokee Reservoir. Although the length of the canal metal and wooden flumes carry water over several small creeks and drainages. Although some of the flumes have been repaired or replaced; several of these structure date back to the historic mining era of the mid 1800's."

Leakage and overtopping of canals and structures were observed. Losses would also include PG&E and Cal Water "regulating" the Middle Canal and the Lower Canal, respectively, by discharging "excess" flows into unnamed creeks. Subject to further study, Miocene Canal losses and/or consumptive uses appear to have increased over time prior to the Camp Fire.

3.5. Non-consumptive Power Uses. Before the Camp Fire, PG&E was not generating electricity at the Coal Canyon Powerhouse because the penstock ruptured in 2002 and had not been repaired. The Lime Saddle Powerhouse is only a 2.0 MW plant and is not generating post-Camp Fire.

3.6. PG&E's Consumptive Water Uses. PG&E had no customers along the Upper Miocene Canal. PG&E had 4 turnouts located immediately downstream of the Kunkle Reservoir and 8 located south of Lime Saddle Road, for a total of 12 contract water customers. PG&E reports that it has a maximum contractual obligation to deliver just under 3,700 AFY to the 12 customers, but only if and when water is available. See Paragraph 2.2 above on PG&E's water service contracts.

3.7. Annual Operation and Maintenance Costs. PG&E estimates that after the Upper Miocene Canal is fixed, it will cost PG&E approximately $1 to $2 million per year to operate and maintain the Upper and Middle Miocene Canals. Given the abundance of solar energy in California today, it would seem probable that operating the small 2 MW Lime Saddle PH would not be economically feasible

as a stand-alone power generator. Subject to further investigation and based upon Cal Water's experience, there is a major question whether the California Public Utilities Commission would allow PG&E to include in its rates the costs to operate and maintain the Upper and Middle Miocene System. See Action II, Operations and Maintenance, page 4 in Paul Gosselin's April 9, 2019 Memorandum to the Butte County Board of Supervisors, concluding that "Reliance on PG&E and any future owner of Miocene facility to maintain and repair the system is not practicable."

4. Cal Water's Contract Water Right and Uses.

4.1. Since 1927, Cal Water has a contract right to all PG&E water discharged into the Lower Miocene (Powers Canal) as a result of the PG&E's operation of the Coal Canyon Powerhouse. That is nominally 33,000 AFY, but Cal Water's Oroville District's municipal and industrial (M&I) water demand in 2020 was only 2,753 AF. Cal Water Oroville District service area population in 2020 was 10,849. Prior to the Camp Fire, Cal Water had also supplied irrigation water to up to 12 customers along the Lower Miocene Canal but those customers are not within Cal Water's CPUC-designated water service area.

4.2. Butte County's Water Wheeling Agreement with DWR. Before the Camp Fire, Butte County negotiated an agreement with DWR to transport up to 3,000 AFY of Cal Water's non-State Water Project water (i.e., PG&E water) through Lake Oroville to the Thermalito Power Canal where Cal Water diverts the water for M&I uses within its Oroville District service area. That agreement is in effect through December 2027 with an option to renew on a ten-year rotating basis. Cal Water also diverts its Butte County Table A from the Thermalito Power Canal. Because Cal Water now diverts all of its PG&E and Butte County Table A water from the Thermalito Power Canal, Cal Water has no need for its Lower Miocene (Powers) Canal. Cal Water would like this arrangement to become a permanent arrangement. DWR benefits from this wheeling agreement because the water can now be used to generate electricity at DWR's Hyatt Power Plant.

4.3. Cal Water's Non-Oroville Customers along the Lower Miocene/Powers Canal. If Butte County's water wheeling agreement with DWR can be made permanent, then Cal Water would only need the Miocene Canal to deliver irrigation water to 7 of its 12 customers along the Lower Miocene/Powers Canal. The 7 include a commercial olive orchard operation, a silica miner, a cattle operation, and 4 smaller irrigators.

The other 5 customers are smaller irrigators who were cut off from water when there was a fire within the lower Power Canal section before the Camp Fire. That section has not been fixed because Cal Water estimates that the fix would cost an estimated $1 million. As discussed in Paragraph 7.3 below, in CPUC Decision 09-06-036 issued June 18, 2009, PG&E agreed to fix the Coal Canyon Powerhouse penstock and Cal Water agreed to fix the Powers Canal. The

conserved water saved was to be sold and the proceeds from the water sale was to be used to pay for both fixes. Without this outside funding source, Cal Water believes that the CPUC would not allow Cal Water to add such costs to its Oroville District M&I customers' water rates because that would result in the M&I customers subsidizing the irrigation customers. However, neither the fixes nor the water sale has been accomplished.

4.4. In Cal Water's 2010 Urban Water Management Plan for the Oroville District, it estimated that approximately 1,350 AFY was delivered to its 12 irrigation customers.

5. Current Status of the Miocene Canal System, the estimate time and cost to rebuild the Upper Miocene Canal, and Miocene Canal water losses and the estimated annual operation and maintenance costs after rebuild.

5.1. The 2018 Camp Fire destroyed the water conveyance capacity of the Upper Miocene Canal. The Upper Miocene is critical to delivering diverted West Branch Feather River water to the power and consumptive uses within the Middle and Lower Miocene. PG&E has no customers on the Upper Miocene.

5.1.1. Post-Camp Fire, PG&E cannot generate electricity at the 2.0 MW Lime Saddle Powerhouse. PG&E has not been able to generate electricity at the Coal Canyon Powerhouse since the penstock ruptured in 2002. PG&E has never repaired the penstock because the estimated repair cost exceeded the projected revenue generation potential of a repaired powerhouse. Small hydroelectric power plants today cannot typically compete with the extensive solar power generation developed within California.

5.1.2. Now PG&E cannot deliver water to its 12 water customers. However, during the spring of 2020, PG&E was able to deliver a limited amount of water to 3 of its customers from the natural inflow into the Kunkle Reservoir. However, this is not a reliable source of water.

5.1.3. Now Cal Water cannot deliver to the 7 irrigators who were receiving water immediately prior to the Camp Fire.

5.1.4. Because Cal Water now receives both its PG&E contract water and Butte County's Table A water at the Thermalito Power Canal, Cal Water Oroville District customers should continue to receive their normal allocation of water.

5.2. PG&E's estimated time and estimated cost to rebuild the Upper Miocene Canal.

5.2.1. PG&E estimates that it will take 2 to 3 years to perform the necessary on-site environmental surveys and prepare an environmental impact report.

5.2.2. PG&E has very limited land rights and rights to access land within the Upper Miocene corridor. PG&E will need to obtain access rights to perform on-site environmental surveys as well as to bring in heavy equipment and to haul in materials and haul out spoils.

5.2.3. Once PG&E completes all required environmental reviews and assuming that no lawsuits are filed, PG&E estimates that it would take an additional 2 to 3 years to complete construction. In other words, the total estimated time to accomplish a rebuild could take 4 to 6 years from the start of the environmental review process.

5.2.4. We understand that PG&E's estimate to rebuild the Upper Miocene Canal, including all permitting and environment work, is now between $40 to $60 million.

5.3. Canal water losses and the estimated annual operation and maintenance costs after rebuild.

5.3.1. Rebuilding the Upper Miocene Canal should substantially reduce canal leakage from the Upper Miocene Canal. Not knowing the geography and geology of the Upper Miocene corridor, it is unknown what environmental impacts (if any) will occur by eliminating canal leakage. This presumably will be addressed in the environmental review of the rebuilt.

5.3.2. Upper Miocene Canal rebuild does not have any additional money allocated for repairs to the Middle Miocene Canal that could reduce substantial canal water losses. Pre-Camp Fire, PG&E estimates Middle Miocene Canal losses of from 30% to 75%.

5.3.3. PG&E now estimates annual maintenance costs of about $1 to $2 million for the Middle Miocene Canal and what presumably would be a new Upper Miocene Canal. It is not known how much electricity has been generated at the Lime Saddle Powerhouse but it is highly doubtful that the value of the power generated less LSPH costs would offset even a significant portion of those O&M costs given the abundance of solar power in California.

6. Permanent Fixes Not Involving Rebuilding the Upper Miocene Canal Studied by PG&E.

6.1. PG&E retained Luhdorff & Scalmanini, Consulting Engineers, to prepare a Technical Memorandum dated September 16, 2020, on "Miocene Canal Water Delivery Project Conceptual Project Options" to study temporary and permanent water delivery fixes that did not involve rebuilding the Upper Miocene Canal. The fixes do not appear to supply sufficient water to generate power at the Lime Saddle Powerhouse.

6.2. The three long-term non-Upper Miocene Canal fixes are described as follows:

(a) Option 4: Replacing Del Oro Water Company's existing Lake Oroville intake pumps at Lime Saddle Marina with higher capacity pumps and then discharging the raw lake water into the Miocene Canal Turnout to serve 8 PG&E turnouts located south of Lime Saddle Road and downstream of the proposed connection to the canal.

(b) Option 5: Option 4 with the addition of discharging treated water from Paradise Irrigation District into Kunkle Reservoir to serve the 4 PG&E turnouts located immediately downstream of Kunkle reservoir. This fix would result in all 12 pre-Camp Fire PG&E customers being served.

(c) Option 6: Install 2 new separate intakes at Lime Saddle Marina and discharge raw lake water into the Miocene Canal Turnout. The difference between Option 6 and Option 4 is that under Option 6, PG&E would own and operate the 2 new intake pumps and the separate pipeline to the canal.

Planning level estimates of the capital costs of just building each option are as follows: Option 4, $5,943,000; Option 5, $6,845,000; and Option 6, $7,664,000.

6.3. We do not know the status of stakeholder review and discussions with PG&E on these options. The three options would also allow for delivery of irrigation water to at least 7 of Cal Water's Lower Miocene Canal customers.

6.4. Based upon pre-Camp Fire, water consumption estimates for PG&E's 12 water users of 3,700 AFY and Cal Water's 12 irrigators of 1,350 AFY, for a total of 5,050 AFY and assuming a 50% canal leakage factor, a very rough estimate of approximately 10,000 AFY would need to be diverted at the Lime Saddle Marina and supplied by Paradise ID via the Kunkle Reservoir. Luhdorff & Scalmanini's report in Table 3.2 estimates that maximum anticipated flow for Option 5 is 10,200 AFY. Cal Water's 3,000 AFY Oroville District would be supplied via Lake Oroville and the Thermalito Power Tunnel.

6.5. A Very Rough Calculation: Assuming the Option 5 permanent fix, average West Branch Feather River flow at the Upper Miocene Diversion Dam of 25,000 AFY, diversions at the Lime Saddle Marina of 10,000 AFY to meet approximately 5,000 AFY consumptive demand, and Middle and Lower Miocene consumptive uses of 8,000 AFY, then approximately 15,000 AFY would flow passed Lime Saddle Marina consisting of 3,000 AFY for Cal Water's Oroville District. Approximately 12,000 AFY would flow directly to Oroville Dam for DWR's direct benefit. Approximately 5,000 AFY diverted at the Lime Saddle Marina would end up in Lake Oroville or the environment from canal leakage and spills.

6.6. The three long-term fixes do not appear to contain any additional funds to reduce canal losses within the Middle Miocene Canal.

7. Are there opportunities to conserve water along the Miocene Canal System?

7.1. Pre-Camp Fire Miocene Canal Water Operations. As discussed in Paragraph 3.3 above, if you look at a period of time before the Camp Fire and before the fire in the lower Powers Canal, when some water use and loss estimates are available, there was (a) an estimated average amount of water diverted into the Miocene System under PG&E's two pre-1914 water rights of 19,333 AFY (2008-2017 average); (b) maximum consumptive uses within the entire system of 8,050 AFY; and (c) resulting in canal losses and spills of 11,283 AFY or about 58% of the available PG&E water.

7.2. Water for delivery to meet Upper and Middle Miocene Canal pre-Camp Fire consumptive uses and Lime Saddle PH generation would be restored if and when PG&E rebuilds the Upper Miocene Canal section. The amount of West Branch Feather River water that PG&E diverts into the Miocene System should be available to meet future consumptive demands in the Upper and Middle Miocene and in the Lower Miocene before Cal Water's Oroville District M&I service area. This assumes that already substantial amount of leakage, spills, and other non-consumptive losses from the Miocene System do not increase and funds are available to pay for required annual operation and maintenance expenses of the system.

7.3. The Problem of Quantifying the Amount of Water Saved through Water Conservation Projects has already been studied by PG&E and Cal Water for the Lower Miocene (Powers) Canal.

7.3.1. CPUC's Decision 09-06-036 issued June 18, 2009, approved the Cal Water/PG&E Second Amendment to Contract and Supplemental Agreement for Water Supplied from the Miocene Canal. In that agreement, PG&E was to repair the Coal Canyon Powerhouse penstock, which ruptured in 2002, preventing the direct delivery of water from the Middle Miocene Canal into the Lower Miocene (Powers) Canal owned by Cal Water. PG&E estimated that the repair costs for Middle Miocene Canal at $1,827,000. Cal Water agreed to repair and minimize water losses along the Powers Canal at an estimated cost of $1,060,050. Funding for those repairs would come from the sale or transfer by the parties of "Conservation Water," which was defined as the "increase in available water that is attributable to the parties' repairs to the Coal Canyon Penstock and the Powers canal."

7.3.2. Cal Water estimated that the difference in the amount of the water delivered by PG&E at the top of the Powers Canal and Cal Water's measurement of water at the end of the Powers Canal amounted to a difference of about 7,000 AFY, which included water delivered to Cal

Water's 12 water customers. Cal Water estimated in its 2010 Urban Water Management Plan that the maximum amount of water delivered to Cal Water's 12 customers was 1,350 AFY, or an estimated net 5,650 AFY after consumptive uses, or 81%, in losses (5,650/7000).

7.3.3. The difficult problem was to determine the amount of water leaving a 9-mile stretch of the Powers Canal. Cal Water's witness testified that Cal Water did not know where the water is leaving the system. PG&E and Cal Water had MBK Engineers of Sacramento do an on-the-ground investigation of the entire length of the Powers Canal. MBK prepared a preliminary report for the CPUC proceeding and prepared a Lower Miocene (Powers) Canal Final Report dated February 8, 2010. MBK installed various measuring devices but data obtained was limited to only a 21-day period from September 21 to October 11, 2009. The report recommended a number of steps that were needed to be taken to further document water use, potential water savings, and conservation projects to be built along the Powers Canal. In other words, you need to first accurately locate, identify, and measure canal losses, design projects to eliminate or substantially reduce the losses, and then document flows conditions before and after the project is built. Projects could include concrete lining sections of the canal, installing pipelines to replace existing open canals, lining or replacing existing leaking flume structures, eradicate or control weed growth within or along the canal, reduce cattle access to the canal to provide damage to canal banks, and install flow meters.

7.3.4. The need for water flow and baseline data. The foundational element in any water conservation project is the collection and analysis of metered or measured baseline data of water flows and losses and identifying where and how losses are occurring within the conveyance system being studied. It is from this baseline that water savings through proposed conservation projects can be measured. The 2009 field studies performed by MBK provide some baseline information but conditions have changed over the last 11 years with the fire in the lower Powers Canal preventing any water flow to Cal Water's Cherokee Reservoir and no water flow in the entire Powers Canal since the Camp Fire. Until flows are restored in the Middle Miocene Canal and Lower Miocene (Powers) Canal, no baseline data can be collected.

7.3.5. Water Code Section 1011(a) states, "When any person entitled to the use of water under an appropriative right fails to use all or any part of the water because of water conservation efforts, any cessation or reduction in the use of the appropriated water shall be deemed equivalent to a reasonable beneficial use of water to the extent of the cessation or reduction in use. . . . For purposes of this section, the term 'water conservation' shall mean the use of less water to accomplish the same purpose or purposes of use

allowed under the existing appropriative right."

7.3.6. Water Code Section 1011(b) states, "Water, or the right to the use of water, the use of which has ceased or been reduced as the result of water conservation efforts as described in subdivision (a), may be sold, leased, exchanged, or otherwise transferred pursuant to any provision of law relating to the transfer of water or water rights, including, but not limited to, provisions of law governing any change in point of diversion, place of use, and purpose of use due to the transfer."

8. Could conserved Miocene Canal water be sold or transferred elsewhere for use within Butte County and could all required approvals be obtained?

8.1. The obstacle to a transfer of pre-1914 water is Water Code Section 1706, which states, "The person entitled to the use of water by virtue of [a pre-1914 right] . . . may change the point of diversion, place of use, or purpose of use ***if others are not injured by such change***, and may extend the ditch, flume, pipe, or aqueduct by which the diversion is made to places beyond that where the first use was made." [Emphasis added.] The problem with the PG&E/Cal Water Conservation Water plan was identified by a Cal Water witness who stated, "if the water's leaving the system and going directly back into the Sacramento River, it is essentially of no value from a legal standpoint because the State Water Project which controls the Sacramento River . . . they are getting it already. Why would they let us sell it again [?]" [The reference is presumably to the Feather River and not the Sacramento River.]

8.2. Cal Water reports that no water conservation projects were ever built because DWR's position was that the resulting loss of environmental benefits from canal leakage (including recharge) and DWR would object to any canal lining projects. DWR's position was also expressed in an email exchange in September 2020 between DWR and PG&E in which Paul Gosselin was cc'ed, wherein the DWR representative stated, "The Department of Water Resources (DWR) needs to make sure that the changes [to the Miocene System] will cause no injury to DWR and others."

8.3. Any plan to move surplus or conserved Miocene System water outside of the Miocene System, which is the authorized place of use for that water, will need to obtain DWR's approval. Also, any conveyance of non-DWR water via Lake Oroville would need DWR's approval. Butte County was able to get DWR's agreement on PG&E wheeling water via Lake Oroville and the Thermalito Power Canal to Cal Water. Using Lake Oroville to wheel water for sale for use elsewhere would very likely face DWR's opposition.

9. Preliminary Observations based upon the information assembled and analyzed thus far.

9.1. If DWR agrees to allow Cal Water to permanently take its PG&E water at the Thermalito Power Canal, Cal Water could indefinitely provide water to its 10,800+ Oroville District M&I customers via the Thermalito Power Canal. In other words, the largest consumptive user of water in the Miocene System would no longer need the Miocene System except to make irrigation deliveries to 7 of its 12 irrigation customers. Cal Water would still need to fix the fire damaged section of the lower Powers Canal to be able to deliver water to the other 5 customers.

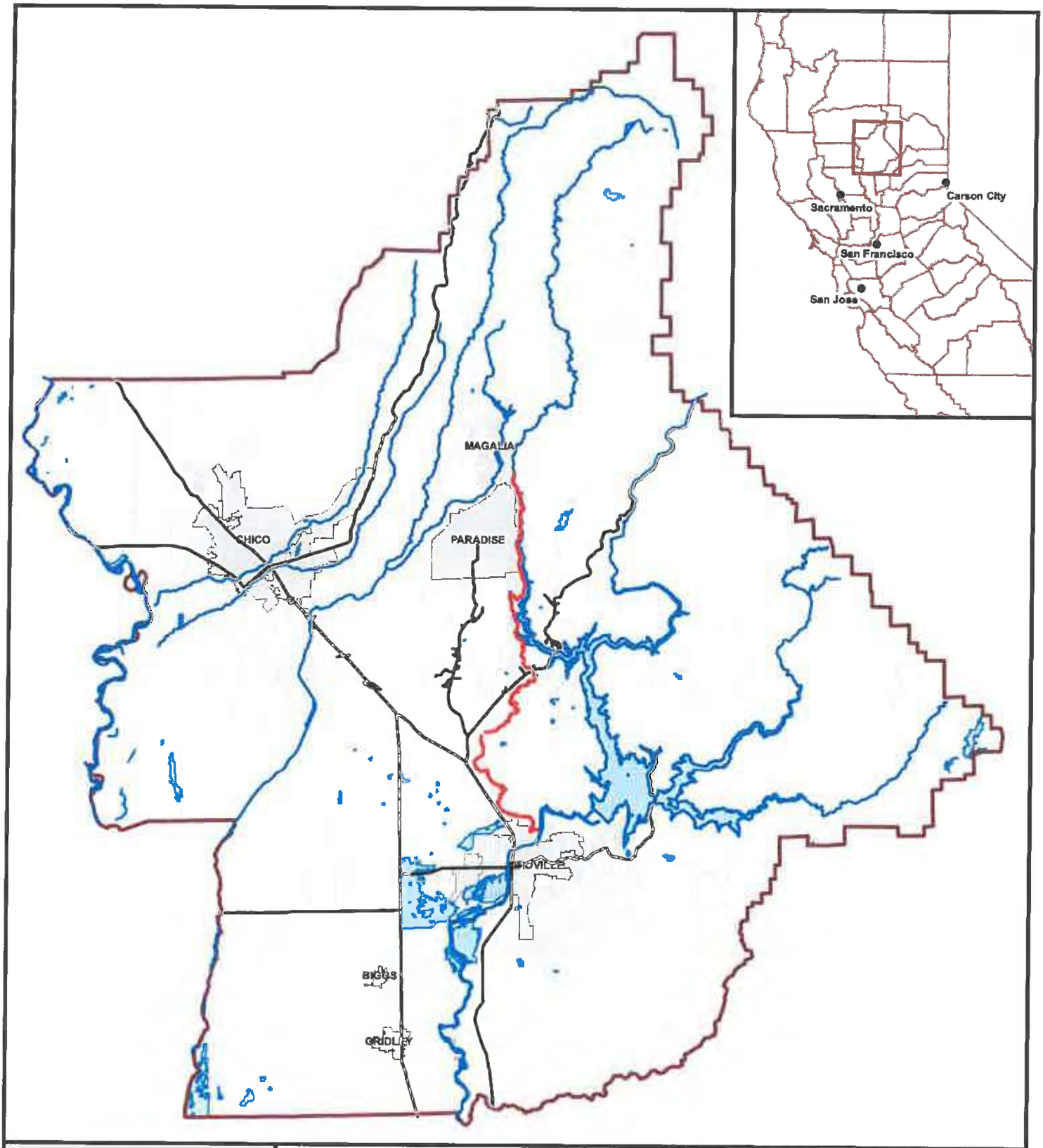
9.2. None of PG&E's 12 water customers on the Middle Miocene and Cal Water's 12 irrigation customers on the Lower Miocene (Powers) Canal can get regular deliveries of water unless and until the Upper Miocene Canal is rebuilt or another non-Upper Miocene alternative is permanently built to serve them.

9.3. Conserved water projects require a lot of on-site baseline data collection before and after a project is built, environmental review, funding of the capital costs to build the project, and the physical and legal means to get the water to the buyer. PG&E and Cal Water's effort with attempting to develop water conservation projects on the Lower Miocene (Powers) Canal is instructive of the effort and the costs and obstacles involved. No such conserved water projects have been developed over the last 10 years because of opposition by DWR on environmental grounds.

Respectfully submitted by

Roger K. Masuda

Roger K. Masuda
Griffith, Masuda & Hobbs



Legend

- Project Area
- Butte County Boundary
- Butte County Roads
- CA City/Town Limits
- CA Lakes and Resevoirs
- CA Major Streams

Miles

0 3.5 7 14

1 inch = 7 miles (printed at 8.5 x 11)

Data Sources:
BCAG and Caltrans

Map Date:	Drawn By:	NSE Project #
8-29-2017	CJW	17-107

Figure 1: Project Location

Redirected Contract PG&E Water

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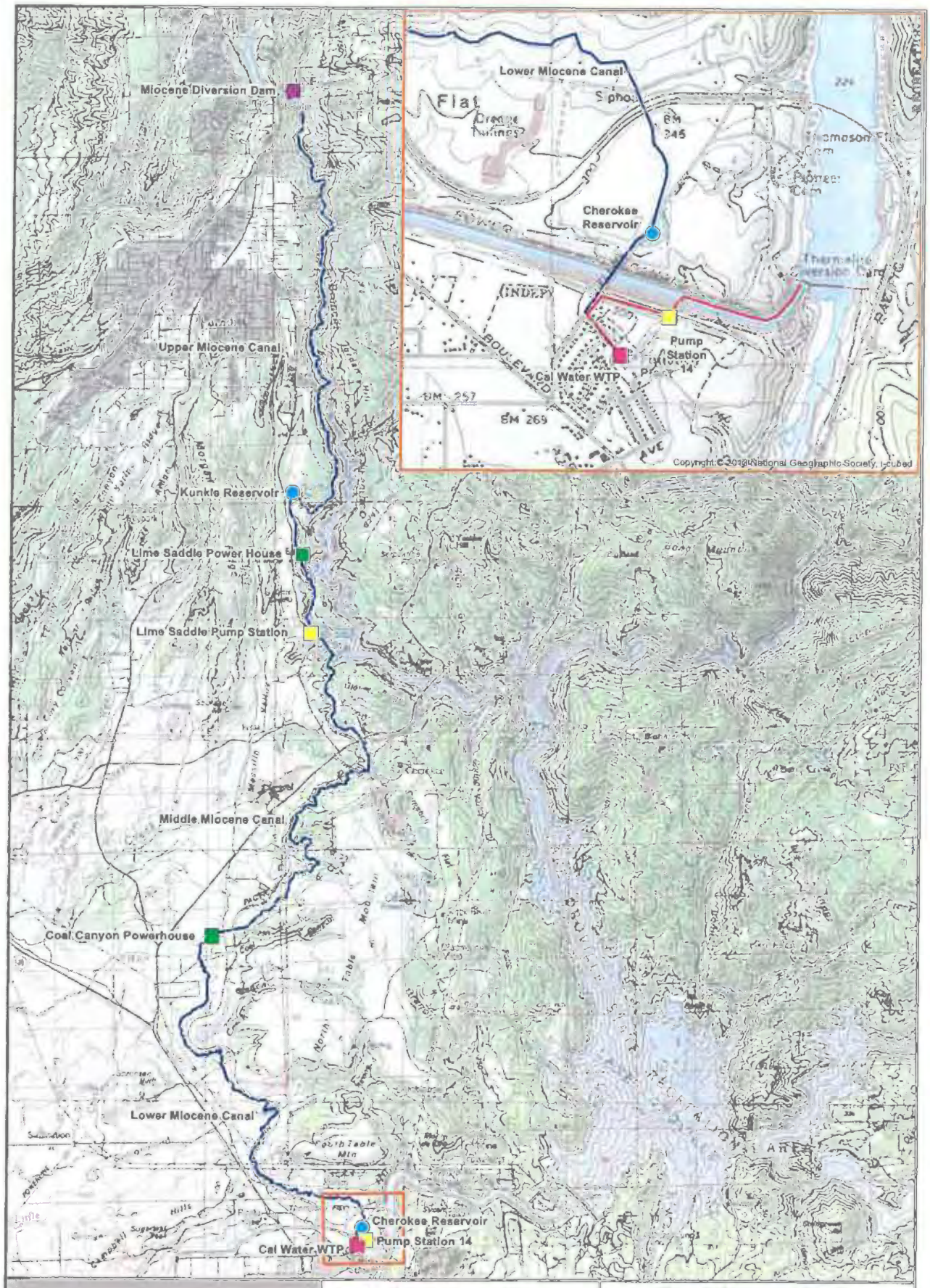

Legend

- Miocene Canal Facility
- Redirected Route
- Reservoir
- Water Treatment Plant
- Diversion Dam
- Pump Station
- Powerhouse

0 0.5 1 2 3 Miles

1 inch = 1.5 miles (printed at 11 x 17)

Imagery Source: USGS Topo
Inset Imagery: National Geographic
Facility Data Provided By: Cal Water / PG&E

Within Sections 30-31 of T23N R4E; 6-8, 18, 19, & 30-32 of T22N R4E; 6, 7, 18-20, & 29-31 of T21N R4E; 6, 12, 14, 25, 26, & 31 of T20N R3E; 36 of T19N R4E; 5 & 8 of T19N R4E
Paradise East, Cherokee, and Oroville USGS 7.5' Quads (listed North to South)

Map Date: 8-29-2017 | Drawn By: CJW | NSE Project #17-107

Figure 2: Conveyance Facilities for Contract PG&E Water

Re-Directed Contract PG&E Water

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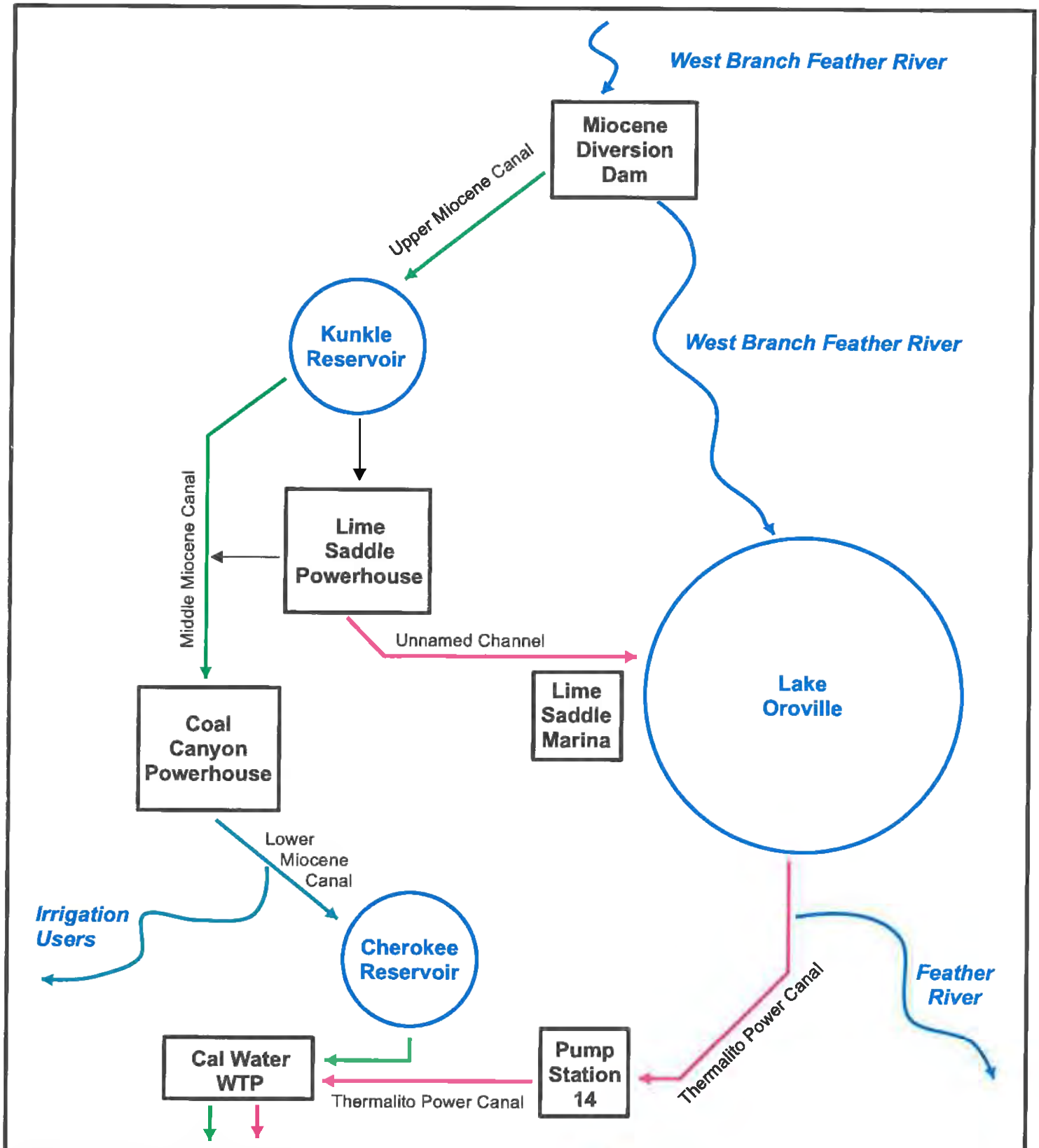

Legend

- Existing Water Route
- Proposed Water Route
- Natural Waterway
- Water Body
- Facility

Figure 3:

Conveyance Schematic

Redirected Contract
PG&E Water

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